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

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

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	9	15	7%	Basic and support courses
College Requirements	14	37	19%	Basic and support courses
Department Requirements	51	137	74%	Core courses
Summer Training	1	Non credited		
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
1st	UOW-101	Human Rights and Democracy	2	0
1st	UOW -102	English Language I	2	0
1st	ENG-101	Mathematics I	3	0
1st	ENG-102	Engineering Drawing	1	3
1st	BME-111	bio-Chemistry	4	3
1st	BME-112	Electrical Circuits I	3	3
1st	UOW-103	Arabic Language I	2	0
1st	UOW-104	Computer science I	1	2
1st	ENG-103	Mathematics II	3	0
1st	ENG-104	Physics	3	0
1st	BME-121	Medical Physics	2	3
1st	BME-122	Electrical Circuits II	3	3
2nd	BME-211	Electronic Circuits I	3	3

2nd	BME-212	Cell Biology	3	0
2nd	ENG-201	MATHEMATICS III	3	0
2nd	ENG-202	Engineering Mechanics	3	0
2nd	BME-213	Medical Informatics	2	2
2nd	BME-214	Materials Science	2	2
2nd	UOW-201	Baath Part Criminals	1	0
2nd	UOW-105	Ethics	2	0
2nd	UOW -202	Arabic Language II	2	0
2nd	UOW-102	English Language II	2	0
2nd	UOW-104	Computer science II	1	2
2nd	ENG-203	Computer Programming	4	3
2nd	BME-222	Electronics Circuits II	3	3
2nd	BME-224	Limbs Anatomy	3	3
3rd	WBM-31-01	Engineering Analysis	3	0
3rd	WBM-31-02	Mechanics of Materials I	2	0
3rd	WBM-31-03	Trunk Anatomy	2	3
3rd	WBM-31-04	Physiology I	2	3
3rd	WBM-31-05	Histology	2	2
3rd	WBM-31-06	Medical Equipment	2	2
3rd	WBM-31-07	Fiber Optics	2	2
3rd	WBM-32-01	Engineering Statistics	2	0
3rd	WBM-32-02	Numerical Analysis	2	2
3rd	WBM-32-03	Mechanics of Materials II	2	3
3rd	WBM-32-04	Neck & Nervous Anatomy	2	3
3rd	WBM-32-05	Physiology II	2	3
3rd	WBM-32-06	Electronics III	2	0
3rd	WBM-32-07	Bone Injury and Fractures	2	0
4th	WBM-41-01	Biomechanics I	2	3
4th	WBM-41-02	Biomaterials I	2	0
4th	WBM-41-03	Communications I	2	3
4th	WBM-41-04	Medical	2	2

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

8. Expected learning outcomes of the program

Skills	1)An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.
	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.

Knowledge	1)An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion.
	2)An ability to communicate effectively with a range of audiences.
	3)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
	4)An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge
Ethics	1)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.

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)

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	skills		knowledge				Ethics	
				1	2	1	2	3	4	1	
1st 1st	UOW-101	Human Rights and Democracy	Basic				x				
	UOW -102	English Language I	Basic				x				
1st 1st	ENG-101	Mathematics I	Basic	x					x		
	ENG-102	Engineering Drawing	Basic	x	x						
1st 1st	BME-111	bio-Chemistry	Basic	x		x		X	x	x	
	BME-112	Electrical Circuits I	Basic	X	x	x			x	x	
1st 1st	UOW-103	Arabic Language I	Basic				x				
	UOW-104	Computer science I	Basic	X	x	x					
1st	ENG-103	Mathematics II	Basic	X					x		
1st	ENG-104	Physics	Basic	X	X	x			X		
1st	BME-121	Medical Physics	Basic	X	x	x			X		
1st	BME-122	Electrical Circuits II	Basic				x	x			
2nd	BME-211	Electronic Circuits I	Basic	X	x	x			x	x	
2nd	BME-212	Cell Biology	Basic	X					x		
2nd	ENG-201	MATHEMATICS III	Basic	x					x		
2nd	ENG-202	Engineering Mechanics	Basic	x	x				X		
2nd	BME-213	Medical Informatics	Basic	X	x	x		X			
2nd	BME-214	Materials Science	Basic	x	x	X		x			
2nd	UOW-201	Baath Part Criminals	Basic				X				
2nd	UOW-105	Ethics	Basic				x			X	
2nd	UOW -202	Arabic Language II	Basic							X	
2nd	UOW-102	English Language II	Basic				x				
2nd	UOW-104	Computer science II	Basic	x							

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

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