

Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department



# Course Description

University of Al-Hamdaniya / College of Education for Pure  
Sciences / Department of Physics

Signature:

Head of Department Name:

Dr. Abdulrahman Ismael Ahmed

Date: 23/9/2024

Signature:

Scientific Associate Name:

Dhafer Sabah Yassin

Date: 23/9/2024

2025-2024



Dr. Ridwan Nubarak

## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>1. Course name:</b>                                                          |
| Educational and Developmental Psychology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>2. Course code:</b>                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | HAEPSPH-106                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>3. Semester/Year:</b>                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2024-2025-1st                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>4. Date of preparation of this description:</b>                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 09/21/2024                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>5. Available forms of attendance:</b>                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | In-person education                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>6. Number of study hours (total) / Number of units (total)</b>               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 60 hours / (4) units                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>7. Name of the course administrator (if more than one name is mentioned)</b> |
| Name: Selvana Faris khudhu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                 |
| Email : selvanafaris@uohamdniya.edu.iq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>8. Course objectives</b>                                                     |
| <p style="text-align: center;"><b>The course aims to introduce students to:</b></p> <p><b>Educational psychology, its concept and objectives. –1</b></p> <p><b>The concept of learning, its applications, theories and educational applications and role in the educational process. –2</b></p> <p><b>Information processing theory and its educational applications. –3</b></p> <p><b>Transfer of learning, its types, feedback and its importance for learners. –4</b></p> <p><b>Motivation: definition, functions, types, theories and Teaching. –5</b></p> <p><b>Problem solving, problem definition, learning problem solving skills. –6</b></p> <p><b>Historical background For Learning by computer programs, its principles and effectiveness in A Learning process. –7</b></p> <p><b>The concept of developmental psychology. –8</b></p> | <p><b>Course objectives</b></p>                                                 |



|                                                                           |                         |                           |                                                                                                                                              |       |            |
|---------------------------------------------------------------------------|-------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| with meAThe stages of language development. –9                            |                         |                           |                                                                                                                                              |       |            |
| Stages of human cognitive development. –10                                |                         |                           |                                                                                                                                              |       |            |
| Stages of the emergence of theAHuman. –11                                 |                         |                           |                                                                                                                                              |       |            |
| theDistinguish between branches of developmental –12                      |                         |                           |                                                                                                                                              |       |            |
| psychology.                                                               |                         |                           |                                                                                                                                              |       |            |
| 9. Teaching and learning strategies                                       |                         |                           |                                                                                                                                              |       |            |
| The lecture. -                                                            |                         |                           |                                                                                                                                              |       |            |
| Discussion. -                                                             |                         |                           |                                                                                                                                              |       |            |
| Brainstorming. -                                                          |                         |                           |                                                                                                                                              |       |            |
| Cooperative groups. -                                                     |                         |                           |                                                                                                                                              |       |            |
| Self-learning. -                                                          |                         |                           |                                                                                                                                              |       |            |
| Homework and its submission in class by students -                        |                         |                           |                                                                                                                                              |       |            |
| Use of educational tools: -                                               |                         |                           |                                                                                                                                              |       |            |
| Science books, blackboard, colored pencils, slide projector (PowerPoint). |                         |                           |                                                                                                                                              |       |            |
| 10. Course structure                                                      |                         |                           |                                                                                                                                              |       |            |
| Evaluation method                                                         | Learning method         | Name of the unit or topic | Required learning outcomes                                                                                                                   | hours | week       |
| Feedback via direct questions                                             | Lecture and discussion  | Educational Psychology    | Introducing students to:<br>Educational Psychology: Definition, Historical Development<br>Goals, fields and topics of educational psychology | 2     | the first  |
| Feedback via direct questions                                             | Lecture, discussion     | Educational Psychology    | Educational objectives, their levels, and their formulation<br>Learning and teaching: concept, nature of the learning process                | 2     | the second |
| Feedback via direct questions                                             | Lecture and discussion, | Educational               | Its characteristics<br>The difference                                                                                                        | 2     | the third  |



|                                             |                                                     |                        |                                                                                                                                                                                                                          |   |            |
|---------------------------------------------|-----------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------|
|                                             | brainstorming methods                               | Psychology             | between learning and teaching                                                                                                                                                                                            |   |            |
| Feedback via direct questions               | Lecture and discussion                              | Educational Psychology | Factors affecting learning<br>Learning and teaching theories and their educational applications                                                                                                                          | 2 | Fourth     |
| Feedback via direct questions               | Lecture, discussion and brainstorming techniques    | Educational Psychology | Theories: Thorndike, Pavlov, Skinner, Gestalt                                                                                                                                                                            | 2 | Fifth      |
| Feedback via direct questions               | Lecture and discussion, methods of scientific doubt | Educational Psychology | social learning theory<br>Cognitive learning theory                                                                                                                                                                      | 2 | Sixth      |
| Feedback via direct questions               | Lecture, discussion and brainstorming techniques    | First month exam       | First month exam                                                                                                                                                                                                         | 2 | Seventh    |
| Feedback through questions<br>Direct<br>Rah | Lecture, discussion and brainstorming mental        | Educational Psychology | Remembering and forgetting<br>Memory and its types                                                                                                                                                                       | 2 | The eighth |
| Feedback via direct questions               | Lecture and discussion<br>brainstorming methods     | Educational Psychology | Theories explaining forgetting<br>Strategies to help with memorization and recall, applications in acquisition and retention                                                                                             | 2 | Ninth      |
| Extracurricular activities                  | Discussion sessions                                 | Educational Psychology | Information Processing Theory, Applications of Theory<br>Transfer of learning: definition and types                                                                                                                      | 2 | tenth      |
| Feedback via direct questions               | Lecture, discussion and dialogue                    | Educational Psychology | His educational theories and applications, assistive technologies<br>It is said after learning<br>Learning concepts: definition of the concept, nature of its components, influencing factors<br>In concept acquisition, | 2 | eleventh   |



|                               |                                              |                          |                                                                                                                                                                                              |   |                  |
|-------------------------------|----------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------|
|                               |                                              |                          | concept acquisition theories.                                                                                                                                                                |   |                  |
| Feedback via direct questions | Lecture and discussion brainstorming methods | Educational Psychology   | Thinking, its concept, creative thinking, learning skills and habits, motivation and classroom interaction, feedback: its definition, types, educational applications, practical application | 2 | twelfth          |
| Feedback via direct questions | Lecture and discussion cooperative learning  | Educational Psychology   | Problem solving Programs for teaching problem solving, practical application                                                                                                                 | 2 | thirteenth       |
| Feedback via direct questions | Lecture and discussion                       | Second month exam        | Second month exam                                                                                                                                                                            | 2 | fourteenth       |
| Feedback via direct questions | Lecture and discussion                       | Educational Psychology   | Computerized e-learning                                                                                                                                                                      | 2 | fifteenth        |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Developmental Psychology: Definition, Importance, Meaning of Development General laws (principles) of growth                                                                                 | 2 | Week 16          |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Factors affecting growth Genetic factors - environmental factors                                                                                                                             | 2 | Seventeenth week |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Research Methods in Developmental Psychology Research: longitudinal, cross-sectional, experimental, correlational.                                                                           | 2 | Eighteenth week  |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Childhood Its definition, importance, and stages                                                                                                                                             | 2 | Nineteenth week  |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Mental and language development Social and Emotional Development - Moral Development                                                                                                         | 2 | Week twentieth   |



|                               |                                                  |                          |                                                                                                                                                                                    |   |                   |
|-------------------------------|--------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------|
| Feedback via direct questions | Brainstorming, discussion and lecture techniques | Developmental Psychology | The role of social institutions in the socialization of children<br><br>Family, school, peers, media                                                                               | 2 | Week twenty-one   |
| Feedback via direct questions | Monthly exam                                     | First month exam         | First month exam                                                                                                                                                                   | 2 | Week twenty-two   |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Adolescence: Definition, Importance, Stages, and Mental Development<br>Cognitive, social and emotional development, moral development                                              | 2 | Week twenty-three |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Adolescent and society                                                                                                                                                             | 2 | Week twenty-four  |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Teenagers and Careers: The Importance of Work in Teenagers' Life.<br><br>The importance of choosing a career and the factors influencing it... Teenagers' compatibility with work. | 2 | Week twenty-five  |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Adolescent trends and tendencies<br><br>The importance of tendencies and trends                                                                                                    | 2 | Week 26           |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Sources of acquisition of tendencies and trends<br><br>Factors affecting adolescents' attitudes and tendencies                                                                     | 2 | Week 27           |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Some adolescent problems-academic delay                                                                                                                                            | 2 | Week 28           |
| Feedback via direct questions | Discussion and dialogue                          | Second month exam        | Second month exam                                                                                                                                                                  | 2 | Week 29           |



|                                   |                         |                          |                                              |   |         |
|-----------------------------------|-------------------------|--------------------------|----------------------------------------------|---|---------|
| By evaluating a practical session | Discussion and dialogue | Developmental Psychology | -Aggressive behavior –adolescent delinquency | 2 | Week 30 |
|-----------------------------------|-------------------------|--------------------------|----------------------------------------------|---|---------|

## 11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc.

### Learning and teaching resources:

- 1) Educational Psychology: Theories, Methods and Applications (2024) Nabil Ad Al-Hadi, Dar Al-Yazouri Scientific.
- 2) Educational Psychology: Theory and Application, Adnan Yousef Al-Atoum, Shafiq Falah Al-Alauna, and Abdul Al-Nasser Diab Al-Jarrah and Muawiya Mahmoud Ghaly (2013), Dar Al-Masirah for Publishing and Distribution Printing, Amman, Jordan.
- 3) Educational Psychology, Abdul Majeed Nashwaty(2003) Dar Al-Furqan for Publishing and Distribution, Jordan
- 4) Educational Psychology, Saleh Abu Jado. Ghazal Dar Al-Masirah for Publishing, Distribution and Printing, Amman. Jordan.
- 5) Foundations of Child and Adolescent Psychology, Kuwait – Al-Falah Library. Masn, Paul, and others.
- 6) Evolutionary Psychology, Jordan – Amman, Majdalawi Publishing House. Arefej, Sami (1993).
- 7) Introduction to Evolutionary Psychology, Cairo – Arab House Library for Books. Alwan, Fadia.



## Course Description Template

|                                                                                                 |                                                                                                                                                                                                                                                                                                                   |  |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>1. Course Title</b>                                                                          |                                                                                                                                                                                                                                                                                                                   |  |
| <b>Mathematics I</b>                                                                            |                                                                                                                                                                                                                                                                                                                   |  |
| <b>2. Course Code</b>                                                                           |                                                                                                                                                                                                                                                                                                                   |  |
| <b>HAEPSPH-103</b>                                                                              |                                                                                                                                                                                                                                                                                                                   |  |
| <b>3. Semester / Academic Year</b>                                                              |                                                                                                                                                                                                                                                                                                                   |  |
| <b>/ First Year 2024-2025</b>                                                                   |                                                                                                                                                                                                                                                                                                                   |  |
| <b>4. Date of Preparation of this Description</b>                                               |                                                                                                                                                                                                                                                                                                                   |  |
| <b>1 / 9 / 2024</b>                                                                             |                                                                                                                                                                                                                                                                                                                   |  |
| <b>5. Available Attendance Modes</b>                                                            |                                                                                                                                                                                                                                                                                                                   |  |
| <b>Face-to-Face Instruction</b>                                                                 |                                                                                                                                                                                                                                                                                                                   |  |
| <b>6. Total Study Hours / Total Credit Units</b>                                                |                                                                                                                                                                                                                                                                                                                   |  |
| <b>90 hours / 6 units</b>                                                                       |                                                                                                                                                                                                                                                                                                                   |  |
| <b>7. Name of Course Coordinator (If more than one, list all)</b>                               |                                                                                                                                                                                                                                                                                                                   |  |
| <b>Lecturer : Shahab Ahmed Hassan</b><br><b>Email: <u>shahab19862023@uohamdaniya.edu.iq</u></b> |                                                                                                                                                                                                                                                                                                                   |  |
| <b>8. Course Objectives</b>                                                                     |                                                                                                                                                                                                                                                                                                                   |  |
| <b>Subject Learning Objectives</b>                                                              | <ul style="list-style-type: none"> <li>• To equip and train the student in the principles and methods of ordinary differentiation and its applications, as well as methods of ordinary integration and their utilisation within the advanced differentiation course in the second year; to prepare the</li> </ul> |  |



|  |                                                                                                                                                                                                      |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>student to solve ordinary and partial differential equations and to relate these to other topics. Lectures on differentiation and integration are delivered for 5 theoretical hours per .week</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 9. Teaching and Learning Strategies

|                        |                                                                                                                                                                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategy</b></p> | <ul style="list-style-type: none"> <li>• Managing the lecture in a manner that emphasises the importance of time</li> <li>• Assigning students group tasks</li> <li>• Assigning students to gather sources and references and prepare a report on the lecture topic</li> </ul> |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## 10.Course Structure

| Week | Hours | Required Learning Outcomes                 | Unit or Topic Name                                                                                            | Teaching Method                                               | Assessment Method |
|------|-------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------|
| 1    | 3     | Theoretical Knowledge and Applied Analysis | Definition of number sets and intervals, including examples, inequalities, absolute value, and its properties | According to the teaching and learning methods outlined above | Direct questions  |
| 2    | 3     | Theoretical Knowledge and Applied Analysis | Function composition and its properties                                                                       | According to the teaching and learning methods outlined above | Direct questions  |
| 3    | 3     | Theoretical Knowledge and Applied Analysis | Types of functions (constant, identity, absolute, quadratic, polynomial)                                      | According to the teaching and learning methods outlined above | Direct questions  |
| 4    | 3     | Theoretical Knowledge and Applied Analysis | Types of functions (square root, even and odd, sign function, rational, greatest integer function)            | According to the teaching and learning methods outlined above | Direct questions  |



|    |   |                                            |                                                                                                                         |                                                               |                  |
|----|---|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------|
| 5  | 3 | Theoretical Knowledge and Applied Analysis | Trigonometric functions with proofs                                                                                     | According to the teaching and learning methods outlined above | Direct questions |
| 6  | 3 | Theoretical Knowledge and Applied Analysis | Limits and continuity of functions.                                                                                     | According to the teaching and learning methods outlined above | Direct questions |
| 7  | 3 | Theoretical Knowledge and Applied Analysis | Limits using definition and finding limits from one side + mid-course exam                                              | According to the teaching and learning methods outlined above | Direct questions |
| 8  | 3 | Theoretical Knowledge and Applied Analysis | Continuity (definition of continuity, conditions of continuity) with various examples                                   | According to the teaching and learning methods outlined above | Direct questions |
| 9  | 3 | Theoretical Knowledge and Applied Analysis | Explaining the relationship between limit and continuity through various examples and solving exercises and assignments | According to the teaching and learning methods outlined above | Direct questions |
| 10 | 3 | Theoretical Knowledge and Applied Analysis | Solve various questions about limit and continuity based on students' questions                                         | According to the teaching and learning methods outlined above | Direct questions |
| 11 | 3 | Theoretical Knowledge                      | Defining the derivative                                                                                                 | According to the teaching                                     | Direct questions |



|    |   |                                            |                                                                                                          |                                                               |                  |
|----|---|--------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------|
|    |   | and Applied Analysis                       | mathematically and physically with a graph and finding the derivative using the definition with examples | and learning methods outlined above                           |                  |
| 12 | 3 | Theoretical Knowledge and Applied Analysis | Derivation of trigonometric functions with various examples                                              | According to the teaching and learning methods outlined above | Direct questions |
| 13 | 3 | Theoretical Knowledge and Applied Analysis | Laws of hyperbolic functions, higher-order derivatives, and implicit differentiation                     | According to the teaching and learning methods outlined above | Direct questions |
| 14 | 3 | Theoretical Knowledge and Applied Analysis | L'Hopital's rule with various examples                                                                   | According to the teaching and learning methods outlined above | Direct questions |
| 15 | 3 | Theoretical Knowledge and Applied Analysis | Chain rule with various examples                                                                         | According to the teaching and learning methods outlined above | Direct questions |
| 16 | 3 | Theoretical Knowledge and Applied Analysis | Rules of slope and tangent with examples                                                                 | According to the teaching and learning methods outlined above | Direct questions |
| 17 | 3 | Theoretical Knowledge and Applied Analysis | Integration rules with examples and integration of trigonometric functions                               | According to the teaching and learning methods outlined above | Direct questions |



|    |   |                                            |                                                                                                                     |                                                               |                  |
|----|---|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------|
| 18 | 3 | Theoretical Knowledge and Applied Analysis | Finding the area under and above a curve and the area between two curves using definite integration                 | According to the teaching and learning methods outlined above | Direct questions |
| 19 | 3 | Theoretical Knowledge and Applied Analysis | Inverse functions and finding the domain and codomain of inverse functions                                          | According to the teaching and learning methods outlined above | Direct questions |
| 20 | 3 | Theoretical Knowledge and Applied Analysis | Derivative of inverse trigonometric functions and integral of inverse trigonometric functions with various examples | According to the teaching and learning methods outlined above | Direct questions |
| 21 | 3 | Theoretical Knowledge and Applied Analysis | Derivative of hyperbolic functions, integration of hyperbolic functions and their rules with examples               | According to the teaching and learning methods outlined above | Direct questions |
| 22 | 3 | Theoretical Knowledge and Applied Analysis | Integration methods (UDV method, trigonometric substitution method) With examples                                   | According to the teaching and learning methods outlined above | Direct questions |
| 23 | 3 | Theoretical Knowledge and                  | Compensation method with various examples                                                                           | According to the teaching and learning                        | Direct questions |



|    |   |                                            |                                                                                                                                                           |                                                               |                  |
|----|---|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------|
|    |   | Applied Analysis                           | + daily exam                                                                                                                                              | methods outlined above                                        |                  |
| 24 | 3 | Theoretical Knowledge and Applied Analysis | Partition Fractions Method (first case + second case with examples)                                                                                       | According to the teaching and learning methods outlined above | Direct questions |
| 25 | 3 | Theoretical Knowledge and Applied Analysis | Finding integration using the method $\sqrt[n]{ax+b}$ + the division method with examples + the mid-course exam                                           | According to the teaching and learning methods outlined above | Direct questions |
| 26 | 3 | Theoretical Knowledge and Applied Analysis | Transcendental functions (definition of the natural logarithm function, its graph and properties with various examples)                                   | According to the teaching and learning methods outlined above | Direct questions |
| 27 | 3 | Theoretical Knowledge and Applied Analysis | Derivative of the natural logarithm function and its integral with various examples                                                                       | According to the teaching and learning methods outlined above | Direct questions |
| 28 | 3 | Theoretical Knowledge and Applied Analysis | Definition of the exponential function, its graph and properties with examples, and the derivative and integral of the exponential function with examples | According to the teaching and learning methods outlined above | Direct questions |



|    |   |                                            |                                                                                               |                                                               |                  |
|----|---|--------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------|
| 29 | 3 | Theoretical Knowledge and Applied Analysis | Properties and derivative (exponential function to base a and logarithmic function to base a) | According to the teaching and learning methods outlined above | Direct questions |
| 30 | 3 | Theoretical Knowledge and Applied Analysis | Solve exercises, assignments and examples based on the student's weakness                     | According to the teaching and learning methods outlined above | Direct questions |

### 11.Course Assessment

15 marks / Monthly Exams  
25 marks / Midterm Exam  
60 marks / Final Exam

### 12.Learning Resources

|                                                                                  |                                                                                      |  |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--|
| Required Textbooks (Methodology, if available)                                   | Calculus                                                                             |  |
| Primary References (Sources)                                                     | Calculus theory                                                                      |  |
| Recommended Supporting Books and References (Scientific Journals, Reports, etc.) | Calculus I,II,III –Jerrold Marsdon & Alan Weinstein (2 <sup>nd</sup> edition , 2003) |  |
| Electronic References, Websites                                                  | YouTube                                                                              |  |

### 13.Curriculum Development Plan

- Add contemporary topics:
  - Applications in economics (compound interest calculation, rates of change).



- Applications in Physics (Motion, Work, Energy)
- Introduction to differential equations as a natural extension of integration

- Active learning: Introducing interactive classroom activities and group problems.

- Relying on programs such as: GeoGebra, Desmos to illustrate graphs and derivations.

- Relying on modern sources in teaching the course, such as:
  - Thomas calculus–George B,2024.
  - Calculus Volume 1–Edwin Jed Herman, 2020.



## Course Description Form

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| <b>Mechanics</b>                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| HAEPSPH-10                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 3. Semester / Year:                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Yearly                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 20/9/2024                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Attendance                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 90 HOURS/ 8UNITS                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Name: Dr. Ali H. Ahmed Suliman                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Email: dr.aha.suliman@uohamdaniya.edu.iq                            |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| <b>Course Objectives</b>                                            | <p>The course aims to provide students with information and skills about mechanics, the relationship and movement of bodies, and the properties of matter</p> <p>Which the student will benefit from for the advanced university stage and which can qualify him for postgraduate studies in science</p> <p>Physics, building a strong background for those who will continue to study mechanics and properties of matter.</p> |  |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |



|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategy</b> | <p>Enabling students to obtain knowledge and understanding of the topics of body mechanics, movement, and properties subject.</p> <p>2- Enabling students to obtain knowledge and understanding of body mechanics applications and to conduct experiments with different processes.</p> <p>3- Enabling students to obtain knowledge and understanding of the use of basic physical laws in mechanics and use it to solve problems.</p> |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 10. Course Structure

| Week | Hours    | Required Learning Outcomes                                       | Unit or subject name             | Learning method | Evaluation method |
|------|----------|------------------------------------------------------------------|----------------------------------|-----------------|-------------------|
| 1    | 3 Theor  | Unit System and Dimensions                                       | Vectors Introduction             | Attendance      | Quiz              |
| 2    | 3 Theor  | Vectors and scalar                                               | Vectors Introduction             | Attendance      | Quiz              |
| 3    | 3 Theor  | Vector algebra                                                   | Vectors Introduction             | Attendance      | Homework          |
| 4    | 3 Theor  | Vector products (dot and cross)                                  | Vectors Introduction             | Attendance      | Quiz              |
| 5    | 3 Theor  | Triple products                                                  | Vectors Introduction             | Attendance      | Quiz              |
| 6    | 3 Theor  | Application of vectors                                           | Vectors Introduction             | Attendance      | Homework          |
| 7    | 3 Theory | Solution of Problems                                             | Vectors Introduction             | Attendance      | Homework          |
| 8    | 3 Theory | Position                                                         | Motion in a straight line Motion | Attendance      | Quiz              |
| 9    | 3 Theory | Average velocity                                                 | Motion in a straight line Motion | Attendance      | Quiz              |
| 10   | 3 Theory | city, Instantaneous velocity, Average Instantaneous acceleration | Motion in a straight line Motion | Attendance      | Quiz              |

|    |             |                                                                                     |                                                    |            |          |
|----|-------------|-------------------------------------------------------------------------------------|----------------------------------------------------|------------|----------|
| 11 | 3<br>Theory | Motion with constant acceleration                                                   | Motion in a straight line Motion                   | Attendance | Quiz     |
| 12 | 3<br>Theory | Freely falling bodies                                                               | Motion in a straight line Motion                   | Attendance | Quiz     |
| 13 | 3<br>Theory | Solution of Problems                                                                | Motion in a straight line Motion                   | Attendance | Homework |
| 14 | 3<br>Theory | Motion in three dimensions                                                          | Motion in a plane Motion in two dimensions (plane) | Attendance | Quiz     |
| 15 | 3<br>Theory | Component of acceleration, and motion of projectile                                 | Motion in a plane Motion in two dimensions (plane) | Attendance | Quiz     |
| 16 | 3<br>Theory | Trajectory of a projectile                                                          | Motion in a plane Motion in two dimensions (plane) | Attendance | Homework |
| 17 | 3<br>Theory | Application on a projectile motion                                                  | Motion in a plane Motion in two dimensions (plane) | Attendance | Quiz     |
| 18 | 3<br>Theory | Solution of Problems                                                                | Motion in a plane Motion in two dimensions (plane) | Attendance | Quiz     |
| 19 | 3<br>Theory | Mass, Weight, Friction (Statics and dynamics), and Friction laws                    | Forces Newton 's laws                              | Attendance | Quiz     |
| 20 | 3<br>Theory | Application of force                                                                | Forces Newton 's laws                              | Attendance | Quiz     |
| 21 | 3<br>Theory | Center mass, and Equilibrium.                                                       | Forces Newton 's laws                              | Attendance | Homework |
| 22 | 3<br>Theory | work done by varying force, work and kinetic energy, Gravitational potential energy | Work and Energy Work done                          | Attendance | Quiz     |



|    |          |                                                                                                                                                                                                      |                                                       |  |            |          |
|----|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|------------|----------|
|    |          |                                                                                                                                                                                                      | by constant force                                     |  |            |          |
| 23 | 3 Theory | Elastic potential energy, Power, Power and velocity.                                                                                                                                                 | Work and Energy<br>Work done by constant force        |  | Attendance | Quiz     |
| 24 | 3 Theory | Angular velocity, Angular acceleration, Rotation with constant linear velocity, Kinetic energy of rotation, moment Inertia, Calculation of moment, Inertia of bodies (Cylinder, Sphere, Ring, Disc), | Rotation of Rigid Bodies<br>Introduction              |  | Attendance | Quiz     |
| 25 | 3 Theory | Radius of gyration, Energy of a body rolling on a horizontal plane, Work and power rotational motion, and the Torque.                                                                                | Rotation of Rigid Bodies<br>Introduction              |  | Attendance | Homework |
| 26 | 3 Theory | Conservation law of linear momentum, Angular momentum and impulse                                                                                                                                    | Momentum and Impulse<br>Momentum and linear impulsive |  | Attendance | Quiz     |
| 27 | 3 Theory | Relation between momentum and impulse in linear and rotational motion, Energy of Rotational motion of body.                                                                                          | Momentum and Impulse<br>Momentum and linear impulsive |  | Attendance | Quiz     |
| 28 | 3 Theory | Elastic Collisions in one-dimension, Inelastic collision, and Collisions in two dimensions                                                                                                           | Collisions                                            |  | Attendance | Quiz     |
| 29 | 3 Theory | Conservation and non-Conservation force, Conservation energy, and Potential energy curve                                                                                                             | Conservation of Energy<br>Conservation laws           |  | Attendance | Homework |
| 30 | 3 Theory | Newton's law of gravitation, Definition of gravitation, Gravitation field, Gravitation potential, Intensity of gravitation, Kepler's law, and Artificial satellite orbital and escape velocity.      | Universal Gravitation<br>Meaning of gravitation       |  | Attendance | Quiz     |

### 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, quizzes

| No. | Evaluation method | Marks | % Grads |
|-----|-------------------|-------|---------|
| 1   | Lab. Exam         | 10    | %10     |

|   |                          |            |      |
|---|--------------------------|------------|------|
| 2 | Quizzes                  | 10         | %10  |
| 3 | Term Exam                | 20         | %20  |
| 4 | Final Exam(experimental) | 10         | %10  |
| 5 | Final Exam (Theory)      | 50         | %50  |
|   | sum                      | <b>100</b> | %100 |

## 12. Learning and Teaching Resources

|                                                                    |                                                                                                                             |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | University Physics by Francis W. Sears, Mark W. Zemansky and Hugh D. Young, 1982.                                           |
| Main references (sources)                                          | Introduction to Physics by John D. Cutnell, Kenneth W. Johnson 8th.Ed., 2010.                                               |
| Recommended books and references (scientific journals, reports...) | Zainul Huda. <i>Metallurgy for Physicists and Engineers-Fundamentals, Applications, and Calculations</i> . CRC Press, 2020. |
| Electronic References, Websites                                    | Wikipedia                                                                                                                   |



## Course Description Form

|                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Course Name:</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Electricity and Magnetism                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>2. Course Code:</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| HAEPSPH-105                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>3. Semester / Year:</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2024-2025                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>4. Description Preparation Date:</b>                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 21 / 9 / 2024                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>5. Available Attendance Forms:</b>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Face-to-face learning                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 90 (Theoretical) + 90 (Practical) / 8 Units                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>7. Course administrator's name (mention all, if more than one name)</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Name: Asst. pro. Ban abd-almaseeh bader<br>Email: banbader71@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>8. Course Objectives</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Course Objectives</b>                                                        | <ul style="list-style-type: none"> <li>Introduce students to the fundamentals of electricity and magnetism and their importance in our lives, integrating physical concepts with mathematical derivations, and broadening students' horizons toward scientific theories and applications.</li> <li>Enable students to understand the basics of physics.</li> <li>Enable students to interpret physical phenomena from a mathematical perspective.</li> <li>Provide students with knowledge and understanding of scientific laws in physics, practical applications, logical and scientific analysis, and interpretation of physical phenomena.</li> <li>Develop students' thinking skills and enable them to understand and solve scientific problems related to physical laws.</li> <li>.....</li> </ul> |

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <ul style="list-style-type: none"> <li>• .....</li> <li>• .....</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>9. Teaching and Learning Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                            | <ol style="list-style-type: none"> <li>1. Enabling students to acquire knowledge and understanding of electricity and magnetism.</li> <li>2. Providing knowledge about charges and the electric field.</li> <li>3. Understanding the equations of the electric and magnetic fields, and electric current.</li> <li>4. Linking capacitors and understanding the effect of dielectric materials.</li> <li>5. Understanding how DC circuits work.</li> <li>6. Solving numerical problems related to current in electric networks.</li> <li>7. Deeper and more comprehensive understanding of mathematical aspects related to resistors and capacitors.</li> </ol> |

| <b>10. Course Schedule (Translated)</b> |       |                                                                          |                |                                      |                                        |
|-----------------------------------------|-------|--------------------------------------------------------------------------|----------------|--------------------------------------|----------------------------------------|
| Week                                    | Hours | Intended Learning Outcomes                                               | Unit / Topic   | Teaching Method                      | Assessment Method                      |
| 1                                       | 3     | Prove Coulomb's law and solve problems related to the inverse square law | Coulomb's Law  | Lecture, discussion, problem-solving | Direct questions and daily assignments |
| 2                                       | 3     | Verify Coulomb's law, nucleus of the atom in Rutherford's experiment     | Coulomb's Law  | Lecture, discussion, problem-solving | Direct questions                       |
| 3                                       | 3     | Electric field intensity                                                 | Electric Field | Lecture, discussion, problem-solving | Direct questions                       |
| 4                                       | 3     | Electric field lines                                                     | Electric Field | Lecture, discussion, problem-solving | Direct questions                       |
| 5                                       | 3     | Applications on                                                          | Electric Field | Lecture, discussion,                 | Direct questions                       |



|    |   |                                        |                          |                                      |                  |
|----|---|----------------------------------------|--------------------------|--------------------------------------|------------------|
|    |   | calculating electric field intensity   |                          | problem-solving                      |                  |
| 6  | 3 | Electron charge                        | Electric Field           | Lecture, discussion, problem-solving | Monthly exam     |
| 7  | 3 | Electric flux                          | Gauss's Law              | Lecture, discussion, problem-solving | —                |
| 8  | 3 | Electric field between parallel plates | Gauss's Law              | Lecture, discussion, problem-solving | —                |
| 9  | 3 | Electric potential                     | Electric Potential       | Lecture, discussion, problem-solving | Monthly exam     |
| 10 | 3 | Applications on electric potential     | Electric Potential       | Lecture, discussion, problem-solving | Direct questions |
| 11 | 3 | Electric potential energy              | Electric Potential       | Lecture, discussion, problem-solving | Direct questions |
| 12 | 3 | Van de Graaff generator                | Electric Potential       | Lecture, discussion, problem-solving | Direct questions |
| 13 | 3 | Capacitance                            | Capacitors & Dielectrics | Lecture, discussion, problem-solving | Direct questions |
| 14 | 3 | Calculating capacitance                | Capacitors & Dielectrics | Lecture, discussion, problem-solving | Direct questions |
| 15 | 3 | Importance of insulators in capacitors | Capacitors & Dielectrics | Lecture, discussion, problem-solving | —                |
| 16 | 3 | Capacitors in series and parallel      | Capacitors & Dielectrics | Lecture, discussion, problem-solving | Direct questions |
| 17 | 3 | Practical applications of capacitors   | Capacitors & Dielectrics | Lecture, discussion, problem-solving | Direct questions |
| 18 | 3 | Stored                                 | Capacitors &             | Lecture,                             | Direct           |

|    |   |                                                            |                          |                                      |                  |
|----|---|------------------------------------------------------------|--------------------------|--------------------------------------|------------------|
|    |   | energy in capacitors                                       | Dielectrics              | discussion, problem-solving          | questions        |
| 19 | 3 | Variable capacitors                                        | Capacitors & Dielectrics | Lecture, discussion, problem-solving | Direct questions |
| 20 | 3 | Theoretical and applied knowledge, problem-solving ability | Capacitors & Dielectrics | Lecture, discussion, problem-solving | Direct questions |
| 21 | 3 | Electric current                                           | Current & Resistance     | Lecture, discussion, problem-solving | Direct questions |
| 22 | 3 | Resistance and resistivity                                 | Current & Resistance     | Lecture, discussion, problem-solving | Direct questions |
| 23 | 3 | Problems on resistivity                                    | Current & Resistance     | Lecture, discussion, problem-solving | —                |
| 24 | 3 | Temperature coefficient of resistivity                     | Current & Resistance     | Lecture, discussion, problem-solving | Direct questions |
| 25 | 3 | Practical types of resistors                               | Current & Resistance     | Lecture, discussion, problem-solving | —                |
| 26 | 3 | Color code of resistors                                    | Current & Resistance     | Lecture, discussion, problem-solving | Monthly exam     |
| 27 | 3 | Ohm's Law                                                  | Current & Resistance     | Lecture, discussion, problem-solving | Direct questions |
| 28 | 3 | Power dissipation in resistors                             | Current & Resistance     | Lecture, discussion, problem-solving | Direct questions |
| 29 | 3 | Joule's Law                                                | Current & Resistance     | Lecture, discussion, problem-solving | Direct questions |
| 30 | 3 | Problem solving                                            | Current & Resistance     | Lecture, discussion, problem-        | —                |



|                                                                                                                                                                                    |  |                                                                                                                                                                                         |  |         |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|--|
|                                                                                                                                                                                    |  |                                                                                                                                                                                         |  | solving |  |
| <b>11. Course Assessment:</b>                                                                                                                                                      |  |                                                                                                                                                                                         |  |         |  |
| The grade is distributed out of 100 according to the tasks assigned to the student, such as daily preparation, daily quizzes, oral and written exams, monthly exams, reports, etc. |  |                                                                                                                                                                                         |  |         |  |
| <b>12. Learning and Teaching Resources</b>                                                                                                                                         |  |                                                                                                                                                                                         |  |         |  |
| Prescribed Textbooks (if available)                                                                                                                                                |  | <i>Fundamentals of Electricity and Magnetism</i> by Yahya Abdul-Hamid Al-Hajj Ali                                                                                                       |  |         |  |
| Main References (sources)                                                                                                                                                          |  | <i>Electricity and Magnetism, Part I</i> , translated by Dr. Hazem Falah Sakeek                                                                                                         |  |         |  |
| Recommended Textbooks and References (scientific journals, reports):                                                                                                               |  | <ul style="list-style-type: none"> <li>Following electronic references and the internet, including reliable websites and library portals of some international universities.</li> </ul> |  |         |  |

## Course Description Form

|                                                                                                 |                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Course Name:</b>                                                                          |                                                                                                                                                                                                                                                                                                                                                     |
| General Arabic language                                                                         |                                                                                                                                                                                                                                                                                                                                                     |
| <b>2. Course Code:</b>                                                                          |                                                                                                                                                                                                                                                                                                                                                     |
| HAEPSPH-108                                                                                     |                                                                                                                                                                                                                                                                                                                                                     |
| <b>3. Semester / Year:</b>                                                                      |                                                                                                                                                                                                                                                                                                                                                     |
| 2024-2025 First Stage                                                                           |                                                                                                                                                                                                                                                                                                                                                     |
| <b>4. Description Preparation Date:</b>                                                         |                                                                                                                                                                                                                                                                                                                                                     |
| 18-9-2024                                                                                       |                                                                                                                                                                                                                                                                                                                                                     |
| <b>5. Available Attendance Forms:</b>                                                           |                                                                                                                                                                                                                                                                                                                                                     |
| In-person teaching                                                                              |                                                                                                                                                                                                                                                                                                                                                     |
| <b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>                              |                                                                                                                                                                                                                                                                                                                                                     |
| 30 hours / 2 units                                                                              |                                                                                                                                                                                                                                                                                                                                                     |
| <b>7. Course administrator's name (mention all, if more than one name)</b>                      |                                                                                                                                                                                                                                                                                                                                                     |
| Name: Assistant Lecturer Zahraa Mohammed Kadhim Al bayati<br>Email: z.m.k.89@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                     |
| <b>8. Course Objectives</b>                                                                     |                                                                                                                                                                                                                                                                                                                                                     |
| <b>Course Objectives</b>                                                                        | <p>1- Introduce students to the importance of the Arabic language and its literature, and help them understand Arabic grammar.</p> <p>2. Develop students' language skills.</p> <p>3. Enable students to acquire the necessary skills to understand syntactic and semantic structures.</p> <p>4. Foster students' pride in the Arabic language.</p> |
| <b>9. Teaching and Learning Strategies</b>                                                      |                                                                                                                                                                                                                                                                                                                                                     |
| <b>Strategy</b>                                                                                 | <p>1. Provide students with knowledge and concepts of the Arabic language, preparing qualified cadres for work in institutions.</p> <p>2. Teach students how to apply general Arabic grammar in their writing.</p> <p>3. Discuss with students and conduct assessments to address common linguistic and expressive errors.</p>                      |



| 10. Course Structure |       |                            |                                                               |                                                                  |                   |
|----------------------|-------|----------------------------|---------------------------------------------------------------|------------------------------------------------------------------|-------------------|
| Week                 | Hours | Required Learning Outcomes | Unit or subject name                                          | Learning method                                                  | Evaluation method |
| 1                    | 1     | Koran                      | Surah Al-Hajj - Verse (5)                                     | Reading and interpretation of the Surah                          | Direct questions  |
| 2                    | 1     | The Noble Prophet's Hadith | I was sent only to perfect good morals.                       | Explanation of the hadith and its meanings                       | Direct questions  |
| 3                    | 1     | Arabic literature          | Selections of poetry from the pre-Islamic era / Al-Mu'allaqat | Reading the text and analyzing it technically and linguistically | Direct questions  |
| 4                    | 1     | Arabic literature          | The poem of Al-Afwah Al-Awdi in the rule                      | Reading and analyzing the text at several levels                 | Direct questions  |
| 5                    | 1     | <b>Morphology</b>          | Morphological                                                 | Lecture and practical applications                               | Direct questions  |
| 6                    | 1     | <b>Morphology</b>          | conjugation                                                   | Lecture and practical applications                               | Direct questions  |
| 7                    | 1     | First month exam           |                                                               |                                                                  |                   |

|                                                                                                                                                                     |   |                             |                                                                                                                         |                                                      |                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------|
|                                                                                                                                                                     |   |                             | rhetoric to t<br>Arabic language                                                                                        | present<br>ation                                     |                     |
| 25                                                                                                                                                                  | 1 | Arabic<br>rhetoric          | Definition<br>statement and<br>types                                                                                    | Lecture<br>and<br>historic<br>al<br>present<br>ation | Direct<br>questions |
| 26                                                                                                                                                                  | 1 | Arabic<br>rhetoric          | Simile, truth a<br>metaphor                                                                                             | Lecture<br>and<br>historic<br>al<br>present<br>ation | Direct<br>questions |
| 27                                                                                                                                                                  | 1 | Arabic<br>rhetoric          | Linguistic<br>metaphor<br>definition,<br>relationships, a<br>applications<br>metaphor,<br>definition a<br>applications) | Lecture<br>and<br>historic<br>al<br>present<br>ation | Direct<br>questions |
| 28                                                                                                                                                                  | 1 | Mental<br>metaphor          | Its definiti<br>relationships a<br>applications,<br>metonymy,<br>definition a<br>applications                           | Lecture<br>and<br>historic<br>al<br>present<br>ation | Direct<br>questions |
| 29                                                                                                                                                                  | 1 | Second<br>month exam        |                                                                                                                         |                                                      |                     |
| 30                                                                                                                                                                  | 1 | Common<br>linguistic errors | Common<br>mistakes<br>television<br>journalism                                                                          |                                                      | Direct<br>questions |
| 11. Course Evaluation                                                                                                                                               |   |                             |                                                                                                                         |                                                      |                     |
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc |   |                             |                                                                                                                         |                                                      |                     |
| 12. Learning and Teaching Resources                                                                                                                                 |   |                             |                                                                                                                         |                                                      |                     |
| Required textbooks (curricular books, if any)                                                                                                                       |   |                             | None.                                                                                                                   |                                                      |                     |



|                                                                    |                                                                                                                                   |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Main references (sources)                                          | Ibn Aqil's Commentary on Ibn Malik's Alfiyyah/ Rhetoric and Application, Ahmed Matloub                                            |
| Recommended books and references (scientific journals, reports...) | Meanings of Grammar - Dr. Fadhel Al-Samarrai, Comprehensive Grammar - Abbas Hassan, Sufficient Morphology, Ayman Amin Abdul-Ghani |
| Electronic References, Websites                                    | Waqf Library, Al-Sharakh Archives, Central Library - University of Mosul                                                          |

## Course Description Template

|                                                            |                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Description Template                                |                                                                                                                                                                                                                                                                                                                                                                           |
| Course Name                                                |                                                                                                                                                                                                                                                                                                                                                                           |
| 1. Course Code                                             |                                                                                                                                                                                                                                                                                                                                                                           |
| HAEPSPH-109                                                |                                                                                                                                                                                                                                                                                                                                                                           |
| 2. Semester/Year                                           |                                                                                                                                                                                                                                                                                                                                                                           |
| 2024-2025                                                  |                                                                                                                                                                                                                                                                                                                                                                           |
| 3. Date of Description Preparation                         |                                                                                                                                                                                                                                                                                                                                                                           |
| 23/9/2024                                                  |                                                                                                                                                                                                                                                                                                                                                                           |
| 4. Date of Description Preparation                         |                                                                                                                                                                                                                                                                                                                                                                           |
| In-Person Education                                        |                                                                                                                                                                                                                                                                                                                                                                           |
| 2.Total Credit Hours / Total Units                         |                                                                                                                                                                                                                                                                                                                                                                           |
| 30hours                                                    |                                                                                                                                                                                                                                                                                                                                                                           |
| 2. Course Coordinator's Name (if more than one, list them) |                                                                                                                                                                                                                                                                                                                                                                           |
| Dr. Humam Mohammed Yaqoub                                  |                                                                                                                                                                                                                                                                                                                                                                           |
| Email:dr.humam.slama@uohamdaniya.edu.iq                    |                                                                                                                                                                                                                                                                                                                                                                           |
| Course Objectives                                          |                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>Course Objectives</b></p>                            | <p>(Defining fundamental human rights and explaining human rights in the constitution and Iraqi laws, discussing religious principles, providing students with information about their rights, and offering adequate information on human rights at both the national and international levels, as well as introducing democracy and its concepts, outlining types of</p> |



|                                  |                         |                                            |                            | democracy, and assessing the feasibility of applying it in Iraq).                                                                                                                                                                                                                                                                                                                                                                                                                   |           |
|----------------------------------|-------------------------|--------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Teaching and Learning Strategies |                         |                                            |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |
| Strategy                         |                         |                                            |                            | <ul style="list-style-type: none"> <li>• Understanding rights in the context of modernity and development.</li> <li>• Familiarizing with laws and amendments related to human rights.</li> <li>• Equipping students with essential skills in rights and systems, including democracy.</li> <li>• Providing students with information on rights in the Iraqi constitution and laws.</li> </ul> <p>Offering students rights into rights in international treaties and agreements.</p> |           |
| Course Structure                 |                         |                                            |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |
| Assessment Method                | Learning Method         | Unit or Topic Name                         | Required Learning Outcomes | hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | week      |
|                                  |                         |                                            | Required Learning Outcomes | hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | week      |
| Clarification                    | Theoretical Explanation | Definition of Human Rights<br>1            | Basic Definitions          | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The First |
| Clarification                    | Theoretical Explanation | The Historical Development of Human Rights | Historical Development     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The       |



|                                                     |                         |                                                             |                                                                   |   |                       |
|-----------------------------------------------------|-------------------------|-------------------------------------------------------------|-------------------------------------------------------------------|---|-----------------------|
|                                                     |                         | in the Mesopotamian Valley                                  |                                                                   |   | Second                |
| Clarification                                       | Theoretical Explanation | Human Rights in Islam, Christianity, and Judaism            | Students' Definition of Human Rights in Religions                 | 2 | The Third             |
| Clarification, Discussion, and Daily Exam           | Theoretical Explanation | Types of Rights and Their Characteristics                   | Students' Definition of Types of Rights and Their Characteristics | 2 | The Fourth            |
| Clarification, Discussion, and Daily Quiz           | Theoretical Explanation | The Iraqi Constitution of 2005                              | Human Rights in the Iraqi Constitution                            | 2 | The Fifth             |
| Discussion and Dialogue                             | Theoretical Explanation | Continuation of the Texts of the Iraqi Constitution of 2005 | Human Rights in the Iraqi Constitution                            | 2 | The Sixth             |
| Discussion and Dialogue                             | Theoretical Explanation | Supplement to the Texts of the Iraqi Constitution of 2005   | Human Rights in the Iraqi Constitution                            | 2 | The Seventh           |
| Clarification                                       | Theoretical Explanation | Human Rights in International Agreements                    | Human Rights in International Laws and Agreements                 | 2 | The Eighth            |
| Clarification                                       | Theoretical Explanation | Human Rights in International Organizations                 | Human Rights in International Laws and Agreements                 | 2 | The Ninth             |
| Clarification and Discussion                        | Theoretical Explanation | Human Rights in Global Organizations                        | Human Rights in International Laws and Agreements                 | 2 | The Tenth             |
| Clarification and Discussion                        | Theoretical Explanation | Human Rights in Regional Organizations                      | Human Rights in International Laws and Agreements                 | 2 | The Eleventh          |
| Clarification and Discussion                        | Theoretical Explanation | Labor and Social Security Law                               | Human Rights in Some Iraqi Laws                                   | 2 | The Twelfth           |
| Clarification, Discussion, Dialogue, and Daily Quiz | Theoretical Explanation | Personal Status Law                                         | Human Rights in Some Iraqi Laws                                   | 2 | <b>The Thirteenth</b> |
| Clarification and Discussion                        | Theoretical Explanation | Student Discipline Guidelines                               | Human Rights in Some Iraqi Laws                                   | 2 | The Fourteenth        |
| Questions, Answers, and                             | Theoretical Explanation | Student Discipline                                          | Student Discipline Regulations                                    | 2 | The Fifteenth         |



| Discussion                         |                         | Guidelines                                                    |                                                 |   |                           |
|------------------------------------|-------------------------|---------------------------------------------------------------|-------------------------------------------------|---|---------------------------|
| Questions, Answers, and Discussion | Theoretical Explanation | Human Rights in Iraqi Legislation                             | General Review                                  | 2 | The Sixteenth             |
| Discussion and Daily Exam          | Theoretical Explanation | Human Rights in Iraqi Laws                                    | General Review                                  | 2 | The Seventeenth           |
| Clarification                      | Theoretical Explanation | General Definitions of Democracy                              | Definitions of Democracy                        | 2 | The Eighteenth            |
| Clarification                      | Theoretical Explanation | Basic Concepts in the Democratic System                       | Basic Concepts in the Democratic System         | 2 | The Nineteenth            |
| Clarification                      | Theoretical Explanation | Forms of Democracy in Iraq                                    | Types of Democracy                              | 2 | The Twentieth             |
| Clarification and Discussion       | Theoretical Explanation | Advantages and Disadvantages of Democracy                     | Evaluation of the Democratic System             | 2 | The Twenty-First          |
| Clarification and Discussion       | Theoretical Explanation | The Feasibility of Implementing the Democratic System in Iraq | Implementation of the Democratic System in Iraq | 2 | The Twenty-Second         |
| Clarification and Discussion       | Theoretical Explanation | Examples and Models                                           | Global Governance Systems                       | 2 | The Twenty-Third          |
| Clarification and Discussion       | Theoretical Explanation | Examples and Models                                           | <b>Democracy in Middle Eastern Countries</b>    | 2 | The Twenty-Fourth         |
| Clarification and Discussion       | Theoretical Explanation | Examples, Models, and Cases                                   | Democracy in the Iraqi Context                  | 2 | The Twenty-Fifth          |
| Clarification and Daily Exam       | Theoretical Explanation | Definitions, Evolution, and Types of Democratic Systems       | General Review                                  | 2 | The Twenty-Sixth          |
| Reclarification                    | Theoretical Explanation | Human Rights                                                  | General Review of the Curriculum                | 2 | <b>The Twenty-Seventh</b> |
| Reclarification                    | Theoretical Explanation | Human Rights                                                  | General Review of the Curriculum                | 2 | The Twenty-Eighth         |
| Reclarification                    | Theoretical Explanation | Democracy                                                     | General Review of the Curriculum                | 2 | The Twenty-Ninth          |



|                                                                                                                                                                                     |                                       |                                                                          |                                  |   |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------|----------------------------------|---|---------------|
| Reclarification                                                                                                                                                                     | Theoretical and Practical Explanation | Democracy                                                                | General Review of the Curriculum | 2 | The Thirtieth |
| 1. Course Evaluation                                                                                                                                                                |                                       |                                                                          |                                  |   |               |
| "Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral exams, monthly exams, written exams, and reports, etc." |                                       |                                                                          |                                  |   |               |
| 2. Learning and Teaching Resources                                                                                                                                                  |                                       |                                                                          |                                  |   |               |
| 1. Prof. Dr. Riyad Aziz Human Rights and Democracy                                                                                                                                  |                                       | Required textbooks (methodology, if applicable)                          |                                  |   |               |
| 2- Omar MA., 1975, Elementary solid state physics, principles and applications, Addison-Wesley Publishing Company.                                                                  |                                       |                                                                          |                                  |   |               |
| 3. Solid State Physics, Mueid Gabriel Part One and Part Two                                                                                                                         |                                       |                                                                          |                                  |   |               |
| 4. Solid State Physics, Yahya Al-Jan                                                                                                                                                |                                       |                                                                          |                                  |   |               |
| Human Rights (Dr. Hamid Hanoon)                                                                                                                                                     |                                       | Essential References (Sources)                                           |                                  |   |               |
| Human Rights (Prof. Dr. Ali Youssef Al-Shukri)                                                                                                                                      |                                       | Recommended Standard Books and References (Scientific Journals, Reports) |                                  |   |               |
| Websites of Human Rights Organizations                                                                                                                                              |                                       | Electronic References, Internet Websites                                 |                                  |   |               |



## Course Description Form

|                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Computer                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2. Course Code:                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| HAEPSPH-104                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3. Semester / Year:                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Yearly\ first stage                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. Description Preparation Date:                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2024/10/3                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5. Available Attendance Forms:                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Attendance                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 30 HOURS/ 2 UNITS                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 7. Course administrator's name (mention all, if more than one name)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Name: alaa salim abd alrazzaq<br>Email :alaasalimabd161194@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 8. Course Objectives                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Course Objectives</b>                                                      | <ul style="list-style-type: none"> <li>Explain the concept of computers and identify their characteristics and different types.</li> <li>Explain the components of a computer and their functions.</li> <li>Explain the physical components of a computer and their different types.</li> <li>Provide a brief overview of computer software and its applications.</li> <li>Identify some application programs and enable them to print reports, prepare presentations, and spreadsheets.</li> <li>Learn how to use the Internet.</li> </ul> |
| 9. Teaching and Learning Strategies                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Strategy</b>                                                               | - Graduating individuals with a culture and knowledge of everything related to computers and the rapid developments in this field.                                                                                                                                                                                                                                                                                                                                                                                                          |

- Educating students to become good computer users and enthusiasts of using them by highlighting the features they will enjoy through using the device.
- Building a generation that keeps pace with the computer age and loves it.
- Providing students with the opportunity to observe, reflect, and implement practical and applied knowledge in the field of computers.

## 10. Course Structure

## 11.

| Week | Hours | Required Learning Outcomes | Unit or subject name               | Learning method                                     | Evaluation method        |
|------|-------|----------------------------|------------------------------------|-----------------------------------------------------|--------------------------|
| 1    | 1     | Gain knowledge             | Introduction to Computers          | Lecture and use data show ,discussion and dialogue  | Homework                 |
| 2    | 1     | Gain knowledge             | Computer Hardware                  | Lecture and use data show ,discussion and dialogue  | Discussion and questions |
| 3    | 1     | Gain knowledge             | Computer Components 2 Software     | Lecture and use data show , discussion and dialogue | Discussion and questions |
| 4    | 1     | Gain knowledge             | Computer Storage Units and Devices | Lecture and use data show ,discussion and dialogue  | Discussion and questions |
| 5    | 1     | Performance evaluation     | Previous Lecture Test              | Lecture and use data show ,discussion and dialogue  | Test                     |
| 6    | 1     | Gain knowledge             | Computer Security                  | Lecture and use data show ,discussion and dialogue  | Discussion and questions |
| 7    | 1     | Gain knowledge             | Computer Software Licenses         | Lecture and use data show ,discussion and dialogue  | Questions and discussion |
| 8    | 1     | Gain knowledge             | Computer Networks                  | Lecture and use data show ,discussion and dialogue  | Questions and discussion |
| 9    | 1     | Performance evaluation     | Previous Lecture Test              | Lecture and use data show ,discussion and dialogue  | Test                     |



|    |   |                        |                                          |                                                    |                          |
|----|---|------------------------|------------------------------------------|----------------------------------------------------|--------------------------|
| 10 | 1 | Gain knowledge         | Internet                                 | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 11 | 1 | Gain knowledge         | Websites                                 | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 12 | 1 | Gain knowledge         | Email                                    | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 13 | 1 | Gain knowledge         | Operating System Basics                  | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 14 | 1 | Gain knowledge         | Operating System Basics 2                | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 15 | 1 | Performance evaluation | Theoretical Exam (Midterm)               | Lecture and use data show ,discussion and dialogue | Test                     |
| 16 | 1 | Gain knowledge         | Definition of Microsoft Office Word      | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 17 | 1 | Gain knowledge         | Definition of the Home Page and Toolbars | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 18 | 1 | Gain knowledge         | Menu Bar: File Menu                      | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 19 | 1 | Gain knowledge         | Menu Bar: Main Menu                      | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 20 | 1 | Performance evaluation | Test                                     | Lecture and use data show ,discussion and dialogue | Test                     |
| 21 | 1 | Gain knowledge         | Menu Bar: Insert Menu                    | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 22 | 1 | Gain knowledge         | Design Menu                              | Lecture and use data show                          | Discussion and questions |

|    |   |                        |                                                            |                                                    |                          |
|----|---|------------------------|------------------------------------------------------------|----------------------------------------------------|--------------------------|
|    |   |                        |                                                            | discussion and dialogue                            |                          |
| 23 | 1 | Gain knowledge         | Page Layout Menu                                           | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 24 | 1 | Performance evaluation | Test                                                       | Lecture and use data show ,discussion and dialogue | Test                     |
| 25 | 1 | Gain knowledge         | Definition of PowerPoint Presentation Program              | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 26 | 1 | Gain knowledge         | Definition of the Home Page and Toolbars                   | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 27 | 1 | Gain knowledge         | Inserting, Deleting, and Duplicate Slides and Slide Design | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 28 | 1 | Performance evaluation | Test                                                       | Lecture and use data show ,discussion and dialogue | Test                     |
| 29 | 1 | Gain knowledge         | Animation Effects on Objects and Slide Transitions         | Lecture and use data show ,discussion and dialogue | Discussion and questions |
| 30 | 1 | Performance evaluation | Final Exam                                                 | Lecture and use data show ,discussion and dialogue | Test                     |

## 12. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, quizzes

## 13. Learning and Teaching Resources

|                                                                    |                                                                            |                             |
|--------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------|
| Required textbooks (curricular books, if any)                      | A lecture prepared by the lecturer                                         |                             |
| Main references (sources)                                          | أساسيات الحاسوب اعداد : الخضر علي الخضر بحاث                               | مهارات الحاسوب :م.وسيم يوسف |
|                                                                    | ليلاس مظلوم                                                                |                             |
| Recommended books and references (scientific journals, reports...) | Recommended mainstream books and references (scientific journals, reports) |                             |



## Course Description Form

| 1. Course Name:                                                     |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
|---------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|
| English Language                                                    |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 2. Course Code:                                                     |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| HAEPSPH-110                                                         |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 3. Semester / Year:                                                 |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Annual/2024-2025                                                    |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 4. Description Preparation Date:                                    |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 2024                                                                |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 5. Available Attendance Forms:                                      |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Daily Attendance                                                    |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 30 Hour and 2 units                                                 |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 7. Course administrator's name (mention all, if more than one name) |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Name: Al-Hadan Abdulrahman Awad Aljburi                             |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Email: hasanawad@uohamdaniya.edu.ig                                 |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 8. Course Objectives                                                |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Course Objectives                                                   |       |                                                                                                                                                                                                                                                                                                                                                                                                              | 1-Enriching and developing students' English language skills<br>2-Developing students' language abilities and skills |                                                                                                          |                               |
| 9. Teaching and Learning Strategies                                 |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Strategy                                                            |       | 1. Develop students' ability to recognize the most important vocabulary and linguistic terms in the English language.<br>2. Enrich students' vocabulary.<br>3. Understand the importance of learning English and its impact on learning other subjects.<br>4- Developing students' English language skills.<br>5- Developing reading and writing skills.<br>6- Developing students' English-speaking skills. |                                                                                                                      |                                                                                                          |                               |
| 10. Course Structure                                                |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Week                                                                | Hours | Required Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                                   | Unit or subject name                                                                                                 | Learning method                                                                                          | Evaluation method             |
| 1 <sup>st</sup>                                                     | 1     | Theoretical knowledge and practical educational application                                                                                                                                                                                                                                                                                                                                                  | Unit one<br>Verbs to be/<br>Questions word                                                                           | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 2 <sup>nd</sup>                                                     | 1     | Theoretical knowledge and practical educational application                                                                                                                                                                                                                                                                                                                                                  | Unit Two<br>Possessive adjective/ Plural nouns                                                                       | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |



|                  |   |                                                             |                                                              |                                                                                                          |                               |
|------------------|---|-------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|
| 3 <sup>rd</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Three<br>Questions with question words/Yes-No questions | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 4 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Three<br>Verbs to be/positive and negative              | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 5 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Four<br>Have/ Has                                       | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 6 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Four<br>Plural nouns                                    | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 7 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Four<br>Possessive pronoun                              | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 8 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Five<br>Possessive adjective                            | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 9 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Five<br>Present simple                                  | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 10 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Five<br>a-an/ Adjective noun                            | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 11 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Six<br>Present simple                                   | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 12 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Six<br>Adverbs of frequency                             | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 13 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit seven<br>Question word:                                 | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |



|                  |   |                                                             |                                  |                                                                                                          |                               |
|------------------|---|-------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|
| 14 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Seven<br>Pronouns           | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 15 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Seven<br>This & That        | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 16 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Eight<br>There is & The are | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 17 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Eight<br>Some & Any         | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |

### 11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

### 12.Learning and Teaching Resources

|                                                                    |                                                                                                                                                      |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | New Headway Plus for Beginners.                                                                                                                      |
| Main references (sources)                                          |                                                                                                                                                      |
| Recommended books and references (scientific journals, reports...) |                                                                                                                                                      |
| Electronic References, Websites                                    | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities. |

## Sample Course Description for Phase II

|                                                                                                                                                                                                                                                                                                                                                                                                          |                          |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|
| <b>Course Title: Heat and material properties/Phase I</b>                                                                                                                                                                                                                                                                                                                                                |                          | <b>1</b>  |
| <b>Course Code: HAEPSPH-102</b>                                                                                                                                                                                                                                                                                                                                                                          |                          | <b>2</b>  |
| <b>Semester/Year: 2024-2025</b>                                                                                                                                                                                                                                                                                                                                                                          |                          | <b>3</b>  |
| <b>Date of this description:23/9/2024</b>                                                                                                                                                                                                                                                                                                                                                                |                          | <b>4</b>  |
| <b>Available Attendance Formats: Attendance</b>                                                                                                                                                                                                                                                                                                                                                          |                          | <b>5</b>  |
| <b>Number of study hours (total) / number of units (total): 60 hours</b>                                                                                                                                                                                                                                                                                                                                 |                          | <b>6</b>  |
| <b>Name of the course administrator (if more than one name is mentioned): Assoc. Muwaffaq Mosa Mansour</b>                                                                                                                                                                                                                                                                                               |                          | <b>7</b>  |
| <b>Email: muwaffaq1968@gmail.com</b>                                                                                                                                                                                                                                                                                                                                                                     |                          | <b>8</b>  |
| <b>Course Objectives</b>                                                                                                                                                                                                                                                                                                                                                                                 |                          |           |
| <ul style="list-style-type: none"> <li>• Understand the principles and techniques of computer human intelligence simulation.</li> <li>• Developing the student's critical and creative thinking skills to deal with artificial intelligence</li> <li>• Learn to troubleshoot your computer.</li> <li>• Learn security, networking, and e-commerce.</li> </ul>                                            | <b>Course Objectives</b> | <b>9</b>  |
| <b>Teaching and Learning Strategies</b>                                                                                                                                                                                                                                                                                                                                                                  |                          |           |
| <ul style="list-style-type: none"> <li>• Reading books and lectures related to the curriculum.</li> <li>• Exercises and activities during and outside the lecture.</li> <li>• Presentations on the topics of the lecture.</li> <li>• Lecture, discussion, dialogue, and applied analysis.</li> <li>• Theoretical and practical lecture, dialogue and discussions, oral questions and reports.</li> </ul> | <b>Strategy</b>          | <b>10</b> |



## Curriculum Skills Chart

**Please indicate the boxes corresponding to the individual learning outcomes from the program being evaluated**

### Learning Outcomes Required from the Program

**Transferred General and  
Qualifying Skills  
(Other skills related to  
employability and  
personal development)**

## Emotional and Values Goals

| Program Skills | Objectives |
|----------------|------------|
|----------------|------------|

## Cognitive Goals

**fundamental**

**Course Name**

| Course | Code |
|--------|------|
|--------|------|

Year/L

D4

3D

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

C4



1



2

A4

A

A1

✓



10

✓

2



100

✓

2

## Essential

## Heat and Mate

## First

**Sample Course Description:****Course Description:**

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It must be linked to the description of the program.

|                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| 1. Educational Institution                                                                                                                                                                                                                                                                                                                                                                                                     | Hamdaniya University                                           |
| 2. Scientific Department/Center                                                                                                                                                                                                                                                                                                                                                                                                | Department of Physics / College of Education for Pure Sciences |
| 3. Course Name/Code                                                                                                                                                                                                                                                                                                                                                                                                            | Heat and Material Properties                                   |
| 4. Available Forms of Attendance                                                                                                                                                                                                                                                                                                                                                                                               | Face-to-face education                                         |
| 5. Semester/Year                                                                                                                                                                                                                                                                                                                                                                                                               | annual                                                         |
| 6. Number of Hours (Total)                                                                                                                                                                                                                                                                                                                                                                                                     | 60                                                             |
| 7. Date this description was prepared                                                                                                                                                                                                                                                                                                                                                                                          | 23 / 9 / 2025                                                  |
| 8. Course Objectives: To teach students to study the basic concepts in the subject of heat, the amount of heat and its effect on the thermal properties of the material. It also studies the kinetic theory of gases, the laws that are subject to them, the mechanical properties of the material such as stress and compliance of all kinds, Junk's law, and the electrical and magnetic properties of solids in particular. |                                                                |



|                                                              |  |
|--------------------------------------------------------------|--|
| 9.Course Outcomes, Teaching, Learning and Assessment Methods |  |
|--------------------------------------------------------------|--|

|                         |  |
|-------------------------|--|
| <p>Course Outcomes:</p> |  |
|-------------------------|--|

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <ul style="list-style-type: none"> <li>-Explains the basic principles and concepts of heat.</li> <li>- The student distinguishes between temperature and temperature.</li> <li>- The student will learn about the methods of finding the specific heat of solids.</li> <li>- Mentions the most important practical applications of Pascal's base.</li> <li>- The student connects the scientific facts and data to derive Torcelli's equation.</li> <li>- Enable the student to understand the mathematical laws in solving gas problems.</li> <li>- Distinguishes between conductive and insulating materials.</li> <li>- Identifies the factors affecting the amount and type of deformation that occurs in the solid.</li> <li>- Enumerates the properties of paramagnetic materials.</li> </ul> |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

|                                           |  |
|-------------------------------------------|--|
| <p>B. Skill Objectives of the Course:</p> |  |
|-------------------------------------------|--|

- |                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <ul style="list-style-type: none"> <li>- The student is introduced to the basic laws of heat, gases, and liquids.</li> <li>- Develop the student's abilities to understand the laws of gases and the kinetic theory of gases.</li> <li>- The student discovers the properties of fluids in both stillnesses and motion.</li> <li>- The student compares different magnetic materials and the extent to which heat affects them.</li> </ul> |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

|                               |  |
|-------------------------------|--|
| Teaching and Learning Methods |  |
|-------------------------------|--|

|                                            |  |
|--------------------------------------------|--|
| Lecture, Discussion, Dialogue and Analysis |  |
|--------------------------------------------|--|

|                                                                                                                                                                                                                                                                                                                                                                                                |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Evaluation Methods                                                                                                                                                                                                                                                                                                                                                                             |  |
| <ul style="list-style-type: none"> <li>– Daily and quarterly questions.</li> <li>– Homework.</li> <li>– Direct questions addressed to students during the lecture.</li> </ul>                                                                                                                                                                                                                  |  |
| <p>C. Emotional and Values Goals:</p> <p>A1– Directing students' attention to know the mechanisms of heat transfer.</p> <p>C2– Developing the student's ability to interpret the phase shifts that occur in the subject.</p> <p>A3– Motivating students to participate in the lecture.</p> <p>C4– Developing the student's skills in solving mathematical problems related to the subject.</p> |  |
| Teaching and Learning Methods                                                                                                                                                                                                                                                                                                                                                                  |  |
| Lecture , discussion, dialogue and analysis.                                                                                                                                                                                                                                                                                                                                                   |  |
| Evaluation Methods                                                                                                                                                                                                                                                                                                                                                                             |  |
| Written and oral tests                                                                                                                                                                                                                                                                                                                                                                         |  |
| <p>d. Transferred general and qualifying skills (other skills related to employability and personal development).</p> <ul style="list-style-type: none"> <li>– Access to scientific sources</li> <li>– Reviewing the latest studies in the specialization.</li> <li>– Follow scientific websites using the Internet</li> </ul>                                                                 |  |



| 1. Course Structure |       |                                                                                                                                                                                   |                          |                                   |                   |
|---------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------|-------------------|
| The week            | Hours | Required Learning Outcomes                                                                                                                                                        | Module Name / or Subject | Teaching Method                   | Evaluation Method |
| First               | 2     | Temperature, Temperature Measurement Bases, Temperature Gauges and Conversion Between Them, Types of Diapers                                                                      | temperatur               | Lecture, Discussion and Dialogue  | Direct Questios   |
| Second              | 2     | Seal Staging, Fixed-Volume Gas Heater, Thermocouple Thermodynamic, Electrical Resistance, Effect of Temperature on Material States, Thermal Expansion - Expansion of Solid Bodies | temperature              | Lecturer, Discussion and Dialogue |                   |
| Third               | 2     | Fluid Expansion, Gas Expansion, Heat Transfer Mechanisms, Conductivity                                                                                                            | temperature              | Lecturer, Discussion and Dialogue |                   |
| Fourth              | 2     | Radiation, Low Temperatures, Heat Energy Sources, Energy-Matter Relationship, Solved Examples                                                                                     | temperature              | Lecture, Discussion and Dialogue  |                   |
| Fifth               | 2     | Solving questions                                                                                                                                                                 | temperature              | Lecture, Discussion and Dialogue  |                   |
| Sixth               | 2     | Heat and its effects, amount of heat, specific heat, methods of measuring specific heat, phase concept, phase shifts                                                              | Heat                     | Lecture, Discussion and Dialogue  | Daily exam        |
| Seventh             | 2     | Phase diagram, triple point of water, state transformations of matter, evaporation, fusion, boiling, sublimation                                                                  | Heat                     | Lecture, Discussion and Dialogue  |                   |
| Eighth              | 2     | The first law of thermodynamics, solving                                                                                                                                          | Heat                     | Lecture, Discussion               |                   |

|            |   |                                                                                                                                       |               |                                         |                     |
|------------|---|---------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------|---------------------|
|            |   | <b>examples</b>                                                                                                                       |               | <b>and Dialogue</b>                     |                     |
| Ninth      | 2 | <b>Solving questions.</b>                                                                                                             | <b>Heat</b>   | <b>Lecture, Discussion and Dialogue</b> |                     |
| Tenth      | 2 | <b>Ideal Gas and Real Gas, Kinetic Theory of Gases, Avocadora Number, Gas Law, Boyle's Law, Charles' Law, Gas Constant</b>            | <b>Gases</b>  | <b>Lecture, Discussion and Dialogue</b> | <b>Daily exam</b>   |
| Eleventh   | 2 | <b>The Ideal Gas Law, Vandervase's Equation, The Internal Energy of the Gas</b>                                                       | <b>Gases</b>  | <b>Lecture, Discussion and Dialogue</b> |                     |
| Twelfth    | 2 | <b>Specific Heat of Gases CV, CP Relationship between CV, CP Calculation of CV, CP of Ideal Gas, Workpiece Performed by Ideal Gas</b> | <b>Gases</b>  | <b>Lecture, Discussion and Dialogue</b> |                     |
| Thirteenth | 2 | <b>Ideal Gas Pressure, Solved Examples</b>                                                                                            | <b>Gases</b>  | <b>Lecture, Discussion and Dialogue</b> |                     |
| Fourteenth | 2 | <b>Solving questions</b>                                                                                                              | <b>Gases</b>  | <b>Lecture, Discussion and Dialogue</b> |                     |
| Fifteenth  | 2 | <b>Solving questions</b>                                                                                                              | <b>Gases</b>  | <b>Lecture, Discussion and Dialogue</b> | <b>Monthly exam</b> |
| Sixteenth  | 2 | <b>fluids Density and specific weight, capillary property, surface tensile, liquid surface, contact angle</b>                         | <b>fluids</b> | <b>Lecture, Discussion and Dialogue</b> |                     |



|              |   |                                                                                                                                                                                                           |                                         |                                         |                   |
|--------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|-------------------|
| Seventeen    | 2 | <b>Viscosity, Pressure in Liquids, Pascal Base, Archimedes Base</b>                                                                                                                                       | <b>fluids</b>                           | <b>Lecture, Discussion and Dialogue</b> |                   |
| Eighteenth   | 2 | <b>Flowflow Regular, Poisselle Equation, Bernoulli's Equation, Torchley's Equation</b>                                                                                                                    | <b>fluids</b>                           | <b>Lecture, Discussion and Dialogue</b> |                   |
| Nineteen     | 2 | <b>Flow meters, venturi meter, petut tube, solved examples</b>                                                                                                                                            | <b>fluids</b>                           | <b>Lecture, Discussion and Dialogue</b> |                   |
| Twenty       | 2 | <b>Solving questions</b>                                                                                                                                                                                  | <b>fluids</b>                           | <b>Lecture, Discussion and Dialogue</b> |                   |
| Twenty one   | 2 | <b>Stress and its types, Adaptability and its types, Stress curve, Adaptability, Flexibility coefficient</b>                                                                                              | <b>Mechanical properties of solids,</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Daily exam</b> |
| Twenty two   | 2 | <b>Junk's coefficient, an experiment to measure the Junk coefficient, the Poisson ratio, an experiment to measure the Poisson ratio</b>                                                                   | <b>Mechanical properties of solids,</b> | <b>Lecture, Discussion and Dialogue</b> |                   |
| Twenty Three | 2 | <b>The relationship between mechanical properties and temperature, the effect of temperatures on all properties, the thermal treatment of the material at high and low temperatures, solving examples</b> | <b>Mechanical properties of solids,</b> | <b>Lecture, Discussion and Dialogue</b> |                   |
| Twenty Four  | 2 | <b>Solving questions</b>                                                                                                                                                                                  | <b>Mechanical properties of solids,</b> | <b>Lecture, Discussion and Dialogue</b> |                   |

| 2.Infrastructure                                                                                                                                                                                                                                                               |                                                                           |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--|
| <b>1- Heat and properties of the material. (Dr. Kazim Ahmed)</b><br><b>2- Thermodynamics (Dr. Sami Mazloun, Dr. Amjad Karajieh, Dr. Abdellatif Ibrahim)</b><br><b>3- Mechanic, Heat and Sound, By: Sears.</b><br><b>4- Physics ( part 1 ), By: R. Resuich and D. Halliday.</b> | 1- Required Textbooks                                                     |  |
|                                                                                                                                                                                                                                                                                | 2- Main References (Sources)                                              |  |
|                                                                                                                                                                                                                                                                                | A) Recommended books and references (scientific journals, reports, .....) |  |
| Various locations and locations about heat and water properties.Online.                                                                                                                                                                                                        | B) Electronic References, Websites, .....                                 |  |

| 3. Course Development Plan                                                                                              |  |  |
|-------------------------------------------------------------------------------------------------------------------------|--|--|
| 1- Developing some topics of play.<br>2- Using modern means of presentation (smart board).<br>3- Developing classrooms. |  |  |

| 4. Faculty                   |                                             |  |                 |                                    |
|------------------------------|---------------------------------------------|--|-----------------|------------------------------------|
| Faculty Member:              |                                             |  |                 |                                    |
| Preparing the teaching staff | Special requirements/skills (if applicable) |  | Specialization: |                                    |
| lecturer                     |                                             |  | Fiber Optic     | Academic Rank : Assistant Lecturer |
|                              |                                             |  |                 |                                    |



## Course Description Form

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1. | :Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |
|    | Fundamentals of Education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| 2. | :Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |
|    | EHAEPSPH-107                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |
| 3. | :Semester/Year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |
|    | 2024-2005                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| 4. | :Date of preparation of this description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2024-9-18         |
| 5. | :Available Forms of Attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |
|    | Face-to-face education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |
| 6. | (Number of Hours (Total) / Number of Units (Total))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |
|    | Academic 30 Hours/2 Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| 7. | Course administrator name (if more than one name is mentioned)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |
|    | Name: Assistant Lecturer Alaa Talal Hamid saeid<br>Email: alaa.talal@uohamdaniya.edu.iq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |
| 8. | Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |
|    | <p>Increasing students' awareness of the importance of linking the .1 scientific aspect with the practical, especially if it is related to improving aspects of daily life, through which society is reformed, .serving the country, and living that achieves happiness for all</p> <p>Increasing the student's understanding of the educational and .2 social reality throughout the ages and the awareness of the</p>                                                                                                                                                                                                                                       | Course Objectives |
| 9. | Teaching and Learning Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |
|    | <p style="text-align: right;">Dialogue and discussion .1</p> <p style="text-align: right;">.Brainstorming and problem-solving .2</p> <p style="text-align: right;">Measurement and Induction .3</p> <p style="text-align: right;">Collaborative Learning.Dialogue and discussion .4</p> <p style="text-align: right;">.Brainstorming and problem-solving .5</p> <p style="text-align: right;">Measurement and Induction .6</p> <p style="text-align: right;">.Collaborative learning .7</p> <p style="text-align: right;">."Educational seminars "Seminar .8</p> <p style="text-align: right;">The Five Pillars Strategy and Linking to the Reality of .9</p> | Strategy          |

|                                                                                                                    |     |
|--------------------------------------------------------------------------------------------------------------------|-----|
| Students' Daily Life to Consolidate What They Have Learned                                                         |     |
| .Blended learning                                                                                                  | .10 |
| Assignments and Class Activities                                                                                   | .11 |
| ."Educational seminars "Seminar                                                                                    | .12 |
| The Five Pillars Strategy and Linking to the Reality of Students' Daily Life to Consolidate What They Have Learned | .13 |
| .Blended learning                                                                                                  | .14 |
| .Assignments and class activities                                                                                  | .15 |

#### 10. Course Structure

| طريقة التقييم            | Teaching Method   | Unit Name or Subject                                                                                                                 | Required Learning Outcomes                                                            | Hours | Week |
|--------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|------|
| Oral and written testing | Dialog Discussion | <b>The meaning of education and its objectives are necessary</b><br><b>The meaning of education and its objectives are necessary</b> | Students should explain the meaning of education and its objectives and its necessity | 2     | 1    |
| Oral and written testing | Dialog Discussion | <b>Theories, Fields</b>                                                                                                              | Students should distinguish between their theories and fields                         | 2     | 2    |
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b>                                                                                             | Students should be introduced to the historical basis of education                    | 2     | 3    |
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b>                                                                                             | To understand the ancient education                                                   | 2     | 4    |
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b>                                                                                             | To summarize how to raise Chinese                                                     | 2     | 5    |



|                          |                   |                                          |                                                                                                                                              |   |    |
|--------------------------|-------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---|----|
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b> | Explain Greek Education                                                                                                                      | 2 | 6  |
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b> | Illustrate Medieval Education                                                                                                                | 2 | 7  |
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b> | To compare Arab education before Islam and after Islam                                                                                       | 2 | 8  |
| Oral and written testing | Dialog Discussion | <b>The Historical Basis of Education</b> | Students should distinguish between the challenges that hinder them and the factors that contribute to the application of modern ..education | 2 | 9  |
| Oral and written testing | Dialog Discussion | <b>The Social Basis of Education</b>     | Shows the relationship between education and society                                                                                         | 2 | 10 |
| Oral and written testing | Dialog Discussion | <b>The Social Basis of Education</b>     | Summarizes the relationship between the individual and the environment                                                                       | 2 | 11 |
| Oral and written testing | Dialog Discussion | <b>The Social Basis of Education</b>     | To practice moral education                                                                                                                  | 2 | 12 |
| Oral and written testing | Dialog Discussion | <b>The Social Basis of Education</b>     | Students should apply family ,education                                                                                                      | 2 | 13 |
| Oral and written testing | Dialog Discussion | <b>The Social Basis of Education</b>     | Students should apply civic ,education                                                                                                       | 2 | 14 |
| Oral and written testing | Dialog Discussion | <b>The Social Basis of Education</b>     | Students should apply health education                                                                                                       | 2 | 15 |

|                          |                   |                                                                                  |                                                                                        |   |    |
|--------------------------|-------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---|----|
| Oral and written testing | Dialog Discussion | <b>The Economic Basis of Education</b><br><b>The Economic Basis of Education</b> | Illustrates education and its impact on economic development                           | 2 | 16 |
| Oral and written testing | Dialog Discussion | <b>The Economic Basis of Education</b>                                           | To enumerate natural resources and how to invest them                                  | 2 | 17 |
| Oral and written testing | Dialog Discussion | <b>The Scientific Basis of Education</b>                                         | Demonstrate education and methodology in research                                      | 2 | 18 |
| Oral and written testing | Dialog Discussion | <b>National and Social Foundations</b>                                           | National and Social Foundations                                                        | 2 | 19 |
| Oral and written testing | Dialog Discussion | <b>Education in the Perspective of Islam</b>                                     | Education in the Islamic Perspective                                                   | 2 | 20 |
| Oral and written testing | Dialog Discussion | <b>Educational Renewal in Iraq</b>                                               | Explains the Comprehensive School                                                      | 2 | 21 |
| Oral and written testing | Dialog Discussion | <b>Educational Renewal in Iraq</b>                                               | Understands Systematic Education                                                       | 2 | 22 |
| Oral and written testing | Dialog Discussion | <b>Educational Renewal in Iraq</b>                                               | Expresses the importance of acceleration schools                                       | 2 | 23 |
| Oral and written testing | Dialog Discussion | <b>Primitive Education</b>                                                       | The individual accepts the primitive environment and how the education itself is woven | 2 | 24 |
| Oral and written testing | Dialog Discussion | <b>Social Education</b>                                                          | Students have a specific social need                                                   | 2 | 25 |
| Oral and written testing | Dialog Discussion | <b>Education throughout history</b>                                              | Finding the Relationship of Harmony                                                    | 2 | 26 |



|                             |                      |                                                                  |                                                                                                                                |          |           |
|-----------------------------|----------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------|-----------|
|                             |                      |                                                                  | between<br>Civilizations                                                                                                       |          |           |
| Oral and<br>written testing | Dialog<br>Discussion | <b>Islamic<br/>Education</b>                                     | I mean symmetry<br>and consistency<br>in thinking and<br>acting according<br>to our religion                                   | <b>2</b> | <b>27</b> |
| Oral and<br>written testing | Dialog<br>Discussion | <b>Community<br/>Educational<br/>Applications</b>                | Students should<br>apply the most<br>prominent<br>educational and<br>awareness<br>programs that<br>serve the<br>.community     | <b>2</b> | <b>28</b> |
| Oral and<br>written testing | Dialog<br>Discussion | <b>Educational<br/>Methodologica<br/>l Applications</b>          | Students should<br>be able to<br>understand the<br>foundations on<br>which the<br>methodological<br>applications are<br>.based |          | <b>29</b> |
| Oral and<br>written testing | Dialog<br>Discussion | <b>Challenges of<br/>Social and<br/>National<br/>Foundations</b> | Students should<br>contribute to<br>reducing obstacles<br>facing societal<br>and national<br>progress                          | <b>2</b> | <b>30</b> |

#### 11. Course Evaluation

Distribution of the score out of 100 according to the

| 12. Teaching and Learning Resources                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                            | (Required Textbooks (Methodology, if any))                      |
| <p><b>Ibn Rushd and his .1</b><br/> <b>Philosophy between</b><br/> <b>Heritage and Modernity, Al-</b><br/> <b>Asam, Abd al-Amir, vol. 1</b><br/> <b>Bayt al-Hikma, Baghdad,</b><br/> <b>.1999</b></p> <p><b>Dr. Ibrahim Nasser, .2</b><br/> <b>Foundations of Education,</b><br/> <b>Dar Al-Tali'a, Amman, 2004</b></p> <p><b>The Republic, Plato, .3</b><br/> <b>translated by Hanna</b><br/> <b>Khabbaz, Dar al-Turath,</b><br/> <b>Beirut, 1969</b></p> | (Primary References)                                            |
| <p><b>Dr. Maher Al-Jaafari, .4</b><br/> <b>Foundations of Education,</b><br/> <b>Dar Ammar, Amman, 1998</b></p> <p><b>Dr. Ibrahim Othman, .5</b><br/> <b>Education, Dar Kazma,</b><br/> <b>Kuwait, 1983</b></p> <p><b>Dr. Mahmoud El-Sayed, .6</b><br/> <b>Studies in Education and</b><br/> <b>Society, Al-Nadim, Cairo,</b><br/> <b>1988</b></p>                                                                                                         | Recommended Books and References (Scientific Journals, Reports) |



|  |                      |
|--|----------------------|
|  |                      |
|  | References, Websites |

## Course Description Form

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Course Name:                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Sound and Wave Motion                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 2. Course Code:                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| HAEPSPH-204                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 3. Semester / Year:                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 2024-2025                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 4. Description Preparation Date:                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 20/9/2024                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 5. Available Attendance Forms:                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| In-person Education                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 60 hours / 2 units                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 7. Course administrator's name (mention all, if more than one name)          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Name: Prof. Dr. Malik Hussein Kheder<br>Email: dr.malik73@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 8. Course Objectives                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Course Objectives                                                            | <p><b>Skill-based Objectives of the Sound Course for Second-Year Physics Students may include the following:</b></p> <ol style="list-style-type: none"> <li>1. <b>Understanding the concepts of sound:</b> The ability to comprehend the wave nature of sound and the fundamental concepts such as wave, frequency, and wavelength.</li> <li>2. <b>Analyzing the behavior of sound waves:</b> Understanding and analyzing the behavior of sound, how it propagates in different media, and its effect on the surrounding environment.</li> <li>3. <b>Understanding the applications of sound:</b> The ability to grasp and understand the applications of sound in various fields such as audio and video technology, and industrial acoustics.</li> <li>4. <b>Interaction:</b> The ability to interact with the surrounding acoustic environment and sound applications.</li> </ol> |  |
| 9. Teaching and Learning Strategies                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Strategy                                                                     | 1. Understanding the nature of sound waves: Comprehending the fundamentals of sound as a wave phenomenon and understanding the relationship between sound speed, frequency, and wavelength.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |



2. Analyzing sound and its behavior: The ability to analyze the behavior of sound, including reflection, refraction, propagation, and diffraction in the presence of obstacles.
3. Interaction with the acoustic environment: The ability to interact with the surrounding acoustic environment and understand its effects on humans and the environment.
4. Empowering students: Enabling students to acquire knowledge and understanding of scientific laws in physics, practical applications of physics, logical and scientific analysis, and interpretation of physical phenomena.

#### 10. Course Structure

| Week | Hours | Required Learning Outcomes                 | Unit or subject name                                                                                                 | Learning method               | Evaluation method           |
|------|-------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------|
| 1    | 2     | Theoretical knowledge and applied analysis | Basic concepts of wave motion, means of energy transfer, characteristics of mechanical wave motion                   | Lecture, discussion, dialogue | Direct questions            |
| 2    | 2     | Theoretical knowledge and applied analysis | Types of wave motion, kind of mechanical waves, basic properties of mechanical wave transmission                     | Lecture, discussion, dialogue |                             |
| 3    | 2     | Theoretical knowledge and applied analysis | Transmission of mechanical wave motion                                                                               | Lecture, discussion, dialogue |                             |
| 4    | 2     | Theoretical knowledge and applied analysis | Waves in vibrating strings, waves in a helical spring                                                                | Lecture, discussion, dialogue |                             |
| 5    | 2     | Theoretical knowledge and applied analysis | Waves on liquid surfaces, sound waves                                                                                | Lecture, discussion, dialogue |                             |
| 6    | 2     | Theoretical knowledge and applied analysis | Simple explanation using a piston, properties of sound waves in a piston                                             | Lecture, discussion, dialogue |                             |
| 7    | 2     | Theoretical knowledge and applied analysis | Wave velocity and particle velocity, mathematical representation of wave motion                                      | Lecture, discussion, dialogue |                             |
| 8    | 2     | Theoretical knowledge and applied analysis | Theory of free vibration, oscillatory motion, simple harmonic motion                                                 | Lecture, discussion, dialogue |                             |
| 9    | 2     | Theoretical knowledge and applied analysis | Equation of linear harmonic motion, energy of a simple harmonic oscillator, average kinetic energy of the oscillator | Lecture, discussion, dialogue |                             |
| 10   | 2     | Theoretical knowledge and applied analysis | Applications of simple harmonic motion: simple pendulum, floating body                                               | Lecture, discussion, dialogue | In addition to monthly exam |
| 11   | 2     | Theoretical knowledge and applied analysis | Liquid in a U-tube, transverse vibration of a particle in a stretched string                                         | Lecture, discussion, dialogue |                             |
| 12   | 2     | Theoretical knowledge and applied analysis | Longitudinal vibration of a body between two identical springs, piston oscillation in cylinder containing gas        | Lecture, discussion, dialogue |                             |



|    |   |                                            |                                                                                                      |                               |              |
|----|---|--------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------|--------------|
| 13 | 2 | Theoretical knowledge and applied analysis | Resonator, theory of the resonator                                                                   | Lecture, discussion, dialogue |              |
| 14 | 2 | Theoretical knowledge and applied analysis | Simple angular harmonic motion, torsional pendulum                                                   | Lecture, discussion, dialogue |              |
| 15 | 2 | Theoretical knowledge and applied analysis | Compound pendulum                                                                                    | Lecture, discussion, dialogue |              |
| 16 | 2 | Theoretical knowledge and applied analysis | Superposition of simple harmonic motions, principle of superposition                                 | Lecture, discussion, dialogue |              |
| 17 | 2 | Theoretical knowledge and applied analysis | Result of combining two harmonic motions in the same line                                            | Lecture, discussion, dialogue |              |
| 18 | 2 | Theoretical knowledge and applied analysis | Superposition of two harmonic motions in perpendicular directions, Lissajous figures                 | Lecture, discussion, dialogue |              |
| 19 | 2 | Theoretical knowledge and applied analysis | Graphical method of superposition of two perpendicular harmonic motions with equal angular frequency | Lecture, discussion, dialogue |              |
| 20 | 2 | Theoretical knowledge and applied analysis | Superposition of two perpendicular motions when one frequency is double the other                    | Lecture, discussion, dialogue |              |
| 21 | 2 | Theoretical knowledge and applied analysis | Beats                                                                                                | Lecture, discussion, dialogue |              |
| 22 | 2 | Theoretical knowledge and applied analysis | Damped oscillation, damping force                                                                    | Lecture, discussion, dialogue | Monthly exam |
| 23 | 2 | Theoretical knowledge and applied analysis | Equation of damped motion, solution of the damped harmonic oscillator equation                       | Discussion, dialogue          |              |
| 24 | 2 | Theoretical knowledge and applied analysis | Cases of damping: no damping, underdamping, overdamping, critical damping                            | Discussion, dialogue          |              |
| 25 | 2 | Theoretical knowledge and applied analysis | Measures of damping: logarithmic decrement, relaxation time, quality factor                          | Discussion, dialogue          |              |
| 26 | 2 | Theoretical knowledge and applied analysis | Forced oscillation                                                                                   | Discussion, dialogue          |              |
| 27 | 2 | Theoretical knowledge and applied analysis | Transverse waves in one dimension                                                                    | Discussion, dialogue          |              |
| 28 | 2 | Theoretical knowledge and applied analysis | Longitudinal waves (sound waves)                                                                     | Discussion, dialogue          |              |
| 29 | 2 | Theoretical knowledge and applied analysis | General considerations on sound and wave phenomena                                                   | Discussion, dialogue          |              |
| 30 | 2 | Theoretical knowledge and applied analysis | Ultrasonic waves and their applications                                                              | Discussion, dialogue          |              |

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

## 12. Learning and Teaching Resources

|                                               |                                                                       |
|-----------------------------------------------|-----------------------------------------------------------------------|
| Required textbooks (curricular books, if any) | Sound and Wave Motion / Authored by Amjad Abdulrazzaq Karjiya         |
| Main references (sources)                     | Physics of Sound and Wave Motion Authored by Dr. Mustafa Amin Mustafa |



|                                                                       |                                                                                                                                                         |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended books and references<br>(scientific journals, reports...) | Following up on electronic references at the Internet, including reputable scientific websites and library websites of some international universities. |
| Electronic References, Websites                                       | Internet websites related to sound and wave motion.                                                                                                     |

## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1. Course name:                                            |
| Educational and Developmental Psychology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2. Course code:                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | HAEPSPH-207                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3. Semester/Year:                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2024-2025                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4. Date of preparation of this description:                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 09/21/2024                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5. Available forms of attendance:                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | In-person education                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6. Number of study hours (total) / Number of units (total) |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 60 hours / (4) units                                       |
| 7. Name of the course administrator (if more than one name is mentioned)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                            |
| Name: T.A. Mohammed Qazi Jassim Email: mohammedalhadidi@uohamdaniya.edu.iq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8. Course objectives                                       |
| <p style="text-align: center;"><b>The course aims to introduce students to:</b></p> <p><b>Educational psychology, its concept and objectives. -1</b></p> <p><b>The concept of learning, its applications, theories and educational applications and role in the educational process. -2</b></p> <p><b>Information processing theory and its educational applications. -3</b></p> <p><b>Transfer of learning, its types, feedback and its importance for learners. -4</b></p> <p><b>Motivation: definition, functions, types, theories and Teaching. -5</b></p> <p><b>Problem solving, problem definition, learning problem solving skills. -6</b></p> <p><b>Historical background For Learning by computer programs, its principles and effectiveness in A Learning process. -7</b></p> <p><b>The concept of developmental psychology. -8</b></p> <p><b>with me A The stages of language development. -9</b></p> | <p><b>Course objectives</b></p>                            |



|                                                                           |                                       |                           |                                                                                                                                        |       |            |
|---------------------------------------------------------------------------|---------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| Stages of human cognitive development. -10                                |                                       |                           |                                                                                                                                        |       |            |
| Stages of the emergence of the A Human. -11                               |                                       |                           |                                                                                                                                        |       |            |
| theDistinguish between branches of developmental -12 psychology.          |                                       |                           |                                                                                                                                        |       |            |
| 9. Teaching and learning strategies                                       |                                       |                           |                                                                                                                                        |       |            |
| The lecture. - Strategy                                                   |                                       |                           |                                                                                                                                        |       |            |
| Discussion. -                                                             |                                       |                           |                                                                                                                                        |       |            |
| Brainstorming. -                                                          |                                       |                           |                                                                                                                                        |       |            |
| Cooperative groups. -                                                     |                                       |                           |                                                                                                                                        |       |            |
| Self-learning. -                                                          |                                       |                           |                                                                                                                                        |       |            |
| Homework and its submission in class by students -                        |                                       |                           |                                                                                                                                        |       |            |
| Use of educational tools: -                                               |                                       |                           |                                                                                                                                        |       |            |
| Science books, blackboard, colored pencils, slide projector (PowerPoint). |                                       |                           |                                                                                                                                        |       |            |
| 10. Course structure                                                      |                                       |                           |                                                                                                                                        |       |            |
| Evaluation method                                                         | Learning method                       | Name of the unit or topic | Required learning outcomes                                                                                                             | hours | week       |
| Feedback via direct questions                                             | Lecture and discussion                | Educational Psychology    | Introducing students to: Educational Psychology: Definition, Historical Development Goals, fields and topics of educational psychology | 2     | the first  |
| Feedback via direct questions                                             | Lecture, discussion                   | Educational Psychology    | Educational objectives, their levels, and their formulation Learning and teaching: concept, nature of the learning process             | 2     | the second |
| Feedback via direct questions                                             | Lecture and discussion, brainstorming | Educational Psychology    | Its characteristics The difference between learning and                                                                                | 2     | the third  |



|                                          |                                                     |                        |                                                                                                                                                                                                                                              |   |            |
|------------------------------------------|-----------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------|
|                                          | methods                                             |                        | teaching                                                                                                                                                                                                                                     |   |            |
| Feedback via direct questions            | Lecture and discussion                              | Educational Psychology | Factors affecting learning and teaching theories and their educational applications                                                                                                                                                          | 2 | Fourth     |
| Feedback via direct questions            | Lecture, discussion and brainstorming techniques    | Educational Psychology | Theories: Thorndike, Pavlov, Skinner, Gestalt                                                                                                                                                                                                | 2 | Fifth      |
| Feedback via direct questions            | Lecture and discussion, methods of scientific doubt | Educational Psychology | social learning theory<br>Cognitive learning theory                                                                                                                                                                                          | 2 | Sixth      |
| Feedback via direct questions            | Lecture, discussion and brainstorming techniques    | First month exam       | First month exam                                                                                                                                                                                                                             | 2 | Seventh    |
| Feedback through questions<br>Direct Rah | Lecture, discussion and brainstorming mental        | Educational Psychology | Remembering and forgetting<br>Memory and its types                                                                                                                                                                                           | 2 | The eighth |
| Feedback via direct questions            | Lecture and discussion<br>brainstorming methods     | Educational Psychology | Theories explaining forgetting<br>Strategies to help with memorization and recall, applications in acquisition and retention                                                                                                                 | 2 | Ninth      |
| Extracurricular activities               | Discussion sessions                                 | Educational Psychology | Information Processing Theory, Applications of Theory<br>Transfer of learning: definition and types                                                                                                                                          | 2 | tenth      |
| Feedback via direct questions            | Lecture, discussion and dialogue                    | Educational Psychology | His educational theories and applications, assistive technologies<br>It is said after learning<br>Learning concepts: definition of the concept, nature of its components, influencing factors<br>In concept acquisition, concept acquisition | 2 | eleventh   |



|                               |                                              |                          |                                                                                                                                                                                              |   |                  |
|-------------------------------|----------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------|
|                               |                                              |                          | theories.                                                                                                                                                                                    |   |                  |
| Feedback via direct questions | Lecture and discussion brainstorming methods | Educational Psychology   | Thinking, its concept, creative thinking, learning skills and habits, motivation and classroom interaction, feedback: its definition, types, educational applications, practical application | 2 | twelfth          |
| Feedback via direct questions | Lecture and discussion cooperative learning  | Educational Psychology   | Problem solving Programs for teaching problem solving, practical application                                                                                                                 | 2 | thirteenth       |
| Feedback via direct questions | Lecture and discussion                       | Second month exam        | Second month exam                                                                                                                                                                            | 2 | fourteenth       |
| Feedback via direct questions | Lecture and discussion                       | Educational Psychology   | Computerized e-learning                                                                                                                                                                      | 2 | fifteenth        |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Developmental Psychology: Definition, Importance, Meaning of Development General laws (principles) of growth                                                                                 | 2 | Week 16          |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Factors affecting growth Genetic factors - environmental factors                                                                                                                             | 2 | Seventeenth week |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Research Methods in Developmental Psychology Research: longitudinal, cross-sectional, experimental, correlational.                                                                           | 2 | Eighteenth week  |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Childhood Its definition, importance, and stages                                                                                                                                             | 2 | Nineteenth week  |
| Feedback via direct questions | Lecture, discussion and dialogue             | Developmental Psychology | Mental and language development Social and Emotional Development - Moral Development                                                                                                         | 2 | Week twentieth   |



|                               |                                                  |                          |                                                                                                                                                                                    |   |                   |
|-------------------------------|--------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------|
| Feedback via direct questions | Brainstorming, discussion and lecture techniques | Developmental Psychology | The role of social institutions in the socialization of children<br><br>Family, school, peers, media                                                                               | 2 | Week twenty-one   |
| Feedback via direct questions | Monthly exam                                     | First month exam         | First month exam                                                                                                                                                                   | 2 | Week twenty-two   |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Adolescence: Definition, Importance, Stages, and Mental Development<br>Cognitive, social and emotional development, moral development                                              | 2 | Week twenty-three |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Adolescent and society                                                                                                                                                             | 2 | Week twenty-four  |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Teenagers and Careers: The Importance of Work in Teenagers' Life.<br><br>The importance of choosing a career and the factors influencing it... Teenagers' compatibility with work. | 2 | Week twenty-five  |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Adolescent trends and tendencies<br><br>The importance of tendencies and trends                                                                                                    | 2 | Week 26           |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Sources of acquisition of tendencies and trends<br><br>Factors affecting adolescents' attitudes and tendencies                                                                     | 2 | Week 27           |
| Feedback via direct questions | Discussion and dialogue                          | Developmental Psychology | Some adolescent problems-academic delay                                                                                                                                            | 2 | Week 28           |
| Feedback via direct questions | Discussion and dialogue                          | Second month exam        | Second month exam                                                                                                                                                                  | 2 | Week 29           |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                          |                                              |   |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------|----------------------------------------------|---|---------|
| By evaluating a practical session                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Discussion and dialogue | Developmental Psychology | -Aggressive behavior –adolescent delinquency | 2 | Week 30 |
| 11. Course Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                          |                                              |   |         |
| The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                          |                                              |   |         |
| <p>Learning and teaching resources:</p> <p>1) Educational Psychology: Theories, Methods and Applications (2024) Nabil Ad Al-Hadi, Dar Al-Yazouri Scientific.</p> <p>2) Educational Psychology: Theory and Application, Adnan Yousef Al-Atoum, Shafiq Falah Al-Alauna, and Abdul Al-Nasser Diab Al-Jarrah and Muawiya Mahmoud Ghaly (2013), Dar Al-Masirah for Publishing and Distribution Printing, Amman, Jordan.</p> <p>3) Educational Psychology, Abdul Majeed Nashwaty(2003) Dar Al-Furqan for Publishing and Distribution, Jordan</p> <p>4) Educational Psychology, Saleh Abu Jado. Ghazal Dar Al-Masirah for Publishing, Distribution and Printing, Amman. Jordan.</p> <p>5) Foundations of Child and Adolescent Psychology, Kuwait – Al-Falah Library. Masn, Paul, and others.</p> <p>6) Evolutionary Psychology, Jordan – Amman, Majdalawi Publishing House. Arefej, Sami (1993).</p> <p>7) Introduction to Evolutionary Psychology, Cairo – Arab House Library for Books. Alwan, Fadia.</p> |                         |                          |                                              |   |         |



## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                      |                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                      | 1. Course name:                                            |
|                                                                                                                                                                                                                                                                                                                                                                      | Crimes of the Baath regime in Iraq                         |
|                                                                                                                                                                                                                                                                                                                                                                      | 2. Course code:                                            |
|                                                                                                                                                                                                                                                                                                                                                                      | HAEPSPH-212                                                |
|                                                                                                                                                                                                                                                                                                                                                                      | 3. Semester/Year:                                          |
|                                                                                                                                                                                                                                                                                                                                                                      | 2024-2025                                                  |
|                                                                                                                                                                                                                                                                                                                                                                      | 4. Date of preparation of this description:                |
|                                                                                                                                                                                                                                                                                                                                                                      | 09/21/2024                                                 |
|                                                                                                                                                                                                                                                                                                                                                                      | 5. Available forms of attendance:                          |
|                                                                                                                                                                                                                                                                                                                                                                      | In-person education                                        |
|                                                                                                                                                                                                                                                                                                                                                                      | 6. Number of study hours (total) / Number of units (total) |
|                                                                                                                                                                                                                                                                                                                                                                      | 30 hours / (2) units                                       |
| 7. Name of the course administrator (if more than one name is mentioned)                                                                                                                                                                                                                                                                                             |                                                            |
| Name: Assistant Teacher. Ahmed Ismael Juma'a                                                                                                                                                                                                                                                                                                                         |                                                            |
| Email: ahmedalrwas@uohamdaniya.edu.iq                                                                                                                                                                                                                                                                                                                                |                                                            |
|                                                                                                                                                                                                                                                                                                                                                                      | 8. Course objectives                                       |
| <p><b>The course aims to introduce students to:</b></p> <p><b>Educational psychology, its concept and objective.</b></p> <p>Introducing students to the crimes of the Baath regime in Iraq, such as the mass graves in Iraq before 2003. Providing the opportunity to understand the details of one of the darkest periods in modern Iraqi history.</p>              | Course objectives                                          |
| 9. Teaching and learning strategies                                                                                                                                                                                                                                                                                                                                  |                                                            |
| <p>1. Understanding the nature of the ruling system during the rule of the Ba'ath Party in Iraq.</p> <p>2. Informing students about the magnitude of the crimes committed by the Ba'ath Party in Iraq.</p> <p>3. Developing students' knowledge about the darkest period in contemporary Iraqi history.</p> <p>B - The specific skills objectives of the course.</p> | Strategy                                                   |



|                               |                                         |                                                                                                           |  | 10. Course structure       |       |            |
|-------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------|--|----------------------------|-------|------------|
| Evaluation method             | Learning method                         | Name of the unit or topic                                                                                 |  | Required learning outcomes | hours | week       |
| Feedback via direct questions | The lecture and discussion and dialogue | The crimes concepts and its classification                                                                |  | Theoretical knowledge      | 1     | the first  |
| Feedback via direct questions | The lecture and discussion and dialogue | The crimes classification and the Baath regime crimes according to the Iraqi Criminal Court documentation |  | Theoretical knowledge      | 1     | the second |
| Feedback via direct questions | The lecture and discussion and dialogue | The International Crimes Types                                                                            |  | Theoretical knowledge      | 1     | the third  |
| Feedback via direct questions | The lecture and discussion and dialogue | The Verdicts of the Iraqi Criminal Court regarding Halabja and Dijil Trials                               |  | Theoretical knowledge      | 1     | Fourth     |



|                                             |                                         |                                                                                                        |  |                          |   |               |
|---------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------|--|--------------------------|---|---------------|
| Feedback via direct questions               | The lecture and discussion and dialogue | Anfal<br>Genocides<br>crime and the<br>executions of<br>several Iraqi<br>Merchants                     |  | Theoretical<br>knowledge | 1 | Fifth         |
| Feedback via direct questions               | The lecture and discussion and dialogue | The oppression<br>of the<br>Shabbaniya<br>uprising and<br>the dismissal<br>of the religious<br>parties |  | Theoretical<br>knowledge | 1 | Sixth         |
| Feedback via direct questions               | The lecture and discussion and dialogue | The Legal<br>Interest<br>Protection in<br>the society                                                  |  | Theoretical<br>knowledge | 1 | Seven<br>th   |
| Feedback through questions<br>Direct<br>Rah | The lecture and discussion and dialogue | The<br>Psychological<br>crimes and its<br>types                                                        |  | Theoretical<br>knowledge | 1 | The<br>eighth |
| Feedback via direct questions               | The lecture and discussion and dialogue | The effect of<br>the<br>Psychological<br>crimes                                                        |  | Theoretical<br>knowledge | 1 | Ninth         |
| Extracurricular activities                  | The lecture and discussion and dialogue | The societal<br>crimes                                                                                 |  | Theoretical<br>knowledge | 1 | tenth         |



|                               |                                         |                                                                 |  |                       |   |            |
|-------------------------------|-----------------------------------------|-----------------------------------------------------------------|--|-----------------------|---|------------|
| Feedback via direct questions | The lecture and discussion and dialogue | The role of the Baath Regime with regards to the Islam 1        |  | Theoretical knowledge | 1 | eleven th  |
| Feedback via direct questions | The lecture and discussion and dialogue | The role of the Baath Regime with regards to the Islam 2        |  | Theoretical knowledge | 1 | twelfth    |
| Feedback via direct questions | The lecture and discussion and dialogue | Human Rights Violation and the Authority crimes                 |  | Theoretical knowledge | 1 | thirteenth |
| Feedback via direct questions | Lecture and discussion                  | The Baath Regime oppression towards Iraqi People                |  | Theoretical knowledge | 1 | fourteenth |
| Feedback via direct questions | Lecture and discussion                  | Monthly Exam                                                    |  | Theoretical knowledge | 1 | fifteenth  |
| Feedback via direct questions | Lecture, discussion and dialogue        | Prisons and detentions center's location under the Baath regime |  | Theoretical knowledge | 1 | Week 16    |



|                               |                                                  |                                         |  |                       |   |                   |
|-------------------------------|--------------------------------------------------|-----------------------------------------|--|-----------------------|---|-------------------|
| Feedback via direct questions | Lecture, discussion and dialogue                 | Environmental crimes under Baath Regime |  | Theoretical knowledge | 1 | Seventeenth week  |
| Feedback via direct questions | Lecture, discussion and dialogue                 | Usage of Internationally Banned Weapons |  | Theoretical knowledge | 1 | Eighteenth week   |
| Feedback via direct questions | Lecture, discussion and dialogue                 | Radiation Spreading under Baath Regime  |  | Theoretical knowledge | 1 | Nineteenth week   |
| Feedback via direct questions | Lecture, discussion and dialogue                 | Cities Demolition                       |  | Theoretical knowledge | 1 | Week twentieth    |
| Feedback via direct questions | Brainstorming, discussion and lecture techniques | Marshals Drying                         |  | Theoretical knowledge | 1 | Week twenty-one   |
| Feedback via direct questions |                                                  | Agricultural Farms Demolition           |  | Theoretical knowledge | 1 | Week twenty-two   |
| Feedback via direct questions | Discussion and dialogue                          | Graveyards Crimes 1                     |  | Theoretical knowledge | 1 | Week twenty-three |
| Feedback via direct questions | Discussion and dialogue                          | Graveyards Crimes 2                     |  | Theoretical knowledge | 1 | Week twenty-four  |
| Feedback via direct questions | Discussion and dialogue                          | Events 1979–2003                        |  | Theoretical knowledge | 1 | Week twenty-five  |
| Feedback via direct questions | Discussion and dialogue                          | Timelapse of graveyards 1963–2003       |  | Theoretical knowledge | 1 | Week 26           |



|                                   |                         |                                         |  |                       |   |         |
|-----------------------------------|-------------------------|-----------------------------------------|--|-----------------------|---|---------|
| Feedback via direct questions     | Discussion and dialogue | Iraqi–Iranian War crimes                |  | Theoretical knowledge | 1 | Week 27 |
| Feedback via direct questions     | Discussion and dialogue | Crimes against the Kurds                |  | Theoretical knowledge | 1 | Week 28 |
| Feedback via direct questions     | Discussion and dialogue | Crimes against the Shaabanyiah uprising |  | Theoretical knowledge | 1 | Week 29 |
| By evaluating a practical session | Discussion and dialogue | Monthly Exam                            |  | Theoretical knowledge | 1 | Week 30 |

#### 11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc.

The score for the first semester is (25) points, the theoretical exam is (25) points, including attendance and participation. The score for the second semester is (25) points, the theoretical exam is (25) points, including attendance and participation. The score for the final exam is (50) points for the theoretical exam. The total becomes (100) points.

## Course Description Form

|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Course Name:                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <b>mathematics</b>                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 2. Course Code:                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| HAEPSPH-209                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 3. Semester / Year:                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Yearly                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 4. Description Preparation Date:                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 202/9/194                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 5. Available Attendance Forms:                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Attendance                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 90 HOURS/ 6 UNITS                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 7. Course administrator's name (mention all, if more than one name)                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Name: A.PROF. Rajaa Abdullah Basheer                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Email: <a href="mailto:ragaa.habsh@uohamdaniya.edu.iq">ragaa.habsh@uohamdaniya.edu.iq</a> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 8. Course Objectives                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Course Objectives                                                                         | <p>A. Introducing students to the basic principles of mathematics, which are relevant to all fields of mathematics and its applications, including engineering applications and all branches of science.</p> <p>B. Providing students with the skills that enable them to teach mathematics.</p> <p>C. Working to enable students to acquire the skills to conduct scientific research in the field of mathematics.</p> <p style="padding-left: 40px;">C. Introducing students to the importance of mathematics and acquiring mental and thinking skills in mathematics.</p> |  |



## 9. Teaching and Learning Strategies

|                 |                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategy</b> | <p>1. Providing students with information and concepts in physics and mathematics. Preparing trained and qualified personnel to work in institutions.</p> <p>2. Identifying the scientific applications of each scientific knowledge.</p> <p>3. Identify the different types of scientific knowledge, including facts, concepts, principles, and theories.</p> |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 10. Course Structure

| Week | Hours    | Required Learning Outcomes                                                | Unit or subject name          | Learning method                  | Evaluation method                  |
|------|----------|---------------------------------------------------------------------------|-------------------------------|----------------------------------|------------------------------------|
| 1    | 3 Theor  | Displaying the curriculum vocabulary, the student learns about sequences. | Finite and infinite sequences | Lecture, discussion and dialogue | Direct questions + solved examples |
| 2    | 3 Theor  | The student learns the ends of sequences.                                 | limit                         | Lecture, discussion and dialogue | Direct questions + solved examples |
| 3    | 3 Theor  | The student learns about finite and infinite series.                      | infinite series               | Lecture, discussion and dialogue | Exam + Solutions to Examples       |
| 4    | 3 Theor  | The student learns how to solve series.                                   | infinite series               | Lecture, discussion and dialogue | Direct questions + solved examples |
| 5    | 3 Theor  | The student learns about geometric series.                                | geometric series              | Lecture, discussion and dialogue | Direct questions                   |
| 6    | 3 Theor  | The student learns methods of testing series.                             | Test of Convergent            | Lecture, discussion and dialogue | Direct questions                   |
| 7    | 3 Theory | The student learns how to conduct an integration test.                    | Integrat testi                | Lecture, discussion and dialogue | exam                               |
| 8    | 3 Theory | The student learns how to conduct a comparison test.                      | Comparison test               | Lecture, discussion and dialogue | Direct questions                   |
| 9    | 3 Theory | The student learns how to test the ratio.                                 | ratio test                    | Lecture, discussion and dialogue | Direct questions                   |
| 10   | 3 Theory | The student learns about the convergence of exponential series.           | Power series                  | Lecture, discussion and dialogue | Direct questions+ exam             |
| 11   | 3 Theory | Tyler series solution method                                              | Tyler series                  | Lecture, discussion and dialogue | Direct questions                   |
| 12   | 3 Theory | How to solve with Maclaurin series                                        | Maclaurin series              | Lecture, discussion and dialogue | Direct questions                   |



|    |             |                                                                                                                |                                                                           |                                  |                                    |
|----|-------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------|------------------------------------|
| 13 | 3<br>Theory | How to apply the binomial series to find roots                                                                 | binomial series                                                           | Lecture, discussion and dialogue | Direct questions                   |
| 14 | 3<br>Theory | Learn about vectors and vector units, adding and subtracting vectors                                           | Vectors                                                                   | Lecture, discussion and dialogue | Solving examples                   |
| 15 | 3<br>Theory | Learn how to multiply vectors and find areas and volumes.                                                      | Vector multiplication methods                                             | Lecture, discussion and dialogue | Exam                               |
| 16 | 3<br>Theory | Partial derivatives with two or more variables                                                                 | Partial derivatives                                                       | Lecture, discussion and dialogue | Direct questions + solved examples |
| 17 | 3<br>Theory | Learn about gradient, skew, divergence, and Laplacian functions and the partial vector derivative.             | Slope, divergence, involution, and partial vector derivative of functions | Lecture, discussion and dialogue | Direct questions + solved examples |
| 18 | 3<br>Theory | Learn how to solve using the chain rule for partial derivatives.                                               | chain rule                                                                | Lecture, discussion and dialogue | Solve examples + exam              |
| 19 | 3<br>Theory | First-order differential equations and methods of solving them. Degree and order of the differential equation. | Methods of separating variables                                           | Lecture, discussion and dialogue | Direct questions + solved examples |
| 20 | 3<br>Theory | How to solve homogeneous equations                                                                             | homogeneous equations                                                     | Lecture, discussion and dialogue | Direct questions + solved examples |
| 21 | 3<br>Theory | How to solve exact differential equations                                                                      | Exact equations                                                           | Lecture, discussion and dialogue | Direct questions + solved examples |
| 22 | 3<br>Theory | How to solve linear equations                                                                                  | linear equations                                                          | Lecture, discussion and dialogue | Direct questions + solved examples |
| 23 | 3<br>Theory | Second order equations                                                                                         | Second order differential equations                                       | Lecture, discussion and dialogue | Quiz                               |



|    |             |                                                              |                                                 |                                  |                                           |
|----|-------------|--------------------------------------------------------------|-------------------------------------------------|----------------------------------|-------------------------------------------|
| 24 | 3<br>Theory | homogeneous of the second degree                             | Homogeneous second-order differential equations | Lecture, discussion and dialogue | Direct questions + solved examples        |
| 25 | 3<br>Theory | Identifying nonhomogeneous equations                         | nonhomogeneous differential equations           | Lecture, discussion and dialogue | Direct questions + solved examples        |
| 26 | 3<br>Theory | Learn how to solve first-degree and second-degree equations. | Differential equations with dependent variables | Lecture, discussion and dialogue | Direct questions + solved examples + Quiz |
| 27 | 3<br>Theory | Solving non-dependent differential equations                 | Equations with non-dependent variables          | Lecture, discussion and dialogue | Direct questions + solved examples        |
| 28 | 3<br>Theory | Second order equations                                       | Bernoulli's equation                            | Lecture, discussion and dialogue | Direct questions                          |
| 29 | 3<br>Theory | Learn about Laplace transforms                               | Laplace transforms                              | Lecture, discussion and dialogue | Direct questions + solved examples        |
| 30 | 3<br>Theory | Inverse Laplace Transforms                                   |                                                 | Lecture, discussion and dialogue | solved examples                           |

### 11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, homework, daily, oral, monthly and written exams, reports, etc.

### 12. Learning and Teaching Resources

|                                               |                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any) | <p>Mathematical Physics, by Ma'an Abdul Majeed Ibrahim,<br/>First Edition, 2000</p> <p>Partial Differential Equations for Scientific and Engineering Colleges, by S. G. Farlow, translated by Dr. Atallah Thamer Al-Ani, University of Baghdad, Bayt Al-Hikma.</p> <p>1- Calculus and Analytic Geometry by George Thomas, 7th Edition</p> |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                    | <p>2- Schaum's Outline of Theory and Problems of Advanced Calculus, 2nd Edition by Robert Wrede and Murray R. Spiegel, 2002</p> <p>3- Differential Equations with Boundary Value Problems, 2nd Edition, by John Polking, Albert Boggess, and David Arnold, 2006</p> <p>5- A First Course in Differential Equations, with Modeling Applications, 8th Edition by Dennis G. Zill, 2005</p> |
| Main references (sources)                                          |                                                                                                                                                                                                                                                                                                                                                                                         |
| Recommended books and references (scientific journals, reports...) | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities.                                                                                                                                                                                                                                    |
| Electronic References, Websites                                    | Websites about mathematics                                                                                                                                                                                                                                                                                                                                                              |



## Course Description Form

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Scientific research method</b>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| HAEPSPH-205                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3. Semester / Year:                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Yearly                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 20/9/2024                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Attendance                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 60 HOURS/ 2 UNITS                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Name: Dr. Ali H. Ahmed Suliman                                      |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Email: dr.aha.suliman@uohamdaniya.edu.iq                            |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Course Objectives</b>                                            | Introducing students to how to write scientific research. Students learn what the science, and its principles. Students learn about the scientific research method and how to use it in writing research and reports by defining the research problem and the other sections that comprise the research, leading up to writing the sources.                                                                     |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Strategy</b>                                                     | <p>Knowledge and understanding through:</p> <ol style="list-style-type: none"> <li>1. Understanding the fundamentals of scientific research and acquiring the necessary skills in reading books and absorbing information.</li> <li>2. Anyone who wants to understand the foundations, rules, and principles necessary for scientific research must learn the fundamentals of the scientific method.</li> </ol> |



3. Learning the essential principles of scientific research will enable us to understand most of the vocabulary and concepts needed in writing research papers.

#### 10. Course Structure

| Week | Hours    | Required Learning Outcomes                                     | Unit or subject name                                             | Learning method | Evaluation method |
|------|----------|----------------------------------------------------------------|------------------------------------------------------------------|-----------------|-------------------|
| 1    | 1 Theory | The Scientific Spirit                                          | The origins of science, its development, and scientific research | Attendance      |                   |
| 2    | 1 Theory | The Meaning of Scientific Research                             | The origins of science, its development, and scientific research | Attendance      |                   |
| 3    | 1 Theory | The Evolution of the Concept of Publishing Scientific Research | The origins of science, its development, and scientific research | Attendance      | Homework          |
| 4    | 1 Theory | Pure Scientific Research                                       | Types of scientific research                                     | Attendance      | Quiz              |
| 5    | 1 Theory | Applied Research                                               | Types of scientific research                                     | Attendance      |                   |
| 6    | 1 Theory | Types of Scientific Intellectual Product                       | Types of scientific research                                     | Attendance      |                   |
| 7    | 1 Theory | Reference Review Article                                       | Types of scientific research                                     | Attendance      | Homework          |
| 8    | 1 Theory | Reports and Studies                                            | Types of scientific research                                     | Attendance      |                   |
| 9    | 1 Theory | Assumptions                                                    | The problem and research plan                                    | Attendance      |                   |
| 10   | 1 Theory | Defining the Title of the Problem                              | The problem and research plan                                    | Attendance      |                   |
| 11   | 1 Theory | Preparing a Research Plan                                      | The problem and research plan                                    | Attendance      |                   |
| 12   | 1 Theory | Historical Method and its Tools                                | Scientific research methods and tools                            | Attendance      | Quiz              |
| 13   | 1 Theory | Questionnaire                                                  | Scientific research                                              | Attendance      | Homework          |



|    |          |                                                                                     |                                                        |            |          |
|----|----------|-------------------------------------------------------------------------------------|--------------------------------------------------------|------------|----------|
|    |          |                                                                                     | methods and tools                                      |            |          |
| 14 | 1 Theory | Survey Method                                                                       | Scientific research methods and tools                  | Attendance | Quiz     |
| 15 | 1 Theory | Experimental Method                                                                 | Scientific research methods and tools                  | Attendance | Quiz     |
| 16 | 1 Theory | Theoretical Method                                                                  | Scientific research methods and tools                  | Attendance | Homework |
| 17 | 1 Theory | Mathematical Method                                                                 | Scientific research methods and tools                  | Attendance | Quiz     |
| 18 | 1 Theory | Simple Experiments                                                                  | Main requirements for conducting experimental research | Attendance |          |
| 19 | 1 Theory | Complex Experiments                                                                 | Main requirements for conducting experimental research | Attendance |          |
| 20 | 1 Theory | Experimental Method Samples                                                         | Main requirements for conducting experimental research | Attendance |          |
| 21 | 1 Theory | Center mass, and Equilibrium.                                                       | Main requirements for conducting experimental research | Attendance |          |
| 22 | 1 Theory | work done by varying force, work and kinetic energy, Gravitational potential energy | Main requirements for conducting experimental research | Attendance |          |
| 23 | 1 Theory | Elastic potential energy, Power, Power and velocity.                                | Main requirements for conducting experimental research | Attendance |          |
| 24 | 1 Theory | Angular velocity, Angular acceleration, Rotation with constant linear velocity,     | Information sources                                    | Attendance | Quiz     |

|    |          |                                                                                                                                                                                                   |                     |            |          |
|----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|----------|
|    |          | Kinetic energy of rotation, moment Inertia, Calculation of moment, Inertia of bodies (Cylinder, Sphere, Ring, Disc),                                                                              |                     |            |          |
| 25 | 1 Theory | Radius of gyration, Energy of a body rolling on a horizontal plane, Work and power rotational motion, and the Torque.                                                                             | Information sources | Attendance |          |
| 26 | 1 Theory | Conservation law of linear momentum, Angular momentum and impulse                                                                                                                                 | Information sources | Attendance |          |
| 27 | 1 Theory | Relation between momentum and impulse in linear and rotational motion, Energy of Rotational motion of body.                                                                                       | Information sources | Attendance |          |
| 28 | 1 Theory | Elastic Collisions in one-dimension, Inelastic collision, and Collisions in two dimensions                                                                                                        | Information sources | Attendance | Quiz     |
| 29 | 1 Theory | Conservation and non-Conservation force, Conservation energy, and Potential energy curve                                                                                                          | Information sources | Attendance | Homework |
| 30 | 1 Theory | Newton 's law of gravitation, Definition of gravitation, Gravitation field, Gravitation potential, Intensity of gravitation, Kepler 's law, and Artificial satellite orbital and escape velocity. | Information sources | Attendance |          |

### 11. Course Evaluation

The grade is distributed out of 15 based on the tasks assigned to the student, such as daily preparation, daily, oral and monthly exams, 25 for the mid-year exam, and the remainder is a final exam, which is graded out of 60 according to the annual system.

### 12. Learning and Teaching Resources

|                                                                    |                                                                                           |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | Subject lectures                                                                          |
| Main references (sources)                                          | Research Methodology and Scientific Writing, 2 <sup>nd</sup> Edition, by C. George Thomas |
| Recommended books and references (scientific journals, reports...) | Websites related to publishing scientific research                                        |
| Electronic References, Websites                                    | Websites related to research methods                                                      |



## Course Description Form

1. Course Name:

**Astronomy**

2. Course Code:

HAEPSPH-202

3. Semester / Year:

Yearly\ second stage

4. Description Preparation Date:

22/9/2024

5. Available Attendance Forms:

Attendance

6. Number of Credit Hours (Total) / Number of Units (Total)

30 HOURS/ 4 UNITS

7. Course administrator's name (mention all, if more than one name)

Name: Asst.prof. Hanaa Nafee Azeez

Email: hanaa69@uohamdaniya.edu.iq

8. Course Objectives

**Course Objectives**

Student learn about the importance of scientific knowledge of astronomy in daily life  
Introduction student to the principles of astronomy enabling them to derive laws related to astronomical concepts and providing them with skills to work in the field of physics.

9. Teaching and Learning Strategies

**Strategy**

Providing student with knowledge of astronomy applications and familiarization with astronomical principles theories and instruments.

10. Course Structure

| Week | Hours   | Required Learning Outcomes | Unit or subject name | Learning method           | Evaluation method |
|------|---------|----------------------------|----------------------|---------------------------|-------------------|
| 1    | 2 Theor | Celestial mechanics        | Celestial mechanics  | Lecture and use data show | Direct question   |



|    |          |                                      |                                      |                                                    |                 |
|----|----------|--------------------------------------|--------------------------------------|----------------------------------------------------|-----------------|
|    |          |                                      |                                      | ,discussion and dialogue                           |                 |
| 2  | 2 Theor  | Astronomical coordinate system       | Astronomical coordinate system       | Lecture and use data show ,discussion and dialogue | Direct question |
| 3  | 2 Theor  | The movement of stars and the zodiac | The movement of stars and the zodiac | Lecture and use data show ,discussion and dialogue | Direct question |
| 4  | 2 Theor  | Astronomical seasons                 | Astronomical seasons                 | Lecture and use data show ,discussion and dialogue | Direct question |
| 5  | 2 Theor  | Astronomical units of measurement    | Astronomical units of measurement    | Lecture and use data show ,discussion and dialogue | quise           |
| 6  | 2 Theor  | The origin of the solar system       | The origin of the solar system       | Lecture and use data show ,discussion and dialogue | Direct question |
| 7  | 2 Theory | Physical properties of the sun       | Physical properties of the sun       | Lecture and use data show ,discussion and dialogue | Direct question |
| 8  | 2 Theory | Physical properties of the moon      | Physical properties of the moon      | Lecture and use data show ,discussion and dialogue | Direct question |
| 9  | 2 Theory | Lunar and solar eclipses             | Lunar and solar eclipses             | Lecture and use data show ,discussion and dialogue | Direct question |
| 10 | 2 Theory | Stellar cycles                       | Stellar cycles                       | Lecture and use data show ,discussion and dialogue | quise           |
| 11 | 2 Theory | Physical properties of the planets   | Physical properties of the planets   | Lecture and use data show ,discussion and dialogue | Direct question |
| 12 | 2Theory  | Physical properties of the comets    | Physical properties of the comets    | Lecture and use data show ,discussion and dialogue | Direct question |
| 13 | 2 Theory | Bode base                            | Bode base                            | Lecture and use data show ,discussion and dialogue | Direct question |
| 14 | 2Theory  | meteors                              | meteors                              | Lecture and use data show ,discussion and dialogue | Direct question |



|    |             |                                                           |                                                              |                                                             |                    |
|----|-------------|-----------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------|
| 15 | 2<br>Theory | comets                                                    | comets                                                       | Lecture and use<br>data show<br>,discussion and<br>dialogue | quise              |
| 16 | 2Theory     | Movement of stars                                         | Movement of<br>stars                                         | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 17 | 2<br>Theory | Stars destinies                                           | Stars destinies                                              | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 18 | 2<br>Theory | Measurement the<br>diameters, masses, density<br>of stars | Measurement<br>the diameters,<br>masses, density<br>of stars | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 19 | 2<br>Theory | Spectra of stars                                          | Spectra of stars                                             | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 20 | 2<br>Theory | A plan H-R                                                | A plan H-R                                                   | Lecture and use<br>data show<br>,discussion and<br>dialogue | quise              |
| 21 | 2Theory     | Star life cycle                                           | Star life cycle                                              | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 22 | 2<br>Theory | Black holes                                               | Black holes                                                  | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 23 | 2<br>Theory | Binary stars                                              | Binary stars                                                 | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 24 | 2<br>Theory | Star clusters                                             | Star clusters                                                | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |
| 25 | 2<br>Theory | Classification of binary and<br>variable stars            | Classification of<br>binary and<br>variable stars            | Lecture and use<br>data show<br>,discussion and<br>dialogue | quise              |
| 26 | 2<br>Theory | Types of galaxies                                         | Types of<br>galaxies                                         | Lecture and use<br>data show<br>,discussion and<br>dialogue | Direct<br>question |

|    |             |                                                |                                                |                                                    |                 |
|----|-------------|------------------------------------------------|------------------------------------------------|----------------------------------------------------|-----------------|
| 27 | 2<br>Theory | Components and mass of galaxies                | Components and mass of galaxies                | Lecture and use data show ,discussion and dialogue | Direct question |
| 28 | 2<br>Theory | Star clusters and clusters                     | Star clusters and clusters                     | Lecture and use data show ,discussion and dialogue | Direct question |
| 29 | 2<br>Theory | Stellar nebulae and quasars                    | Stellar nebulae and quasars                    | Lecture and use data show ,discussion and dialogue | Direct question |
| 30 | 2<br>Theor  | The expansion of the universe and the redshift | The expansion of the universe and the redshift | Lecture and use data show ,discussion and dialogue | quise           |

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, quizzes

## 12. Learning and Teaching Resources

|                                                                    |                                                                                                                             |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | كتاب علم الفلك: د.حميد مجول النعيمي ، د.فياض النجم                                                                          |
| Main references (sources)                                          | كتاب علم الفلك: د.حميد مجول النعيمي ، د.فياض النجم                                                                          |
| Recommended books and references (scientific journals, reports...) | Zainul Huda. <i>Metallurgy for Physicists and Engineers-Fundamentals, Applications, and Calculations</i> . CRC Press, 2020. |
| Electronic References, Websites                                    | Wikipedia                                                                                                                   |



## Sample Course Description for Phase II

|                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                      |                            |                   |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|----------------------------|-------------------|------|
| Course Title: Computer/Phase II                                                                                                                                                                                                                                                                                                                                                                          |                 |                      |                            |                   | 1    |
| Course Code: HAEPSPH-206                                                                                                                                                                                                                                                                                                                                                                                 |                 |                      |                            |                   | 2    |
| Semester/Year: 2024-2025                                                                                                                                                                                                                                                                                                                                                                                 |                 |                      |                            |                   | 3    |
| Date of this description:9/1/2024                                                                                                                                                                                                                                                                                                                                                                        |                 |                      |                            |                   | 4    |
| Available Attendance Formats: Attendance Electronic                                                                                                                                                                                                                                                                                                                                                      |                 |                      |                            | Description       | 5    |
| Number of study hours (30) / number of units (total):2                                                                                                                                                                                                                                                                                                                                                   |                 |                      |                            | units             | 6    |
| Name of the course administrator (if more than one name is mentioned): Assoc. Prof. Dr. Riad Mubarak Abdullah                                                                                                                                                                                                                                                                                            |                 |                      |                            |                   | 7    |
| Email: <a href="mailto:drriyad_mubarak@uohamdaniya.edu.iq">drriyad_mubarak@uohamdaniya.edu.iq</a>                                                                                                                                                                                                                                                                                                        |                 |                      |                            |                   | 8    |
| Course Objectives                                                                                                                                                                                                                                                                                                                                                                                        |                 |                      |                            |                   |      |
| <ul style="list-style-type: none"> <li>• Understand the principles and techniques of computer human intelligence simulation.</li> <li>• Developing the student's critical and creative thinking skills to deal with artificial intelligence</li> <li>• Learn to troubleshoot your computer.</li> <li>• Learn security, networking, and e-commerce.</li> </ul>                                            |                 |                      |                            | Course Objectives | 9    |
| Teaching and Learning Strategies                                                                                                                                                                                                                                                                                                                                                                         |                 |                      |                            |                   |      |
| <ul style="list-style-type: none"> <li>• Reading books and lectures related to the curriculum.</li> <li>• Exercises and activities during and outside the lecture.</li> <li>• Presentations on the topics of the lecture.</li> <li>• Lecture, discussion, dialogue, and applied analysis.</li> <li>• Theoretical and practical lecture, dialogue and discussions, oral questions and reports.</li> </ul> |                 |                      |                            | Strategy          | 10   |
| Course Structure                                                                                                                                                                                                                                                                                                                                                                                         |                 |                      |                            |                   |      |
| Evaluation Method                                                                                                                                                                                                                                                                                                                                                                                        | Learning method | Unit Name or Subject | Required Learning Outcomes | Hours             | Week |

|                                                            |                                   |                                                                                            |                              |          |           |
|------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------|------------------------------|----------|-----------|
| <b>Awarding Degrees to Participants</b>                    | <b>Explanation and Discussion</b> | <b>Security &amp; Networks: What is a Network? Network types, basic network components</b> | <b>Gain knowledge</b>        | <b>1</b> | <b>1</b>  |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>Network Security Basics</b>                                                             | <b>Skills acquisition</b>    | <b>1</b> | <b>2</b>  |
| <b>Awarding Degrees to Participants</b>                    | <b>Explain, Discuss and Apply</b> | <b>Network troubleshooting</b>                                                             | <b>Gain knowledge</b>        | <b>1</b> | <b>3</b>  |
| <b>Applying Scientific and Practical Testing Standards</b> | <b>Questions and Quizzes</b>      | <b>Conducting a daily exam with previous lectures</b>                                      | <b>Knowledge Measurement</b> | <b>1</b> | <b>4</b>  |
| <b>Awarding Degrees to Participants</b>                    | <b>Explain, Discuss and Apply</b> | <b>E-commerce: Concepts of e-banking including online banking,</b>                         | <b>Gain knowledge</b>        | <b>1</b> | <b>5</b>  |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>ATM &amp; Debit Card Services</b>                                                       | <b>Skills acquisition</b>    | <b>1</b> | <b>6</b>  |
| <b>Awarding Degrees to Participants</b>                    | <b>Explain, Discuss and Apply</b> | <b>SMS Banking</b>                                                                         | <b>Gain knowledge</b>        | <b>1</b> | <b>7</b>  |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>Electronic Alerts &amp; Mobile Banking</b>                                              | <b>Skills acquisition</b>    | <b>1</b> | <b>8</b>  |
| <b>Applying Scientific and Practical Testing Standards</b> | <b>Questions and Quizzes</b>      | <b>Conducting a daily exam with previous lectures</b>                                      | <b>Knowledge Measurement</b> | <b>1</b> | <b>9</b>  |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>Troubleshooting</b>                                                                     | <b>Skills acquisition</b>    | <b>1</b> | <b>10</b> |
| <b>Awarding Degrees to Participants</b>                    | <b>Explain, Discuss and Apply</b> | <b>Identify and resolve common hardware and software problems faced by computer users</b>  | <b>Gain knowledge</b>        | <b>1</b> | <b>11</b> |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>Basic Techniques and Tools for</b>                                                      | <b>Skills acquisition</b>    | <b>1</b> | <b>12</b> |



|                                                            |                                   |                                                                                       |                              |          |           |
|------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------|------------------------------|----------|-----------|
|                                                            |                                   | <b>Diagnosing and Solving Problems</b>                                                |                              |          |           |
| <b>Applying Scientific and Practical Testing Standards</b> | <b>Questions and Quizzes</b>      | <b>Conducting a daily exam with previous lectures</b>                                 | <b>Knowledge Measurement</b> | <b>1</b> | <b>13</b> |
| <b>Applying Scientific and Practical Testing Standards</b> | <b>Questions and Quizzes</b>      | <b>Quarterly Theoretical Test</b>                                                     | <b>Knowledge Measurement</b> | <b>1</b> | <b>14</b> |
| <b>Applying Scientific and Practical Testing Standards</b> | <b>Presenting projects</b>        | <b>Semester Practical Exam</b>                                                        | <b>Measuring skills</b>      | <b>1</b> | <b>15</b> |
| <b>Awarding Degrees to Participants</b>                    | <b>Explain, Discuss and Apply</b> | <b>Introduction to Artificial Intelligence</b>                                        | <b>Gain knowledge</b>        | <b>1</b> | <b>16</b> |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>Definition of Artificial Intelligence, its History, Techniques and Methodology</b> | <b>Gain knowledge</b>        | <b>1</b> | <b>17</b> |
| <b>Awarding Degrees to Participants</b>                    | <b>Explanation and Discussion</b> | <b>Challenges and Ethical Considerations of Artificial Intelligence</b>               | <b>Gain knowledge</b>        | <b>1</b> | <b>18</b> |
| <b>Providing incentives for encouragement</b>              | <b>Skills Training</b>            | <b>Artificial Intelligence in Our Daily Life</b>                                      | <b>Skills acquisition</b>    | <b>1</b> | <b>19</b> |
| <b>Awarding Degrees to Participants</b>                    | <b>Explain, Discuss and Apply</b> | <b>Artificial Intelligence Applications</b>                                           | <b>Skills acquisition</b>    | <b>1</b> | <b>20</b> |
| <b>Applying Scientific and Practical Testing Standards</b> | <b>Questions and Quizzes</b>      | <b>Conducting a daily exam with previous lectures</b>                                 | <b>Knowledge Measurement</b> | <b>1</b> | <b>21</b> |
| <b>Awarding Degrees to Participants</b>                    | <b>Explanation and Discussion</b> | <b>Artificial Intelligence and Society</b>                                            | <b>Gain knowledge</b>        | <b>1</b> | <b>22</b> |
| <b>Providing incentives for encouragement</b>              | <b>Explanation and Discussion</b> | <b>Its impact on social and international</b>                                         | <b>Gain knowledge</b>        | <b>1</b> | <b>23</b> |

|                                                                                                                                                                     |                            |                                                                                    |                                               |   |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------|-----------------------------------------------|---|----|
|                                                                                                                                                                     |                            | relations and the future of humanity                                               |                                               |   |    |
| Awarding Degrees to Participants                                                                                                                                    | Explanation and Discussion | Ethical Challenges in Artificial Intelligence                                      | Gain knowledge                                | 1 | 24 |
| Providing incentives for encouragement                                                                                                                              | Skills Training            | Privacy & Monitoring                                                               | Gain knowledge                                | 1 | 25 |
| Awarding Degrees to Participants                                                                                                                                    | Explanation and Discussion | The Impact of Artificial Intelligence on the Labor Market                          | Gain knowledge                                | 1 | 26 |
| Awarding Degrees to Participants                                                                                                                                    | Explanation and Discussion | The Future of Artificial Intelligence                                              | Gain knowledge                                | 1 | 27 |
| Providing incentives for encouragement                                                                                                                              | Skills Training            | Future Trends in Artificial Intelligence Modern Research and Emerging Technologies | Skills acquisition                            | 1 | 28 |
| Applying Scientific and Practical Testing Standards                                                                                                                 | Questions and Quizzes      | Quarterly Theoretical Test                                                         | Knowledge Measurement                         | 1 | 29 |
| Applying Scientific and Practical Testing Standards                                                                                                                 | Presenting projects        | Semester Practical Exam                                                            | Measuring skills                              | 1 | 30 |
| <b>Course Evaluation</b>                                                                                                                                            |                            |                                                                                    |                                               |   |    |
| Distribution of the grade out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports.... etc |                            |                                                                                    |                                               |   |    |
| <b>Learning and Teaching Resources</b>                                                                                                                              |                            |                                                                                    |                                               |   |    |
| 1. Adel Abdel Nour, "Introduction to the World of Artificial Intelligence", 2005.<br>2. Lectures that include curriculum vocabulary.                                |                            |                                                                                    | Required Textbooks (Methodology if available) |   |    |



|                                                                                                                      |                                                                           |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>Ahmed Banafa,” Introduction to Artificial Intelligence (AI)”, 1 st Edition (2024)</b>                             | <b>Main References (Sources)</b>                                          |
| <b>David L. Poole &amp; Alan K. Mackworth,” Artificial Intelligence: Foundations of Computational Agents” (2017)</b> | <b>Recommended books and references (scientific journals, reports...)</b> |
| <b><a href="https://www.csail.mit.edu">https://www.csail.mit.edu</a></b>                                             | <b>References, Websites</b>                                               |

## Course Description Form

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| <b>Optical physics</b>                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| HAEPSPH-201                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 3. Semester / Year:                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| سنوي                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 24/9/2024                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| تعليم حضوري                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 90 HOURS/ 8 UNITS                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| Name: Asst. Prof. Dr. Siham Jasim Abdullah                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| Email: : siham.jasim@uohamdaniya.edu.iq                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| <b>Course Objectives</b>                                            | <p>This is an introductory course on optics geometrical and wave optics focusing on fundamental concepts, principles and techniques.</p> <p>1- The first course will introduce basic electromagnetic, mirrors, lenses, thick mirror, thick lenses, aberrations in mirror and lenses</p> <p>2- The second course covers wave optics focusing on interference and its experiment, diffraction and its experiments, polarization and its types and methods for obtaining it.</p> |  |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| <b>Strategy</b>                                                     | <b>Course Intended Outcomes</b><br>1- Be able to explain the theories which interpret the nature of light.                                                                                                                                                                                                                                                                                                                                                                    |  |



|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p>2- Be able to explain image properties by calculations and graphically.</p> <p>3- Be able to contrast between different types of lens</p> <p>4- Be able to describe the interference and diffraction in addition to the method for obtaining them.</p> <p>5- Be able to describe polarized and unpolarized light</p> <p>6- Be able to describe the type of polarization light.</p> <p>Be able to describe the methods of obtaining the polarization light.</p> |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

#### 10. Course Structure

| Week   | Hours | Required Learning Outcomes                                                               | Unit or subject name | Learning method                                                           |  | Evaluation method |
|--------|-------|------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------|--|-------------------|
| الاول  | 3     | View syllabus of the article , Introduction to optical physics                           |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| الثاني | 3     | Concept of ray of light, Light physics and properties, Light waves, Electromagnetic wave |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| الثالث | 3     | Waves, Types of Waves, , Electromagnetic wave , Vocabulary/Definitions,                  |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| الرابع | 3     | Types of Electromagnetic , wave, Longitudinal waves, Transverse waves,                   |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| الخامس | 3     | The Electromagnetic Spectra , Wavelength, Frequency,                                     |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| السادس | 3     | Speed of Light and Refractive Index, Solving Examples                                    |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| السابع | 3     | Exam                                                                                     |                      |                                                                           |  |                   |
| الثامن | 3     | , Propagation of light, reflection, laws of reflection,                                  |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |
| التاسع | 3     | Regular reflection and irregular reflection of light, Plane mirrors, H.W                 |                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة |  | الأسئلة المباشرة  |

|                    |   |                                                                                           |                                                                           |                  |
|--------------------|---|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------|
| العاشر             | 3 | Refraction, Law of refraction of light, Total Internal Reflection, Solving Examples       | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الحادي عشر         | 3 | Concave mirror, Convex mirror, Spherical mirror equation, Solving Examples                | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الثاني عشر         | 3 | The principle of Reversibility, Fermat's principle, Spherical surface, Spherical Mirrors  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الثالث عشر         | 3 | Exam                                                                                      |                                                                           |                  |
| الرابع عشر         | 3 | Lenses, Types of lenses: convex lens, Concave lenses,                                     | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الخامس عشر         | 3 | Ray Diagrams for Lenses , Image Formation by Convex Lens, Image Formation by Concave Lens | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع السادس عشر | 3 | Lens Maker Formula, Solving Examples, The power of the thin lens, Aberration,             | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |



|                         |   |                                                                                             |  |                                                                           |                  |
|-------------------------|---|---------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|------------------|
| الاسبوع السابع عشر      | 3 | Defects of Spherical Lenses, Kind of aberration, Spherical aberration, Chromatic aberration |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الثامن عشر      | 3 | Optical instruments, Applications of Lenses, Lenses in Eyes                                 |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع التاسع عشر      | 3 | , Focusing images , Vision Correction, Nearsightedness and farsightedness                   |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع العشرون         | 3 | , Astigmatism, Refracting Telescopes, Microscopes,                                          |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الحادي والعشرون | 3 | Exam                                                                                        |  |                                                                           |                  |
| الاسبوع الثاني والعشرون | 3 | Solving Examples Interference and Diffraction of light, Double-slit interference,           |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الثالث والعشرون | 3 | Coherent Waves, Measuring the wavelength of light .Solving Examples                         |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الرابع والعشرون | 3 | , Diffraction, Single-Slit Diffraction, Diffraction pattern, Solving examples,.             |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الخامس والعشرون | 3 | Diffraction Gratings, Measuring wavelength,                                                 |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع السادس والعشرون | 3 | Solving Examples                                                                            |  | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |

|                         |   |                                                   |                                                                           |                  |
|-------------------------|---|---------------------------------------------------|---------------------------------------------------------------------------|------------------|
| الاسبوع السابع والعشرون | 3 | Resolving Power of Lenses, , Rayleigh Criterion , | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الثامن والعشرون | 3 | Polarization                                      | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع التاسع والعشرون | 3 | article review                                    | إلقاء المحاضرة من خلال السبورة و شاشات العرض مع المشاركة التفاعلية للطلبة | الأسئلة المباشرة |
| الاسبوع الثلاثون        | 3 | Exam                                              |                                                                           |                  |

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

## 12. Learning and Teaching Resources

|                                                                    |                                                                                                                                                                               |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | -Fundamentals of Optics; 1 -F. A. Jenkins and H. E. White, McGraw-Hill Priml Custom Publishing, 2001.                                                                         |
| Main references (sources)                                          | 1. principle of optics and application by Sharma 2006<br>2. Miles V. Klein and Thomas E. Furtak, Optics, 2nd ed. 1986                                                         |
| Recommended books and references (scientific journals, reports...) | 1- Optics: Principles and Applications, Elsevier Inc(2006)<br>2- Optics, 4th edition, Addison Wesley,(2002(<br>3- Modern Optics, 1st edition, John Wiley and Sons, Inc.(1990) |
| Electronic References, Websites                                    | متابعه المراجع الإلكترونية والأترنتيت التي تتضمن المواقع الإلكترونية العلمية الرصينة ومواقع المكتبات في بعض الجامعات العالمية                                                 |



## Course Description Form

| 1. Course Name:                                                                              |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
|----------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|
| English Language                                                                             |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 2. Course Code:                                                                              |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| HAEPSPH-211                                                                                  |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 3. Semester / Year:                                                                          |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Annual                                                                                       |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 4. Description Preparation Date:                                                             |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 2024-2025                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 5. Available Attendance Forms:                                                               |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Daily Attendance                                                                             |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                                  |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 30 Hour and 2 units                                                                          |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 7. Course administrator's name (mention all, if more than one name)                          |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| <b>Name:</b> Al-Hadan Abdulrahman Awad Aljburi                                               |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| <b>Email:</b> <a href="mailto:hasanawad@uohamdaniya.edu.ig">hasanawad@uohamdaniya.edu.ig</a> |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| 8. Course Objectives                                                                         |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Course Objectives                                                                            |       |                                                                                                                                                                                                                                                                                                                                                                                                              | 1-Enriching and developing students' English language skills<br>2-Developing students' language abilities and skills |                                                                                                          |                               |
| 9. Teaching and Learning Strategies                                                          |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Strategy                                                                                     |       | 1. Develop students' ability to recognize the most important vocabulary and linguistic terms in the English language.<br>2. Enrich students' vocabulary.<br>3. Understand the importance of learning English and its impact on learning other subjects.<br>4- Developing students' English language skills.<br>5- Developing reading and writing skills.<br>6- Developing students' English-speaking skills. |                                                                                                                      |                                                                                                          |                               |
| 10. Course Structure                                                                         |       |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |                                                                                                          |                               |
| Week                                                                                         | Hours | Required Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                                   | Unit or subject name                                                                                                 | Learning method                                                                                          | Evaluation method             |
| 1 <sup>st</sup>                                                                              | 1     | Theoretical knowledge and practical educational application                                                                                                                                                                                                                                                                                                                                                  | Unit One Tenses                                                                                                      | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 2 <sup>nd</sup>                                                                              | 1     | Theoretical knowledge and practical educational application                                                                                                                                                                                                                                                                                                                                                  | Unit One Questions                                                                                                   | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |



|                  |   |                                                             |                                |                                                                                                          |                               |
|------------------|---|-------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|
| 3 <sup>rd</sup>  | 1 | Theoretical knowledge and practical educational application | Unit One<br>Question words     | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 4 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Two<br>Present Continuous | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 5 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Two<br>Present Simple     | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 6 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Two<br>Has-Have got       | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 7 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Three<br>Past Simple      | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 8 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Three<br>Past Continuous  | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 9 <sup>th</sup>  | 1 | Theoretical knowledge and practical educational application | Unit Three<br>Time Expressions | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 10 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Four<br>Quantity          | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 11 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Four<br>Articles          | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 12 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Five<br>Verb Patterns     | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 13 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Five<br>Future intention  | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |



|                  |   |                                                             |                                               |                                                                                                          |                               |
|------------------|---|-------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|
| 14 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Six<br>Comparative and Superlative       | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 15 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Six<br>Superlative adjectives            | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 16 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Seven<br>Present perfect and past simple | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |
| 17 <sup>th</sup> | 1 | Theoretical knowledge and practical educational application | Unit Eight<br>Should & must                   | Delivering the lecture through the blackboard and display screens with interactive student participation | Direct questions and feedback |

### 11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

### 12.Learning and Teaching Resources

|                                                                    |                                                                                                                                                      |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | New Headway Plus for pre- Intermediate                                                                                                               |
| Main references (sources)                                          |                                                                                                                                                      |
| Recommended books and references (scientific journals, reports...) |                                                                                                                                                      |
| Electronic References, Websites                                    | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities. |

## Course Description Form

|                                                                                                 |                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Course Name:</b>                                                                          |                                                                                                                                                                                                                                                                                                                                                     |
| General Arabic language                                                                         |                                                                                                                                                                                                                                                                                                                                                     |
| <b>2. Course Code:</b>                                                                          |                                                                                                                                                                                                                                                                                                                                                     |
| HAEPSPH-210                                                                                     |                                                                                                                                                                                                                                                                                                                                                     |
| <b>3. Semester / Year:</b>                                                                      |                                                                                                                                                                                                                                                                                                                                                     |
| 2024-2025 Second Stage                                                                          |                                                                                                                                                                                                                                                                                                                                                     |
| <b>4. Description Preparation Date:</b>                                                         |                                                                                                                                                                                                                                                                                                                                                     |
| 18-9-2024                                                                                       |                                                                                                                                                                                                                                                                                                                                                     |
| <b>5. Available Attendance Forms:</b>                                                           |                                                                                                                                                                                                                                                                                                                                                     |
| In-person teaching                                                                              |                                                                                                                                                                                                                                                                                                                                                     |
| <b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>                              |                                                                                                                                                                                                                                                                                                                                                     |
| 30 hours / 2 units                                                                              |                                                                                                                                                                                                                                                                                                                                                     |
| <b>7. Course administrator's name (mention all, if more than one name)</b>                      |                                                                                                                                                                                                                                                                                                                                                     |
| Name: Assistant Lecturer Zahraa Mohammed Kadhim Al bayati<br>Email: z.m.k.89@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                     |
| <b>8. Course Objectives</b>                                                                     |                                                                                                                                                                                                                                                                                                                                                     |
| <b>Course Objectives</b>                                                                        | <p>1- Introduce students to the importance of the Arabic language and its literature, and help them understand Arabic grammar.</p> <p>2. Develop students' language skills.</p> <p>3. Enable students to acquire the necessary skills to understand syntactic and semantic structures.</p> <p>4. Foster students' pride in the Arabic language.</p> |
| <b>9. Teaching and Learning Strategies</b>                                                      |                                                                                                                                                                                                                                                                                                                                                     |
| <b>Strategy</b>                                                                                 | <p>1. Provide students with knowledge and concepts of the Arabic language, preparing qualified cadres for work</p>                                                                                                                                                                                                                                  |



| 10. Course Structure |       |                                                                                                              |                                  |                               |                   |
|----------------------|-------|--------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------|-------------------|
| Week                 | Hours | Required Learning Outcomes                                                                                   | Unit or subject name             | Learning method               | Evaluation method |
| 1                    | 1     | Introduction to syllabus, introduction, subject + predicate, types of subject, types of predicate, exercises | Subject and Predicate            | Lecture, discussion, dialogue | Direct questions  |
| 2                    | 1     | Simile: pillars and types, exercises                                                                         | Simile                           | Lecture, discussion, dialogue | Direct questions  |
| 3                    | 1     | Paronomasia: types (perfect and imperfect), conditions of perfect paronomasia, exercises                     | Paronomasia (Jinas)              | Lecture, discussion, dialogue | Direct questions  |
| 4                    | 1     | Linguistic errors and their categories                                                                       | Linguistic Errors                | Lecture, discussion, dialogue | Direct questions  |
| 5                    | 1     | Types of linguistic errors with applied examples                                                             | Application on Linguistic Errors | Lecture, discussion, dialogue | Direct questions  |
| 6                    | 1     | Memorization and explanation of 10 verses from Surat Al-Kahf with meanings                                   | Qur'anic Text                    | Lecture, discussion, dialogue | Direct questions  |
| 7                    | 1     | Exam                                                                                                         |                                  |                               | Direct questions  |
| 8                    | 1     | Numbers: relation with counted noun, gender rules, exercises                                                 | Numbers                          | Lecture, discussion, dialogue | Direct questions  |
| 9                    | 1     | Object: definition and types                                                                                 | Object (ma'bihi)                 | Lecture, discussion, dialogue | Direct questions  |

|    |   |                                                      |                                             |                                     |                     |
|----|---|------------------------------------------------------|---------------------------------------------|-------------------------------------|---------------------|
| 10 | 1 | Causative object:<br>definition with<br>examples     | Cognate<br>Accusative<br>(maf'ul<br>mutlaq) | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 11 | 1 | Causative object:<br>definition with<br>examples     | Causative<br>Object (maf<br>li-ajlihi)      | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 12 | 1 | Comitative object:<br>definition with<br>example     | Comitative<br>Object (maf<br>ma'ahu)        | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 13 | 1 | Adverbial object:<br>definition, types,<br>exercises | Adverbial<br>Object (maf<br>fih)            | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 14 | 1 | Review                                               |                                             | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 15 | 1 | Exam                                                 |                                             | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 16 | 1 | Adjective: definition<br>and types                   | Adjective<br>(Na't)                         | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 17 | 1 | Emphasis: definition<br>and types                    | Emphasis<br>(Tawkid)                        | Lecture,<br>discussion,<br>dialogue | Direct<br>questions |
| 18 | 1 | Conjunction:<br>definition,<br>conjunction           | Conjunction<br>('Atf)                       | Lecture,<br>discussion              | Direct<br>questions |



|    |   |                                                                                                                        |                                 |                               |                  |
|----|---|------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------|------------------|
|    |   | particles, meanings                                                                                                    |                                 | n, dialogue                   |                  |
| 19 | 1 | Apposition: definition, types, whole-partial, partial-whole, inclusion, exercises                                      | Apposition (Badal)              | Lecture, discussion, dialogue | Direct questions |
| 20 | 1 | The five nouns: meanings, declension with letters, conditions, exercises                                               | The Five Nouns                  | Lecture, discussion, dialogue | Direct questions |
| 21 | 1 | Exam                                                                                                                   |                                 |                               |                  |
| 22 | 1 | Punctuation marks: comma, semicolon, period, ellipsis, colon, question mark, exclamation, quotation marks, parentheses | Punctuation                     | Lecture, discussion, dialogue | Direct questions |
| 23 | 1 | Exam                                                                                                                   |                                 | Lecture, discussion, dialogue | Direct questions |
| 24 | 1 | Life and upbringing of Badr Shakir al-Sayyab                                                                           | Biography Badr Shakir al-Sayyab | Lecture, discussion, dialogue | Direct questions |
| 25 | 1 | Memorization of 8 verses from "Rain Song" poem, explanation, semantic and rhetorical analysis                          | "Rain Song" Poem                | Lecture, discussion, dialogue | Direct questions |
| 26 | 1 | The five verbs: definition and declension                                                                              | The Five Verbs                  | Lecture, discussion, dialogue | Direct questions |

|    |   |                                          |                               |                               |                  |
|----|---|------------------------------------------|-------------------------------|-------------------------------|------------------|
|    |   |                                          |                               |                               |                  |
| 27 | 1 | Passive subject: definition and examples | Passive Subject (Nā al-Fā'il) | Lecture, discussion, dialogue | Direct questions |
| 28 | 1 | Applied exercises                        | Exercises                     | Lecture, discussion, dialogue | Direct questions |
| 29 | 1 | General review of syllabus               | Review                        | Lecture, discussion, dialogue | Direct questions |
| 30 | 1 | Exam                                     |                               |                               | Direct questions |

#### 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc

#### 12. Learning and Teaching Resources

|                                                                    |                                                                                               |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | None.                                                                                         |
| Main references (sources)                                          | Main References: Sharḥ Ibn 'Aqīl on Ibn Mālik's Alfiyya.                                      |
| Recommended books and references (scientific journals, reports...) | Meanings of Syntax by Dr. Fadel Al-Samarrai<br>Al-Nahw Al-Wafī by Abbas Hassan.               |
| Electronic References, Websites                                    | Alukah Network<br>Waddood Library<br>Al-Waqfeya Library<br>Archive Library<br>Al-Noor Library |



## Course Description Form

|                                                                                                                                                                                                                                                                               |                   |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|
| 1. Course Name:                                                                                                                                                                                                                                                               |                   |  |
| <b>Advanced Electrical &amp; Magnetic</b>                                                                                                                                                                                                                                     |                   |  |
| 2. Course Code:                                                                                                                                                                                                                                                               |                   |  |
| <b>HAEPSPH-203</b>                                                                                                                                                                                                                                                            |                   |  |
| 3. Chapter/Year:                                                                                                                                                                                                                                                              |                   |  |
| <b>2024-2025</b>                                                                                                                                                                                                                                                              |                   |  |
| 4. Date of preparation of this description:                                                                                                                                                                                                                                   |                   |  |
| 1/9/2024                                                                                                                                                                                                                                                                      |                   |  |
| 5. Available Attendance Formats:                                                                                                                                                                                                                                              |                   |  |
| <b>Face-to-face education</b>                                                                                                                                                                                                                                                 |                   |  |
| 6. Number of Hours (Total) / Number of Credits (Total)                                                                                                                                                                                                                        |                   |  |
| <b>60 Hours/5 Units</b>                                                                                                                                                                                                                                                       |                   |  |
| 7. Course administrator name (if more than one name mentioned)                                                                                                                                                                                                                |                   |  |
| <b>Name: a.t. Ahmed turki abdulhameed</b><br><a href="mailto:phy.ahmedturki@uohamdaniya.edu.iq">phy.ahmedturki@uohamdaniya.edu.iq</a>                                                                                                                                         |                   |  |
| 8. Course Objectives                                                                                                                                                                                                                                                          |                   |  |
| Introduce students to the basic theories and concepts in the science of electricity and magnetism and the laws that link them, through which the student can understand the proofs and solve problems related to the sciences of electricity and magnetism.                   | Course Objectives |  |
| 9. Teaching and Learning Strategies                                                                                                                                                                                                                                           |                   |  |
| 1- Promote a deep understanding of the concepts of electricity and magnetism and their relationship to nature and other sciences.<br>2- Develop the ability to analyze problems related to electric current and magnetic fields and understand the phenomena related to them. | Strategy          |  |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>3- Enable students to understand the practical applications of electricity and magnetism concepts in fields such as electrical engineering, electronics, communications, and renewable energy.</p> <p>4- Develop the computational skills needed to solve complex physical problems, as well as enhance experimental skills through practical experiments and data analysis.</p> <p>Interaction and Communication: Encourage interaction and communication between students by discussing concepts and solving physical problems collectively</p> |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

#### 10. Course Structure

| Evaluation Method | Learning method                  | Unit Name or Subject                                                               | Required Learning Outcomes                              | Hours | Week   |
|-------------------|----------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------|-------|--------|
| Direct Questions  | Lecture, Discussion and Dialogue | Magnetic Field - Magnetic Flux - Motion of Charged Particles in the Magnetic Field | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2     | First  |
| Direct Questions  | Lecture, Discussion and Dialogue | Thomsen's experiment - the magnetic force acting on electric current               | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2     | Second |
| Direct Questions  | Lecture, Discussion and Dialogue | Torque                                                                             | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2     | Third  |



|                  |                                  |                                                                                                                     |                                                         |   |          |
|------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|---|----------|
| Direct Questions |                                  | Solving the First Chapter Questions                                                                                 | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Fourth   |
| Direct Questions | Lecture, Discussion and Dialogue | DC-Kelvanometers -Suspended Coil Kelvanometer                                                                       | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | V        |
| Direct Questions | Lecture, Discussion and Dialogue | DC Amitter - DC Voltmeter                                                                                           | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Sixth    |
|                  |                                  | Solving Second Semester Questions                                                                                   |                                                         | 2 | Seven th |
| Direct Questions | Lecture, Discussion and Dialogue | Magnetic Fields Arising from Current-Carrying Wires - Bayot's Law and Safert                                        | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Eighth   |
| Direct Questions | Lecture, Discussion and Dialogue | Applications to Bayot's Law and Travel-Magnetic Field for Straight Wire - Magnetic Field Arising from Circular Wire | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Ninth    |
| Direct Questions | Lecture, Discussion and Dialogue | Ampere's Law - Applications to Ampere's Law                                                                         | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | X        |



|                  |                                  |                                                                                              |                                                         |   |                |
|------------------|----------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------|---|----------------|
| Direct Questions | Lecture, Discussion and Dialogue | Magnetic Field of Long Cylindrical Wire                                                      | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Eleventh       |
| Direct Questions | Lecture, Discussion and Dialogue | Magnetic field of a helical coil                                                             | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Twelfth        |
| Direct Questions | Lecture, Discussion and Dialogue | Magnetic field of a cyclic helical coil                                                      | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Thirteenth     |
| Direct Questions | Lecture, Discussion and Dialogue | The mutual force between two parallel wires                                                  | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Fourteenth     |
|                  |                                  | Solving Third Semester Questions                                                             |                                                         | 2 | Fifteenth      |
| Direct Questions | Lecture, Discussion and Dialogue | Electromagnetic Induction - Faraday's Law - Kinetic Induced Electromotive Force - Lens's Law | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Sixteenth week |
| Direct Questions | Lecture, Discussion and Dialogue | Measuring the Magnetic Field Strength Using the Research-Generator                           | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Seventeenth    |



|                  |                                  |                                                                                        |                                                         |   |                   |
|------------------|----------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|---|-------------------|
| Direct Questions | Lecture, Discussion and Dialogue | Variable magnetic fields                                                               | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week Eighteenth   |
| Direct Questions | Lecture, Discussion and Dialogue | Inductive property                                                                     | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week Nineteen     |
| Direct Questions | Lecture, Discussion and Dialogue | Current growth and decay in a circuit consisting of inductor and resistor respectively | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week 20           |
| Direct Questions | Lecture, Discussion and Dialogue | Stored energy in the magnetic-cross-induction field                                    | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week 21           |
| Direct Questions | Lecture, Discussion and Dialogue | Electrical Transformer - Transmission of Power to Long Distances                       | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week 22           |
|                  |                                  | Solving Chapter Four Questions                                                         |                                                         | 2 | Week Twenty Three |
| Direct Questions | Lecture, Discussion and Dialogue | AC Basics                                                                              | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week Twenty Four  |



|                  |                                  |                                                                                                                         |                                                         |   |                   |
|------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|---|-------------------|
| Direct Questions | Lecture, Discussion and Dialogue | Voltages – Phase                                                                                                        | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week Twenty Five  |
| Direct Questions | Lecture, Discussion and Dialogue | Shedding sine voltages on pure resistor - Shedding voltages on pure expander - Shedding sine voltages on pure inductor  | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week Twenty Six   |
| Direct Questions | Lecture, Discussion and Dialogue | Effective Alternating Current Value - Average Effective Current Value - Electrical Power                                | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week twenty seven |
| Direct Questions | Discussion and Dialogue          | Expanded Coil Resistance Circuit Sequential Splicing- Capacity in Circuit Resistive Coil Expandable Sequential Splicing | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week Twenty Eight |
| Direct Questions | Discussion and Dialogue          | Resonance in a straight circuit - a circuit resisting a parallel splicing expanded coil                                 | <b>Theoretical Knowledge</b><br><b>Applied Analysis</b> | 2 | Week twenty ninth |



|                                                                                                                                                                                                                                                                                                 |  |                                      |                                                                 |  |   |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------|-----------------------------------------------------------------|--|---|------------|
|                                                                                                                                                                                                                                                                                                 |  | Solving<br>Chapter Five<br>Questions |                                                                 |  | 2 | Week<br>30 |
| 11. Course Evaluation                                                                                                                                                                                                                                                                           |  |                                      |                                                                 |  |   |            |
| Distribution of the grade out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports.... etc                                                                                                                             |  |                                      |                                                                 |  |   |            |
| 12. Learning and Teaching Resources                                                                                                                                                                                                                                                             |  |                                      |                                                                 |  |   |            |
| <ul style="list-style-type: none"> <li>Fundamentals of Electricity and Magnetism, Author : Yahya Abdel Hamid Al-Hajj Ali</li> </ul>                                                                                                                                                             |  |                                      | Required textbooks (methodology if available)                   |  |   |            |
| 1- Introduction to Electromagnetism and Magnetism, by Dr.Mona Abdel Karim Al-Khashab, Dr.Kazem Ahmed Mohammed<br><br>2- Electricity and Magnetism, Part Two, Author: Ibrahim Nasser Ibrahim Fundamentals of Electromagnetic Theory, Translated by: Yahya Abdel Hamid Al-Hajj Ali, Rahman Rustom |  |                                      | Primary References (Sources)                                    |  |   |            |
| Follow up on electronic and internet references that include solid scientific websites and library websites in some international universities                                                                                                                                                  |  |                                      | Recommended Books and References (Scientific Journals, Reports) |  |   |            |
| Websites related to electricity and magnetism                                                                                                                                                                                                                                                   |  |                                      | References, Websites                                            |  |   |            |

## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Course Name .1</b>                     |
| <b>Educational Leadership and Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Course Code .2</b>                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>HAEPSPH-208</b>                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Semester/Year .3</b>                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>2024- 2025</b>                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Date of Preparation of This Row .4</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>18/9/2024</b>                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Available Forms of Attendance .5</b>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Came</b>                               |
| <b>Number of Hours (Total) / Number of Units (Total) .6</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                           |
| <b>/ Total Number ( 60 )</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>\ (4) units</b>                        |
| <b>Name of the course administrator) if more than one name is .7</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>mentioned)</b>                         |
| <b>Name: Assistant Lecturer Alaa Talal Hamid saeid</b><br><b>Email: alaa.talal@uohamdaniya.edu.iq</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Course Objectives .8</b>               |
| <p style="text-align: center;">Introducing students to the importance of educational administration</p> <p style="text-align: center;">Introducing students to the principles of educational administration</p> <p style="text-align: center;">Enabling students in educational administration, educational administration, school administration, classroom management, educational supervision and administrative processes</p> <p style="text-align: center;">Identifying Recent Trends in Educational Administration</p> <p style="text-align: center;">Introducing students to the importance of educational administration</p> <p style="text-align: center;">Introducing students to the principles of educational administration</p> <p style="text-align: center;">Enabling students in educational administration, educational administration, school administration, classroom management, educational supervision and administrative processes</p> <p style="text-align: center;">Identifying Recent Trends in Educational Administration</p> |                                           |



| <b>Teaching and Learning Strategy .9</b>                                                                                                                                                                                                                                                                                                              |                        |                                      |                                                                                                                             |              |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------|-------------|
| <p>1. Discussion, presentation of ideas, proverbs, lecture method.</p> <p>2. Preparing for the process of giving lectures by students and preparing reports on the subject.</p> <p>3. Collaborative learning, then implementing the critically friendly strategy.</p> <p>4. Blended Learning</p> <p>5. Exploration, induction, and brainstorming.</p> |                        |                                      |                                                                                                                             |              |             |
| <b>Course Structure .10</b>                                                                                                                                                                                                                                                                                                                           |                        |                                      |                                                                                                                             |              |             |
| <b>Evaluation Method</b>                                                                                                                                                                                                                                                                                                                              | <b>Teaching Method</b> | <b>Topic Name</b>                    | <b>Required Learning Outcomes</b>                                                                                           | <b>Hours</b> | <b>Week</b> |
| <b>Oral and written testing</b>                                                                                                                                                                                                                                                                                                                       | <b>Lecture</b>         | <b>Types of Departments</b>          | <b>Students should be able to understand meaning of Ultra Management and educational</b>                                    | <b>2</b>     | <b>1</b>    |
| <b>test Oral and Written</b>                                                                                                                                                                                                                                                                                                                          | <b>Lecture</b>         | <b>History of the administration</b> | <b>Students' knowledge of importance of educational administration to clarify Student Duties Educational Administration</b> | <b>2</b>     | <b>2</b>    |

|                          |                   |                                |                                                                                                                                       |   |    |
|--------------------------|-------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---|----|
| Oral and written testing | Dialog Discussion | Difference Between Departments | differentiation between Educational Administration and educational Differentiation between Educational Administration and educational | 2 | 3  |
| Oral and written testing | Dialog Discussion | العمليات الإدارية              | How its importance and need es in solving their problems                                                                              | 2 | 4  |
| Oral and written testing | Dialog Discussion | Planning Educational           | Knowledge of its concept and types identify his most important duties                                                                 | 2 | 5  |
| Oral and written testing | Dialog Discussion | marshalling Administrative     | Clarification of its concept and types Knowledge of its concept and types                                                             | 2 | 6  |
| Oral and written testing | Dialog Discussion | Administrative Guidance        | Knowledge of its concept and types Recognizing His Duties                                                                             | 2 | 7  |
| Oral and written testing | Dialog Discussion | Relations Humanity             | able to build meaningful relationships within the elements of the educational process whether teachers or students                    | 2 | 9  |
| Oral and written testing | Dialog Discussion | Incentives and Communication   | Learn how to use oral or material incentives                                                                                          | 2 | 9  |
| Oral and written testing | Dialog Discussion | valuation & Evaluation         | التعرف على الفرق بين التقييم والتقويم، وكيف استخدامها                                                                                 | 2 | 10 |



|                                 |                          |                                |                                                                                                     |          |           |
|---------------------------------|--------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------|----------|-----------|
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Study Plan</b>              | <b>differentiate between the plan and planning to identify the conditions Successful Study Plan</b> | <b>2</b> | <b>11</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Study Plan</b>              | <b>ference Between Daily Plan and monthly and yearly.</b>                                           | <b>2</b> | <b>12</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Principal</b>               | <b>nowledge of the basics of management Successful School</b>                                       | <b>2</b> | <b>13</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Crisis Management</b>       | <b>nderstanding the Concept of Crisis and its causes.</b>                                           | <b>2</b> | <b>14</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Crisis Management</b>       | <b>Learn how and confronting resolving crises.</b>                                                  | <b>2</b> | <b>15</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Time Management</b>         | <b>nderstanding the concept of time how the importance of time management</b>                       | <b>2</b> | <b>16</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Management Theories</b>     | <b>Understanding management theories Public</b>                                                     | <b>2</b> | <b>17</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Theories Administrative</b> | <b>nowledge of classical theories</b>                                                               | <b>2</b> | <b>18</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Theories Administrative</b> | <b>nowledge of Humanistic Theories</b>                                                              | <b>2</b> | <b>19</b> |
| <b>Oral and written testing</b> | <b>Dialog Discussion</b> | <b>Theories Administrative</b> | <b>nowledge of behavioral theories</b>                                                              | <b>2</b> | <b>20</b> |

|                                     |                   |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                              |   |    |
|-------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|
| Oral and written testing            | Dialog Discussion | Theories of Administrative                                                                                                                                          | Knowledge of social theories                                                                                                                                                                                                                                                                                                 | 2 | 21 |
| Oral and written testing            | Dialog Discussion | Educational supervision                                                                                                                                             | cognize its concept and importance                                                                                                                                                                                                                                                                                           | 2 | 22 |
| Oral and written testing            | Dialog Discussion | Educational supervision                                                                                                                                             | Learn about methods supervision and duties                                                                                                                                                                                                                                                                                   | 2 | 23 |
| Oral and written testing            | Dialog Discussion | Educational Leadership                                                                                                                                              | Learning to know its concept and Definitions                                                                                                                                                                                                                                                                                 | 2 | 24 |
| Oral and written testing            | Dialog Discussion | Similarities between Leadership and Management                                                                                                                      | Knowing Facets Likeness and the difference in detail                                                                                                                                                                                                                                                                         | 2 | 25 |
| Course Evaluation .11               |                   |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                              |   |    |
|                                     |                   | Distribution of the grade out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports.... etc |                                                                                                                                                                                                                                                                                                                              |   |    |
| Learning and Teaching Resources .12 |                   |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                              |   |    |
|                                     |                   |                                                                                                                                                                     | Textbooks Methodology                                                                                                                                                                                                                                                                                                        |   |    |
|                                     |                   |                                                                                                                                                                     | Sources and Approved References/ Khaled Abdullah Dahmash (2016) (2), Educational Administration. Abdullah Ahmed Ahmed Amarat (2009) The Perspective of Al-Kadba for Educational Administration Asina Haram (2009) Educational Institutions Management Ahmed Battah (2006), Contemporary Issues in Educational Administration |   |    |



|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>med Mohammed Al Hubaishi (201)Sources<br/> d Approved References/ Khaled Abdullah<br/> nmash (2016) (2), Educational<br/> Administration.<br/> dullah Ahmed Ahmed Amarat (2009) The<br/> erspective of Al-Kadba for Educational<br/> Administration<br/> sina Haram (2009) Educational Institutions<br/> Management<br/> med Battah (2006), Contemporary Issues in<br/> Educational Administration<br/> Ahmed Mohammed Al Hubaishi (201)</p> |
|  | <p>Electronic References and<br/> Websites.Electronic References and<br/> Websites.</p>                                                                                                                                                                                                                                                                                                                                                         |
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Course Description Form

|                                                                                              |                                                                           |  |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--|
| 1. Course name:                                                                              |                                                                           |  |
| Curricula and teaching methods                                                               |                                                                           |  |
| 2. Course code:                                                                              |                                                                           |  |
| HAEPSPH-308                                                                                  |                                                                           |  |
| 3. Semester/Year: Annual System                                                              |                                                                           |  |
| 2024-2025                                                                                    |                                                                           |  |
| 4. Date of preparation of this description:                                                  |                                                                           |  |
| 17/9/2024                                                                                    |                                                                           |  |
| 5. Available attendance forms: Daily morning attendance                                      |                                                                           |  |
| In-person education                                                                          |                                                                           |  |
| 6. Number of study hours / Number of units                                                   |                                                                           |  |
| 60 hours / 4 units                                                                           |                                                                           |  |
| 7. Course Supervisor Name (if more than one name is mentioned)                               |                                                                           |  |
| Name: Email:                                                                                 |                                                                           |  |
| M.M. Younis Dharar Jassim                                                                    |                                                                           |  |
| <a href="mailto:youniesdrar12345@uohamdaniya.edu.iq">youniesdrar12345@uohamdaniya.edu.iq</a> |                                                                           |  |
| 8. Course objectives                                                                         |                                                                           |  |
| <b>Course objectives</b>                                                                     | The curriculum and teaching methods course aims to enable the student to: |  |
| <b>s</b>                                                                                     | 1. Recognize the teacher's message in society.                            |  |



|                                     |                                                                                                                                                                                                                                                                                                        |  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                     | <ol style="list-style-type: none"> <li>2. Deduce the responsibilities of the teacher in society.</li> <li>3. Identify aspects of teacher preparation.</li> <li>4. Understand the concept of teaching competence.</li> <li>5. Classifies the teaching competencies required for the teacher.</li> </ol> |  |
| 9. Teaching and learning strategies |                                                                                                                                                                                                                                                                                                        |  |
| Strategy                            | <ol style="list-style-type: none"> <li>1. Lectures of all kinds.</li> <li>2. Dialogue, discussion and question and answer sessions.</li> <li>3. Collaborative learning.</li> <li>4. Project method.</li> <li>5. Numbered heads strategy.</li> </ol>                                                    |  |

| Evaluation method | Teaching method             | Unit name/topic                                                      | Required learning outcomes                                                        | hours | week |
|-------------------|-----------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|------|
| Feedback          | discussion, lecture, debate | Historical development of the concept of eachOf methods and teaching | –Enable learners to identify historical stages.For teaching methods and curricula | 2     | 1    |
| Feedback          | discussion, n,              | Understanding the conceptScience                                     | Forming students to define the concept ofFor your                                 | 2     | 2    |

|          |                                       |                                                                             |                                                                                                                               |   |   |
|----------|---------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---|---|
|          | lecture,<br>debate                    |                                                                             | informationAnd its<br>connection with<br>other concepts                                                                       |   |   |
| Feedback | discussio<br>n,<br>lecture,<br>debate | Understand the<br>concept of each of<br>(a)For the<br>truthandprinciple)    | Enable students to<br>define<br>termsScientific facts<br>and scientific<br>conceptsAnd find the<br>difference between<br>them | 2 | 3 |
| Feedback | discussio<br>n,<br>lecture,<br>debate | The importance of<br>science                                                | Empowering<br>studentsfrom Learn<br>about the<br>characteristics of<br>science                                                | 2 | 4 |
| Feedback | discussio<br>n,<br>lecture,<br>debate | The relationship<br>betweenObservati<br>on, interview, and<br>questionnaire | Students were able<br>to distinguish<br>betweenScientific<br>thinking skills                                                  | 2 | 5 |
| Feedback | discussio<br>n,<br>lecture,<br>debate | Identify the<br>elements<br>Curriculum                                      | Students were able<br>toLinking curriculum<br>elements                                                                        | 2 | 6 |



|          |                                   |                                              |                                                                                               |   |    |
|----------|-----------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------|---|----|
| Feedback | discussion,<br>lecture,<br>debate | Types of calendar                            | Enable students to identify and apply types of educational assessment.                        | 2 | 7  |
| Feedback | discussion,<br>lecture,<br>debate | Types Objectives                             | Students were able to identify the types of Educational objectives and its field applications | 2 | 8  |
| Feedback | discussion,<br>lecture,<br>debate | Sources of educational objectives            | Students were able to identify Sources of derivation of educational objectives                | 2 | 9  |
| Feedback | discussion,<br>lecture,<br>debate | role in formulating the behavioral objective | Students were able to Defining the formulation of behavioral objectives                       | 2 | 10 |
| a test   | discussion,<br>lecture,<br>debate | Teaching objectives                          | Students were able to identify Classification of behavioral objectives                        | 2 | 11 |

|                  |                                   |                                |                                                                                |   |    |
|------------------|-----------------------------------|--------------------------------|--------------------------------------------------------------------------------|---|----|
| Feedback         | discussion,<br>lecture,<br>debate | Behavioral<br>Objectives Areas | Enabling students to know how to Linking the fields of objectives              | 2 | 12 |
| Feedback         | discussion,<br>lecture,<br>debate | Teaching methods               | EmpowermentAFor students of determinationStrategic concepts, methods and style | 2 | 13 |
| Feedback         | discussion,<br>lecture,<br>debate | Teaching methods               | Enabling students toKnowing the specifications of successful teaching          | 2 | 14 |
| Semi-annual news | discussion,<br>lecture,<br>debate | Teaching methods               | Empowering studentsTo learn about the types of teaching methods                | 2 | 15 |
| Feedback         | discussion,<br>lecture,<br>debate | Teaching Jokes                 | Enabling students toKnowing the method of delivery and its steps               | 2 | 16 |
| Feedback         | discussion,<br>n,                 | Teaching methods               | Enabling students toKnowing how                                                | 2 | 17 |



|              |                                   |                                                                    |                                                                                                  |   |    |
|--------------|-----------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---|----|
|              | lecture,<br>debate                |                                                                    | Discussion and Mentoring on her steps                                                            |   |    |
| Feedback     | discussion,<br>lecture,<br>debate | Objective tests                                                    | Empowering students to identify the problem method and mention its advantages and disadvantages. | 2 | 18 |
| Feedback     | discussion,<br>lecture,<br>debate | Classification of tests by method                                  | Enabling students to identify different testing methods                                          | 2 | 19 |
| Feedback     | discussion,<br>lecture,<br>debate | strategy                                                           | Enabling students to learn about cooperative learning                                            | 2 | 20 |
| Monthly exam | –                                 | Knowing the students' level and the information they have acquired | Monthly exam                                                                                     | 2 | 21 |
| Feedback     | discussion,<br>n,                 | Teaching methods                                                   | Enabling students to know the role                                                               | 2 | 22 |

|          |                                   |                  |                                                                        |   |    |
|----------|-----------------------------------|------------------|------------------------------------------------------------------------|---|----|
|          | lecture,<br>debate                |                  | of the teacher during<br>collaborative work                            |   |    |
| Feedback | discussion,<br>lecture,<br>debate | Teaching methods | Enabling students<br>to Master one<br>method in reality                | 2 | 23 |
| Feedback | discussion,<br>lecture,<br>debate | Teaching methods | Enabling students<br>to Applying the<br>standard method in<br>teaching | 2 | 24 |
| a test   | discussion,<br>lecture,<br>debate | Teaching methods | Enabling students<br>to Model teaching<br>steps                        | 2 | 25 |
| Feedback | discussion,<br>lecture,<br>debate | Teaching methods | Enabling students to<br>apply methods In<br>teaching                   | 2 | 26 |
| Feedback | discussion,<br>n,                 | Field visits     | Enabling students to<br>identify On field visits                       | 2 | 27 |



|          |                                   |                  |                                                                                              |   |    |
|----------|-----------------------------------|------------------|----------------------------------------------------------------------------------------------|---|----|
|          | lecture,<br>debate                |                  |                                                                                              |   |    |
| Feedback | discussion,<br>lecture,<br>debate | Field visits     | Enabling students<br>toPreparing reports<br>when visiting<br>schools                         | 2 | 28 |
| Feedback | discussion,<br>lecture,<br>debate | Teaching methods | Enabling students<br>toModel teaching<br>steps                                               | 2 | 29 |
| Feedback | discussion,<br>lecture,<br>debate | Calendar         | Enabling students<br>toKnowing the<br>calendar and the<br>characteristics of the<br>calendar | 2 | 30 |

|                                     |                                                                                                                                        |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 11- Learning and teaching resources |                                                                                                                                        |
| 1- Required textbooks               | -General teaching methods Its planning and educational applications,Walid Ahmed,Jaber,Dar Al Fikr for Publishing and Distribution 2013 |

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                                                          | <p>-Curriculum and teaching methods,Ramadan Masoud Badawi,Dar Al Fikr for Publishing and Distribution 2011 AD</p> <p>-General teaching methods and their evaluation,Abdul-Hayy Ahmed Al-Subhi Mohammed Abdullah Al-Qasaymeh Khwarazm Scientific Publishers and Libraries 2011 AD</p> <p>-Teaching methods,Khaled Al-Sarayrah and others ,Dar Al Masirah for Printing and Publishing 2010 AD</p> |  |
| 2- Main references (sources)                                             | <p>- Teaching strategies. Ali Munir Al-Husari Dar Al-Asar Al-Ilmi for Printing and Publishing 2015</p> <p>2- Creativity in teaching,Khalil Abdel Fattah Hammad,And my name is Yasra Badr,Al-Falah Library for Publishing and Distribution 2014</p>                                                                                                                                              |  |
| A- Recommended books and references (scientific journals, reports, etc.) |                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| B - Electronic references, Internet sites                                | -Al-Noor Library (electronic library) is free on the search engine.Google                                                                                                                                                                                                                                                                                                                       |  |



## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                           |                                   |       |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------|-----------------------------------|-------|-------------------|
| 1. Course name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                           |                                   |       |                   |
| Complex functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |                           |                                   |       |                   |
| 2. Course code:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                           |                                   |       |                   |
| HAEPSPH-305                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                           |                                   |       |                   |
| 3. Chapter/Year:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |                           |                                   |       |                   |
| 2024-2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          |                           |                                   |       |                   |
| 4. Date of preparation of this description:                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                           |                                   |       |                   |
| 15/9/2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          |                           |                                   |       |                   |
| 5. Available attendance forms:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                          |                           |                                   |       |                   |
| In-person education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                           |                                   |       |                   |
| 6. Number of study hours (total) / Number of units (total):                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                           |                                   |       |                   |
| 60 hours /4 units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |                           |                                   |       |                   |
| 7. Course Instructor Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          |                           |                                   |       |                   |
| Name: Asst.prof. Hanaa Nafee Azeez                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                           |                                   |       |                   |
| Email: hanaa69@uohamdaniya.edu.iq                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |                           |                                   |       |                   |
| 8. Course objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                           |                                   |       |                   |
| 1. Introducing students to complex number their properties , related functions, complex integrals, complex derivatives, and .complex number sequences and series<br>2. Enabling students to solve mathematical problems related to the subject Complex functions                                                                                                                                                                                                                                                |                          |                           |                                   |       | Course objectives |
| 9. Teaching and learning strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                           |                                   |       |                   |
| 1. Providing students with information and concepts related to mathematics and complex functions.<br>2. Preparing trained and qualified cadres to work in educational institutions<br>3. Identifying the scientific applications of each scientific knowledge<br>4. Identifying the different types of scientific knowledge, including facts, concepts, principles, and theories in the field of mathematics.<br>5. Enabling the student to gain knowledge and understanding of scientific laws in mathematics. |                          |                           |                                   |       | Strategy          |
| 10. Course structure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                           |                                   |       |                   |
| Evaluation method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Learning method          | Name of the unit or topic | Required learning outcomes        | hours | week              |
| Evaluation method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Teaching method          | Unit name/topic           | Required learning outcomes        | hours | week              |
| Direct questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Lecture , discussion and | complex number            | Complex number - its properties - | 2     | the first         |



|                                   |                                           |                                                |                                                |   |            |
|-----------------------------------|-------------------------------------------|------------------------------------------------|------------------------------------------------|---|------------|
| +Daily homework                   | problem solving                           |                                                | arithmetic operations                          |   |            |
| Direct + Questions Daily Homework | Lecture , discussion and problem solving  | Utilities and absolute value                   | Utilities and absolute value                   | 2 | the second |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | Polar coordinates and geometric representation | Polar coordinates and geometric representation | 2 | the third  |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | Powers and roots                               | Powers and roots                               | 2 | Fourth     |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | complex variable                               | complex variable                               | 2 | Fifth      |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | Endings                                        | Endings                                        | 2 | Sixth      |
| exam                              | Lecture , discussion and problem solving  | Continuity                                     | Continuity                                     | 2 | Seventh    |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | Derivative                                     | Derivative                                     | 2 | Eighth     |
| Direct questions +Daily homework  | Lecture and discussion and solve problems | Analytical functions                           | Analytical functions                           | 2 | Ninth      |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | Analytical functions                           | Analytical functions                           | 2 | tenth      |
| Direct questions Exam+            | Lecture , discussion and problem solving  | Harmonic functions                             | Harmonic functions                             | 2 | eleventh   |
| Direct questions +Daily homework  | Lecture , discussion and problem solving  | exponential function                           | exponential function                           | 2 | twelfth    |



|                                     |                                                |                                      |                                              |   |                          |
|-------------------------------------|------------------------------------------------|--------------------------------------|----------------------------------------------|---|--------------------------|
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | logarithmic<br>function              | logarithmic function                         | 2 | thirteenth               |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | trigonometric<br>function            | trigonometric<br>function                    | 2 | fourteenth               |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | inverse<br>trigonometric<br>function | inverse<br>trigonometric<br>function         | 2 | fifteenth                |
| exam                                | Lecture ,<br>discussion and<br>problem solving | hyperbolic<br>function               | hyperbolic function                          | 2 | Sixteenth                |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | Complex<br>number<br>integration     | Complex number<br>integration                | 2 | Seventeen<br>th week     |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | Integration<br>paths                 | Integration paths                            | 2 | Eighteenth<br>week       |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | Korsa's theorem                      | Korsa's theorem                              | 2 | Nineteenth<br>week       |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | Indefinite<br>integrals              | Indefinite integrals                         | 2 | Week<br>twentieth        |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | Cauchy's<br>integral formula         | Cauchy's integral<br>formula                 | 2 | Week<br>twenty-one       |
| exam                                | Lecture ,<br>discussion and<br>problem solving | Theorems                             | Theorems                                     | 2 | Week<br>twenty-two       |
| Direct questions<br>+Daily homework | Lecture ,<br>discussion and<br>problem solving | Sequences and<br>series              | Sequences and<br>Series - Types of<br>Series | 2 | Week<br>twenty-<br>three |



|                                     |                                           |                                    |                                    |   |                   |
|-------------------------------------|-------------------------------------------|------------------------------------|------------------------------------|---|-------------------|
| Direct questions<br>+Daily homework | Lecture and discussion and solve problems | Power chains                       | Power chains                       | 2 | Week twenty-four  |
| Direct questions<br>+Daily homework | Lecture , discussion and problem solving  | Tyler Series                       | Tyler Series                       | 2 | Week twenty-five  |
| exam                                | Lecture , discussion and problem solving  | Laurent series                     | Laurent series                     | 2 | Week twenty-six   |
| Direct questions<br>+Daily homework | Lecture , discussion and problem solving  | Outliers                           | Outliers                           | 2 | Week twenty-seven |
| Direct questions<br>+Daily homework | Lecture , discussion and problem solving  | Classification of anomalous points | Classification of anomalous points | 2 | Week twenty-eight |
| Direct questions<br>+Daily homework | Lecture , discussion and problem solving  | Sediment zeros                     | Sediment zeros                     | 2 | Week twenty-nine  |
| Direct questions<br>+Daily homework | Lecture , discussion and problem solving  | Residue theorem                    | Residue theorem                    | 2 | thirty            |

#### 11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, homework, daily, oral, monthly and written exams, etc

#### 12. Learning and teaching resources

|                                                                                                                                                     |                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Complex Functions: Samir Bashir Hadid, Yahya Abdul Saeed                                                                                            | Required textbooks (methodology if available)                              |
| Complex Functions: Samir Bashir Hadid, Yahya Abdul Saeed                                                                                            | Primary References (Sources)                                               |
| Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities | Recommended mainstream books and references (scientific journals, reports) |
| Websites that are interested in the field of mathematics                                                                                            | Electronic references, websites                                            |



## Course Description Form

|                                                                     |                                                                                                                                                                                                                                                                                                                                                  |  |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                  |  |
| Electronics                                                         |                                                                                                                                                                                                                                                                                                                                                  |  |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                  |  |
| HAEPSPH-303                                                         |                                                                                                                                                                                                                                                                                                                                                  |  |
| 3. Semester / Year:                                                 |                                                                                                                                                                                                                                                                                                                                                  |  |
| Yearly                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                  |  |
| 21/9/2024                                                           |                                                                                                                                                                                                                                                                                                                                                  |  |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                  |  |
| Attendance                                                          |                                                                                                                                                                                                                                                                                                                                                  |  |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                  |  |
| 90 HOURS/ 7 UNITS                                                   |                                                                                                                                                                                                                                                                                                                                                  |  |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                  |  |
| Name: Assistant Prof. Dr. Thoalfiqar Ali Zaker                      |                                                                                                                                                                                                                                                                                                                                                  |  |
| Email: thoalfiqar.physics@uohamdaniya.edu.iq                        |                                                                                                                                                                                                                                                                                                                                                  |  |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                  |  |
| Course Objectives                                                   | <p>Introducing students to the principles of electronics, the physical laws used, and electronic circuits, in addition to the practical application of connecting electronic circuits, their working mechanism, and their applications in the laboratory.</p>                                                                                    |  |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                  |  |
| Strategy                                                            | <ol style="list-style-type: none"> <li>1. Providing students with physical information and concepts<br/>Preparing trained and qualified cadres to work in institutions.</li> <li>2. Identify the scientific applications of each scientific knowledge.</li> <li>3. Identify the scientific applications of each scientific knowledge.</li> </ol> |  |



## 10. Course Structure

| Week | Hours | Required Learning Outcomes        | Unit or subject name                             | Learning method                                         | Evaluation method |
|------|-------|-----------------------------------|--------------------------------------------------|---------------------------------------------------------|-------------------|
| 1    | 3     | theoretical and applied knowledge | General introduction to semiconductors           | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 2    | 3     | theoretical and applied knowledge | Classification of materials                      | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 3    | 3     | theoretical and applied knowledge | Electron distribution and Fermi level            | Lecture, discussion, dialogue, and practical experience | Homework          |
| 4    | 3     | theoretical and applied knowledge | Pure semiconductors                              | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 5    | 3     | theoretical and applied knowledge | Conduction in solids (semiconductors)            | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 6    | 3     | theoretical and applied knowledge | Doping                                           | Lecture, discussion, dialogue, and practical experience | Homework          |
| 7    | 3     | theoretical and applied knowledge | Diodes                                           | Lecture, discussion, dialogue, and practical experience | Homework          |
| 8    | 3     | theoretical and applied knowledge | Reverse bias                                     | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 9    | 3     | theoretical and applied knowledge | Energy band diagram of a diode in biased state   | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 10   | 3     | theoretical and applied knowledge | Calculate the barrier voltage                    | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 11   | 3     | theoretical and applied knowledge | Introduction to Diode Applications               | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 12   | 3     | theoretical and applied knowledge | Continuous Component                             | Lecture, discussion, dialogue, and practical experience | Quiz              |
| 13   | 3     | theoretical and applied knowledge | Modulation efficiency of half-wave rectifier hHW | Lecture, discussion, dialogue, and practical            | Homework          |



|    |   |                                   |                                                                           |                                                         |          |
|----|---|-----------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------|----------|
|    |   |                                   |                                                                           | experience                                              |          |
| 14 | 3 | theoretical and applied knowledge | Modulation efficiency of hFW full wave modulator                          | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 15 | 3 | theoretical and applied knowledge | Clipping and Clamping Circuits                                            | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 16 | 3 | theoretical and applied knowledge | Introduction to bipolar transistor                                        | Lecture, discussion, dialogue, and practical experience | Homework |
| 17 | 3 | theoretical and applied knowledge | Types of transistor bias                                                  | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 18 | 3 | theoretical and applied knowledge | Transistor connection methods                                             | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 19 | 3 | theoretical and applied knowledge | Load line and working point                                               | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 20 | 3 | theoretical and applied knowledge | The effect of temperature and the stability of the transistor's operation | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 21 | 3 | theoretical and applied knowledge | Transistor bias circuits                                                  | Lecture, discussion, dialogue, and practical experience | Homework |
| 22 | 3 | theoretical and applied knowledge | Self-biasing circuit                                                      | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 23 | 3 | theoretical and applied knowledge | Voltage divider bias circuit                                              | Lecture, discussion, dialogue, and practical experience | Quiz     |
| 24 | 3 | theoretical and applied knowledge | Introduction: Bipolar Transistor Amplifiers                               | Lecture, discussion, dialogue, and practical experience | Quiz     |

|    |   |                                                                                                                                         |                                                         |                                                                  |          |
|----|---|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------|----------|
| 25 | 3 | Radius of gyration,<br>Energy of a body<br>rolling on a<br>horizontal plane,<br>Work and power<br>rotational motion,<br>and the Torque. | Frequency response<br>of the amplifier                  | Lecture, discussion,<br>dialogue, and<br>practical<br>experience | Homework |
| 26 | 3 | theoretical and<br>applied knowledge                                                                                                    | Darlington's Pair                                       | Lecture, discussion,<br>dialogue, and<br>practical<br>experience | Quiz     |
| 27 | 3 | theoretical and<br>applied knowledge                                                                                                    | multistage<br>amplifiers                                | Lecture, discussion,<br>dialogue, and<br>practical<br>experience | Quiz     |
| 28 | 3 | theoretical and<br>applied knowledge                                                                                                    | Field effect<br>transistors                             | Lecture, discussion,<br>dialogue, and<br>practical<br>experience | Quiz     |
| 29 | 3 | theoretical and<br>applied knowledge                                                                                                    | Characteristic<br>curves of field<br>effect transistors | Lecture, discussion,<br>dialogue, and<br>practical<br>experience | Homework |
| 30 | 3 | theoretical and<br>applied knowledge                                                                                                    | Metal oxide field<br>effect transistor                  | Lecture, discussion,<br>dialogue, and<br>practical<br>experience | Quiz     |

### 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, quizzes

| No. | Evaluation method        | Marks      | % Grads     |
|-----|--------------------------|------------|-------------|
| 1   | Lab. Exam                | 10         | %10         |
| 2   | Quizzes                  | 10         | %10         |
| 3   | Term Exam                | 20         | %20         |
| 4   | Final Exam(experimental) | 10         | %10         |
| 5   | Final Exam (Theory)      | 50         | %50         |
|     | sum                      | <b>100</b> | <b>%100</b> |

### 12. Learning and Teaching Resources

|                                               |                                         |
|-----------------------------------------------|-----------------------------------------|
| Required textbooks (curricular books, if any) | Electronic Principles by Albert Malvino |
| Main references (sources)                     | Introduction to Electronics             |





## Course Description Form

|                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Thermodynamics                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 2. Course Code:                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| HAEPSPH-302                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 3. Semester / Year:                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 2024-2025                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4. Description Preparation Date:                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1/9/2024                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5. Available Attendance Forms:                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| In-person learning                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 90 HOURS/ 5 UNITS                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 7. Course administrator's name (mention all, if more than one name)             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Name: Lect. Dr. Abdulrahman Ismael Ahmed<br>Email: a.i.ahmed@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 8. Course Objectives                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Course Objectives                                                               | <p>1. Application of Thermodynamic Equations: The ability to use thermodynamic equations and concepts to calculate energy, work, and thermal efficiency in various thermodynamic systems.</p> <p>2. Analysis of Thermodynamic Cycles: The ability to analyze and understand various thermodynamic cycles, including the Carnot cycle.</p> <p>3. Critical Thinking and Creative Solutions: Develop the ability to think critically and devise creative solutions to complex thermodynamic problems.</p> <p>4. Mathematical Analysis: Develop mathematical analysis skills in the context of thermodynamics, including an understanding of the mathematical relationships between thermodynamic quantities.</p> <p>5. Data Handling and Experiments: The ability to analyze thermodynamic data, understand the results of practical experiments, and apply them to theoretical concepts.</p> |
| 9. Teaching and Learning Strategies                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Strategy                                                                        | 1. Providing students with basic information and concepts in the field of thermodynamics: The strategy aims to provide students with basic information and concepts in the field of thermodynamics and to prepare trained and qualified personnel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |



to work in educational and research institutions.

2. Identifying Scientific Applications: Enhancing students' understanding of the practical and scientific applications of thermodynamic principles in daily life and in industrial and research fields.

3. Identifying Types of Scientific Knowledge: Enabling students to distinguish between different types of scientific knowledge, such as facts, concepts, principles, and theories in the field of thermodynamics. Students will also learn about the devices and techniques used to measure and analyze thermodynamic phenomena and thermodynamics concepts.

4. Enabling students to acquire knowledge and understanding: Enhancing students' ability to understand scientific laws in thermodynamics and their practical applications, and developing logical and scientific analysis skills to explain physical phenomena related to thermodynamics.

# 1. Course Structure

| Week | Hours | Required Learning Outcomes                                     | Unit or subject name                                                                                                                                                                                                                                                                       | Learning method     | Evaluation method |
|------|-------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------|
| 1    | 3     | Theoretical Knowledge and Applied Analysis                     | Chapter One: Basic Concepts: The meaning of thermodynamics, introducing basic concepts: the entity (system) and its types (real entity and ideal entity), the boundaries of the surrounding entity the system and its types (open, closed and isolated), the adiabatic and diathermic wall | Lecture, discussion | Direct questions  |
| 2    | 3     | Theoretical knowledge and applied analysis. Classical concepts | Implicit and non-implicit properties processes in thermodynamics, reversible and irreversible processes, thermal equilibrium and                                                                                                                                                           | Lecture, discussion | Direct questions  |



|    |   |                                            |                                                                                                                                               |                     |                  |
|----|---|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|
|    |   |                                            | thermodynamic equilibrium, properties of an entity (concentrated and comprehensive independent and dependent), state of the system            |                     |                  |
| 3  | 3 | Theoretical knowledge and applied analysis | Thermodynamic processes: adiabatic, isothermal, cyclic, reversible and irreversible, energy (relationship between heat and work), zeroth law. | Lecture, discussion | Direct questions |
| 4  | 3 | Theoretical knowledge and applied analysis | Chapter Two: Equation of State<br>The equation of state of an ideal gas and the empirical method for deriving it.                             | Lecture, discussion | Direct questions |
| 5  | 3 | Theoretical knowledge and applied analysis | Real (non-ideal) gases, equations of state for real gases                                                                                     | Lecture, discussion | Direct questions |
| 6  | 3 | Theoretical knowledge and applied analysis | Equation of state for a van der Waals gas and finding its constants.                                                                          | Lecture, discussion | Direct questions |
| 7  | 3 | Theoretical knowledge and applied analysis | Chapter Three: Useful Mathematical Theories                                                                                                   | Lecture, discussion | Direct questions |
| 8  | 3 | Theoretical knowledge and applied analysis | Useful identities, state function and its conditions.                                                                                         | Lecture, discussion | Direct questions |
| 9  | 3 | Theoretical knowledge and applied analysis | Path function, extensibility and compression.                                                                                                 | Lecture, discussion | Direct questions |
| 10 | 3 | Theoretical knowledge and applied analysis | Chapter Four: Properties of Pure Substances<br>Phases of Pure Substances (Solid, Liquid, Gas).                                                | Lecture, discussion | Exam             |



|    |   |                                            |                                                                                                                                                                                                                         |                     |                  |
|----|---|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|
| 11 | 3 | Theoretical knowledge and applied analysis | Gas and vapor, properties of vapors, saturated and unsaturated vapors, behavior of pure substances, graph of a real pure substance.                                                                                     | Lecture, discussion | Direct questions |
| 12 | 3 | Theoretical knowledge and applied analysis | Clapeyron equations, applications of Clapeyron equations.                                                                                                                                                               | Lecture, discussion | Direct questions |
| 13 | 3 | Theoretical knowledge and applied analysis | Chapter Five: The First Law of Thermodynamics: Joule's experiments, the text of the first law, the formula of the first law as a law of conservation of energy, application of the first law, results of the first law. | Lecture, discussion | Direct questions |
| 14 | 3 | Theoretical knowledge and applied analysis | Meaning of enthalpy, free expansion of gas, true expansion of gas, work done in adiabatic, isothermal and constant volume processes, gas work in constant temperature processes                                         | Lecture, discussion | Direct questions |
| 15 | 3 | Theoretical knowledge and applied analysis | Heat capacity at constant pressure and heat capacity at constant volume, the relationship between them, and the practical proof. The concept of work in thermodynamics, the dependence of work on the path.             | Lecture, discussion | Direct questions |
| 16 | 3 | Theoretical knowledge and applied analysis | Chapter Six: The Second Law of Thermodynamics Formulation of the Second Law of Thermodynamics (Clausius, Kelvin-Planck, Carnot Cycle Machine)                                                                           | Lecture, discussion | Direct questions |
| 17 | 3 | Theoretical knowledge and applied analysis | Linking the first and second laws and the consequences of this link when applied to an ideal gas. Example: the                                                                                                          | Lecture, discussion | Direct questions |

|    |   |                                            |                                                                                                                                                             |                     |                  |
|----|---|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|
|    |   |                                            | first law, the second law                                                                                                                                   |                     |                  |
| 18 | 3 | Theoretical knowledge and applied analysis | Heat engines - cycle efficiency, heat pump.                                                                                                                 | Lecture, discussion | Direct questions |
| 19 | 3 | Theoretical knowledge and applied analysis | Chapter Seven: Entropy (Inertia)<br>Definition of entropy, calculation of entropy change, and the principle of entropy increase in the universe and system. | Lecture, discussion | Direct questions |
| 20 | 3 | Theoretical knowledge and applied analysis | Relationship between entropy and temperature, Clausius theorem, Gibbs function                                                                              | Lecture, discussion | Direct questions |
| 21 | 3 | Theoretical knowledge and applied analysis | Helmholtz function, thermodynamic potential equations, Maxwell's equations.                                                                                 | Lecture, discussion | Direct questions |
| 22 | 3 | Theoretical knowledge and applied analysis | Chapter Eight: The Kinetic Theory of Gases<br>Historical Overview<br>Basic Principles of the Kinetic Theory                                                 | Lecture, discussion | Direct questions |
| 23 | 3 | Theoretical knowledge and applied analysis | Collisions with a moving wall, intermolecular forces of molecules<br>translational phenomena, mean free path.                                               | Exam                | Exam             |
| 24 | 3 | Theoretical knowledge and applied analysis | Diffusion<br>phenomenon, viscosity<br>phenomenon, thermal conduction<br>phenomenon                                                                          | Lecture, discussion | Direct questions |
| 25 | 3 | Theoretical knowledge and applied analysis | Chapter Nine: Statistics                                                                                                                                    | Lecture, discussion | Direct questions |



|    |   |                                            |                                                                 |                          |                  |
|----|---|--------------------------------------------|-----------------------------------------------------------------|--------------------------|------------------|
|    |   |                                            | Energy StatesIntroduction Operators with Spherical Coordinates. |                          |                  |
| 26 | 3 | Theoretical knowledge and applied analysis | Energy levels                                                   | Lecture, discussion      | Direct questions |
| 27 | 3 | Theoretical knowledge and applied analysis | probability                                                     | Lecture, discussion      | Direct questions |
| 28 | 3 | Theoretical knowledge and applied analysis | Maxwell-Boltzman statistics                                     | ' discussion             | Direct questions |
| 29 | 3 | Theoretical knowledge and applied analysis | Fermi-Dirac statistics                                          | Discussio n and dialogue | Direct questions |
| 30 | 3 |                                            | Bose-Einstei statistics.                                        | Exam                     |                  |

## 2. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, assignments etc.

## 3. Learning and Teaching Resources

|                                                                            |                                                                                                                                                      |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1- Thermodynamics.                                                         | Written by Dr. Amjad Abdul Razzaq Karajiya, Dr. Abdul Hamid Al-Abd.                                                                                  |
| 2- Thermal motion and the kinetic theory of gas                            | 2- Written by Dr. Abdul Rahman Mahmoud Al-Jumaili, Dr. Mu'ayyad Gabriel, Dr. Musa Abbas Muhammad.                                                    |
| Recommended mainstream books and references (scientific journals, reports) | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities. |
| Electronic References, Websites                                            | Websites about thermodynamics                                                                                                                        |

## Course Description Form

|                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Course Name:                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| solar energy                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 2. Course Code:                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| HAEPSPH-306                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 3. Semester / Year:                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Yearly                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 4. Description Preparation Date:                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 2024/9/19                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 5. Available Attendance Forms:                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Attendance                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 60 HOURS/ 4 UNITS                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 7. Course administrator's name (mention all, if more than one name)                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Name: A.PROF. Rajaa Abdullah Basheer                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Email: <a href="mailto:ragaa.habsh@uohamdaniya.edu.iq">ragaa.habsh@uohamdaniya.edu.iq</a> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 8. Course Objectives                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Course Objectives                                                                         | <p>1. Introduce students to the concept of energy, its characteristics, sources, classifications of energy forms, types of sources, operating principles, and energy use technologies.</p> <p>2. The course aims to familiarize students with traditional (fossil) energy sources, namely: coal energy, petroleum energy, natural gas energy, and nuclear energy.</p> <p>3. Students will be introduced to renewable energy sources, namely: wind energy, hydropower, solar energy, bioenergy,</p> |  |



|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <p>geothermal energy, hydrogen energy, and lightning energy.</p> <p>4. Students will understand the generation and production of electrical energy (energy conversion), which includes: first, its characteristics and advantages; second, its limitations and problems; third, energy conversion technology.</p> <p>5. Identify the problems resulting from energy use, including: first, general problems; second, environmental problems; and third, economic problems.</p>                                                                                                                                                    |
| <b>9. Teaching and Learning Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Strategy</b>                            | <p>1. Providing students with knowledge and concepts of physics. Preparing trained and qualified personnel to work in institutions and familiarize themselves with the scientific applications of each scientific knowledge.</p> <p>2. Identifying the various types of scientific knowledge, including facts, concepts, principles, theories, and devices for measuring weather and climate elements.</p> <p>3. Enabling students to acquire knowledge and understanding of the scientific laws of physics, practical applications of physics, and logical and scientific analysis and interpretation of physical phenomena.</p> |
| <b>10. Course Structure</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Week | Hours | Required Learning Outcomes                                                                                  | Unit or subject name                                                        | Learning method                  | Evaluation method            |
|------|-------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------|------------------------------|
| 1    | 2     | Learn about the concept of energy and its types                                                             | The concept of energies + types of energies                                 | Lecture, discussion and dialogue | Direct questions             |
| 2    | 2     | Learn about renewable and non-renewable energies                                                            | Renewable energies, non-renewable energies                                  | Lecture, discussion and dialogue | Direct questions             |
| 3    | 2     | Learn about the advantages, disadvantages and uses of solar energy (direct and indirect)                    | Solar energy, its advantages and disadvantages, the use of solar energy.    | Lecture, discussion and dialogue | Direct questions + oral exam |
| 4    | 2     | Learn about the sun, its physical composition, and the solar constant.                                      | Solar model, solar constant                                                 | Lecture, discussion and dialogue | Direct questions             |
| 5    | 2     | Blackbody and solar spectrum recognition                                                                    | black body radiation                                                        | Lecture, discussion and dialogue | Direct questions + oral exam |
| 6    | 2     | Learn about solar emissions                                                                                 | Radiation emission from the sun                                             | Lecture, discussion and dialogue | Direct questions             |
| 7    | 2     | Learn about solar astronomy and Earth's orbit                                                               | solar orbit, Earth's orbit                                                  | Lecture, discussion and dialogue | Direct questions             |
| 8    | 2     | Learn about the solar day, its characteristics, the sidereal day, and the equation of time.                 | solar day, sidereal day, equation of time                                   | Lecture, discussion and dialogue | Direct questions + oral exam |
| 9    | 2     | Learn about standard and local solar coordinates                                                            | Local solar coordinates, sunrise and sunset                                 | Lecture, discussion and dialogue | Direct questions             |
| 10   | 2     | Knowing the angle of the sun's inclination and the number of daylight hours                                 | Knowing the angle of the sun's inclination and the number of daylight hours | Lecture, discussion and dialogue | Direct questions             |
| 11   | 2     | Learn how sunlight falls on inclined surfaces                                                               | Sun rays tilt on sloping surfaces                                           | Lecture, discussion and dialogue | Direct questions + oral exam |
| 12   | 2     | Learn about the thermal composition of the atmosphere and the changes in density, temperature, and pressure | atmospheric model                                                           | Lecture, discussion and dialogue | Direct questions             |



|    |   |                                                                                                                                                    |                                                                        |                                  |                              |
|----|---|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------|------------------------------|
|    |   | with altitude. Air components (air thermodynamics)                                                                                                 |                                                                        |                                  |                              |
| 13 | 2 | Learn how solar radiation is absorbed and scattered by the atmosphere.                                                                             | Absorption and scattering of solar radiation by atmospheric components | Lecture, discussion and dialogue | Direct questions             |
| 14 | 2 | Learn about solar power plant design and solar collector operation.                                                                                | Solar power plant and solar collector design                           | Lecture, discussion and dialogue | Direct questions             |
| 15 | 2 | Learn about solar radiation measuring devices, climate elements measuring devices, and the properties that must be available in measuring devices. | Solar radiation measuring devices                                      | Lecture, discussion and dialogue | Direct questions             |
| 16 | 2 | Identify the factors affecting solar radiation and the effects of the atmosphere and the Earth on absorbing solar radiation.                       | Weather factors affecting solar radiation                              | Lecture, discussion and dialogue | Direct questions             |
| 17 | 2 | Learn about insulators, conductors, semiconductors, and energy bands.                                                                              | Insulators, junctions and semiconductors                               | Lecture, discussion and dialogue | Direct questions             |
| 18 | 2 | Types of solar cells and solar cell manufacturing                                                                                                  | Solar cell manufacturing and types                                     | Lecture, discussion and dialogue | Direct questions             |
| 19 | 2 | Photovoltaic cell and factors affecting solar cell efficiency                                                                                      | Solar cell efficiency and photocurrent spectral response               | Lecture, discussion and dialogue | Direct questions + oral exam |
| 20 | 2 | Learn about solar collectors and their components                                                                                                  | solar collectors                                                       | Lecture, discussion and dialogue | Direct questions             |
| 21 | 2 | Learn about the operation of the solar collector and the variables that affect it.                                                                 | Solar collector operation                                              | Lecture, discussion and dialogue | Direct questions             |
| 22 | 2 | Learn about solar radiation estimation models.                                                                                                     | Solar radiation estimation                                             | Lecture, discussion and dialogue | Direct questions             |
| 23 | 2 | The usefulness of solar radiation estimation models                                                                                                | Solar radiation estimation models                                      | Lecture, discussion and dialogue | exam                         |

|    |   |                                                                                     |                                                                                   |                                  |                              |
|----|---|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|------------------------------|
| 24 | 2 | Daily and hourly direct and diffuse solar radiation                                 | solar radiation                                                                   | Lecture, discussion and dialogue | Direct questions             |
| 25 | 2 | Identify the total solar radiation falling on the horizontal surface                | Solar radiation calculation                                                       | Lecture, discussion and dialogue | Direct questions             |
| 26 | 2 | Identify the solar radiation falling on a surface inclined from the Earth's surface | Radiation falling on an inclined surface                                          | Lecture, discussion and dialogue | Direct questions             |
| 27 | 2 | Identifying air masses                                                              | air masses                                                                        | Lecture, discussion and dialogue | Direct questions             |
| 28 | 2 | Identify solar radiation outside the atmosphere                                     | Solar radiation outside the atmosphere                                            | Lecture, discussion and dialogue | Direct questions + oral exam |
| 29 | 2 | reflected solar radiation                                                           | Solar radiation reflected from the Earth's surface falling on an inclined surface | Lecture, discussion and dialogue | Direct questions             |
| 30 | 2 | Identify diffuse sky radiation                                                      | Diffuse sky radiation falling on an inclined surface                              | Lecture, discussion and dialogue | exam                         |

### 11. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, homework, daily, oral, monthly and written exams, reports, etc.

### 12. Learning and Teaching Resources

|                                               |                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any) | <ol style="list-style-type: none"> <li>1. Introduction to Solar Energy by Saul Weider</li> <li>2. Solar Cells by Martin Crane</li> <li>3. Meteorology, Eric, Levin, Abrams, second edition</li> <li>4. An Introduction to Solar Radiation, Muhammad Iqbal, 1983</li> </ol> |
| Main references (sources)                     | <p>I recommend relying on modern sources.</p> <p>In addition to all academic studies and scientific research published in academic journals that are relevant to the subject matter.</p>                                                                                   |



|                                                                       |                                                                                                                                                    |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended books and references<br>(scientific journals, reports...) | Consider electronic references and the internet, which include reputable scientific websites and the libraries of some international universities. |
| Electronic References, Websites                                       | Websites that contain information about solar energy and the scientific methods used to harness it.                                                |

## Course Description Form

|                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Analytical mechanics</b>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2. Course Code:                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| HAEPSPH-304                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3. Semester / Year                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3 <sup>d</sup> class /2024- 2025                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4. Description Preparation Date:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 12 /9/2024                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5. Available Attendance Forms:                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Face-to-Face theoretical lectures                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 6. Number of Credit Hours (Total) / Number of Units (Total)           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 90 HOURS/ 5 UNITS                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7. Course administrator's name (mention all, if more than one name)   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Name: Asst.prof. Muna Y. Slewa<br>Email: muna-sh.y@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8. Course Objectives                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Course Objectives</b>                                              | <p>The aim of the study of analytical mechanics is to solve mechanical problems that arise in physics. Starting from the physical concept of a given system, a mathematical concept or model is developed in the form of equations or differential equations and an attempt is made to solve it. The method is based on Newton's laws that describe motion with the help of vector quantities such as force, velocity and acceleration. These quantities characterize the motion of a body that is idealized as a "point mass" or a "particle" understood as a single point to which the mass is attached. Newton's method was successful and has been applied to a wide range of physical problems.</p> |
| 9. Teaching and Learning Strategies                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Strategy</b>                                                       | <p>1. Build up a good foundation in Newtonian mechanics. Solve variety of problems analytically and systematically with confidence.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



|  |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>2. Learn analytical mechanics. Know how to set up and obtain the equations of motion in generalized coordinates.</p> <p>3. Acquire the knowledge of some advanced topics such as central force field, gyroscopic motion, and normal modes.</p> <p>- Since we will use mathematics in describing physical concepts and solving problems quantitatively, a working knowledge of algebra, and calculus is a prerequisite.</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 10. Course Structure

| Week   | Hours | Required Learning Outcomes                                                                                                                                                                                                                          | Unit or subject name                      | Learning method                                                                           | Evaluation method                         |
|--------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------|
| 1 - 4  | 12    | vectors, frames rotation in Cartesian coordinate, velocity and acceleration components in different coordinate systems (polar, cylindrical, spherical), some mathematical operation on vectors, gradient, divergence, curl. Exam                    | CH 1: Basic principles                    | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 5-10   | 18    | Newtons law of motion, Rectilinear Motion of Particles, force as a function of the velocity only, force as a function of time only, damping forces depending on the velocity, conservative force depending on position and some applications. Exam. | CH 2: Newtonian Mechanics                 | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 11 -15 | 15    | Linear Restoring Force, Harmonic Motion, The Simple Harmonic Oscillator, Simple Harmonic Motion, Energy Considerations in Simple Harmonic Motion                                                                                                    | CH 3: Oscillating Systems                 | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 16-19  | 12    | Damped Harmonic Motion, Forced Harmonic Motion (Resonance), Applications of Simple Harmonic Motion, Exam                                                                                                                                            | CH 3: Oscillating Systems                 | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 20-24  | 15    | The Work Principle, Conservative Forces and Force Fields, Potential Energy Function, The Potential in a                                                                                                                                             | CH 4: Dynamics a Particle, General Motion | Lecture through the blackboard and display screens with interactive                       | Daily exam with end of each semester exam |



|                                                                                                                                                                             |    |                                                                                                                                             |                                                                                                                                             |                                                                                           |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------|
|                                                                                                                                                                             |    | Uniform Gravitational Field, The Del Operator, Exam                                                                                         |                                                                                                                                             | student participation                                                                     |                                           |
| 25-30                                                                                                                                                                       | 18 | Translation of the Coordinate System, General Motion of the Coordinate System, Dynamics of a Particle in a Rotating Coordinate System, Exam | CH 5: Mov Reference System                                                                                                                  | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| <b>11. Course Evaluation</b>                                                                                                                                                |    |                                                                                                                                             |                                                                                                                                             |                                                                                           |                                           |
| The grade is distributed out of 100 according to the tasks assigned to the student, such as: daily preparation, daily, oral, monthly, and written exams, student attendance |    |                                                                                                                                             |                                                                                                                                             |                                                                                           |                                           |
| <b>12. Learning and Teaching Resources</b>                                                                                                                                  |    |                                                                                                                                             |                                                                                                                                             |                                                                                           |                                           |
| <b>13. Developing a planning strategy: brainstorming, research groups, activities, solving more deep questions.</b>                                                         |    |                                                                                                                                             |                                                                                                                                             |                                                                                           |                                           |
| Required textbooks (curricular books, if any)                                                                                                                               |    |                                                                                                                                             | Golwala, Sunil. "Lecture notes on classical mechanics for physics 106ab."<br>Publisher: CreateSpace Independent Publishing Platform (2014). |                                                                                           |                                           |
| Main references (sources)                                                                                                                                                   |    |                                                                                                                                             | Golwala, Sunil. "Lecture notes on classical mechanics for physics 106ab."<br>Publisher: CreateSpace Independent Publishing Platform (2014). |                                                                                           |                                           |
| Recommended books and references (scientific journals, reports...)                                                                                                          |    |                                                                                                                                             | كتاب الميكانيك التحليلي<br>المؤلف / كرانك ر. فاوولس<br>ترجمة الدكتور / طالب ناهي الخفاج                                                     |                                                                                           |                                           |
| Electronic References, Websites                                                                                                                                             |    |                                                                                                                                             | متابعه المراجع الإلكترونية ولأنترنت التي تتضمن<br>المواقع الإلكترونية العلمية الرصينة ومواقع المكتبات في<br>بعض الجامعات العالمية           |                                                                                           |                                           |



## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|
| <b>1. Course Name:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |  |
| Atomic physics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |  |
| <b>2. Course Code:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |  |
| HAEPSPH-301                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |  |
| <b>3. Chapter/Year:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |  |
| 2024-2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |  |
| <b>4. Date of preparation of this description:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |  |
| 1/9/2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |  |
| <b>5. Available Attendance Formats:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |  |
| Face-to-face education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |  |
| <b>6. Number of Hours (Total) / Number of Credits (Total)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |  |
| 90 Hours/7 Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |
| <b>7. Course administrator name (if more than one name mentioned)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |  |
| Name: a.t. Ahmed Turki Abdulhameed<br>Email: <a href="mailto:phy.ahmedturki@uohamdaniya.edu.iq">phy.ahmedturki@uohamdaniya.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |  |
| <b>8. Course Objectives</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |  |
| <p><b>1- Introduce students to the theory of special and general relativity and understand its key concepts such as relativity, temporal dilation, longitudinal contraction, and how supervelocity affects mass and energy.</b></p> <p><b>2- Understand the effect of relativity on motion, time, and energy, and how to explain phenomena such as time variation and longitudinal contraction using the theory of relativity.</b></p> <p><b>3- Study of atomic structures, nuclear reactions, nuclear energy reactions and their practical applications.</b></p> | Course Objectives |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------|
| <p>4– Understand the practical applications of nuclear physics such as nuclear energy, nuclear medicine, and medical radiography.</p> <p>5– Develop the computational skills necessary to understand and analyze relativistic and atomic phenomena, as well as empirical skills through conducting practical experiments and data analysis.</p> <p>6– Scientific Communication: Enhancing skills in scientific communication and presenting results and conclusions accurately and understandably.</p>                                                                                                                                             |  |                 |
| <b>9. Teaching and Learning Strategies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                 |
| <p>1– Students should be able to understand the concepts of special theory of relativity, such as relativistic time and longitudinal contraction, as well as understand how these concepts can be applied to solving related physics problems.</p> <p>2– Students should gain a deep knowledge of atomic structures and nuclear reactions, including understanding different atomic models and interpreting nuclear fusion and fission reactions.</p> <p>3– Students must be able to analyze and understand the practical applications of relativistic and atomic physics, such as nuclear power technology and nuclear medicine applications.</p> |  | <p>Strategy</p> |



|                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| <p>4- Students should acquire the skills needed to solve complex physical problems in the fields of relativity and atomization, as well as develop experimental skills by conducting hands-on experiments and data analysis.</p> <p>5- Students should be able to explain physical results accurately and understandably, and present the conclusions of experiments and studies in a scientific manner.</p> |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

| 10. Course Structure |                                  |                                                                                         |                                           |          |       |        |
|----------------------|----------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------|----------|-------|--------|
| Evaluation Method    | Learning method                  | Unit Name or Subject                                                                    | Required Outcomes                         | Learning | Hours | Week   |
| Direct Questions     | Lecture, Discussion and Dialogue | Introduction to the Special Relativity Theory - The Experiment of Michelson and Morley  | Theoretical Knowledge<br>Applied Analysis |          | 3     | First  |
| Direct Questions     | Lecture, Discussion and Dialogue | Attribution Frameworks - Galileo Transformers - Hypotheses of Special Relativity Theory | Theoretical Knowledge<br>Applied Analysis |          | 3     | Second |



|                         |                                         |                                                                                          |                                                   |          |                |
|-------------------------|-----------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------|----------|----------------|
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Lawrence Transformations - Relativity of Time - The Twins Dilemma</b>                 | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Third</b>   |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Relative Length-Relative Mass-Velocity Addition</b>                                   | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Fourth</b>  |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Mass and Energy Equivalence - Solving Problems</b>                                    | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>V</b>       |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Photon Theory - Black Body Radiation - Laws for the Study of Black Body Radiation</b> | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Sixth</b>   |
|                         | <b>Lecture, Discussion and Dialogue</b> | <b>PV Phenomenon - Stop Voltage - Threshold Frequency</b>                                | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Seventh</b> |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>The photoelectric equation of Einstein-</b>                                           | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Eighth</b>  |



|                         |                                         |                                                                                                |                                               |          |                    |
|-------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------|----------|--------------------|
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Comptnet-Postern Electron Pair Formation Phenomenon</b>                                     | <b>Theoretical Knowledge Applied Analysis</b> | <b>3</b> | <b>Ninth</b>       |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Problem Solving</b>                                                                         |                                               | <b>3</b> | <b>X</b>           |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Introduction of X-rays-X-ray generation-X-ray spectrum</b>                                  | <b>Theoretical Knowledge Applied Analysis</b> | <b>3</b> | <b>Eleven th</b>   |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Interpretation of the Spectrum Phenomenon According to Quantum Theory-X-Ray Diffraction</b> | <b>Theoretical Knowledge Applied Analysis</b> | <b>3</b> | <b>Twelft h</b>    |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Moseley's Law-X-ray Absorption</b>                                                          | <b>Theoretical Knowledge Applied Analysis</b> | <b>3</b> | <b>Thirtee nth</b> |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>- X-ray absorption methods</b>                                                              | <b>Theoretical Knowledge Applied Analysis</b> | <b>3</b> | <b>Fourte enth</b> |
|                         | <b>Lecture, Discussion and Dialogue</b> | <b>Fluorescent X-ray- and the Oaker Effect-Solving Problems</b>                                | <b>Theoretical Knowledge Applied Analysis</b> | <b>3</b> | <b>Fifteen th</b>  |



|                         |                                         |                                                                           |                                                   |          |                        |
|-------------------------|-----------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------|----------|------------------------|
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>De Broly-Particulate Diffraction Waves</b>                             | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Sixteenth week</b>  |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>De Broly wave velocity-</b>                                            | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week Seventeen</b>  |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Wave speed and cluster speed</b>                                       | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week Eighteenth</b> |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>The principle of indeterminate inaccuracy</b>                          | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week Nineteen</b>   |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Applications to the Principle of Accuracy - Problem Solving</b>        | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week 20</b>         |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Introduction to Atomic Structure - Atomic Theories - Thomson Model</b> | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week 21</b>         |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Rutherford Model- Rutherford Experience</b>                            | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week 22</b>         |



|                     |                                        |                                                                                |                                              |   |                           |
|---------------------|----------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------|---|---------------------------|
|                     |                                        |                                                                                |                                              |   |                           |
|                     | Lecture,<br>Discussion<br>and Dialogue | Electron<br>Orbits -<br>Atomic<br>Spectra                                      | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>Twenty<br>Three   |
| Direct<br>Questions | Lecture,<br>Discussion<br>and Dialogue | Bohr Model of<br>Atoms-<br>Energy Levels<br>and Spectra                        | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>Twenty<br>Four    |
| Direct<br>Questions | Lecture,<br>Discussion<br>and Dialogue | Kernel<br>Movement -<br>Problem<br>Solving                                     | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>Twenty<br>Five    |
| Direct<br>Questions | Lecture,<br>Discussion<br>and Dialogue | Introduction<br>to quantum<br>mechanics                                        | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>twenty<br>sixth   |
| Direct<br>Questions | Lecture,<br>Discussion<br>and Dialogue | Wave-<br>Derivation of<br>Schrödnecker'<br>s Equation                          | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>twenty<br>seven   |
| Direct<br>Questions | Discussion<br>and Dialogue             | Schrödnecker'<br>s non-time-<br>dependent<br>equation                          | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>Twenty<br>y Eight |
| Direct<br>Questions | Discussion<br>and Dialogue             | Schrödenker's<br>Time-Based<br>Equation-<br>Hamiltonian-<br>Momentum<br>Effect | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>twenty<br>ninth   |
|                     |                                        | Problem<br>Solving                                                             | Theoretical<br>Knowledge<br>Applied Analysis | 3 | Week<br>30                |



|                                                                                                                                                                     |                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>11. Course Evaluation</b>                                                                                                                                        |                                                                        |
| Distribution of the grade out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports.... etc |                                                                        |
| <b>12. Learning and Teaching Resources</b>                                                                                                                          |                                                                        |
| <b>1- Atomic Physics (Dr.Talib Nahi Al-Khafaji(.</b><br><b>2- Molecular Physics (Dr.Khalid Abdullah Jassim, Dr.Essam Ahme Mahmoud</b>                               | <b>Required textbooks (methodology if available)</b>                   |
| <b>Concepts in Modern Physics (Arthur Paiser)</b>                                                                                                                   | <b>Primary References (Sources)</b>                                    |
| <b>Follow up on electronic and internet references that include solid scientific websites and library websites in some international universities</b>               | <b>Recommended Books and References (Scientific Journals, Reports)</b> |
| <b>Websites related to modern and atomic physics</b>                                                                                                                | <b>References, Websites</b>                                            |



## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|
| <b>1. Course Name:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |  |
| Atomic physics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |  |
| <b>2. Course Code:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |  |
| HAEPSPH-301                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |  |
| <b>3. Chapter/Year:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |  |
| 2024-2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |  |
| <b>4. Date of preparation of this description:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |  |
| 1/9/2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |  |
| <b>5. Available Attendance Formats:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |  |
| Face-to-face education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |  |
| <b>6. Number of Hours (Total) / Number of Credits (Total)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |  |
| 90 Hours/7 Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |  |
| <b>7. Course administrator name (if more than one name mentioned)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |  |
| Name: a.t. Ahmed Turki Abdulhameed<br>Email: <a href="mailto:phy.ahmedturki@uohamdaniya.edu.iq">phy.ahmedturki@uohamdaniya.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |  |
| <b>8. Course Objectives</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |  |
| <p><b>1- Introduce students to the theory of special and general relativity and understand its key concepts such as relativity, temporal dilation, longitudinal contraction, and how supervelocity affects mass and energy.</b></p> <p><b>2- Understand the effect of relativity on motion, time, and energy, and how to explain phenomena such as time variation and longitudinal contraction using the theory of relativity.</b></p> <p><b>3- Study of atomic structures, nuclear reactions, nuclear energy reactions and their practical applications.</b></p> | Course Objectives |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|
| <p><b>4– Understand the practical applications of nuclear physics such as nuclear energy, nuclear medicine, and medical radiography.</b></p> <p><b>5– Develop the computational skills necessary to understand and analyze relativistic and atomic phenomena, as well as empirical skills through conducting practical experiments and data analysis.</b></p> <p><b>6– Scientific Communication: Enhancing skills in scientific communication and presenting results and conclusions accurately and understandably.</b></p>                                                                                                                                             |  |          |
| <b>9. Teaching and Learning Strategies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |          |
| <p><b>1– Students should be able to understand the concepts of special theory of relativity, such as relativistic time and longitudinal contraction, as well as understand how these concepts can be applied to solving related physics problems.</b></p> <p><b>2– Students should gain a deep knowledge of atomic structures and nuclear reactions, including understanding different atomic models and interpreting nuclear fusion and fission reactions.</b></p> <p><b>3– Students must be able to analyze and understand the practical applications of relativistic and atomic physics, such as nuclear power technology and nuclear medicine applications.</b></p> |  | Strategy |



|                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>4- Students should acquire the skills needed to solve complex physical problems in the fields of relativity and atomization, as well as develop experimental skills by conducting hands-on experiments and data analysis.</p> <p>5- Students should be able to explain physical results accurately and understandably, and present the conclusions of experiments and studies in a scientific manner.</p> |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

| 10. Course Structure |                                  |                                                                                         |                                           |       |        |  |
|----------------------|----------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------|-------|--------|--|
| Evaluation Method    | Learning method                  | Unit Name or Subject                                                                    | Required Learning Outcomes                | Hours | Week   |  |
| Direct Questions     | Lecture, Discussion and Dialogue | Introduction to the Special Relativity Theory - The Experiment of Michelson and Morley  | Theoretical Knowledge<br>Applied Analysis | 3     | First  |  |
| Direct Questions     | Lecture, Discussion and Dialogue | Attribution Frameworks - Galileo Transformers - Hypotheses of Special Relativity Theory | Theoretical Knowledge<br>Applied Analysis | 3     | Second |  |



|                  |                                  |                                                                                   |                                           |   |         |
|------------------|----------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------|---|---------|
| Direct Questions | Lecture, Discussion and Dialogue | Lawrence Transformations - Relativity of Time - The Twins Dilemma                 | Theoretical Knowledge<br>Applied Analysis | 3 | Third   |
| Direct Questions | Lecture, Discussion and Dialogue | Relative Length-Relative Mass-Velocity Addition                                   | Theoretical Knowledge<br>Applied Analysis | 3 | Fourth  |
| Direct Questions | Lecture, Discussion and Dialogue | Mass and Energy Equivalence - Solving Problems                                    | Theoretical Knowledge<br>Applied Analysis | 3 | V       |
| Direct Questions | Lecture, Discussion and Dialogue | Photon Theory - Black Body Radiation - Laws for the Study of Black Body Radiation | Theoretical Knowledge<br>Applied Analysis | 3 | Sixth   |
|                  | Lecture, Discussion and Dialogue | PV Phenomenon - Stop Voltage - Threshold Frequency                                | Theoretical Knowledge<br>Applied Analysis | 3 | Seventh |
| Direct Questions | Lecture, Discussion and Dialogue | The photoelectric equation of Einstein-                                           | Theoretical Knowledge<br>Applied Analysis | 3 | Eighth  |



|                  |                                  |                                                                                         |                                           |   |            |
|------------------|----------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------|---|------------|
| Direct Questions | Lecture, Discussion and Dialogue | Comptnet-Postern Electron Pair Formation Phenomenon                                     | Theoretical Knowledge<br>Applied Analysis | 3 | Ninth      |
| Direct Questions | Lecture, Discussion and Dialogue | Problem Solving                                                                         |                                           | 3 | X          |
| Direct Questions | Lecture, Discussion and Dialogue | Introduction of X-rays-X-ray generation-X-ray spectrum                                  | Theoretical Knowledge<br>Applied Analysis | 3 | Eleventh   |
| Direct Questions | Lecture, Discussion and Dialogue | Interpretation of the Spectrum Phenomenon According to Quantum Theory-X-Ray Diffraction | Theoretical Knowledge<br>Applied Analysis | 3 | Twelfth    |
| Direct Questions | Lecture, Discussion and Dialogue | Moseley's Law-X-ray Absorption                                                          | Theoretical Knowledge<br>Applied Analysis | 3 | Thirteenth |
| Direct Questions | Lecture, Discussion and Dialogue | - X-ray absorption methods                                                              | Theoretical Knowledge<br>Applied Analysis | 3 | Fourteenth |
|                  | Lecture, Discussion and Dialogue | Fluorescent X-ray- and the Oaker Effect-Solving Problems                                | Theoretical Knowledge<br>Applied Analysis | 3 | Fifteenth  |



|                         |                                         |                                                                           |                                                   |          |                        |
|-------------------------|-----------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------|----------|------------------------|
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>De Broly-Particulate Diffraction Waves</b>                             | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Sixteenth week</b>  |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>De Broly wave velocity-</b>                                            | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week Seventeen</b>  |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Wave speed and cluster speed</b>                                       | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week Eighteenth</b> |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>The principle of indeterminate inaccuracy</b>                          | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week Nineteen</b>   |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Applications to the Principle of Accuracy - Problem Solving</b>        | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week 20</b>         |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Introduction to Atomic Structure - Atomic Theories - Thomson Model</b> | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week 21</b>         |
| <b>Direct Questions</b> | <b>Lecture, Discussion and Dialogue</b> | <b>Rutherford Model- Rutherford Experience</b>                            | <b>Theoretical Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week 22</b>         |



|                             |                                                 |                                                                                            |                                                       |          |                                       |
|-----------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------|----------|---------------------------------------|
|                             |                                                 |                                                                                            |                                                       |          |                                       |
|                             | <b>Lecture,<br/>Discussion<br/>and Dialogue</b> | <b>Electron<br/>Orbits -<br/>Atomic<br/>Spectra</b>                                        | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>Twent<br/>y<br/>Three</b> |
| <b>Direct<br/>Questions</b> | <b>Lecture,<br/>Discussion<br/>and Dialogue</b> | <b>Bohr Model of<br/>Atoms-<br/>Energy Levels<br/>and Spectra</b>                          | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>Twent<br/>y Four</b>      |
| <b>Direct<br/>Questions</b> | <b>Lecture,<br/>Discussion<br/>and Dialogue</b> | <b>Kernel<br/>Movement -<br/>Problem<br/>Solving</b>                                       | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>Twent<br/>y Five</b>      |
| <b>Direct<br/>Questions</b> | <b>Lecture,<br/>Discussion<br/>and Dialogue</b> | <b>Introduction<br/>to quantum<br/>mechanics</b>                                           | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>twenty<br/>sixth</b>      |
| <b>Direct<br/>Questions</b> | <b>Lecture,<br/>Discussion<br/>and Dialogue</b> | <b>Wave-<br/>Derivation of<br/>Schrödnecker'<br/>s Equation</b>                            | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>twenty<br/>seven</b>      |
| <b>Direct<br/>Questions</b> | <b>Discussion<br/>and Dialogue</b>              | <b>Schrödnecker'<br/>s non-time-<br/>dependent<br/>equation</b>                            | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>Twent<br/>y Eight</b>     |
| <b>Direct<br/>Questions</b> | <b>Discussion<br/>and Dialogue</b>              | <b>Schrödenker's<br/>Time-Based<br/>Equation-<br/>Hamiltonian-<br/>Momentum<br/>Effect</b> | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>twenty<br/>ninth</b>      |
|                             |                                                 | <b>Problem<br/>Solving</b>                                                                 | <b>Theoretical<br/>Knowledge<br/>Applied Analysis</b> | <b>3</b> | <b>Week<br/>30</b>                    |



|                                                                                                                                                                     |                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <b>11. Course Evaluation</b>                                                                                                                                        |                                                                                  |
| Distribution of the grade out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports.... etc |                                                                                  |
| <b>12. Learning and Teaching Resources</b>                                                                                                                          |                                                                                  |
| <b>1- Atomic Physics (Dr.Talib Nahi Al-Khafaji(.</b><br><b>2- Molecular Physics (Dr.Khalid Abdullah Jassim, Dr.Essam Ahme Mahmoud</b>                               | Required textbooks (methodology if available)                                    |
| <b>Concepts in Modern Physics</b><br><b>(Arthur Paiser)</b>                                                                                                         | Primary References (Sources)                                                     |
| <b>Follow up on electronic and internet references that include solid scientific websites and library websites in some international universities</b>               | <b>Recommended Books and References</b><br><b>(Scientific Journals, Reports)</b> |
| <b>Websites related to modern and atomic physics</b>                                                                                                                | References, Websites                                                             |



## Course Description Form

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .1 Course name                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Counseling and mental health                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .2 Course code                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 307-HAEPSPH                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .3 Chapter/Year                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Third Phase / 2024-2025                                                |
| .4 Date of preparation of this description                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2024/9/20                                                              |
| .5 Available attendance forms                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | In-person education                                                    |
| .6 Number of study hours (total) / Number of units (total)                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | hour / 4 units 60                                                      |
| .7 Course Supervisor Name (if more than one name is mentioned)                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Ibrahim 1977 @uohamdaniya.edu.iq:Name: M.M. Ibrahim Mamiq Sultan Email |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .8 Course objectives                                                   |
| <p>.1 With the concepts of guidance and mental health from (the goals of guidance and mental health, its terminology and the . (most important theories</p> <p>.2 The field of the teacher-guide and educational counselor and his role in helping the student achieve psychological, .educational and social harmony</p> <p>.3 Means of collecting information, their importance, advantages .and disadvantages of each</p> <p>.4 .Parent-teacher councils and their role in educational guidance</p> | <b>Course objectives</b>                                               |
| .9 Teaching and learning strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                        |
| <p>.1 .Understanding and comprehension</p> <p>.2 Methods of solving complex situations and distinguishing .the correct cognitive aspects</p>                                                                                                                                                                                                                                                                                                                                                           | <b>Strategy</b>                                                        |



|                                                                                                                       |                                        |                                                                                                                             |                                                                         |       |               |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------|---------------|
| . Brainstorming techniques .3<br>Learning and self-discovery through extracurricular and .4<br>.curricular activities |                                        |                                                                                                                             |                                                                         |       |               |
| Course structure .10                                                                                                  |                                        |                                                                                                                             |                                                                         |       |               |
| Evaluation<br>method                                                                                                  | Teaching<br>method                     | Unit name/topic                                                                                                             | Required<br>learning<br>outcomes                                        | hours | week          |
| Feedback<br>via direct<br>questions                                                                                   | Lecture,<br>discussion<br>and dialogue | Guidance, the<br>meaning of<br>educational<br>guidance, the<br>origin and<br>development of<br>guidance and its<br>concepts | Theoretical<br>knowledge and<br>practical<br>educational<br>application | 2     | the first     |
| Feedback<br>via direct<br>questions                                                                                   | Lecture,<br>discussion<br>and dialogue | Justifications for<br>guidance, its<br>objectives,<br>principles of<br>guidance and<br>direction                            | Theoretical<br>knowledge and<br>practical<br>educational<br>application | 2     | the<br>second |
| Feedback<br>via direct<br>questions                                                                                   | Lecture,<br>discussion<br>and dialogue | The relationship<br>between<br>counseling and<br>other sciences,<br>areas of<br>counseling                                  | Theoretical<br>knowledge and<br>practical<br>educational<br>application | 2     | the<br>third  |
| Feedback<br>via direct<br>questions                                                                                   | Lecture,<br>discussion<br>and dialogue | Guidance methods<br>individual )<br>guidance, group<br>( (guidance                                                          | Theoretical<br>knowledge and<br>practical<br>educational<br>application | 2     | Fourth        |
| Feedback<br>via direct<br>questions                                                                                   | Lecture,<br>discussion<br>and dialogue | Foundations of<br>guidance,<br>philosophical,                                                                               | Theoretical<br>knowledge and<br>practical                               | 2     | Fifth         |



|                                      |                                  |                                                                                                 |                                                             |   |          |
|--------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---|----------|
|                                      |                                  | social                                                                                          | educational application                                     |   |          |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Foundations of guidance, moral, religious, psychological                                        | Theoretical knowledge and practical educational application | 2 | Sixth    |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Counseling theories                                                                             | Theoretical knowledge and practical educational application | 2 | Seventh  |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Psychoanalytic theories                                                                         | Theoretical knowledge and practical educational application | 2 | Eighth   |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | behavioral theories                                                                             | Theoretical knowledge and practical educational application | 2 | Ninth    |
| <b>Extracurricular activities</b>    | Lecture, discussion and dialogue | Existential and humanistic theories                                                             | Theoretical knowledge and practical educational application | 2 | tenth    |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Information needed for guidance, importance of information, types of information                | Theoretical knowledge and practical educational application | 2 | eleventh |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Information collection methods cumulative record, case study, narrative record, (autobiography) | Theoretical knowledge and practical educational application | 2 | twelfth  |
| <b>Feedback</b>                      | Lecture,                         | Methods of                                                                                      | Theoretical                                                 | 2 | thirteen |

|                               |                                  |                                                                                                                                               |                                                             |   |                  |
|-------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---|------------------|
| via direct questions          | discussion and dialogue          | collecting information (tests and measures, observation, ( interview                                                                          | knowledge and practical educational application             |   | th               |
| Feedback via direct questions | Lecture, discussion and dialogue | Guidance and counseling in school, the counselor teacher - his duties and preparation, the educational counselor - his duties and preparation | Theoretical knowledge and practical educational application | 2 | fourteenth       |
| Feedback via direct questions | Lecture, discussion and dialogue | Parent-Teacher Councils and their role in guidance, the need for guidance programs in schools                                                 | Theoretical knowledge and practical educational application | 2 | fifteenth        |
| Feedback via direct questions | Lecture, discussion and dialogue | Problems addressed by educational guidance, meaning of mental health - its objectives - its importance                                        | Theoretical knowledge and practical educational application | 2 | Week 16          |
| Feedback via direct questions | Lecture, discussion and dialogue | Normal and abnormal person, normal and abnormal personality standards                                                                         | Theoretical knowledge and practical educational application | 2 | Seventeenth week |
| Feedback via direct questions | Lecture, discussion and dialogue | Features of normal and abnormal behavior, personality integration                                                                             | Theoretical knowledge and practical educational application | 2 | Eighteenth week  |
| Feedback                      | Lecture,                         | Personal crises                                                                                                                               | Theoretical                                                 | 2 | Nineteenth       |



|                               |                                  |                                                                                                             |                                                             |   |                   |
|-------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---|-------------------|
| via direct questions          | discussion and dialogue          |                                                                                                             | knowledge and practical educational application             |   | nth week          |
| Feedback via direct questions | Lecture, discussion and dialogue | The meaning of crisis, the causes and sources of psychological crises                                       | Theoretical knowledge and practical educational application | 2 | Week twentieth    |
| Feedback via direct questions | Lecture, discussion and dialogue | Proper ways to solve psychological crises, frustration, and psychological disorders                         | Theoretical knowledge and practical educational application | 2 | Week twenty-one   |
| Feedback via direct questions | Lecture, discussion and dialogue | Defense mechanisms Defensive ) ( methods                                                                    | Theoretical knowledge and practical educational application | 2 | Week twenty-two   |
| Feedback via direct questions | Lecture, discussion and dialogue | Origin of defensive behavior, development of defense mechanisms                                             | Theoretical knowledge and practical educational application | 2 | Week twenty-three |
| Feedback via direct questions | Lecture, discussion and dialogue | Its types compensation, ) reincarnation, reverse formation, projection, justification and its ( (phenomenon | Theoretical knowledge and practical educational application | 2 | Week twenty-four  |
| Feedback via direct questions | Lecture, discussion and dialogue | Results of defensive behavior, escape methods suppression, ) withdrawal, daydreaming, ( sleep dreams        | Theoretical knowledge and practical educational application | 2 | Week twenty-five  |



|                                      |                                  |                                                                                                     |                                                             |   |                   |
|--------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---|-------------------|
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Escape methods, regression, cancellation, compensation                                              | Theoretical knowledge and practical educational application | 2 | Week twenty-six   |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Pathological, defensive, and escape symptoms                                                        | Theoretical knowledge and practical educational application | 2 | Week twenty-seven |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Compatibility, meaning of compatibility, nature of compatibility, types of compatibility            | Theoretical knowledge and practical educational application | 2 | Week twenty-eight |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue | Characteristics of a compatible person, adaptation, compatibility and the relationship between them | Theoretical knowledge and practical educational application | 2 | Week twenty-nine  |
| <b>Feedback via direct questions</b> | Lecture, discussion and dialogue |                                                                                                     | Theoretical knowledge and practical educational application | 2 | Week 30           |

#### Course Evaluation .11

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily, .oral, monthly and written exams, reports, etc

#### Learning and teaching resources .12

|                                                                                                                                                                                                                                     |                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Principles of Guidance and Psychological Counseling, Sami Muhammad Malham, 2010, Amman, Dar .Al Masirah Publishing and Distribution<br>Zahran, Hamed Abdel Salam, 1980, Guidance and - Psychological Counseling, Alam .Books, Cairo | Required textbooks (methodology if available) |
| Psychological Guidance and Educational Guidance, - Mustafa Mahmoud Al-Imam )1991(<br>University of Baghdad<br>Principles of psychological counseling for psychological                                                              | Primary References (Sources)                  |



|                                                                                                                                                                                                   |             |                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------|
| counselors, Muhammad Ahmad Mashaqa )2008(<br>.Oman - Dar Al Manahj for Publishing and Distribution<br>Guidance and Psychological Counseling, Hamed -<br>Zahran (2005) Cairo<br>The world of books |             |                                                                   |
| Personality Psychology, Dawood Aziz Hanna, and -<br>Nazim Hashim Al-Obaidi, 1990, University of Baghdad                                                                                           | Recommended | mainstream books and<br>references (scientific journals, reports) |
| Al-Noor Library (an electronic library) is free on the -<br>and contains various types of Google search engine<br>. specialized sources                                                           |             | Electronic references, websites                                   |

## Course Description Form

|                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Course Name:</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Quantum Mechanics                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>2. Course Code:</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| HAEPSPH-404                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>3. Semester / Year:</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2024-2025                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>4. Description Preparation Date:</b>                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1/9/2024                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>5. Available Attendance Forms:</b>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| In-person learning                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 90 HOURS/ 5 UNITS                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>7. Course administrator's name (mention all, if more than one name)</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Name: Lect. Dr. Abdulrahman Ismael Ahmed<br>Email: a.i.ahmed@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>8. Course Objectives</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Course Objectives</b>                                                        | Introducing students to the principles and fundamentals of quantum mechanics, including the time-dependent and time-independent Schrödinger equation, in addition to introducing students to derivation methods, how to deal with different influences, deriving quantum momentum equations, and various applications of the Schrödinger equation.                                                                                                                                                                                                                                                            |
| <b>9. Teaching and Learning Strategies</b>                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Strategy</b>                                                                 | <p>1. Providing students with basic physics information and concepts: The strategy aims to provide students with basic information and concepts in the field of quantum mechanics and to prepare trained and qualified personnel to work in educational and research institutions.</p> <p>2. Understanding Scientific Applications: Enhancing students' understanding of the practical and scientific applications of quantum mechanics principles in technological and research fields.</p> <p>3. Identifying Types of Scientific Knowledge: Enabling students to distinguish between different types of</p> |



scientific knowledge, such as facts, concepts, principles, and theories in the field of quantum mechanics, as well as familiarizing themselves with the mathematical tools and techniques used to analyze quantum phenomena.

4. Enabling students to acquire knowledge and understanding: Enhancing students' ability to understand the scientific laws of quantum mechanics and their practical applications, and developing logical and scientific analysis skills to explain physical phenomena associated with the quantum world.

### 1. Course Structure

| Week | Hours | Required Learning Outcomes                                     | Unit or subject name                                                        | Learning method     | Evaluation method |
|------|-------|----------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------|-------------------|
| 1    | 3     | Theoretical Knowledge and Applied Analysis                     | Chapter One: Foundations and Principles of Quantum Mechanics                | Lecture, discussion | Direct questions  |
| 2    | 3     | Theoretical knowledge and applied analysis. Classical concepts | fail to describe some physical phenomena                                    | Lecture, discussion | Direct questions  |
| 3    | 3     | Theoretical knowledge and applied analysis                     | Foundations of quantum mechanics, the state of a physical system.           | Lecture, discussion | Direct questions  |
| 4    | 3     | Theoretical knowledge and applied analysis                     | State functions, observables and operators, superposition of states.        | Lecture, discussion | Direct questions  |
| 5    | 3     | Theoretical knowledge and applied analysis                     | Orthogonality of functions, normalization of functions.                     | Lecture, discussion | Direct questions  |
| 6    | 3     | Theoretical knowledge and applied analysis                     | Probability and probability density                                         | Lecture, discussion | Direct questions  |
| 7    | 3     | Theoretical knowledge and applied analysis                     | Probability current density, expected value.                                | Lecture, discussion | Direct questions  |
| 8    | 3     | Theoretical knowledge and applied analysis                     | Chapter Two: Operators<br>What do operators represent in quantum mechanics? | Lecture, discussion | Direct questions  |



|    |   |                                            |                                                                        |                     |                  |
|----|---|--------------------------------------------|------------------------------------------------------------------------|---------------------|------------------|
| 9  | 3 | Theoretical knowledge and applied analysis | Linear effects.                                                        | Lecture, discussion | Direct questions |
| 10 | 3 | Theoretical knowledge and applied analysis | Properties of operators, Hermitian operators, exchange of operators.   | Lecture, discussion | Exam             |
| 11 | 3 | Theoretical knowledge and applied analysis | Time variation of expected value, Ehrenfest theory                     | Lecture, discussion | Direct questions |
| 12 | 3 | Theoretical knowledge and applied analysis | Laws of conservation energy and angular momentum                       | Lecture, discussion | Direct questions |
| 13 | 3 | Theoretical knowledge and applied analysis | Heisenberg's uncertainty principle<br>Properties of operators          | Lecture, discussion | Direct questions |
| 14 | 3 | Theoretical knowledge and applied analysis | Hermitian influences, exchange of influence                            | Lecture, discussion | Direct questions |
| 15 | 3 | Theoretical knowledge and applied analysis | Chapter Three: Schrödinger's Equation                                  | Lecture, discussion | Direct questions |
| 16 | 3 | Theoretical knowledge and applied analysis | Time-independent Schrödinger equation                                  | Lecture, discussion | Direct questions |
| 17 | 3 | Theoretical knowledge and applied analysis | Time-dependent Schrödinger equation                                    | Lecture, discussion | Direct questions |
| 18 | 3 | Theoretical knowledge and applied analysis | Solve the time dependent Schrödinger equation.                         | Lecture, discussion | Direct questions |
| 19 | 3 | Theoretical knowledge and applied analysis | Chapter Four: Motion in One Dimension<br>Free Body, Potential Gradient | Lecture, discussion | Direct questions |
| 20 | 3 | Theoretical knowledge and applied analysis | voltage wall, low voltage of infinite depth                            | Lecture, discussion | Direct questions |
| 21 | 3 | Theoretical knowledge and applied analysis | Low voltage, limited depth, harmonic oscillator.                       | Lecture, discussion | Direct questions |



|    |   |                                            |                                                                                                        |                         |                  |
|----|---|--------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------|------------------|
| 22 | 3 | Theoretical knowledge and applied analysis | Chapter Five: Motion in Three Dimensions                                                               | Lecture, discussion     | Direct questions |
| 23 | 3 | Theoretical knowledge and applied analysis | Chapter 6: Angular Momentum<br>Angular Momentum Influences in Spherical Coordinates                    | Exam                    | Exam             |
| 24 | 3 | Theoretical knowledge and applied analysis | Exchange of angular momentum effects.                                                                  | Lecture, discussion     | Direct questions |
| 25 | 3 | Theoretical knowledge and applied analysis | Chapter Seven: Spherically Symmetric Potentials<br>Introduction, Operators with Spherical Coordinates. | Lecture, discussion     | Direct questions |
| 26 | 3 | Theoretical knowledge and applied analysis | Hydrogen atom, solution of the Schrödinger equation for the hydrogen atom.                             | Lecture, discussion     | Direct questions |
| 27 | 3 | Theoretical knowledge and applied analysis | Chapter Eight: Approximation Methods                                                                   | Lecture, discussion     | Direct questions |
| 28 | 3 | Theoretical knowledge and applied analysis | Unsolved cases.                                                                                        | , discussion            | Direct questions |
| 29 | 3 | Theoretical knowledge and applied analysis | Applications of perturbation theory.                                                                   | Discussion and dialogue | Direct questions |
| 30 | 3 |                                            |                                                                                                        | Exam                    |                  |

## 2. Course Evaluation

The grade is distributed out of 100 based on the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, assignments, etc.

## 3. Learning and Teaching Resources

|                                                                            |                                                                                                                                                      |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1- Quantum mechanics:                                                      | Written by Dr. Jassim Al-Hussaini and Dr. Abdul Salam Abdul Amir.                                                                                    |
| 2- Fundamentals of quantum mechanics                                       | Written by Salem Hassan Al-Shamaa and Dr. Amjad Abdul Razzaq Karajiya.                                                                               |
| Recommended mainstream books and references (scientific journals, reports) | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities. |
| Electronic References, Websites                                            | Websites about quantum mechanics                                                                                                                     |



## Course Description Form

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| electromagnetic theory                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2. Course Code:                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| HAEPSPH-405                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3. Semester / Year                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4 <sup>th</sup> class /2024 – 2025                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4. Description Preparation Date:                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 22/9/2024                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5. Available Attendance Forms:                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Face-to-Face theoretical lectures                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 90 HOURS/ 5 UNITS                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 7. Course administrator's name (mention all, if more than one name) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Name: prof. Muna Y. Slewa                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Email: muna-sh.y@uohamdaniya.edu.iq                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 8. Course Objectives                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Course Objectives</b>                                            | <p>1 introduce the student to the coordinate system and its implementation to electro magnetics.</p> <p>2 elaborate the concept of electromagnetic waves and their practical applications.</p> <p>3 study the propagation, reflection, and refraction of plane waves in different media.</p> <p>4 Study time varying Maxwell equations and their applications in electromagnetic problems</p> <p>5 Demonstrate the reflection and refraction of waves at boundaries</p> |
| 9. Teaching and Learning Strategies                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Strategy</b>                                                     | <p>Weekly lectures include providing students with basics and topics related to pre-skills learning outcomes to solve practical problems through presentation or lecture.</p> <ul style="list-style-type: none"> <li>- Solving a set of practical and applied examples by the instructor and the student.</li> </ul>                                                                                                                                                    |



|  |                                                                                                                                                                                                                                                                                                                                                                         |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>- Student participation in the discussion and solving some practical problems.</li> <li>- Asking the student to visit the library and the Internet to gain additional knowledge of academic materials.</li> <li>- Presenting a seminar to the student in front of his fellow students to enhance his self-confidence.</li> </ul> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 10. Course Structure

| Week   | Hours | Required Learning Outcomes                                                                                                                                                                                                                                                                                                                                   | Unit or subject name                        | Learning method                                                                           | Evaluation method                         |
|--------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------|
| 1 - 5  | 15    | Vector analysis- Representation, operations-Dot product and cross product, Basics of coordinate system- rectangular, cylindrical and spherical co-ordinate systems. Electrostatics one: Coulomb's Law, Electric Field Intensity - Fields due to Different Charge Distributions, Electric Flux Density; Illustrative Problems. Exam                           | CH 1 : Vector Analysis & Co-ordinate system | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 6 -11  | 18    | Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Equations for Electrostatic Fields, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations, Boundary conditions-conductor-Dielectric and Dielectric-Dielectric; Illustrative Problems.Exam | CH 2: Electrostatics two                    | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 12 -15 | 12    | Biot - Savart's Law , Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials,                                                                                                                                                                                   | CH 3: Magnetostatics                        | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 16,17  | 6     | Ampere's Force law , Faraday's Law, Displacement Current Density, Maxwell's Equations for time varying fields, Illustrative Problems. Exam                                                                                                                                                                                                                   | CH 3: Magnetostatics                        | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |



|        |    |                                                                                                                                                                                                                                                                                    |                                    |                                                                                           |                                           |
|--------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------|
| 18 -24 | 21 | Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves - Definition, Relation Between E & H, Wave Propagation in Lossless and Conducting Media, Wave Propagation in Good Conductors and Good Dielectrics, Illustrative Problems. Exam                     | CH 4: EM Wave Characteristics-I    | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |
| 25-30  | 18 | Reflection and Refraction of Plane Waves – Normal incidence for both perfect Conductors and perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Illustrative Problems. Exam | CH 5: EM Wave Characteristics – II | Lecture through the blackboard and display screens with interactive student participation | Daily exam with end of each semester exam |

### 11. Course Evaluation

The grade is distributed out of 100 according to the tasks assigned to the student, such as: daily preparation, daily, oral, monthly, and written exams, student attendance

### 12. Learning and Teaching Resources

|                                                                    |                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | Foundation Of Electromagnetic Theory<br>.By: John R. Reitz, Frederick J. Milford & Robert W. Christy                                                                                                                                                                             |
| Main references (sources)                                          | 1.Elements of Electromagnetics - Matthew N. O. Sadiku, 4th., Oxford Univ. Press.<br>2.Electromagnetic Waves and Radiating Systems - E.C. Jordan and K. G. Balmain, 2nd Ed., 2000, PHI.<br>3.Engineering Electromagnetic - William H. Hay Jr. and John A. Buck, 7thEd., 2006, TMH |
| Recommended books and references (scientific journals, reports...) | 1- المجالات الكهرومغناطيسية الجزء الاول والثاني<br>2- اساسيات النظرية الكهرومغناطيسية الجزء الاول والثاني<br>سلسلة ملخصات شوم: الكهرومغناطيسيات 2000 تأليف جوزيف ادمنست                                                                                                          |
| Electronic References, Websites                                    | متابعه المراجع الإلكترونية والإنترنت التي تتضمن المواقع الإلكترونية العلمية الرصينة ومواقع المكتبات في بعض الجامعات العالمية                                                                                                                                                     |



## Course Description Form

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Course Name:</b>                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Laser                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>2. Course Code:</b>                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| HAEPSPH-402                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>3. Semester / Year:</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2024-2025                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>4. Description Preparation Date:</b>                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 21 / 9 / 2024                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>5. Available Attendance Forms:</b>                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Face-to-face learning                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 60 Hours (Theory) / 4 Credit Units                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>7. Course administrator's name (mention all, if more than one name)</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Name: Asst. Prof. Ban Abd Al-Maseeh Bader<br>Email: banbader1971@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>8. Course Objectives</b>                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Course Objectives</b>                                                            | <ul style="list-style-type: none"> <li>Introduce students to the topic of lasers and their importance in physics.</li> <li>Enable students to apply the knowledge they acquire to explain natural phenomena related to light and lasers.</li> <li>Equip students with the thinking skills necessary for teaching the subject of lasers when practicing their profession as teachers in primary, intermediate, and secondary schools, within the science or physics curriculum.</li> <li>Develop students' scientific research skills for use in research and applied fields within government agencies involved in research activities.</li> </ul> |
| <b>9. Teaching and Learning Strategies</b>                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Strategy</b>                                                                     | <b>A-1.</b> The student should become familiar with the types, facts, concepts, principles, theories, and laws related to the laser course.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p><b>A-2.</b> The student should understand the phenomena and practical applications related to the subject of lasers.</p> <p><b>B. Subject-Specific Skills</b></p> <p><b>B-1.</b> Equip the student with the necessary skills to learn the scientific thinking method that helps acquire scientific knowledge and apply it in solving scientific problems.</p> <p><b>B-2.</b> Provide the student with skills that help understand and interpret natural phenomena and practical applications related to lasers.</p> <p><b>C. Thinking Skills</b></p> <p><b>C-1.</b> Teach students the steps of scientific thinking to solve scientific problems.</p> <p><b>C-2.</b> Enable the student to connect scientific content with their environment and daily observations.</p> <p><b>C-3.</b> Pose thought-provoking questions and examples, and discuss students' answers to stimulate scientific thinking.</p> <p><b>D. General and Transferable Skills (Other Employability and Personal Development Skills)</b></p> <p><b>D-1.</b> Introduce the student to sound waves.</p> <p><b>D-2.</b> Link theoretical concepts with practical application</p> |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

### 10. Laser Course Structure

| Week | Hours | Intended Learning Outcomes                                                                              | Unit / Topic               | Teaching Method               | Assessment Method |
|------|-------|---------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------|-------------------|
| 1    | 2     | Meaning of Maser and Laser                                                                              | Meaning of Maser and Laser | Lecture, discussion, dialogue | Direct questions  |
| 2    | 2     | Stimulated emission                                                                                     | Meaning of Maser and Laser | Lecture, discussion, dialogue | —                 |
| 3    | 2     | Einstein calculations for probability factors and the ratio between spontaneous and stimulated emission | Meaning of Maser and Laser | Lecture, discussion, dialogue | —                 |
| 4    | 2     | Laser system as amplifier (Laser amplifier)                                                             | Laser System               | Lecture, discussion, dialogue | —                 |
| 5    | 2     | Properties of laser beam                                                                                | Laser System               | Lecture, discussion, dialogue | —                 |
| 6    | 2     | Spectral line exposure operations                                                                       | Spectral line exposure     | Lecture, discussion, dialogue | Monthly exam      |

|    |   |                                                                     |                                         |                               |                  |
|----|---|---------------------------------------------------------------------|-----------------------------------------|-------------------------------|------------------|
| 7  | 2 | Types of exposure                                                   | Spectral line exposure                  | Lecture, discussion, dialogue | —                |
| 8  | 2 | Properties of laser beam                                            | Spectral line exposure                  | Lecture, discussion, dialogue | —                |
| 9  | 2 | Components of the laser device                                      | Spectral line exposure                  | Lecture, discussion, dialogue | Monthly exam     |
| 10 | 2 | Pumping power                                                       | Pumping Methods                         | Lecture, discussion, dialogue | —                |
| 11 | 2 | Pumping efficiency                                                  | Pumping Methods                         | Lecture, discussion, dialogue | Monthly exam     |
| 12 | 2 | Importance of resonator                                             | Optical Resonator                       | Lecture, discussion, dialogue | —                |
| 13 | 2 | Oscillator                                                          | Optical Resonator                       | Lecture, discussion, dialogue | Direct questions |
| 14 | 2 | Types of resonators                                                 | Optical Resonator                       | Lecture, discussion, dialogue | Direct questions |
| 15 | 2 | Resonator stability                                                 | Optical Resonator                       | Lecture, discussion, dialogue | —                |
| 16 | 2 | Resonator oscillation formulas                                      | Optical Resonator                       | Lecture, discussion, dialogue | Direct questions |
| 17 | 2 | Resonator quality factor                                            | Optical Resonator                       | Lecture, discussion, dialogue | Direct questions |
| 18 | 2 | Adjusting the quality factor                                        | Optical Resonator                       | Lecture, discussion, dialogue | Direct questions |
| 19 | 2 | Techniques for adjusting the quality factor                         | Techniques for adjusting quality factor | Lecture, discussion, dialogue | Direct questions |
| 20 | 2 | Energy and power of a pulse resulting from quality factor switching | Techniques for adjusting quality factor | Lecture, discussion, dialogue | Direct questions |
| 21 | 2 | Mode locking                                                        | Techniques for adjusting quality factor | —                             | Direct questions |
| 22 | 2 | Solid-state lasers                                                  | Types of lasers                         | Monthly exam                  | —                |



## Course Description Form (Measurement and Evaluation)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course name: .1                 |
| <b>Measurement and Evaluation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course code: .2                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | HAEPSPH-406                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Chapter/Year: .3                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2024-2025                       |
| Date of preparation of this description: .4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 17/9/2024                       |
| Available attendance forms: .5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | In-person education             |
| Number of study hours (total) / Number of units (total) .6                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 60 hours / 4 units              |
| Course Supervisor Name (if more than one name is mentioned) .7                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                 |
| Name: M.M. Younis Dharar Jassim Email: <a href="mailto:youniesdrar12345@uohamdaniya.edu.iq">youniesdrar12345@uohamdaniya.edu.iq</a>                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |
| Course objectives .8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                 |
| <p>The importance of evaluation and measurement and its role in -1</p> <p style="padding-left: 40px;">improving the educational process.</p> <p>Basic concepts in educational measurement and evaluation -2</p> <p>Types of achievement tests, advantages and disadvantages of -3</p> <p style="padding-left: 40px;">each, and methods of preparing them</p> <p>Testing methods and the advantages and disadvantages of -4</p> <p style="padding-left: 40px;">each</p> <p>Educational objectives, their types and formulation -5</p> | <p><b>Course objectives</b></p> |
| Teaching and learning strategies .9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |
| Self-learning strategy-brainstorming-Problem solving-<br>Cooperative Learning - Active Learning                                                                                                                                                                                                                                                                                                                                                                                                                                      | Strategy                        |

|                   |                             |                                                                              |                                                                                                                  |       | 10-Course structure |
|-------------------|-----------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------|---------------------|
| Evaluation method | Teaching method             | Unit name/topic                                                              | Required learning outcomes                                                                                       | hours | AFor a week         |
| Feedback          | discussion, lecture, debate | The historical development of the concept of both measurement and evaluation | -Enable learners to identify historical stages across different cultures for both measurement and evaluation.    | 2     | 1                   |
| Feedback          | discussion, lecture, debate | Understanding the concept of tests                                           | Forming students to define the concept of the test and link it with other concepts                               | 2     | 2                   |
| Feedback          | discussion, lecture, debate | Understand the concept of (values and appreciation)                          | Enabling students to define the terms measurement and evaluation and find the difference between them            | 2     | 3                   |
| Feedback          | discussion, lecture, debate | Defining the concept of each of (measurement and evaluation)                 | Enabling students to define the concepts of measurement and evaluation and to find the relationship between them | 2     | 4                   |
| Feedback          | discussion, lecture, debate | The relationship between (measurement, testing, evaluation)                  | Students are able to distinguish between concepts and create a diagram that links them together.                 | 2     | 5                   |
| Feedback          | discussion, lecture, debate | Characteristics of educational measurement                                   | Enable students to employ educational measurement skills                                                         | 2     | 6                   |
| Feedback          | discussion,                 | Types of calendar                                                            | Enable students to identify and apply                                                                            | 2     | 7                   |



|                         |                                   |                                                                     |                                                                                                                       |          |    |
|-------------------------|-----------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------|----|
|                         | lecture,<br>debate                |                                                                     | types of educational<br>assessment.                                                                                   |          |    |
| Feedback                | discussion,<br>lecture,<br>debate | Types of<br>measurement                                             | Students are able to<br>identify types of<br>measurement and<br>their<br>applications.HField                          | <b>2</b> | 8  |
| Feedback                | discussion,<br>lecture,<br>debate | Evaluation and<br>measurement in<br>educational fields              | Students are able to<br>identify types of<br>assessment.                                                              | <b>2</b> | 9  |
| Feedback                | discussion,<br>lecture,<br>debate | The role of<br>evaluation in<br>improving<br>education              | Enable students to<br>use educational<br>applications for<br>assessment.                                              | <b>2</b> | 10 |
| a test                  | discussion,<br>lecture,<br>debate | Teaching<br>objectives                                              | Enable students to<br>identify the primary<br>objectives of<br>teaching.                                              | <b>2</b> | 11 |
| Feedback                | discussion,<br>lecture,<br>debate | Measurement and<br>evaluation and<br>their relationship<br>to goals | Enabling students to<br>link measurement<br>and evaluation to<br>educational goals                                    | <b>2</b> | 12 |
| Feedback                | discussion,<br>lecture,<br>debate | Steps for<br>constructing<br>educational tests                      | Enable students to<br>identify the main<br>steps for<br>constructing tests.                                           | <b>2</b> | 13 |
| Feedback                | discussion,<br>lecture,<br>debate | Specifications<br>table                                             | Enabling students to<br>take steps to<br>prepare a<br>specification table in<br>the educational field                 | <b>2</b> | 14 |
| Semi-<br>annual<br>news | discussion,<br>lecture,<br>debate | Statistical concept<br>of tests                                     | Enabling students to<br>understand the main<br>concepts of<br>statistical analysis of<br>different types of<br>tests. | <b>2</b> | 15 |
| Feedback                | discussion,<br>n,                 | Types of tests                                                      | Enabling students to<br>identify types of<br>tests                                                                    | <b>2</b> | 16 |

|              |                                   |                                                                    |                                                                               |   |    |
|--------------|-----------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------|---|----|
|              | lecture,<br>debate                |                                                                    |                                                                               |   |    |
| Feedback     | discussion,<br>lecture,<br>debate | Essay tests                                                        | Enabling students to identify the types of essay tests and their features     | 2 | 17 |
| Feedback     | discussion,<br>lecture,<br>debate | Objective tests                                                    | Enabling students to identify the types of objective tests and their features | 2 | 18 |
| Feedback     | discussion,<br>lecture,<br>debate | Classification of tests by method                                  | Enabling students to identify different testing methods                       | 2 | 19 |
| Feedback     | discussion,<br>lecture,<br>debate | Correction keys                                                    | Enabling students to define correction instructions and keys for tests        | 2 | 20 |
| Monthly exam | -                                 | Knowing the students' level and the information they have acquired | Monthly exam                                                                  | 2 | 21 |
| Feedback     | discussion,<br>lecture,<br>debate | Good test specifications                                           | Enabling students to define new test specifications                           | 2 | 22 |
| Feedback     | discussion,<br>lecture,<br>debate | Honesty and its types                                              | Enabling students to define the concept of validity for tests                 | 2 | 23 |
| Feedback     | discussion,<br>lecture,<br>debate | Persistence and its methods                                        | Enabling students to define the concept of reliability of educational tests   | 2 | 24 |
| a test       | discussion,<br>lecture,<br>debate | Objectivity in educational testing                                 | Enabling students to define the concept of objectivity in educational testing | 2 | 25 |
| Feedback     | discussion,                       | Evaluation without tests                                           | Enabling students to apply assessment                                         | 2 | 26 |



|          |                                   |                                            |                                                                                                             |          |    |
|----------|-----------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------|----|
|          | lecture,<br>debate                |                                            | methods other than<br>exams                                                                                 |          |    |
| Feedback | discussion,<br>lecture,<br>debate | Cumulative<br>records                      | Enabling students to<br>identify types of<br>honesty                                                        | <b>2</b> | 27 |
| Feedback | discussion,<br>lecture,<br>debate | Educational and<br>learning<br>observation | Enabling students to<br>define the concept<br>of educational<br>observation                                 | <b>2</b> | 28 |
| Feedback | discussion,<br>lecture,<br>debate | Educational<br>checklists                  | Enabling students to<br>make the<br>connection between<br>concurrent validity<br>and predictive<br>validity | <b>2</b> | 29 |
| Feedback | discussion,<br>lecture,<br>debate | The interview                              | Enabling students to<br>identify the role of<br>the interview in the<br>educational aspect                  | <b>2</b> | 30 |

| 11- Learning and teaching resources                                                                                                                                                                                                                            |  |                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------|
| Measurement and Evaluation for the University<br>Student, Abdul Hussein Arzouqi, and Yassin Ayal<br>Measurement and Evaluation in the Educational<br>Process, Ahmed Suleiman Awda<br>-Badr for Educational Measurement and<br>Evaluation, Al-Atrahi and others |  | 1- Required textbooks           |
| Measurement and Evaluation for the University<br>Student, Abdul Hussein Arzouqi, and Yassin Ayal<br>Measurement and Evaluation in the Educational<br>Process, Ahmed Suleiman Awda<br>-Badr for Educational Measurement and<br>Evaluation, Al-Atrahi and others |  | 2- Main references<br>(sources) |

|                                                                                                                                                                                 |                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <p>Educational Measurement and Evaluation in the Educational Process, Salah El-Din Mahmoud Allam</p> <p>Measurement and Evaluation in the Teaching Process, Rahim Al-Azzawi</p> | <p>A- Recommended books and references (scientific journals, reports, etc.)</p> |
| <p>General Curriculum and Teaching Methods</p> <p>Library (Telegram)</p> <p>-Al-Noor Library (electronic library) is free on the search engine.Google</p>                       | <p>B - Electronic references, Internet sites</p>                                |



Course Description Form

|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Solid state physical                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 2. Course Code:                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| HAEPSPH-403                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3. Semester / Year:                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| yearly                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4. Description Preparation Date:                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 23/9/2024                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5. Available Attendance Forms:                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| In-person learning                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 90 HOURS/ 5 UNITS                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 7. Course administrator's name (mention all, if more than one name)                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Name: Asst. Prof. Dr. Siham Jasim Abdullah<br>Email: : siham.jasim@uohamdaniya.edu.iq |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 8. Course Objectives                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Course Objectives                                                                     | <div>1. Students learn about the importance of scientific knowledge in solid-state physics in everyday life.</div> <div>2. Students learn about the different types of scientific knowledge, including facts, concepts, principles, and strict laws, in solid-state physics.</div> <div>3. Study the structural and functional properties of solid materials related to the crystal structure of solid materials. The course includes the study of interatomic forces and types of crystal bonds, crystal structure and the concept of the crystal lattice, crystal systems, elements of crystal symmetry, Miller coefficients, crystal defects, inverted lattice, X-ray diffraction and its use in studying the crystal structure, Lattice</div> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>dynamics, lattice vibration patterns and phonons, thermal properties of solids, heat capacity: classical model, Einstein model, Debye model. This course enables the student to understand the crystal structure on which the various properties of solids depend.</p> <ol style="list-style-type: none"> <li>4. Providing students with the theory of bundles in solid materials and semiconductors.</li> <li>5. Acquiring the skills necessary to work in the fields of physics.</li> <li>6. Enhancing the value and importance of physics subjects for students in the College of Education when practicing their professions as teachers in middle and secondary schools.</li> </ol> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 9. Teaching and Learning Strategies

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategy</b> | <ol style="list-style-type: none"> <li>1. Providing students with physics information and concepts. Preparing trained and qualified personnel to work in institutions.</li> <li>2. Identifying the scientific applications of each scientific knowledge.</li> <li>3. Identify the different types of scientific knowledge, including facts, concepts, principles, theories, and special devices for structural and optical examinations related to the Solid State Physics course.</li> </ol> <p>Enabling the student to acquire knowledge and understanding of the scientific laws of physics, practical applications of physics, logical and scientific analysis, and interpretation of physical phenomena.</p> |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 7. Course Structure



| Week | Hours | Required Learning Outcomes                                                                                                                                           | Unit or subject name                      | Learning method     | Evaluation method |
|------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------|-------------------|
| 1    | 3     | Presentation of syllabus vocabulary, introduction, crystal structure, crystal formula of solids, crystal lattice, Bravais lattice and transition vectors in crystals | Crystal structure                         | Lecture, discussion | Direct questions  |
| 2    | 3     | Unit cell, crystal lattice in 3D space, Wickner-Sitz primitive cell, filling factor, solving examples                                                                | Unit cell                                 | Lecture, discussion | Direct questions  |
| 3    | 3     | Miller indexes, angle between planes, distance between parallel planes, crystal symmetry, solve examples                                                             | Miller indexes                            | Lecture, discussion | Direct questions  |
| 4    | 3     | Diffraction in crystals, types of diffraction, Braque's law of diffraction, solving examples                                                                         | Diffraction                               | Lecture, discussion | Direct questions  |
| 5    | 3     | Experimental methods for X-ray diffraction from crystal planes, Laue method, rotating crystal method, powder method                                                  | Diffraction method                        | Lecture, discussion | Direct questions  |
| 6    | 3     | Reciprocal lattice, construction methods, fundamental axes                                                                                                           | Understanding reciprocal lattice concepts | Lecture, discussion | Direct questions  |
| 7    | 3     |                                                                                                                                                                      |                                           | Exam                |                   |
| 8    | 3     | Lattice dynamics, lattice vibration, one-atom lattice vibration in one dimension                                                                                     | Lattice dynami                            | Lecture, discussion | Direct questions  |
| 9    | 3     | lattice vibration, vibration of a two-atomic lattice in one dimension, Einstein's model, Debye's model                                                               | lattice vibration                         | Lecture, discussion | Direct questions  |
| 10   | 3     | Band theory of solids, origin of                                                                                                                                     | Band theory                               | Lecture, discussion | Direct questions  |

|    |   |                                                                                                                                 |                       |                     |                  |
|----|---|---------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|------------------|
|    |   | energy bands, energy states in electron orbitals, Hall effect, physical explanation of Hall effect                              |                       |                     |                  |
| 11 | 3 | PN junction: diode, depletion region, barrier potential,                                                                        | diode                 | Lecture, discussion | Direct questions |
| 12 | 3 | Semiconductors, Introduction, Properties of Semiconductor Materials, Types of Semiconductors,                                   | Semiconductors        | Lecture, discussion | Direct questions |
| 13 | 3 | Impure semiconductor (doped), negative type (n-type), positive type (p-type), doping levels                                     | Semiconductor types   | Lecture, discussion | Direct questions |
| 14 | 3 |                                                                                                                                 | review                | Lecture, discussion | Direct questions |
| 15 | 3 |                                                                                                                                 |                       | Exam                |                  |
| 16 | 3 | Semiconductor devices, tunnel diode, current-voltage properties,                                                                | Semiconductor devices | Lecture, discussion | Direct questions |
| 17 | 3 | Semiconductor lasers, advantages of semiconductor lasers, introduction to nanotechnology and its relationship to semiconductors | Semiconductor laser   | Lecture, discussion | Direct questions |
| 18 | 3 | Classification of nanomaterials and their applications, one-dimensional                                                         | nanomaterials         | Lecture, discussion | Direct questions |



|    |   |                                                                                                       |                           |                     |                  |
|----|---|-------------------------------------------------------------------------------------------------------|---------------------------|---------------------|------------------|
|    |   | nanomaterials, two-dimensional nanomaterials                                                          |                           |                     |                  |
| 19 | 3 | 3D nanomaterials, properties of nanomaterials, Nano semiconductors,                                   | nanomaterials, properties | Lecture, discussion | Direct questions |
| 20 | 3 | Crystal defects<br>Crystal defects are classified as point defects, gaps, and Schottky defects.       | Crystal defects           | Lecture, discussion | Direct questions |
| 21 | 3 | Frenkel defects, lattice defects, linear defects, dislocations, ridge dislocation, spiral dislocation | Defects types             | Lecture, discussion | Direct questions |
| 22 | 3 | Surface defect, grain boundary, stacking defect, twins                                                | Surface defect            | Lecture, discussion | Direct questions |
| 23 | 3 |                                                                                                       |                           | Exam                |                  |
| 24 | 3 | Superconductivity, Introduction, Applications of Superconductivity, Critical Temperature,             | Superconductivity         | Lecture, discussion | Direct questions |
| 25 | 3 | Josephson effect, Meissner effect, critical magnetic field, some applications of hyper conductivity   | Josephson effect,         | Lecture, discussion | Direct questions |
| 26 | 3 | Free electrons, classical theory of free electrons,                                                   | Free electrons,           | Lecture, discussion | Direct questions |

|    |   |                                                                                                                                              |                        |                         |                  |
|----|---|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------|------------------|
|    |   | Drude theory, Lortz model                                                                                                                    |                        |                         |                  |
| 27 | 3 | Failure of classical theory, Fermi-Dirac statistics of free electrons in three dimensions, Fermi energy, density of electron specific states | Fermi-Dirac statistics | Lecture, discussion     | Direct questions |
| 28 | 3 | Solve various examples                                                                                                                       |                        | ' discussion            | Direct questions |
| 29 | 3 | General review of curriculum vocabulary                                                                                                      |                        | Discussion and dialogue | Direct questions |
| 30 | 3 |                                                                                                                                              |                        | Exam                    |                  |

#### 8. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

#### 9. Learning and Teaching Resources

|                                               |                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any) | <p>Kittel, C., 2005,. Introduction to solid state physics, 8th ed., Wiley.</p> <p>-2 Omar MA., 1975, Elementary solid state physics, principles and applications, Addison-Wesley Publishing Company.</p> <p>-3 فيزياء الحالة الصلبة ، مؤيد جبرائيل الجزء الاول والثاني.</p> <p>-4 فيزياء حالة صلبة ، يحيى الجمال</p> |
| Main references (sources)                     | <p>1- Om Prakash Pahuja "Solid State Physics" Laxmi Publications (P) LTD 1<sup>st</sup> ed., 2005 , New Delhi.</p> <p>2- Ziman, Z.M., "Principles of the theory of solids" Cambridge, 1964</p>                                                                                                                       |



|                                                                       |                                                                                                                                                      |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | 3- Peter M., Lectures at Manchester University 2006                                                                                                  |
| Recommended books and references<br>(scientific journals, reports...) | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities. |
| Electronic References, Websites                                       | Solid State Websites                                                                                                                                 |

## Course Description Form

|                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Course Name:                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Nuclear Physics                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2. Course Code:                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| HAEPSPH-401                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3. Semester / Year:                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2024-2025                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4. Description Preparation Date:                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 21/9/2024                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 5. Available Attendance Forms:                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Presence education                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6. Number of Credit Hours (Total) / Number of Units (Total)                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 90 hours/7 units                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 7. Course administrator's name (mention all, if more than one name)                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Name: Prof. Dr. Malik Hussein Kheder<br>Email: <a href="mailto:dr.malik73@uohamdaniya.edu.iq">dr.malik73@uohamdaniya.edu.iq</a> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 8. Course Objectives                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Course Objectives                                                                                                               | <p>1. Enhancing the skill objectives of the nuclear subject for fourth-year students in the Physics Department.</p> <p>2. Nuclear Data Analysis: The ability to analyze nuclear data, understand its foundations, and apply it to various nuclear reactions...</p> <p>3. Understanding Nuclear Design and Operation: The ability to design and analyze various nuclear systems and understand how to operate and maintain them.</p> <p>4. Nuclear Safety Assessment: The ability to assess the nuclear safety of nuclear systems and processes and implement necessary safety procedures.</p> |
| 9. Teaching and Learning Strategies                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Strategy                                                                                                                        | <p>1. Understanding Nuclear Theories: The ability to understand basic concepts in nuclear theories, such as nuclear reactions, radioactive decay, and nuclear fusion reactions.</p> <p>2. Radioactive Decay Analysis: The ability to analyze the behavior of radioactive decay using appropriate nuclear models and understand its effects on matter and the environment.</p>                                                                                                                                                                                                                 |



3. Interpretation of Nuclear Reactions: The ability to interpret and analyze various nuclear reactions, including fission and fusion reactions, and their applications.

4. Applications of Nuclear Technologies: The ability to understand and analyze applications of nuclear technologies such as nuclear energy, radiation, medical imaging, and chemical analysis.

## 10. Course Structure

| Week | Hours | Required Learning Outcomes                 | Unit or subject name                                                                                         | Learning method                  | Evaluation method             |
|------|-------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------|
| 1    | 3     | Theoretical knowledge and applied analysis | Introduction to nuclear properties, definitions and important terms, units and dimensions in nuclear physics | Lecture, discussion and dialogue | Direct questions              |
| 2    | 3     | Theoretical knowledge and applied analysis | Nuclear charge, nuclear radius, distance of closest approach                                                 | Lecture, discussion and dialogue |                               |
| 3    | 3     | Theoretical knowledge and applied analysis | Nuclear mass, mass increase and decrease, binding ratio                                                      | Lecture, discussion and dialogue |                               |
| 4    | 3     | Theoretical knowledge and applied analysis | nuclear binding energy, binding energy rate, dissociation energies                                           | Lecture, discussion and dialogue |                               |
| 5    | 3     | Theoretical knowledge and applied analysis | Valley of stability, quantum numbers of individual nucleons, fundamental quantum number,                     | Lecture, discussion and dialogue |                               |
| 6    | 3     | Theoretical knowledge and applied analysis | Orbital quantum number, magnetic quantum number, spin quantum number                                         | Lecture, discussion and dialogue |                               |
| 7    | 3     | Theoretical knowledge and applied analysis | The quantum number of the total angular momentum of a single particle                                        | Lecture, discussion and dialogue |                               |
| 8    | 3     | Theoretical knowledge and applied analysis | Nuclear angular momentum, nuclear spin, symmetry                                                             | Lecture, discussion and dialogue |                               |
| 9    | 3     | Theoretical knowledge and applied analysis | Introduction to nuclear activity, the law of radioactivity                                                   | Lecture, discussion and dialogue |                               |
| 10   | 3     | Theoretical knowledge and applied analysis | half-life, average lifespan                                                                                  | Lecture, discussion and dialogue | In addition to a monthly exam |
| 11   | 3     | Theoretical knowledge and applied analysis | Total number of radioactive nuclei, measurement of half-lives                                                | Lecture, discussion and dialogue |                               |
| 12   | 3     | Theoretical knowledge and applied analysis | Production of radioactive isotopes from the decay of the parent nucleus, the perfect balance                 | Lecture, discussion and dialogue |                               |



|    |   |                                            |                                                                                                                           |                                  |                               |
|----|---|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------|
| 13 | 3 | Theoretical knowledge and applied analysis | Time of greatest effectiveness for productive newborn nuclei, dissolution in multiple ways                                | Lecture, discussion and dialogue |                               |
| 14 | 3 | Theoretical knowledge and applied analysis | Show the breadth of dissolved cases, specify the date                                                                     | Lecture, discussion and dialogue |                               |
| 15 | 3 | Theoretical knowledge and applied analysis | Production of a radioactive isotope by nuclear bombardment                                                                | Lecture, discussion and dialogue |                               |
| 16 | 3 | Theoretical knowledge and applied analysis | Introduction to units of radioactivity, curie, specific potency, roentgen                                                 | Lecture, discussion and dialogue |                               |
| 17 | 3 | Theoretical knowledge and applied analysis | Absorption dose, rem, permissible exposure limit                                                                          | Lecture, discussion and dialogue |                               |
| 18 | 3 | Theoretical knowledge and applied analysis | Introduction to radiation interactions with matter, bremsstrahlung, and the interaction of charged particles with matter. | Lecture, discussion and dialogue |                               |
| 19 | 3 | Theoretical knowledge and applied analysis | Interaction of heavy charged particles, energy loss by collision                                                          | Lecture, discussion and dialogue |                               |
| 20 | 3 | Theoretical knowledge and applied analysis | Range, electron interaction                                                                                               | Lecture, discussion and dialogue | In addition to a monthly exam |
| 21 | 3 | Theoretical knowledge and applied analysis | Neutron interaction with matter                                                                                           | Lecture, discussion and dialogue |                               |
| 22 | 3 | Theoretical knowledge and applied analysis | nuclear fission, chain reaction                                                                                           | Lecture, discussion and dialogue | In addition to a monthly exam |
| 23 | 3 | Theoretical knowledge and applied analysis | How nuclear fission occurs, fission products                                                                              | Lecture, discussion and dialogue |                               |
| 24 | 3 | Theoretical knowledge and applied analysis | Nuclear fusion, how fusion occurs                                                                                         | Lecture, discussion and dialogue |                               |
| 25 | 3 | Theoretical knowledge and applied analysis | controlled fusion, magnetic confinement fusion                                                                            | Lecture, discussion and dialogue |                               |
| 26 | 3 | Theoretical knowledge and applied analysis | Problems facing scientists in nuclear fusion, advantages of nuclear fusion                                                | Lecture, discussion and dialogue |                               |
| 27 | 3 | Theoretical knowledge and applied analysis | Nuclear models, liquid drop model                                                                                         | Lecture, discussion and dialogue |                               |
| 28 | 3 | Theoretical knowledge and applied analysis | Correction of the liquid drop equation                                                                                    | Lecture, discussion and dialogue |                               |
| 29 | 3 | Theoretical knowledge and applied analysis | Shell model                                                                                                               | Lecture, discussion and dialogue |                               |
| 30 | 3 | Theoretical knowledge and applied analysis | How do magic numbers appear?                                                                                              | Lecture, discussion and dialogue |                               |



## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

## 12. Learning and Teaching Resources

|                                                                    |                                                                                                                                                      |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required textbooks (curricular books, if any)                      | Nuclear Physics / Written by Munib Adel Khalil                                                                                                       |
| Main references (sources)                                          | Principles of Nuclear Physics / Translated by Dr. Asim Abdel Karim Azouz                                                                             |
| Recommended books and references (scientific journals, reports...) | Follow up on electronic references and the Internet, including reliable scientific websites and library websites in some international universities. |
| Electronic References, Websites                                    | Websites about nuclear physics                                                                                                                       |