# Course description template

| Course Information | | | |
|---|---|---|---|
| Material delivery | | **electromagnetic waves** | Article title |
| **theoretical ✓** | | **Basic** | Type of material |
| | | MPH2201 | Article code |
| | | **study units 5** | Units of matter |
| | | **125** | Student's academic workload (hours/semester) |
| 2 | Delivery semester | UG II | Unit level |
| the sciences | College | Department of Medical Physics | Scientific Department |
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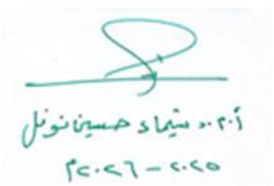
| M.Sc. | Subject Leader Qualifications | Assistant teacher | The academic title of the unit head |
| ali.n@uowa.edu.iq | e-mail | Ali Nazim Munif | References for the material |
| ahmed.mo@uowa.edu.iq | e-mail | Ahmed Moussa Jaafar | Name of peer reference |
| 1.0 | Issuing the article | 2026/2/9 | Date of approval by the Scientific Committee |

| Relationship with other study subjects | | | |
|---|---|---|---|
| Second semester | semester | Electricity and magnetism | Basic Requirements Unit |
| without | semester | without | Common Requirements Unit |

| Course objectives, learning outcomes, and guidance content | |
|---|---|
| 1. Introducing the student to the concept of electromagnetic waves, how they travel, the phenomena that occur to them, and how they differ from longitudinal waves.<br>2. Introducing the student to the basic theories of electromagnetic waves.<br>3. Introducing the student to the types of vectors and how to deal with them.<br>4. To provide the student with knowledge of how to calculate electromagnetic force and electromagnetic field.<br>5. Introducing the student to the types of shapes affected by the electromagnetic field.<br>6. Studying Ampere's law and its applications, and studying Faraday's law and the stimulated electric field.<br>7. Explaining the unknown through analogy with the known counterpart.<br>8. Understanding the nature of electromagnetic wave propagation.<br>9. Studying the properties of the electromagnetic spectrum.<br>10. Introducing the student to the applications of electromagnetic waves in the medical field. | Course objectives |
| 1. The student understands the basic concepts of wave science.<br>2. Describe the mathematical relationships related to the electromagnetic field.<br>3. Linking the different wave vectors.<br>4. Enabling the student to devise solutions and explain physical phenomena with some modernity and creativity.<br>5. Explanation of the general properties of electromagnetic waves. | Learning outcomes for the subject |

| | |
|---|---|
| 6. To enable students to gain knowledge of the parts of the magnetic spectrum and the basis of its division.<br>7. Analyzing, investigating, and collecting information in a systematic and scientific manner to establish facts and principles. | |
| **Theoretical lectures**<br><br>Learning the concepts of each lecture or group of lectures = 28 hours<br><br>Total hours= ∑SSWL + ( Midterm exam hours + Final exam hours)<br>Total hours = 28 + 1 + 3 = 32 | Guidelines |

| **Learning and teaching strategies** | |
|---|---|
| 1. a lecture<br>2. Problem-based learning(PBL)<br>3. Peer teaching and collaborative learning<br>4. meditative practice<br>5. Student groups<br>6. discussion<br>7. Posing questions to students using the brainstorming method<br>8. Giving students problem-solving assignments<br>9. Assigning students to prepare reports related to the course | Strategies |

| **.The student's academic workload is calculated for 15 weeks** | | | |
|---|---|---|---|
| 3 | Regular weekly study load for the student | 45 | Regular academic workload for the student during the semester |
| 5.133 | Irregular weekly study load for the student | 77 | Irregular student workload during the semester |

| | |
|---|---|
| Final = 125 3 + 122 | The student's total academic workload during the semester |

| Course Material Assessment | | | | | |
|---|---|---|---|---|---|
| Learning outcomes | The weeks | Weight (degrees) | Time/Number | | |
| 5.7 | 4,7,10 | 10% (10) | 3 | **Tests** | **Formative assessment** |
| 10 | **Throughout the semester** | 10 % ( 7) | 1 | **Project** | |
| 3,5,7 | 4,7,12 | 10 % ( 10) | 3 | **homework** | |
| All outputs | 4,6,13 | 10 % ( 8) | 3 | **Report** | |
| All outputs | **Throughout the semester** | 10 % ( 5) | 1 | **seminars** | |
| 3.4 | 7 | 10% (10) | 1 | **Midterm exam** | **Summary assessment** |
| 1,2,3,4,5,6,7 | 16 | 50% (50) | 1 | **Final exam** | |
| %100 | | | **Overall assessment** | | |

| Weekly theoretical curriculum | |
|---|---|
| Vector analysis and vector algebra | Week 1 |
| Coordinate system | Week 2 |
| Applications of coordinate systems | Week 3 |
| Static electric field in the presence of coordinates | Week 4 |
| Coulomb's law and electrical power | Week 5 |
| vector form of Coulomb's law | Week 6 |
| Midterm exam | Week 7 |
| The force resulting fromn charges | Week 8 |
| electric field intensity | Week 9 |

| | |
|---|---|
| The electric field strength at a point is due to the numbern .charges | Week 10 |
| Types of shipment distribution | Week 11 |
| Electric field strength resulting from different charge distributions | Week 12 |
| The electric field produced by an unlimited line of charges | Week 13 |
| The electric field produced by a charged circular loop | Week 14 |
| The electric field produced by the surface of an unlimited charge | Week 15 |

| Learning and teaching resources | | |
|---|---|---|
| Is it available ?in the library | Required texts | |
| no | Engineering Electromagnetic, 8th edition, 2010 William Hyatt . | Required texts |
| no | Electromagnetic waves and Transmission lines, 2007 Bakshi U. A. and Bakshi A. V. | Recommended texts |
| | | Websites |

| Grade chart | | | | |
|---|---|---|---|---|
| Definition | % Rating | Appreciation | Degree | The group |
| Outstanding performance | 100-90 | privilege | A | Success Group (100 – 50) |
| Above average with some errors | 89-80 | very good | B | |
| Sound work with noticeable errors | 79-70 | good | C | |
| Fair, but with significant .shortcomings | 69-60 | middle | D | |
| The work meets minimum .standards | 59-50 | acceptable | E | |
| More work is needed, but the decision It can be given | 49-45 | Sediment (under (processing | FX | sedimentation group (49 – 0) |
| A large amount of work is required | 44 - 0 | Precipitate | F | |

Note: Marks with decimal places greater than 0.5 or less than the highest or lowest full mark will be rounded up (for example , a mark of 54.5 will be rounded up to 55, while a mark of will be rounded up to 54). The university has a policy of not tolerating "near-pass 54.4 failure ", so the only adjustment to the marks awarded by the original mark(s) will be the . automatic rounding described above