

Course Description Form

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| 1. Course Name: | | | | | |
| Therapeutic Instrumentation | | | | | |
| 2. Course Code: | | | | | |
| WBM-42-05 | | | | | |
| 3. Semester / Year: | | | | | |
| 2 nd Semester / 2025 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 19/3/2025 | | | | | |
| 5. Available Attendance Forms: | | | | | |
| Weekly (Theoretical & Practical) | | | | | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | | | | | |
| 45 Hrs. Theoretical & 30 Hrs. Practical / 3 Units | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: Dr. Hayder A. Yousif Email: hayder.ab@uowa.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | <ol style="list-style-type: none"> 1. Identify the therapeutic devices that deal with the human body 2. How to design the therapeutic device 3. Identifying cases that require the use of a therapeutic device | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | <p style="text-align: center;">To make the student able to understand the principle of operation of the therapeutic medical device and its dealings with the human body, and to graduate engineers specialized in the field of biomedical engineering, which relates to human life with the medical device and work in the medical engineering environment.</p> | | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |

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| 1 | 3 | Introduction to physical therapy devices, their classifications, and the purpose of their use | Physiotherapy devices | Theoretical & Practical | Daily test and oral questions |
| 2 | 3 | Learn about the infrared device and how to use these rays to treat cramps and other sports injuries | Infrared (IR) therapeutic device | Theoretical & Practical | Daily test and oral questions |
| 3 | 3 | The student learns about the method of generating ultrasound waves, their different frequencies, and the method of using these waves in the treatment of some joint inflammations | ultrasonic therapeutic devices | Theoretical & Practical | Daily test and oral questions |
| 4 | 3 | The student should be aware of the benefits of microwaves in their use to accelerate blood flow in blood vessels | Microwave device | Theoretical & Practical | Daily test and oral questions |
| 5 | 3 | Knowing how shortwaves affect increasing blood flow in blood vessels and contributing to natural treatment | short waves devices | Theoretical & Practical | Daily test and oral questions |
| 6 | 3 | Explaining the benefits and harms of a wax bath by using it to treat some muscle spasms or stiffness related to the ligaments. | Wax bath device | Theoretical & Practical | Daily test and oral questions |
| 7 | 3 | Explaining how to use a lithotripsy device and what its advantages and disadvantages are | Lithotripsy | Theoretical & Practical | Daily test and oral questions |
| 8 | 3 | A detailed explanation of the artificial respirator and its impact on saving the lives of those suffering from shortness of breath | Artificial pulmonary ventilators | Theoretical & Practical | Daily test and oral questions |
| 9 | 3 | Explaining the number of artificial respiratory devices according to their use | Ventilators classification | Theoretical & Practical | Daily test and oral questions |
| 10 | 3 | The student's knowledge of medical gases that can be used in anesthesia machines or respirators | Medical gases | Theoretical & Practical | Daily test and oral questions |
| 11 | 3 | The student's knowledge of the importance of using the anesthesia device in surgical operations and a preferred explanation of how the patient loses consciousness while using the device | Anesthesia machine | Theoretical & Practical | Daily test and oral questions |

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| 12 & 13 | 3 | A detailed explanation of the electric shock device, its benefits, and the harms resulting from its misuse | Cardiac defibrillators | Theoretical & Practical | Daily test and oral questions |
| 14 | 3 | The student's knowledge of all dental chair procedures and how to calibrate the equipment associated with it, as well as delving into its electrical circuits. | Tooth chair (dental unit) | Theoretical & Practical | Daily test and oral questions |
| 15 | 3 | The student's knowledge of how to control all positions and movements of the dental chair through knowledge of electrical and mechanical methods | Pneumatic and hydraulic circuit | Theoretical & Practical | Daily test and oral questions |

11. Course Evaluation

- 1- Weekly exams
- 2- Monthly exams
- 3- Participations inside the class
- 4-present the seminars
- 5- Writing reports

12. Learning and Teaching Resources

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| Required textbooks (curricular books any) | <ol style="list-style-type: none"> 1. Introduction to Biomedical Engineering, Joseph D. Bronzino, 3rd Ed. 2012, Academic Press. 2. Handbook of Biomedical Instrumentation Second Edition - R S KHANDPUR |
| Main references (sources) | <ol style="list-style-type: none"> 1. Introduction to Biomedical Engineering, Joseph D. Bronzino, 3rd Ed. 2012, Academic Press. 2. Medical Devices and Systems, Joseph D. Bronzino, 1st Ed. 2006, CRC, Taylor & Francis. 3. The Biomedical Engineering Handbook, Joseph D. Bronzino, 4th Ed. 2015, CRC Press. |
| Recommended books and references (scientific journals, reports...) | Standard handbook of biomedical engineering & design - M Kutz |
| Electronic References, Websites | https://books.google.iq/books/about/Handbook_of_Biomedical_Instrumentation |

