MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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| **Module Information**  معلومات المادة الدراسية | | | | | | | |
| **Module Title** |  | Medical physics  **فيزياء طبية** | | | **Module Delivery** | | |
| **Module Type** |  | Supportive | | | **☒ Theory Lecture**  **☒ Lab**  **Tutorial Practical Seminar** | | |
| **Module Code** |  | MIET1201 | | |
| **ECTS Credits** |  | 5 | | |
| **SWL (hr/sem)** |  | 125 | | |
| **Module Level** | | 1 | **Semester of Delivery** | | | | 2 |
| **Administering Department** | | MIE | **College** | MUC | | | |
| **Module Leader** |  | Athraa Ali | **e-mail** | athraa.ali@muc.edu.iq | | | |
| **Module Leader’s Acad. Title** | | Asst. lecturer | **Module Leader’s Qualification** | | | | M.Sc. |
| **Module Tutor** |  |  | **e-mail** |  | | | |
| **Peer Reviewer Name** | | Dr.Noor Kadhim Meftin | **e-mail** | noor.kadhim@muc.edu.iq | | | |
| **Scientific Committee Approval Date** | | 15/6/2023 | **Version Number** | | | 1 | |

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| **Relation with other Modules**  العلاقة مع المواد الدراسية األخرى | | | |
| **Prerequisite module** | none | **Semester** |  |
| **Co-requisites module** | none | **Semester** |  |

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| **Module Aims, Learning Outcomes and Indicative Contents**  أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية | |
| **Module Aims**  أهداف المادة الدراسية | 1. to recognize the influence of forces on the human body Identify how the skeleton works 2. to show how pressure affects the body's organs Recognize physical activity of the lungs and breathing 3. to demonstrate the physics of the cardiovascular system and the urinary system 4. to distinguishes the basic principles using the applications of electricity and magnetism in medicine 5. to shall be acquainted with respiratory, cardiovascular and cardiovascular equipment 6. to distinguishes the basic principles, using the sound waves in medicine and the use of x-rays in the diagnosis and identification of diseases |
| **Module Learning Outcomes**  مخرجات التعلم للمادة الدراسية | Upon completion of the course, students should be able to:   1. Understand the difference between the Forces. 2. Know the bone has at least six functions. What are the main components of the bone, and to study the methods of Measurement the minerals quantity in the bone 3. know methods of diathermy 4. understand how Energy change in the body 5. know pressures inside the body parts and measure it 6. understand how to work the lungs and How the blood and lungs interact 7. know nervous system and the neuron 8. know the graphing devices of the body organs 9. know the applications of Electricity and Magnetism in Medicine 10. know the application of sound in medicine, know sonar devices 11. know the application of light and laser in medicine 12. know Major components of the cardiovascular system 13. know physics of nuclear medicine 14. know the x- ray device |

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| المحتويات الارشادية  **Indicative Contents** | 1- Define the Forces , Frictional Forces , Dynamics (4hrs)   1. functions of the skeleton and Bone consists of quite different materials and how to measure mineral in the bones (5 hrs) 2. Types of thermometers , Heat therapy, Cryogenics (4hrs) 3. Sphygmomanometer, blood pressure, bladder pressure , tonometer(4hrs) 4. Function of Lungs & Breathing, breath rate, airways, Dalton’s law of partial pressures(2hrs) 5. The nervous system and the neuron, Electrocardiogram, Electro retion gram (ERG), The magneto cardio gram (MCG)(4hrs) 6. Magnetic signals from the heart –magneto cardiogram(2hrs) 7. Macro shock, Micro shock (2hrs) 8. General Properties of Sound, Acoustic Impedance, Absorption, A-mode Display, Doppler Ultrasound(4hrs) 9. Endoscope, cytoscopes, Emissive IR photography.(4hrs) 10. Laser, population inversion, xray (4hrs) 11. Physics of the cardiovascular system (4 hrs) |

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| **Learning and Teaching Strategies**  استراتيجيات التعلم والتعليم | |
| **Strategies** | Daily assessment - weekly assessment - quarterly assessment - objective questions - general questions - practical tests. |

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| **Student Workload (SWL)**  الحمل الدراسي للطالب | | | |
| **Structured SWL (h/sem)**  الحمل الدراسي المنتظم للطالب خلال الفصل | 64 | **Structured SWL (h/w)**  الحمل الدراسي المنتظم للطالب أسبوعيا | 4 |
| **Unstructured SWL (h/sem)**  الحمل الدراسي غير المنتظم للطالب خلال الفصل | 61 | **Unstructured SWL (h/w)**  الحمل الدراسي غير المنتظم للطالب أسبوعيا | 8.5 |
| **Total SWL (h/sem)**  الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

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| **Module Evaluation**  تقييم المادة الدراسية | | | | |
|  | **Time/Numb** | **Weight (Marks)** | **Week Due** | **Relevant** |

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|  | | **er** |  |  | **Learning**  **Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 4, 11 | LO # 1-3 and 8-10 |
| **assessment** | 2 | 10% (10) | 9, 13 | LO # 8 and 11-12 |
| **Reports** | 1 | 10% (10) | Continuous |  |
| **practical test** | 2 | 10% (10) | 7 , 12 | LO # 1-6 and 7-11 |
| **Summative**  **assessment** | **Midterm Exam** | 2 hr. | 10% (10) | 7 | LO # 1-7 |
| **Final Exam** | 3 hr. | 50% (50) | 14 | All |
| **Total assessment** | | | 100% (100  Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  المنهاج االاسبوعي النظري | |
|  | **Material Covered** |
| **Week 1** | Forces on and in the body. |
| **Week 2** | Physics of the skeleton. |
| **Week 3** | Heat & cold in medicine |
| **Week 4** | Energy, work and power of the body. |
| **Week 5** | Pressure in body organs |
| **Week 6** | Physics of the lungs and breathing. |
| **Week 7** | **Mid Term Exam** + Physics of cardiovascular system |
| **Week 8** | Physics of urinary system. |
| **Week 9** | Electricity within the body. |
| **Week 10** | Sound in medicine and physics of hearing. |
| **Week 11** | Light in medicine and physics of vision. |
| **Week 12** | Diagnostic X-rays |
| **Week 13** | Physics of nuclear medicine (radioisotopes in medicine). |
| **Week 14** | Physics of radiation therapy |
| **Week 15** | Radiation protection |
| **Week 16** | **Preparatory week before the final exam** |

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| **Delivery Plan (Weekly Lab. Syllabus)**  المنهاج الاسبوعي للمختبر | |
|  | **Material Covered** |

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| **Week 1** | Lab 1: Introduction to laboratory tools |
| **Week 2** | Lab 2: the simple pendulum |
| **Week 3** | Lab 3: hook’s law |
| **Week 4** | Lab 4: the blood pressure |
| **Week 5** | Lab 5: the friction |
| **Week 6** | Lab 6: the speed of sound |
| **Week 7** | Lab 7: the laser |
| **Week 8** | Lab 8: viscosity of liquids |
| **Week 9** | Lab 9: The cylindrical body |
| **Week 10** | Lab 10: The convex lens |
| **Week 11** | Lab 11: the concave lens |

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| **Learning and Teaching Resources**  مصادر التعلم والتدريس | | |
|  | **Text** | **Available in the**  **Library?** |
| **Recommended**  **Texts** | Introductory Physics I Elementary Mechanics by Robert G.  Brown | NO |
| **Websites** | <https://webhome.phy.duke.edu/~rgb/Class/intro_physics_1/intro_physics_1.pdf> | |

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| **Grading Scheme**  مخطط الدرجات | | | | |
| **Group** | **Grade** | التقدير | **Marks**  **(%)** | **Definition** |
| **Success Group (50 - 100)** | **A -** Excellent | امتياز | 90 - 100 | Outstanding Performance |
| **B -** Very  Good | جيد جدا | 80 - 89 | Above average with some errors |
| **C -** Good | جيد | 70 - 79 | Sound work with notable errors |
| **D -**  Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| **E -** Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX –** Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit  awarded |
| **F –** Fail | راسب | (0-44) | Considerable amount of work  required |
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| **Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. | | | | |