Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Section

Academic Program and Course Description Guide

2025-2026

Academic Program Description Form

University Name: Al-Mustaqbal University College

College/Institute: College of Engineering and Engineering Technologies

Academic Department: Biomedical Engineering Department

Program Title: Bachelor of Science in Biomedical Engineering

Title of Final Award: Bachelor of Science in Biomedical Engineering

Academic System: Courses

Description Preparation Date:

File Completion Date: 16/9/2024

Signature	Signature
Head of the department	Scientific Associate
Prof. Dr. Ibrahim Abdullah Murdas	**Dr.**

File Verified By:

Quality Assurance and University Performance Division

Name of the Quality Assurance and University Performance Division Director:

Dr.

Date:

Signature:

Dean's Approval

1. Program Vision

The Department of Biomedical Engineering aspires to locally and regional leadership in medical technological innovation, developing advanced healthcare solutions, serving the community, and preparing qualified graduates who keep pace with healthcare advancements.

2. Program Mission

The Department of Biomedical Engineering strives to prepare distinguished engineers equipped with modern scientific and technical skills through a stimulating educational environment and innovative research, enabling them to develop engineering solutions that meet the needs of the healthcare sector and contribute to serving the community, in alignment with quality standards and academic accreditation.

3. Program Goals

1. To actively contribute to prestigious institutions within the field of biomedical engineering, take on leadership roles, and strive for professional advancement through continuous learning and active participation in professional associations.
2. To seek innovative scientific solutions by developing and applying modern technologies through continuous research and scientific development.
3. To integrate sustainability and ethical practices by considering environmental and economic factors to ensure effective and responsible engineering solutions.

4. Program Accreditation

Currently working on preparing the required reports for the program accreditation, and the files will be submitted in June of this year.

5. Other External Influences
is there a sponsoring entity for the program? Not available

6. Program structure				
Program Structure	Number of Courses	Credit	Percentage	Notes *
Institution Requirements	**8**	**14**	10.13%	
College Requirements	**12**	**56**	15.19%	
Department Requirements	**59**	**176**	74.68%	
Summer Training	**2**			
Other				

* Notes may include whether the course is basic or elective.

ECTS	Credit Hours		Course Name	Course Code	Year/Level
	Practical	Theoretical			
8	0	8	Engineering Mechanics	UOMU0101011	First Year - First Semester
7	0	5	Intro to Biomedical Engineering I	UOMU0101012	
7	0	8	Calculus	UOMU0101013	
4	0	2	General Biology	UOMU0101014	
2	0	2	English language skills		
2	0	2	Arabic language skills		
7	0	5	Intro to Biomedical Engineering II	UOMU0101021	First Year - Second Semester
6	2	2	Axial Anatomy	UOMU0101022	
5	0	3	Medical Physics	UOMU0101023	
5	2	3	Engineering Drawing	UOMU0101024	
2	2	1	Engineering Workshops	UOMU0101025	
3	2	1	Computer Science		
2	0	2	Democracy and Human Rights		
6	0	6	Applied Mathematics	UOMU0101031	Second Year - First Semester
6	2	2	Appendicular Division Anatomy	UOMU0101032	
6	2	4	Introductory Electric Circuits	UOMU0101033	
4	0	4	Strength and Properties of Materials	UOMU0101034	
4	2	1	Computing for BME (Mat. Lab)	UOMU0101035	
4	2	2	Chemistry	UOMU0101036	
6	2	4	Digital Electronics	UOMU0101041	Second Year - Second Semester
6	2	4	Electric Circuits	UOMU0101042	
5	2	2	Biochemistry	UOMU0101043	
4	0	3	Biomaterials Engineering	UOMU0101044	
3	2	2	Computers (Applications of Artificial Intelligent)	UOMU0101045	
2	0	1	Advance Arabic Language		
2	0	1	Advance English Language		
2	0	1	Baath Party Crimes		
6	2	2	Medical Monitoring Devices	UOMU0101051	Third Year - First Semester
5	2	3	Analog Electronics	UOMU0101052	
5	0	4	Bioelectromagnetic fields	UOMU0101053	

5	0	3	Transport Phenomena in BME	UOMU0101054	
5	0	3	Optics in Biomedical Engineering	UOMU0101055	
4	0	3	Physiology	UOMU0101056	
6	2	4	Biomedical Signals Processing	UOMU0101061	Third Year - Second Semester
7	0	8	Engineering Analysis and Numerical Methods	UOMU0101062	
5	0	4	Rehabilitation Science	UOMU0101063	
4	0	4	Thermodynamics in BME	UOMU0101064	
4	0	3	Medical Lasers	UOMU0101065	
4	0	4	Biomedical Circuits & Electronics	UOMU0101066	

Credit Hours		Course Name	Course Code	Year/Level
Theoretical	Theoretical			
2	2	Control Systems 1	MU01014101	Fourth Year - First Semester
0	3	Clinical Issues in BME Design	MU01014102	
0	3	Biom. Instrumentation Design I 1	MU01014103	
0	3	Design of Machine Elements	MU01014104	
2	1	Computer Aided Design 1	MU01014105	
0	3	Artificial Limbs	MU01014106	
0	2	Microwave, X-ray & Gamma ray 1	MU01014107	
3	0	Medical Measurements Lab1	MU01014108	
2	2	Control Systems 2	MU01014201	Fourth Year - Second Semester
2	2	Microcontroller	MU01014202	
0	3	Biom. Instrumentation Design I 2	MU01014203	
0	3	Laboratory Instrumentation	MU01014204	
2	1	Computer Aided Design 2	MU01014205	
0	3	Artificial Organs	MU01014206	
0	2	Microwave, X-ray & Gamma ray 2	MU01014207	
3	0	Medical Measurements Lab2	MU01014208	
2	2	Biomedical Sensors 1	MU01015101	Fifth Year - First Semester
2	3	Senior Design Project 1	MU01015102	
0	4	Biom. Instrumentation Design II 1	MU01015103	
2	2	Image Processing for the BME 1	MU01015104	

0	2	Neural Engineering	MU01015105	
4	0	Biomedical Instrumentation Lab	MU01015106	
2	1	Statistics for Biomedical Engineer	MU01015107	
1	2	Biomedical sensors 2	MU01015201	Fifth Year - Second Semester
2	3	Senior Design Project 2	MU01015202	
2	2	Biomedical Signal Analysis	MU01015203	
4	0	Biomechanics Design Lab	MU01015204	
0	4	Biom. Instrumentation Design II 2	MU01015205	
2	2	Image Processing for the BME 2	MU01015206	
0	4	Selected Topics in Biom. Eng.	MU01015207	

8. Program Expected Learning Outcomes	
Knowledge	
Technical Knowledge Graduates will have a strong understanding of the principles, theories, and concepts related to biomedical engineering. They will have knowledge of electrical circuits and electronics, biomechanics, control systems, computer-aided design, medical imaging, biomaterials, and other related fields.	Learning Outcome 1
Skills	
Teamwork and Communication Graduates will be able to collaborate effectively with multidisciplinary teams, whether in hospitals or in the private medical sector, and communicate technical information clearly and concisely. They will develop skills in teamwork, leadership, and interpersonal communication..	Learning Outcome 2
Laboratory and Field Studies Graduates will be able to conduct laboratory experiments and project-based tasks in their studies, using scientific equipment and computer technology, while observing and learning through practical tasks..	Learning Outcome 3
Data Collection and Analysis Graduates will be able to demonstrate scientific quantitative skills, such as the ability to design scientific experiments,	Learning Outcome 4

collect data, analyze collected data, and draw conclusions from the analysis..	
Values	
Problem Solving and Critical Thinking Graduates will be able to develop and apply problem-solving and critical thinking skills in the field of biomedical engineering. They will learn how to identify and analyze issues related to their field, propose effective solutions, and make informed decisions in complex technical situations.	Learning Outcome 5
Professionalism and Work Ethics Students will understand the ethical and professional responsibilities associated with biomedical engineering. Because their work interacts significantly with patients, whether in hospitals or in the private sector, they will demonstrate professionalism, integrity, and an understanding of the impact of their work on society and patient well-being. They will also be prepared to adapt to advances in technology, follow industry trends, and engage in self-learning to help them face challenges in this field.	Learning Outcome 6

9. Teaching and Learning Strategies

- Classroom instruction through theoretical lectures.
- Education in scientific laboratories.
- Preparing reports.
- Assigning students homework.
- Preparing reports using the library, the Internet, and scientific research.
- Theoretical lectures.
- Using electronic presentations.
- Practical lectures in scientific laboratories..

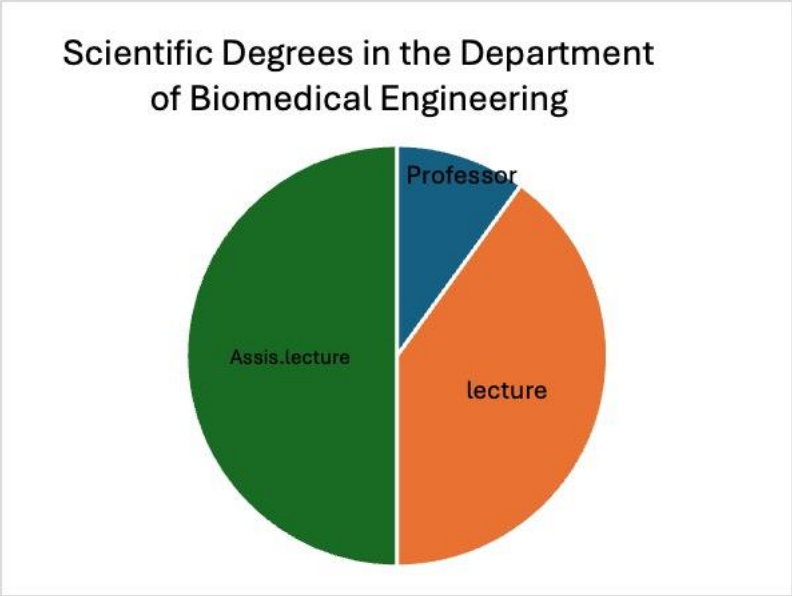
10. Assessment Methods

- Monthly and final exams.
- Daily activities.
- Writing and delivering reports.
- Observing students' performance on assignments.
- Conducting student surveys.

- Quizzes.
- Practical exams.
- Homework assignments..

10. Faculty						
Faculty Members						
Number of academic staff		Requirements/Special Skills (if any)		Specialization		**Name**
Lecturer	**Staff**			Specific	General	
2	10			Electronics and Communications	Electrical Engineering	Prof. Dr. Ibrahim Abdullah Mirdas
				Applied Mechanics	Mechanical Engineering	Dr. Ali Kamel Karim
				Biomaterials engineering	Material Engineering	Dr. Amir Najah Saud
				Electronics and Communications	Electrical Engineering	Dr. Hussam Jawad Kadhim
				Metallic	Materials Engineering	Dr. Alaa Mohammed Hussein
				Biomedical Engineering	Biomedical Engineering	Lecturer Maher Rahman Abdulamir
				Metallic	Materials Engineering	Lecturer Iman Yasser Hussein
				Biomedical Engineering	Biomedical Engineering	Lecturer Zainab Sattar Jabbar
				Biomedical Engineering	Biomedical Engineering	Lecturer Heba Diyaa Abdulamir
				Applied Mechanics	Mechanical Engineering	Lecturer Fatima Rehaeem Abbas
				Biomaterials engineering	Material Engineering	Lecturer Abd Allah Kais Hashim
				Applied Mechanics	Mechanical Engineering	Prof. Dr. Mustafa Turki

				Biomedical Engineering	Biomedical Engineering	Assist.Prof. Shaima Ibraheem



Professional Development
Orientation of new faculty members
The orientation for new faculty members aims to provide the necessary support and guidance to ensure their success in the academic environment. This is achieved through a structured orientation program that includes workshops focusing on modern teaching methods, classroom management, and student assessment techniques. Experienced faculty members are assigned as mentors to accompany new members and offer continuous advice and support. Additionally, regular meetings are organized to discuss challenges faced by new faculty and to exchange ideas and educational resources.
• Professional development for faculty members

The professional development of faculty members aims to enhance their academic and teaching skills through continuous and diverse training opportunities. Workshops and training courses are provided covering areas such as modern teaching techniques, scientific research, and the use of technology in university education. Faculty members are also encouraged to participate in local and international conferences and seminars, allowing them to share knowledge and experiences with colleagues and specialists in the field of biomedical engineering. Lastly, a culture of self-evaluation and constructive feedback is promoted to continuously improve academic performance.

Admission Criteria

Applicants will normally be required to have passed the Baccalaureate Examination of the Secondary School / Scientific Branch according to the regulations stated by the Ministry of Higher Education and Scientific Research.

The minimum requirements for applicants to the Department of Biomedical Engineering are as follows:

Branch	Morning Study	Evening Study
Scientific (Biological - Applied)	70%	60%

Key Sources of Information About the Program

Ministry of Higher Education and Scientific Research
www.en.mohesr.gov.iq
Biomedical Engineering Department - College of Engineering and Engineering Technologies - Al-Mustaqbal University College

Program Development Plan

- **Updating Curricula and Enhancing Practical Training:**

Reviewing and updating the current curricula to include the latest technologies in biomedical engineering, covering topics such as artificial intelligence in medicine, bio-modeling, medical imaging techniques, and medical robotics, with increased focus on practical applications and training in hospitals and research centers.

- **Strengthening Scientific Research and Infrastructure:**

Supporting scientific research by providing advanced resources and laboratories, and encouraging faculty members and students to innovate and publish in specialized journals.

- **Developing Academic Staff and Partnerships:**

Enhancing faculty competence through continuous training and participation in conferences,

while building strategic partnerships with the medical and industrial sectors to improve training and employment opportunities.

 Fostering Student Activities and Innovation:
Supporting student clubs and events that develop professional and innovative skills, and organizing competitions and applied projects that encourage creativity.

Program Skills Outline															
Required program Learning outcomes															
Ethics				**Skills**				**Knowledge**				**Basic or elective**	Course Name	Course Code	Year/Level
C4	**C3**	**C2**	**C1**	**B4**	**B3**	**B2**	**B1**	**A4**	**A3**	**A2**	**A1**				
			√		√	√					√	Basic	Engineering Mechanics	UOMU0101011	**2025-2024** First Year - First Semester
		√	√			√					√	Basic	General Biology	UOMU0101014	
			√			√	√				√	Basic	Calculus	UOMU0101013	
		√	√		√	√	√				√	Basic	Intro to Biomedical Engineering I	UOMU0101012	
			√		√		√				√	Basic	English language skills		
			√		√		√				√	Basic	Arabic language skills		
		√	√		√	√	√				√	Basic	Engineering Workshops	UOMU0101025	**2025-2024**
			√			√	√				√	Basic	Engineering Drawing	UOMU0101024	

			√			√	√				√	Basic	Axial Anatomy	UOMU0101022	First Year - Second Semester
			√		√	√					√	Basic	Medical Physics	UOMU0101023	
			√		√	√					√	Basic	Computer Science		
		√	√		√	√	√				√	Basic	Intro to Biomedical Engineering II	UOMU0101021	
			√		√		√				√	Basic	Democracy and Human Rights		
			√		√	√	√			√	√	Basic	Applied Mathematics	UOMU0101031	**2025-2024** Second Year - First Semester
√	√	√	√			√	√		√	√	√	Basic	Strength and Properties of Materials	UOMU0101034	
						√	√		√	√	√	Basic	Appendicular Division Anatomy	UOMU0101032	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Introductory Electric Circuits	UOMU0101033	
√	√	√	√			√	√	√	√	√	√	Basic	Computing for BME (Mat. Lab)	UOMU0101035	
√	√	√	√		√	√	√		√	√	√	Basic	Chemistry	UOMU0101036	

√	√	√	√			√	√		√	√	√	Basic	Digital Electronics	UOMU0101041	**2025-2024** Second Year - Second Semester
	√	√	√			√	√		√	√	√	Basic	Computes (Applications of Artificial Intelligent)	UOMU0101045	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Electric Circuits	UOMU0101042	
√	√	√	√		√	√	√		√	√	√	Basic	Biochemistry	UOMU0101043	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Biomaterials Engineering	UOMU0101044	
		√	√	√							√	Basic	Baath Party Crimes		
		√	√			√	√		√	√	√	Basic	Advance Arabic Language		
√	√	√	√			√	√	√	√	√	√	Basic	Advance English Language		
√	√	√	√			√	√		√	√	√	Basic	Analog electronics	UOMU0101052	**2025-2024**
	√	√	√	√	√	√	√	√	√	√	√	Basic	Physiology	UOMU0101056	
√	√	√	√			√	√		√	√	√	Basic	Bioelectromagnetic fields	UOMU0101053	

	√	√	√				√	√	√	√	√	Basic	Medical Monitoring Devices	UOMU0101051	Third Year - First Semester
		√	√	√	√	√	√	√	√	√	√	Basic	Transport phenomena for BME	UOMU0101054	
√	√	√	√	√	√	√	√		√	√	√	Basic	Optics in Biomedical Engineering	UOMU0101055	
		√	√	√	√	√	√	√	√	√	√	Basic	Biomedical Signals processing	UOMU0101061	**2025-2024** Third Year - Second Semester
		√	√			√	√			√	√	Basic	Engineering Analysis and Numerical Methods	UOMU0101062	
√	√	√	√			√	√		√	√	√	Basic	Rehabilitation Science	UOMU0101063	
		√	√	√	√	√	√	√	√	√	√	Basic	Thermodynamics in BME	UOMU0101064	
√	√	√	√	√	√	√	√		√	√	√	Basic	Medical Lasers	UOMU0101065	

√	√	√	√			√	√		√	√	√	Basic	Biomedical Circuits & Electronic	UOMU0101066	
			√				√			√	√	Basic	Control system 1	MU01014101	**2025-2024** Fourth Year - First Semester
√	√	√	√		√	√	√		√	√	√	Basic	Clinical issues in BME design	MU01014102	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Biom. Instrumentation design I 1	MU01014103	
						√	√		√	√	√	Basic	Design of Machine Elements	MU01014104	
		√	√		√	√	√	√	√	√	√	Basic	Computer aided design 1	MU01014105	
	√	√		√	√	√	√		√	√	√	Basic	Artificial limbs	MU01014106	
	√	√	√			√	√		√	√	√	Basic	Microwave, X-ray & Gamma ray 1	MU01014107	
√	√	√	√			√	√		√	√	√	Basic	Medical measurments lab 1	MU01014108	
			√				√			√	√	Basic	Control system 2	MU01014201	**2025-2024** Fourth Year -
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Biom. Instrumentation design I 2	MU01014203	
√	√	√	√		√	√	√		√	√	√	Basic	Microcontroller	MU01014202	

						√	√		√	√	√	Basic	Laboratory Instrumentation	MU01014204	Second Semester
		√	√		√	√	√	√	√	√	√	Basic	Computers aided design 2	MU01014205	
	√	√		√	√	√	√		√	√	√	Basic	Artificial organs	MU01014206	
	√	√	√			√	√		√	√	√	Basic	Microwave, X-ray & Gamma ray2	MU01014207	
√	√	√	√			√	√		√	√	√	Basic	Medical measurments lab 2	MU01014208	
			√				√			√	√	Basic	Biomedical sensor 1	MU01015101	**2025-2024** Fifth Year – first Semester
						√	√		√	√	√	Basic	Senior Design Project 1	MU01015102	
√	√	√	√		√	√	√		√	√	√	Basic	Neural Engineering	MU01015105	
		√	√		√	√	√	√	√	√	√	Basic	Biomedical instrumentation lab	MU01015106	
√	√	√	√			√	√		√	√	√	Basic	Bioinstrumentation design II 1	MU01015103	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Image processing for the BME 1	MU01015104	
	√	√		√	√	√	√		√	√	√	Basic	Statistics for biomedical engineer	MU01015107	
			√				√			√	√	Basic	Biomedical Sensor 2	MU01015201	

						√	√		√	√	√	Basic	Senior Design Project 2	MU01015202	**2025-2024**
√	√	√	√		√	√	√		√	√	√	Basic	Biomedical Signal Analysis	MU01015203	Fifth Year - Second Semester
		√	√		√	√	√	√	√	√	√	Basic	Biomechanics Design Lab	MU01015204	
√	√	√	√			√	√		√	√	√	Basic	Biom. Instrumentation Design II 2	MU01015205	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Image Processing for the BME 2	MU01015206	
	√	√		√	√	√	√		√	√	√	Basic	Selected Topics in Biom.Eng	MU01015207	