Course Description Form

1. Course Name:

Medical Instrumentation

2. Course Code:

WBM-41-04

3. Semester / Year:

1st Semester / 2023 2024

4. Description Preparation Date:

19/3/2024

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	The aim of this study is to understand the principle working some laboratory and diagnostic devices that related to pathological analyzes of diseases that effect on the human body, and to diagnose some diseases that related to the heart, brain, or muscle damage.

9. Teaching and Learning Strategies

Strategy	The student will be able to understand the principle of operation of the Laboratory and 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.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction to laboratory medical devices	Introduction to Medical Instruments	Theoretical & Practical	Daily test and oral questions

2	3	Identifying the bio- electrical signals	Bio-electric signals	Theoretical & Practical	Daily test and oral questions
3	3	The main purpose of using a centrifuge	Centrifuge (Part 1)	Theoretical & Practical	Daily test and oral questions
4	3	Principle working , types and method of using the device	Centrifuge (Part 2)	Theoretical & Practical	Daily test and oral questions
5	3	The main purpose of using a blood cell counting device	Blood Cell Counter (Part1)	Theoretical & Practical	Daily test and oral questions
6	3	The principle working and method of using the device.	Blood Cell Counter (Part2)	Theoretical & Practical	Daily test and oral questions
7	3	Identify spectrophotometer and the purpose of its use in the laboratory, in addition to the method of calculating concentrations by knowing the absorbance	Spectrophotometer	Theoretical & Practical	Daily test and oral questions
8	3	Identify the colorimeter device and the purpose of its use in the laboratory, in addition to knowing the concentrations of the substance through the absorbance percentage	Colorimeter	Theoretical & Practical	Daily test and oral questions
9	3	Identifying the device and the purpose of its use in the laboratory, in addition to knowing the concentrations of specific elements such as sodium and potassium, according to the required test.	Flame photometer	Theoretical & Practical	Daily test and oral questions
10	3	Learn about heart signals, how they are generated, and how blood is pumped to the body	ECG (Part 1)	Theoretical & Practical	Daily test and oral questions
11	3	Learn about ways to measure cardiac electrical signals by knowing the principle of the device's operation	ECG (Part 2)	Theoretical & Practical	Daily test and oral questions
12	3	Identify muscle signals and how they are generated	EMG (Part 1)	Theoretical & Practical	Daily test and oral questions
13	3	Learn about methods of measuring muscle electrical signals and how to process them	EMG (Part 2)	Theoretical & Practical	Daily test and oral questions

14	3	Learn about brain signals and how it generate.	EEG (Part 1)	Theoretical & Practical	Daily test and oral questions
15	3	Learn how to record brain signals and how to process them	EEG (Part 2)	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

Required textbooks (curricular books any)	Handbook of Biomedical Instrumentation Second Edition - R S KHANDPUR
Main references (sources)	Handbook Of Biomedical Instrumentation 3rd Edition 933920543X · 9789339205430 By 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