1. Course Name:	
Laboratory Medical Instrumentation I	
2. Course Code:	
MIE21201	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
2025/11/25	
5. Available Attendance Forms:	
Theory: 2 hours, Practically: 2 hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Theory: 30 Hours Practically: 30 hours Total: 60 hours ECTS Credits 7	
7. Course administrator's name (mention all, if more than one name)	
Mohammed Najeeb	
8. Course Objectives	
Course Objectives	1. The graduate get scientific and applied skills to diagnose the medical instruments faults. 2. The graduated students will gain the ability of knowledge of different parts of medical instruments. 3. Development and training the engineering technical staff on medical device maintenance. 4. Preparation of the research and studies to improve and develop the action of medical devices. 5. Prepare application engineers in technical and electronic engineering. 6. Put the proposals and alternatives for the medical devices.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the design, while at the same time refining and expanding their medical instrumentations thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to th

	students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Th.: 2 Pr.: 2	Define common medical instruments and explain their basic functions and uses.	Definition to medical instruments.	Theoretical & Practical	Quiz Exam
2	Th.: 2 Pr.: 2	Understand what medical instruments are and their role in healthcare and recognize common medical instruments and their basic functions.	Introduction to medical instruments.	Theoretical & Practical	Quiz Exam
3	Th.: 2 Pr.: 2	Understand how medical instruments are grouped based on use and function. Recognize major categories such as diagnostic, therapeutic, surgical, and monitoring tools.	Classification of medical instrumentation.	Theoretical & Practical	Quiz Homework Exam
4	Th.: 2 Pr.: 2	Understand basic principles that guide hospital layout and structure. Recognize how design supports patient flow, safety, and efficiency.	Design of hospitals	Theoretical & Practical	Quiz Exam
5	Th.: 2 Pr.: 2	Understand key elements involved in planning an operating room. Recognize how layout, equipment placement, and	Design of operating room	Theoretical & Practical	Quiz Exam

		sterile zones support surgical safety.			
6	Th.: 2 Pr.: 2	Understand fundamental concepts of patient safety in healthcare settings. Recognize common risks and basic strategies to prevent medical errors.	Patient Safety.	Theoretical & Practical	Exam
7	3		Mid-term exam		Exam
8	Th.: 2 Pr.: 2	Understand the purpose and basic use of common introductory laboratory instruments. Recognize key components and terminology related to these tools.	Medical Laboratory Instruments and Tools-1	Theoretical & Practical	Exam Homework
9	Th.: 2 Pr.: 2	Understand more advanced or specialized laboratory instruments. Recognize their functions and how they support diagnostic testing.	Medical Laboratory Instruments and Tools- 2	Theoretical & Practical	Exam Homework
10	Th.: 2 Pr.: 2	Understand how medical laboratories are categorized based on function and testing type. Recognize major laboratory types such as clinical chemistry, microbiology, hematology, and pathology.	Classification of different medical laboratories	Theoretical & Practical	Exam Homework
11	Th.: 2 Pr.: 2	Understand the purpose of calibration in maintaining	Calibration of Medical Laboratory Instruments.	Theoretical & Practical	Assignment

		accuracy and reliability. Recognize basic concepts and procedures involved in instrument calibration.			
12	Th.: 2 Pr.: 2	Understand what a laboratory balance is and its role in measurement. Understand basic principles of accuracy, precision, and proper weighing.	Introduction to Balance.	Theoretical & Practical	Exam Quiz
13	Th.: 2 Pr.: 2	Recognize different types of balances commonly used in medical laboratories.	Balance and their types.	Theoretical & Practical	Exam Homework
14	Th.: 2 Pr.: 2	Understand what a wax bath is and its purpose in clinical and therapeutic settings. Understand the function of a laboratory water bath and its role in heating samples.	Wax bath. Water bath.	Theoretical & Practical	Exam Quiz
15	Th.: 2 Pr.: 2		The preparatory week before the final exam.	Theoretical & Practical	Quiz

Practical Course Structure

Week	Experiment Name
1	**Lab 1: Introduction to medical instruments**
2	**Lab 2: Classification of medical instrumentation.**
3	**Lab 3: Medical Laboratory Instruments and Tools.**
4	**Lab 4: Patient Safety.**
5	**Lab 5: Calibration of Medical Laboratory Instruments.**
6	**Lab 6: Classification of different medical lab.**

7	**Lab 7: Introduction to Balance**
8	**Lab 8: Balance and their types.**
9	**Lab 9: Wax bath**
10	**Lab 10: Water bath**
11	**Exam**

11. Course Evaluation

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	% (١٠)	٣,10	LO # 1,2,3…..14 ,
	Assignments	2	% (10)	4,8	LO # 6,13
	Projects / Lab.	1	%(10)	6	LO #3
	Report	2	% (10)	5,9	LO # 7,12
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)		

تقييم المقرر

يكون توزيع الدرجات كما يلي:

السعي: التكويني 40 درجة ، الامتحان الشهري 10

الامتحان النهائي: النظري 40 درجة ، العملي 10 درجات

12. Learning and Teaching Resources	
Required textbooks (curricular books any)	Biomedical device technology ,by ANTHONY Y. K. CHAN, MSc, MEng, PEng, CCE
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Ananthi ,2005,"A text book of medical instruments
Electronic References, Websites	