

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



# **Academic Program and Course Description Guide**

**\* Bologna system**

**2025–2024**



### Aacademic Program Description Form

**University Name:** University of Warith AL-Anbiya

**Faculty/Institute:** College of Engineering

**Scientific Department:** Biomedical Engineering Department

**Academic or Professional Program Name:** Bachelor of Biomedical Engineering

**Final Certificate Name:** Bachelor's Degree in Biomedical Engineering

**Academic Degree System:** Semester System & Bologna Process

**Description Preparation Date:** 2024/12/1

**File Completion Date:** 2024/12/29

**Signature:**

**Head of Department:** Osama Abdulbari Khadhair

**Date:** 8/2/2025

**Signature:**

**Assistant Dean For Scientific**

**Affairs:** Dr. Hassan .T. Hashim

**Date:** 5/2/2025

**The file is checked by:** Dr. Salam Al-Rbeawi

**Department of Quality Assurance and University Performance**

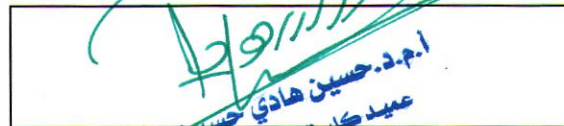
**Director of the Quality Assurance and University Performance**

**Department:**

**Date:** 5/2/2025

**Signature:**

**Approval of the Dean**



أ.م.د. حسين هادي حسين  
عميد كلية الهندسة

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

### **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students

to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the department members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## 1. Program Vision

The Biomedical Engineering Department aims to become a leading and distinguished global educational institution in the field of biomedical engineering. The department seeks to be a natural destination for scientific, research, and practical consultations, in addition to enhancing industrial skills. It aspires to prepare students for successful careers based on high-quality education and rigorous academic standards. Through this vision, the department contributes to achieving comprehensive sustainable development in all the areas it encompasses.

## 2. Program Mission

The Biomedical Engineering Department strives to empower graduates with scientific and technological knowledge, along with practical skills, in the field of biomedical engineering. The department leverages the latest technologies and quantitative engineering methods to advance applications in medical sciences. Its mission aims to prepare graduates capable of designing and developing innovative diagnostic and therapeutic devices that contribute to improving the quality of healthcare and enhancing medical services.

## 3. Program Objectives

**A.** To prepare specialized engineering personnel in the field of Biomedical Engineering who are capable of dealing with the challenges and difficulties they may encounter while working in industrial and technological sectors. This is achieved by providing students with all the essential scientific knowledge and skills required in this field.

**B.** To qualify technical and engineering competencies in Biomedical Engineering, enabling them to keep up with the latest scientific and technological developments and apply them in serving the community, while also enhancing students' teamwork skills.

**C.** To empower graduates to apply engineering principles to solve problems and challenges they may face in their professional field, in addition to strengthening their understanding of the philosophy of engineering design within the scope of the specialization.

## 4. Program Accreditation

In progress.

## 5. Other external influences

NO.

6. Program Structure (Credit Bologna system)				
Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	20	6%	Essential
College Requirements	8	47	15%	Essential
Department Requirements	46	233	79%	Essential
Summer Training	1			Essential
Other				

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
1 <sup>st</sup>	UOW-101	Human Rights and Democracy	2	0
1 <sup>st</sup>	UOW -102	English Language I	2	0
1 <sup>st</sup>	ENG-101	Mathematics I	3	0
1 <sup>st</sup>	ENG-102	Engineering Drawing	1	3
1 <sup>st</sup>	BME-111	bio-Chemistry	4	3
1 <sup>st</sup>	BME-112	Electrical Circuits I	3	3
1 <sup>st</sup>	UOW-103	Arabic Language I	2	0
1 <sup>st</sup>	UOW-104	Computer science I	1	2
1 <sup>st</sup>	ENG-103	Mathematics II	3	0
1 <sup>st</sup>	ENG-104	Physics	3	0
1 <sup>st</sup>	BME-121	Medical Physics	2	3
1 <sup>st</sup>	BME-122	Electrical Circuits II	3	3
2 <sup>nd</sup>	BME-211	Electronic Circuits I	3	3
2 <sup>nd</sup>	BME-212	Cell Biology	3	0
2 <sup>nd</sup>	ENG-201	MATHEMATICS III	3	0
2 <sup>nd</sup>	ENG-202	Engineering	3	0



		Mechanics		
2 <sup>nd</sup>	BME-213	Medical Informatics	2	2
2 <sup>nd</sup>	BME-214	Materials Science	2	2
2 <sup>nd</sup>	UOW-201	Baath Part Criminals	1	0
2 <sup>nd</sup>	UOW-105	Ethics	2	0
2 <sup>nd</sup>	UOW -202	Arabic Language II	2	0
2 <sup>nd</sup>	UOW-102	English Language II	2	0
2 <sup>nd</sup>	UOW-104	Computer science II	1	2
2 <sup>nd</sup>	ENG-203	Computer Programming	4	3
2 <sup>nd</sup>	BME-222	Electronics Circuits II	3	3
2 <sup>nd</sup>	BME-224	Limbs Anatomy	3	3
3 <sup>rd</sup>	WBM-31-01	Engineering Analysis	3	0
3 <sup>rd</sup>	WBM-31-02	Mechanics of Materials I	2	0
3 <sup>rd</sup>	WBM-31-03	Trunk Anatomy	2	3
3 <sup>rd</sup>	WBM-31-04	Physiology I	2	3
3 <sup>rd</sup>	WBM-31-05	Histology	2	2
3 <sup>rd</sup>	WBM-31-06	Medical Equipment	2	2
3 <sup>rd</sup>	WBM-31-07	Fiber Optics	2	2
3 <sup>rd</sup>	WBM-32-01	Engineering Statistics	2	0
3 <sup>rd</sup>	WBM-32-02	Numerical Analysis	2	2
3 <sup>rd</sup>	WBM-32-03	Mechanics of Materials II	2	3
3 <sup>rd</sup>	WBM-32-04	Neck & Nervous Anatomy	2	3
3 <sup>rd</sup>	WBM-32-05	Physiology II	2	3
3 <sup>rd</sup>	WBM-32-06	Electronics III	2	0
3 <sup>rd</sup>	WBM-32-07	Bone Injury and Fractures	2	0
4 <sup>th</sup>	WBM-41-01	Biomechanics I	2	3
4 <sup>th</sup>	WBM-41-02	Biomaterials I	2	0
4 <sup>th</sup>	WBM-41-03	Communications I	2	3
4 <sup>th</sup>	WBM-41-04	Medical Instrumentation	2	2
4 <sup>th</sup>	WBM-41-05	Thermo-Fluid Mechanics I	2	2
4 <sup>th</sup>	WBM-41-06	Digital Electronics	2	3

		I		
4 <sup>th</sup>	WBM-41-07	Pathology	2	0
4 <sup>th</sup>	WBM-42-01	Biomechanics II	2	3
4 <sup>th</sup>	WBM-42-02	Biomaterials II	2	0
4 <sup>th</sup>	WBM-42-03	Communications II	2	3
4 <sup>th</sup>	WBM-42-04	Analytical Mechanics	2	0
4 <sup>th</sup>	WBM-42-05	Therapeutic Instrumentation	2	2
4 <sup>th</sup>	WBM-42-06	Digital Electronics II	2	3
4 <sup>th</sup>	WBM-42-07	Thermo-Fluid Mechanics II	2	2
5 <sup>th</sup>	WBM-51-01	Project	0	4
5 <sup>th</sup>	WBM-51-02	Elective I	2	0
5 <sup>th</sup>	WBM-51-03	Diagnostic Instrumentation	2	2
5 <sup>th</sup>	WBM-51-04	Control I	2	2
5 <sup>th</sup>	WBM-51-05	Image Processing	2	2
5 <sup>th</sup>	WBM-51-06	Microprocessor	2	3
5 <sup>th</sup>	WBM-51-07	Hospital System & Design	2	0
5 <sup>th</sup>	WBM-52-01	Project	0	4
5 <sup>th</sup>	WBM-52-02	Elective II	2	0
5 <sup>th</sup>	WBM-52-03	Elective III	2	0
5 <sup>th</sup>	WBM-52-04	Control II	2	3
5 <sup>th</sup>	WBM-52-05	Computer Network	2	0
5 <sup>th</sup>	WBM-52-06	Bio tribology	2	0
5 <sup>th</sup>	WBM-52-07	Neural Networks	2	0
5 <sup>th</sup>	WBM-52-08	Biomedical Sensor	2	0

## 8. Expected learning outcomes of the program

Learning Outcomes 1	An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.
Learning Outcomes 2	An ability to apply engineering design process to produce solutions that meet specified needs with consideration of public health, safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.
Learning Outcomes 3	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion.



Learning Outcomes 4	An ability to communicate effectively with a range of audiences.
Learning Outcomes 5	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments which must consider the impact of engineering solutions in global, economic, environment, and social context.
Learning Outcomes 6	An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge
Learning Outcomes 7	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

## 9. Teaching and Learning Strategies









The **Biomedical Engineering Department** strives to provide a comprehensive and rigorous education to its students pursuing a Bachelor's degree. It aims to equip them with the necessary knowledge and skills to excel in their professional lives.










- **Research and Development:** The department promotes advanced research in the field of biomedical engineering, with a major focus on innovative technologies, medical devices, tissue engineering, medical imaging, biological modeling, and healthcare sustainability.
- **Industry and Healthcare Collaboration:** The department seeks to establish strong ties with healthcare institutions and the biomedical industry, fostering collaboration and strategic partnerships. It aims to facilitate knowledge transfer, internships, and industry-sponsored projects to ensure students' exposure to real-world challenges and opportunities.
- **Professional Development:** The department places great emphasis on nurturing students' professional growth by encouraging participation in professional societies, conferences, and workshops. It also provides guidance for students to pursue certifications and licenses that enhance their career readiness.
- **Environmental and Health Responsibilities:** Recognizing the importance of environmental and health stewardship, the department emphasizes sustainable practices in the design and development of medical technologies. Students are educated on minimizing environmental impact, improving resource efficiency, and exploring alternative and sustainable healthcare solutions.
- **Diversity and Inclusion:** The department values diversity and supports an inclusive environment that welcomes students from various backgrounds. It promotes equal opportunities and encourages underrepresented groups to pursue biomedical engineering education.

## 10. Evaluation methods

–Mid–term exams

- Final Exams
- Quizzes
- Assignments
- Technical reports
- Projects
- Seminars and presentations

11. Department						
Department teaching stuff						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant Professor	Material Engineering	Biomaterial				
Assistant Professor	Electrical Engineering	Power				
Assistant Professor	Biomedical Engineering	Biomedical engineering				
Assistant Professor	Biomedical Engineering	Biomedical engineering				
Assistant Professor	Biomedical Engineering	Biomedical engineering				
Lecturer	Medical Instrumentation Techniques	Electronic medical instrumentation technologies				
Lecturer	Biomedical Engineering	Biomaterials				
Lecturer	Biomedical Engineering	Biomedical Engineering				

Lecturer	Electrical Engineering	Communications and electronics				
Lecturer	Communications and electronics	Artificial intelligence				
Lecturer	Computer Engineering	Computer networks and artificial intelligence				
Lecturer	Electrical Engineering	Communications				
Lecturer	Biomedical Engineering	Bioelectricity				
Lecturer	Biomedical engineering	Biomedical engineering				
Lecturer	Electromagnetic systems engineering	Microsystems and nanotechnology				
Lecturer	Biomedical Engineering	Bioelectricity				
Lecturer	Biomedical Engineering	Biomedical engineering				

## Professional Development

### Mentoring new department members

- Comprehensive Orientation Program:**  
 Organized upon the appointment of a new department member, this program introduces the institutional organizational structure, academic regulations, assessment policies, e-learning mechanisms, and available services for students and department members.
- Academic and Administrative Mentorship:**  
 An experienced department member is assigned to mentor the new staff member during the first semester, assisting with course planning, syllabus preparation, and understanding quality assurance and academic accreditation processes.
- Specialized Training Workshops:**  
 Courses are held on using e-learning systems (such as Moodle or Blackboard), writing learning outcomes, developing active learning strategies, and assessing student performance.

### Integration into Teamwork:

New members are encouraged to participate in departmental and student activities to enhance

their engagement with the work environment

#### **Professional development of department members**

- **Annual Professional Development Plan:**  
Prepared based on the college's needs and strategic directions, this plan includes identifying required skills, priority topics, and allocating necessary resources.
- **Workshops and Training Courses:**  
Organized periodically to cover areas such as:
  - Modern teaching methods and active learning.
  - Assessment of learning outcomes and analysis of student performance.
  - Use of digital technologies and electronic classroom management tools.
  - Scientific publishing and academic research.
  - Development of leadership and administrative skills for department members.
- **Encouraging External Participation:**  
Department members are supported to attend national and international conferences, seminars, and workshops, as well as specialized training courses both inside and outside the institution.
- **Evaluation and Follow-up:**  
All professional development activities are subject to regular evaluation through satisfaction surveys and feedback, and the results are used to improve future programs.

#### **Professional Development Record:**

An individual record is maintained for each department member, documenting the development activities they have participated in, as part of their academic file and annual performance evaluation.

### **12. Acceptance Criterion**

- ❖ **Admission criteria for students are based on the instructions issued by the Ministry of Higher Education and Scientific Research (Central Admission).**
- ❖ **The applicant must be medically fit for the intended specialization.**
- ❖ **Department-specific admission requirements.**
- ❖ **Student preferences are taken into account, and admission is granted based on merit.**
- ❖ **The passing grade in the preparatory (high school) study.**
- ❖ **The capacity of the academic department.**

### **13. The most important sources of information about the program**

The website of the university of Warith Al-Anbiyaa- Collage of Engineering:

(<https://uowa.edu.iq/english/eng>)

([https://uowa.edu.iq/arabic/eng/medical-eng/?page\\_slag=scientific](https://uowa.edu.iq/arabic/eng/medical-eng/?page_slag=scientific) )

#### 14. Program Development Plan

The biomedical engineering program at the university of Warith Al-Anbiyaa has a development plan that could enrich the educational environment. The plan is represented by the following highlights:

- Updating curricula and academic content.
- Promoting scientific research and innovation.
- Developing the scientific and teaching capabilities of department members.
- Establishing an expert council consisting of experienced professionals from public and private sector companies.
- Relying on student and graduate surveys.
- Improving infrastructure and laboratories.
- Expanding partnerships with the public and private sectors.

Program Skills Outline										
Courses				Required program Learning outcomes						
Year/Level	Course Code	Course Name	Basic or optional							
				1	2	3	4	5	6	7
1 <sup>st</sup> 1 <sup>st</sup>	UOW-101	Human Rights and Democracy	Basic				x			
	UOW -102	English Language I	Basic				x			
1 <sup>st</sup> 1 <sup>st</sup>	ENG-101	Mathematics I	Basic	x					x	
	ENG-102	Engineering Drawing	Basic	x	x					
1 <sup>st</sup> 1 <sup>st</sup>	BME-111	bio-Chemistry	Basic	x		x		x	x	X
	BME-112	Electrical Circuits I	Basic	X	x	x		x	x	
1 <sup>st</sup> 1 <sup>st</sup>	UOW-103	Arabic Language I	Basic				x			
	UOW-104	Computer science I	Basic	X	x	x				
1 <sup>st</sup>	ENG-103	Mathematics II	Basic	X					x	
1 <sup>st</sup>	ENG-104	Physics	Basic	X	X	x			X	
1 <sup>st</sup>	BME-121	Medical Physics	Basic	X	x	x			X	
1 <sup>st</sup>	BME-122	Electrical Circuits II	Basic				x			x
2 <sup>nd</sup>	BME-211	Electronic Circuits I	Basic	X	x	x		x	x	
2 <sup>nd</sup>	BME-212	Cell Biology	Basic	X					x	
2 <sup>nd</sup>	ENG-201	MATHEMATICS III	Basic	x					x	
2 <sup>nd</sup>	ENG-202	Engineering Mechanics	Basic	x	x				X	
2 <sup>nd</sup>	BME-213	Medical Informatics	Basic	X	x	x				X
2 <sup>nd</sup>	BME-214	Materials Science	Basic	x	x	X				x
2 <sup>nd</sup>	UOW-201	Baath Part Criminals	Basic				X			
2 <sup>nd</sup>	UOW-105	Ethics	Basic				x	X		
2 <sup>nd</sup>	UOW -202	Arabic Language II	Basic					X		
2 <sup>nd</sup>	UOW-102	English Language II	Basic				x			
2 <sup>nd</sup>	UOW-104	Computer science II	Basic	x						

2 <sup>nd</sup>	ENG-203	Computer Programming	Basic	x	x	x				
2 <sup>nd</sup>	BME-222	Electronics Circuits II	Basic	x	x	x		x	X	
2 <sup>nd</sup>	BME-224	Limbs Anatomy	Basic	x					x	x
3 <sup>rd</sup>	WBM-31-01	Engineering Analysis	Basic	x		X			X	
3 <sup>rd</sup>	WBM-31-02	Mechanics of Materials I	Basic	x	x	X				
3 <sup>rd</sup>	WBM-31-03	Trunk Anatomy	Basic	x					X	X
3 <sup>rd</sup>	WBM-31-04	Physiology I	Basic	x					X	X
3 <sup>rd</sup>	WBM-31-05	Histology	Basic	x					X	X
3 <sup>rd</sup>	WBM-31-06	Medical Equipment	Basic	x	x	X				X
3 <sup>rd</sup>	WBM-31-07	Fiber Optics	Basic	x	x	X				X
3 <sup>rd</sup>	WBM-32-01	Engineering Statistics	Basic	x	x	X			X	X
3 <sup>rd</sup>	WBM-32-02	Numerical Analysis	Basic	x		X			X	
3 <sup>rd</sup>	WBM-32-03	Mechanics of Materials II	Basic	x	x	X				
3 <sup>rd</sup>	WBM-32-04	Neck & Nervous Anatomy	Basic	x					x	x
3 <sup>rd</sup>	WBM-32-05	Physiology II	Basic	x					x	X
3 <sup>rd</sup>	WBM-32-06	Electronics III	Basic	x	x	x			x	X
3 <sup>rd</sup>	WBM-32-07	Bone Injury and Fractures	Basic	x	x					
4 <sup>th</sup>	WBM-41-01	Biomechanics I	Basic	x						
4 <sup>th</sup>	WBM-41-02	Biomaterials I	Basic	x						
4 <sup>th</sup>	WBM-41-03	Communications I	Basic	x						
4 <sup>th</sup>	WBM-41-04	Medical Instrumentation	Basic	x						
4 <sup>th</sup>	WBM-41-05	Thermo-Fluid Mechanics I	Basic	x						
4 <sup>th</sup>	WBM-41-06	Digital Electronics I	Basic					x	x	
4 <sup>th</sup>	WBM-41-07	Pathology	Basic					x	x	
4 <sup>th</sup>	WBM-42-01	Biomechanics II	Basic	x	x					
4 <sup>th</sup>	WBM-42-02	Biomaterials II	Basic	x	x					
4 <sup>th</sup>	WBM-42-03	Communications II	Basic	x	x					
4 <sup>th</sup>	WBM-42-04	Analytical Mechanics	Basic	x						



4 <sup>th</sup>	WBM-42-05	Therapeutic Instrumentation	Basic	x						
4 <sup>th</sup>	WBM-42-06	Digital Electronics II	Basic				x	x		
4 <sup>th</sup>	WBM-42-07	Thermo-Fluid Mechanics II	Basic	x						
5 <sup>th</sup>	WBM-51-01	Project	Basic	x	x	x	x	x	x	x
5 <sup>th</sup>	WBM-51-02	Elective I	Basic							
5 <sup>th</sup>	WBM-51-03	Diagnostic Instrumentation	Basic		x	x	x	x	x	X
5 <sup>th</sup>	WBM-51-04	Control I	Basic	x	x	x	x		x	X
5 <sup>th</sup>	WBM-51-05	Image Processing	Basic	x	x	x	x		x	x
5 <sup>th</sup>	WBM-51-06	Microprocessor	Basic	x	x	x	x		x	x
5 <sup>th</sup>	WBM-51-07	Hospital System & Design	Basic		x		x	x		
5 <sup>th</sup>	WBM-52-01	Project	Basic	x	x	x	x	x	x	x
5 <sup>th</sup>	WBM-52-02	Elective II	Basic							
5 <sup>th</sup>	WBM-52-03	Elective III	Basic							
5 <sup>th</sup>	WBM-52-04	Control II	Basic	x	x	x	x		x	x
5 <sup>th</sup>	WBM-52-05	Computer Network	Basic	x	x	x	x		x	x
5 <sup>th</sup>	WBM-52-06	Bio tribology	Basic	x	x	x		x		
5 <sup>th</sup>	WBM-52-07	Neural Networks	Basic	x	x	x		x	x	
5 <sup>th</sup>	WBM-52-08	Biomedical Sensor	Basic	x	x	x		x		