**Course Description Form**

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| 1. Course Name:
 |
| Diagnostic Instrumentation  |
| 1. Course Code:
 |
| WBM-51-03  |
| 1. Semester / Year:
 |
| 1st Semester / 2023 2024 |
| 1. Description Preparation Date:
 |
|  19/3/2024 |
| 1. Available Attendance Forms:
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| Weekly (Theoretical & Practical) |
| 1. Number of Credit Hours (Total) / Number of Units (Total)
 |
| 45 Hrs. Theoretical & 30 Hrs. Practical / 3 Units |
| 1. Course administrator's name (mention all, if more than one name)
 |
| Name: Dr. Hayder A. Yousif Email: hayder.ab@uowa.edu.iq |
| 1. Course Objectives
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| **Course Objectives** | The main aim of this study is studying some diagnostic devices that are related to the human body (such as the sonar device, the medical endoscope device, and the vital activity monitoring device) and study the principle working with its effect on the human body.In this course the student will study the Diagnostic Instrumentation (Medical Ultrasound, Endoscopy, and Patient Alarm Systems)The student will be able to know the following:1. The properties of ultrasound waves. The decibel notation for ultrasound intensity and pressure. The ultrasound properties of velocity, attenuation, and absorption. The ultrasound reflection, refraction and scattering, and principle working of ultrasound device.
2. Basic component of Endoscopy, Principle working of Endoscopy, and Types of Endoscopies.
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| 1. Teaching and Learning Strategies
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| **Strategy** | The student will be able to understand the principle of operation of the Diagnostic Instrumentation 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. |
| 1. Course Structure
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| **Week**  | **Hours**  | **Required Learning Outcomes**  | **Unit or subject name**  | **Learning method**  | **Evaluation method**  |
| 1 | 3 | Studying the principle working of ultrasound device  | Introduction to Medical Ultrasound | Theoretical & Practical | Daily test and oral questions |
| 2 | 3 | Learn about ultrasound transducers | Ultrasound Transducers | Theoretical & Practical | Daily test and oral questions |
| 3 | 3 | Learn about sonar imaging systems | Ultrasound Imaging Mode System | Theoretical & Practical | Daily test and oral questions |
| 4&5 | 3 | Learn about sonar imaging systems | Basic Modes of Transmission of Ultrasound | Theoretical & Practical | Daily test and oral questions |
| 6 | 3 | Introduction to the laparoscopic medical device | Introduction to Endoscopy | Theoretical & Practical | Daily test and oral questions |
| 7 | 3 | Learn about the basics of fibers in medical endoscopy | Basic Optics in Endoscopy | Theoretical & Practical | Daily test and oral questions |
| 8 | 3 | Identify the lighting sources used | Light Source | Theoretical & Practical | Daily test and oral questions |
| 9&10 | 3 | Knowing the types of endoscopies | Types of Endoscopies | Theoretical & Practical | Daily test and oral questions |
| 11 | 3 | Introduction to patient monitoring device | Introduction to Patient monitoring systems | Theoretical & Practical | Daily test and oral questions |
| 12 &13 | 3 | Knowledge of heart rate measurement and monitoring | Measurement of Heart Rate | Theoretical & Practical | Daily test and oral questions |
| 14 & 15 | 3 | Learn how to monitor a patient's blood pressure in the intensive care room | Pressure Monitoring | Theoretical & Practical | Daily test and oral questions |
| 1. Course Evaluation
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| 1- Weekly exams2- Monthly exams3- Participations inside the class4-present the seminars5- Writing reports |
| 1. Learning and Teaching Resources
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| Required textbooks (curricular books, if any) | Handbook of Biomedical InstrumentationSecond Edition - R S KHANDPUR |
| Main references (sources) | Handbook Of Biomedical Instrumentation3rd Edition933920543X · 9789339205430By R S Khandpur |
| 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.html?idesc=y |