

Academic Program Description Form

University Name: Al-Salam University College

Faculty/Institute: Engineering College

Scientific Department: Medical Instrumentation Techniques Engineering Department

Academic or Professional Program Name: Medical Instrumentation Techniques Engineering

Final Certificate Name: Bachelor of Science in Medical Instrumentation Techniques Engineering

Academic System: Yearly

Description Preparation Date: 22/9/2025

File Completion Date: 22/9/2025

Signature: H.T. Zilaen

Head of Department Name:

Date: 22/9/2025

Signature:

Scientific Associate Name:

Date:


Prof. Dr. Sabih Karam AL-Kinani
Dean Assistant For Scientific Affairs

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 22/9/2025

Signature:



اديب منصور قاسم



1. Program Vision

The department seeks to provide academic programs that ensure leadership and excellence in the field of medical instrumentation technologies and scientific research at the local, regional and international levels.

2. Program Mission

Providing a sober academic education based on quality standards, promoting scientific research and innovation, and providing a stimulating educational environment that contributes to the preparation of distinguished engineering cadres in the field of medical instrumentation technologies, in cooperation with various health sector institutions, and with a sustainable approach that keeps pace with scientific developments at the local, regional and international levels.

3. Program Objectives

- 1 -Facilitating administrative procedures and providing psychological and educational guidance to ensure the development of the relationship between students and teachers.
- 2 -Supporting scientific research and encouraging leadership and innovation.
- 3 -Modernizing existing laboratories and developing new laboratories to keep pace with the development in the field of medical instrumentation as well as classrooms and other material supplies.
- 4 -Continuous development of teaching and technical cadres through engaging in training courses, scientific visits and local and international conferences.

5 -Keeping up with the scientific development in modern fields related to the field of medical instrumentation through the development and updating of curricula and the use of artificial intelligence and other technologies in this field.

6 -Enhancing the links between the department and various segments of society through the provision of community services and the provision of consultations.

7- Openness and communication with corresponding scientific institutions locally and regionally.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

The department is currently working on fulfilling the program accreditation requirements, and according to the plan prepared by the department, the accreditation files were submitted at the end of June.

5. Other external influences

The Medical Instrumentation Engineering Department Techniques program is designed and developed based on the requirements of institutions that employ graduates in the job market, such as public and private hospitals, healthcare centers, and medical equipment sales and maintenance companies. The program is also guided by continuous feedback from employers to identify the skills and knowledge demanded by the local and regional labor markets. These entities serve as key pillars in shaping learning outcomes and ensuring their alignment with the needs of the healthcare sector, thereby enhancing graduate readiness and facilitating their integration into the professional work environment.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	9	24	%12.2	
College Requirements	2	6	%3	
Department Requirements	29	167	%84.8	
Summer Training	2	Requirement without units		
Other				

7. Program Description

Credit hours		Course code	Course name	Year/Level	
practical	theoretical				
3	2	MIET1101	Fundamental of Electrical Engineering	First Year	
0	3	MIET1103	Mathematics /1		
2	2	MIET1107	Medical Chemistry		
2	2	MTU1202	Medical Physics		
2	2	MTU1004	Computer Applications		
0	2	MIET1203	Mechanics		
0	2	MTU1006	Democracy and Human rights		
4	0	EETC102	Engineering Drawing		
4	0	EETC101	Workshops		
0	1	MTU1002	English		
3	2	MIET2101	Medical devices/1	Second Year	
2	2	MIET2102	Electronic components and circuits		
2	2	MIET2101	Medical Measurements and Transformers		
0	3	MIET2102	Mathematics/2		
2	2	MIET2205	Anatomy and physiology		
2	2	MIET2104	Clinical Chemistry Equipment		
2	2	MIET2105	Digital technologies		
2	1	MIET2204	Computer Applications/2		

0	1	MIET2203	English language II	Third Year	
0	1	MIET1005	The crimes of the Baath Regiem in Iraq		
0	1	MIET1003	Arabic language		
3	2	MIET1009	Medical devices/2		
2	2	MIET3101	Processor and microcomputer		
2	2	MIET3102	Power electronics		
2	2	MIET3204	Medical Communication Systems		
2	2	MIET3203	Electronic medical systems		
2	2	MIET3103	digital signal processing		
2	2	MIET1009	Electrical Technology		
2	1	MIET3105	Computer Applications /3		
0	1	MIET3106	English language III		
3	2	MIET4101	Medical devices/3	Fourth Year	
2	2	MIET4103	Control systems		
2	2	MIET4202	Radiation engineering		
2	2	MIET4102	Medical Laser Systems		
2	2	MIET4203	Advanced digital design		
0	2	MIET4104	Project management		
2	1	MIET4105	Computer Applications		
0	1	MIET4106	English language IV		
0	2	MTU1008	Professional Ethics		
6	0	MIET4107	Graduation Project		

8. Expected learning outcomes of the program

Knowledge and Understanding

1- Learning Outcomes

- A-1. The ability to design, develop, and attempt to find alternatives for certain parts related to medical devices.
- A-2. The ability to segment and analyze the parts of a medical device and the function of each part.
- A-3. The ability to diagnose malfunctions in medical devices, develop an appropriate plan for medical device maintenance, and schedule and program periodic maintenance work.
- A-4. The ability to prepare and study the appropriate conditions for each device.

Topic and specific skills	
2-Learning Outcomes	B-1 Training and development of engineering personnel in the calibration, operation, and maintenance of medical devices. B-2 Designing highly efficient and cost-effective medical devices. B-3 Providing scientific and practical consultations in the field of medical devices. B-4 Installation, operation, and maintenance of electronic and .electromechanical medical devices, both diagnostic and therapeutic
Ethics and Thinking Skills	
3-Learning Outcomes	C-1. The ability to work within a multidisciplinary team (engineers, physicians, technicians) to improve the performance of medical .devices C-2. Commitment to professional ethics and safety standards when .dealing with patients and medical data C-3. Possess effective communication skills when explaining medical .device technologies to non-specialists C-4. Openness and communication with peer scientific institutions locally and regionally, and strengthening ties with various segments of society.
General and Transferable Skills	
4- Learning Outcomes	D-1 Possess leadership skills and the ability to effectively manage work teams. D-2 Ability to lead, innovate, and conduct scientific research in the field of medical devices. D-3 Ability to continuously develop oneself and keep up with developments in the field of specialization. D-4 Ability to use modern software in designing and simulating medical devices.

9. Teaching and Learning Strategies

1 .Knowledge and Understanding:

Demonstrate knowledge of fundamental concepts related to digital biomedical systems, such as bio signal processing, vital data transmission, and integration with smart healthcare technologies.

2 .Intellectual Skills:

Analyze and understand the impact of biomedical devices on disease diagnosis, vital signs monitoring, and accurate clinical data management.

3 .Applied Skills:

Perform practical tasks using engineering simulation software and specialized tools for testing and maintaining biomedical devices such as ECG machines, monitors, and imaging systems.

4 .Transferred Skills

Communicate specialized scientific content using visual and interactive educational tools, and actively participate in workshops or seminars that blend theory with practice in continuous medical education.

10. Evaluation methods

Discussion-Daily Evaluation semester evaluation - practical evaluation - final - evaluation – presentation- Quizzes - weekly reports

11.Faculty

Faculty members

Number of the teaching staff		Special requireme nts/skills (if any)	Specialization		Academic rank
Lecturer	staff	-	Special	General	
-	1	-	-	1	Pof.
-	2	-	2	-	Asst.Prof

2	6	-	4	4	Lecturer
1	10	-	5	6	Asst.Lecturer
3	19	-	11	11	Total

Faculty members by degree, academic title, and specialization

NO	Name	Certificate	Academic title	Specialization		Faculty preparation	
				general	private	Staff	lecturer
.1		PhD	Professor	Electrical Engineering	digital signal processor	✓	
.2		PhD	Assistant Professor	Electrical Engineering	el electronic Engineering and Medical Electronics	✓	
.3		PhD	Assistant Professor	Mechanical Engineering	Control	✓	
.4		PhD	lecturer	Electrical Engineering	wireless communications	✓	
.5		PhD	lecturer	Computer Engineering	artificial intelligence	✓	
.6		PhD	lecturer	Biomedical Engineering	Biomedical Engineering		✓
.7		PhD	lecturer	Electrical Engineering	Communications Engineering	✓	
.8		PhD	lecturer	Electrical Engineering	General Electricity	✓	
.9		PhD	lecturer	communication	Optical communications	✓	
.10		PhD	lecturer	Physics	renewable energy	✓	
.11		PhD	lecturer	Materials engineering	Metallurgical engineering		✓
.12		Master's	lecturer	Industrial Engineering	Industrial Management	✓	
.13		Master's	Assistant Lecturer	Computer Engineering	computer	✓	

.14		Master's	Assistant Lecturer	Electrical Engineering	Communications Engineering	✓	
.15		Master's	Assistant Lecturer	lawH	Common law		✓
.16		Master's	Assistant Lecturer	Project Management	Engineering Project Management	✓	
.17		Master's	Assistant Lecturer	information technology	Software	✓	
.18		Master's	Assistant Lecturer	Electrical Engineering	industrial electronics	✓	
.19		Master's	Assistant Lecturer	Electrical Engineering	Electronics	✓	
.20		Master's	Assistant Lecturer	Electrical Engineering	Electronics	✓	
.21		Master's	Assistant Lecturer	Electrical Engineering	communication	✓	
.22		Master's	Assistant Lecturer	Materials Engineering	metallurgy	✓	

12. Professional development

Orientation of new faculty members

The orientation of new faculty members aims to provide the necessary support and guidance to ensure their success in the academic environment. This is achieved through the preparation of a comprehensive orientation program that includes workshops focusing on modern teaching methods, classroom management, and student assessment techniques. Additionally, experienced faculty members are appointed as mentors to accompany the new members, offering continuous advice and support. Periodic meetings are also organized to discuss the challenges they face and to exchange ideas and educational resources.

Professional development for faculty members

Professional development is the cornerstone for improving the quality of academic education. It helps faculty members stay updated with the latest medical and engineering technologies and develop their skills in using modern devices and analysis

and design software. It also enhances teaching and assessment methods to align with labor market requirements and strengthens their abilities to supervise graduation projects and scientific research. Faculty members are encouraged to participate in workshops and training courses, undertake field visits, and engage in industrial collaborations, which allow them to better understand market needs and apply them within the educational environment.

13.Acceptance Criteria

The Department of Biomedical Equipment Technology Engineering admits the following categories of applicants:

- General Secondary School Graduates – Scientific Branch (Biological and Applied Sciences Eligible for admission to the first academic year with a minimum average of 60% for the morning study and 58% for the evening study
- Industrial Secondary School Graduates – Specializations in Electronics, Control, and Medical Devices Eligible for admission with a minimum average of 63% for the morning study and 58% for the evening study.
- Vocational Industrial Secondary School Graduates – Medical Devices Department for admission to the first academic year with a minimum average of 63% for the morning study and 58% for the evening study.
- Technical Institute Graduates – Medical Devices Department Eligible for admission to the first academic year with a minimum average of 63% for the morning study and 58% for the evening study.

14. The most important sources of information about the program

Website of the Medical Instrumentation Engineering Techniques Department– College of Engineering and Engineering Technologies / Al-Salam College

<https://alsalam.edu.iq/>

Guide of the Department, College, and University

Website of the corresponding department to the Medical Instrumentation Engineering Techniques Department (Middle Technical University / Electrical Technical College)

<https://eetc.mtu.edu.iq/>

15. Program development plan

1. Curriculum Update:

- Keeping up with technological advancements in the field of medical devices by updating existing course materials and introducing new subjects that align with rapid technological development and the ever-changing demands of the job market.

2. Enhancing Practical Training:

- Upgrading laboratories with simulators and modern technologies, and expanding the department's partnerships with hospitals and medical device companies to ensure intensive hands-on training for students.

3. Academic and Research Collaboration:

- Establishing partnerships with local and international universities and research centers to exchange expertise and promote applied research in this field.

4. Quality Assurance and Accreditation:

- The program is aligned with both local and international quality and accreditation standards, such as ABET. Performance is regularly evaluated through surveys conducted among graduates and employers to continuously enhance and improve the learning outcomes

Program Skills Map

Required learning outcomes of the program

				knowledge				Skills				Ethics				General and transferable skills			
Year / Level	Course Code	Course Name	Basic or elective	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4	D 1	D 2	D 3	D 4
First Year	MU0241001	Principles of Electrical Engineering	Specialist	✓	✓	✓	✓	✓	✓		✓	✓					✓	✓	
	MU0241002	Mathematics I	Auxiliary	✓					✓			✓					✓		✓
	MU0241003	medicinal chemistry	Auxiliary	✓					✓			✓	✓	✓			✓	✓	
	MU0241004	Medical Physics	Auxiliary	✓	✓		✓			✓					✓		✓	✓	

	MU0241005	Computer Applications	Specialist	✓		✓												✓			✓	
	MU0241006	Mechanics	Specialist	✓	✓		✓												✓			
	MU0241007	Democracy and human rights	Generally																			
	MU0241008	Engineering drawing	Auxiliary																			
	MU0241009	Workshops	Specialist																			
	MU0241010	English language	Auxiliary																			
	MU0242001	Medical devices/1	Specialist	✓																		
	MU0242002	Electronic components and circuits	Specialist																			
Second year																						

[illegible]

Fourth year									
MU0244002	Control systems	Specialist	✓	✓	✓	✓	✓	✓	✓
MU0244003	Radiation engineering	Specialist	✓		✓			✓	✓
MU0244004	Medical Laser Systems	Specialist	✓		✓			✓	✓
MU0244005	Advanced digital design	Specialist	✓			✓		✓	✓
MU0244006	Project management	Generally				✓	✓	✓	
MU0244007	Computer /4pplicationsA	Auxiliary	✓			✓		✓	✓
MU0244008	English language	Auxiliary					✓	✓	
MU0244009	Professional ethics	Generally					✓		
MU0244010	Graduation Project	Specialist	✓	✓	✓	✓	✓	✓	✓