Academic Program Description Form

University Name: University of Wraith Al-Anbyaa
Faculty/Institute: Engineering
Scientific Department: Biomedical
Academic or Professional Program Name: Biomedical engineer
Final Certificate Name: Biomedical engineer
Academic System Biomedical engineer
Description Preparation Date:
File Completion Date:

20-3-2024

Signature:
Head of Department Name:
Asst. Prof. Dr. Hasan Talib Hashim
Date:

Signature:
Scientific Associate Name:
أ.م.د.حسين هادي حسين
كلية الهندسة

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date: 20/3/2024
Signature:

Approval of the Dean
20/3/2024
أ.م.د.حسين هادي حسين
عميد كلية الهندسة

Academic Program Description Form

1. Program Vision

The department aims at becoming the pioneer and distinguished global educational institute in biomedical engineering. Also, to become an "natural place to turn to" for consulting sciences, research, practical and industrial skills and aspires to create the students for a successful career based on accredited higher education quality. Thus, the department contributes to the achievement of a comprehensive and sustainable development in all of its fields of studies.

2. Program Mission

The Department of Biomedical Engineering aims at enabling the graduates to gain the science, applicable practical technology and skills in the department fields of studies of biomedical by using the up-to-date medical sciences, biomedical applicable skills and quantitative engineering methods. So that they can design the best diagnostic and therapeutic devices that improve the level Healthcare.

3. Program Objectives

The duration of study in the department is five years, including the practical training in the hospitals and centers of maintenance during the summer vacation in the last two years. Therefore, the graduate has the ability to:

1 Acquire basic skills that qualify him to estimate the hospital design requirements and health centers and address doctors to cover the basic requirements in their medical specialty.

2 Design, manufacture, develop and sustain medical devices and equipment as well as measurements devices and diagnosis.

3 Supervising medical engineers at hospitals and specialized treatment centers /institutions and provide training on all medical devices in all sections in the hospitals.

4 The management of the medical devices, especially the estimation of the exact need of medical institution.

5 Setting the technical standards for the importation of medical devices for the Ministry of Health.

6 Work on the application of quality system for the work of medical devices and medical equipment.

4. Program Accreditation

Working on it

5. **Other external influences**
Scientific library, the Internet, laboratories, scientific seminars

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**74**			
College Requirements	**Yes**			
Department Requirements	**Yes**			
Summer Training	**Exist**			
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	WBM-11-01	University Requirements I	1	
1	WBM-11-02	English Language I	2	
1	WBM-11-03	Computer Programming I	2	2
1	WBM-11-04	Mathematics I	3	
1	WBM-11-05	Engineering Drawings I	1	3
1	WBM-11-06	Workshop Technology		3
1	WBM-11-07	Chemistry	2	2
1	WBM-11-08	Electrical Circuits I	2	2
1	WBM-12-01	Arabic Language I	1	
1	WBM-12-02	English Language II	2	

1	WBM-12-03	Computer Programming II	2	2
1	WBM-12-04	Mathematics II	3	
1	WBM-12-05	Engineering Drawings II	1	3
1	WBM-12-06	Physics	2	2
1	WBM-12-07	Bio-Chemistry	3	2
1	WBM-12-08	Electrical Circuits II	3	2
2	WBM-21-01	University Requirements II	1	
2	WBM-21-02	Arabic Language II	1	
2	WBM-21-03	MathematicsIII	3	
2	WBM-21-04	Information Technology	1	2
2	WBM-21-05	Engineering Mechanics I	3	
2	WBM-21-06	Material Science	2	2
2	WBM-21-07	Electronics I	2	3
2	WBM-21-08	Cell Biology	3	
2	WBM-22-01	University Requirements III	1	
2	WBM-22-02	Mathematics IV	3	
2	WBM-22-03	Engineering Mechanics II	3	
2	WBM-22-04	Electronics II	2	3
2	WBM-22-05	Electromagnetic fields	2	
2	WBM-22-06	The Limbs Anatomy	3	3
2	WBM-22-07	Network	2	
3	WBM-31-01	Engineering Analysis	3	
3	WBM-31-02	Mechanics of Materials I	2	
3	WBM-31-03	The Trunk Anatomy	2	3
3	WBM-31-04	Physiology I	2	3
3	WBM-31-05	Histology	2	2
3	WBM-31-06	Medical Equipment	2	2
3	WBM-31-07	Fiber Optics	2	2
3	WBM-32-01	Engineering Statistics	2	
3	WBM-32-02	Numerical Analysis	2	2
3	WBM-32-03	Mechanics of Materials II	2	3
3	WBM-32-04	Neck & Nervous Anatomy	2	3
3	WBM-32-05	Physiology II	2	3
3	WBM-32-06	Electronics III	2	
3	WBM-32-07	Bone Injury and Fractures	2	
4	WBM-41-01	Biomechanics I	2	3
4	WBM-41-02	Biomaterials I	2	
4	WBM-41-03	Communications I	2	3
4	WBM-41-04	Medical Instrumentation	2	2
4	WBM-41-05	Thermo-Fluid Mechanics I	2	2
4	WBM-41-06	Digital Electronics I	2	3
4	WBM-41-07	Pathology	2	
4	WBM-42-01	Biomechanics II	2	3
4	WBM-42-02	Biomaterials II	2	
4	WBM-42-03	Communications II	2	3
4	WBM-42-04	Analytical Mechanics	2	
4	WBM-42-05	Therapeutic Instrumentation	2	2

4	WBM-42-06	Digital Electronics II	2	3
4	WBM-42-07	Thermo-Fluid Mechanics II	2	2
5	WBM-51-01	Project		4
5	WBM-51-02	Elective I	2	
5	WBM-51-03	Diagnostic Instrumentation	2	2

8. Expected learning outcomes of the program

Knowledge

A- Cognitive objectives

A.1.Knowledge of the basic principles of engineering and biomedical science necessary to understand advanced topics in biomedical engineering

A.2. Ability to use techniques, skills, and tools useful for designing biomedical projects, experimental studies, and engineering practice

A.3. Acquiring the basic skills that qualify him to prepare the design requirements of modern hospitals, health centers and other health units.

A.4. Understand the professional and ethical responsibility of the medical engineer.

Skills

B - Skills objectives of the program:
B.1. That the student is familiar with the most important computer and mathematical programs that are used in the field of designing and solving engineering problems and the foundations of their theoretical applications.
B.2. Ability to understand and design engineering in the areas of biomedical engineering including molecular, cellular, and nanotechnology; Biomaterials and tissue engineering; Medical device and systems engineering, biomechanics and rehabilitation engineering; Biomedical optics, modeling of physiological systems, design of hospitals and healthcare centers, computational bioengineering and biomedical imaging.
B.3. The ability to keep pace with scientific development in the fields of biomedical engineering.
B.4. Preparing engineering designs and developing medical devices, systems and equipment

9. Teaching and Learning Strategies

1. Theoretical lectures.
2. Discussion lectures.
3. Practical experiments in laboratories.
4. Scientific seminars by students.
5. Graduation projects.
6. Scientific visits.

10. Evaluation methods

Weekly, monthly, daily exams and the end of the year exam.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof	√				√	
Assist. Prof	√				√	
Lec	√	√			√	
Lec	√				√	
Lec	√				√	
Asst.Lec	√	√			√	
Asst.Lec	√	√			√	
Asst.Lec	√	√			√	
Asst.Lec	√	√			√	
Asst.Lec	√	√			√	
Asst.Lec	√				√	
Asst.Lec	√				√	
Asst.Lec	√				√	
Asst.Lec	√				√	

Asst.Lec	√				√	
Asst.Lec	√				√	
Asst.Lec	√				√	
Asst.Lec	√				√	
Asst.Lec	√				√	

Professional Development
Mentoring new faculty members
Briefly describes the process used to orient new, senior, full-time and part-time faculty at the institution and department levels.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty members such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. **Acceptance Criterion**
Graduates of sixth preparatory school, biology branch and applied branch

13. **The most important sources of information about the program**
1. Sources approved by international universities
2. Local trends
3. Market needs
4. Studies and questionnaires
5. Specialized seminars and workshops with beneficiaries

14. Program Development Plan

Faculty members seek to keep pace with scientific developments and develop teaching and learning mechanisms by attending and holding scientific and cultural seminars and lectures and by conducting quarterly lectures under the title “Cultural Programs for Quality.” The department's staff seeks to raise levels of student interaction and guidance, university service activities, professional and development activities, and interaction with medical staff and professional staff, as well as employers.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First	WBM-11-02	English Language I	Basic	√											
First	WBM-11-03	Computer Programming I	Basic	√				√							
First	WBM-11-04	Mathematics I	Basic	√	√										
First	WBM-11-05	Engineering Drawings I	Basic	√	√	√				√					
First	WBM-11-06	Workshop Technology	Basic	√	√										√
First	WBM-11-07	Chemistry	Basic	√	√										
First	WBM-11-08	Electrical Circuits	Basic	√	√				√	√	√		√	√	√

First	WBM-12-01	Arabic Language I	**Basic**	√											
First	WBM-12-02	English Language II	**Basic**	√											
First	WBM-12-03	Computer Programming II	**Basic**	√				√						√	
First	WBM-12-04	Mathematics II	**Basic**	√	√	√		√	√						
First	WBM-12-05	Engineering Drawings II	**Basic**	√	√	√		√	√						
First	WBM-12-06	Physics	**Basic**	√	√	√			√	√	√	√	√	√	√
First	WBM-12-07	Bio-Chemistry	**Basic**	√	√				√	√	√		√		
First	WBM-12-08	Electrical Circuits II	**Basic**	√	√				√	√	√	√	√	√	√
second	WBM-21-02	Arabic Language II	**Basic**	√											
second	WBM-21-03	Mathematics III	**Basic**	√	√	√		√	√						
second	WBM-21-04	Information Technology	**Basic**	√				√		√				√	

second	WBM-21-05	Engineering Mechanics I	**Basic**	√	√			√	√	√	√	√		√	√
second	WBM-21-06	Material Science	**Basic**	√	√	√	√	√	√	√		√	√	√	
second	WBM-21-07	Electronics I	**Basic**	√	√	√		√	√	√	√	√	√	√	√
second	WBM-21-08	Cell Biology	**Basic**	√	√				√	√		√	√	√	
second	WBM-22-02	Mathematics IV	**Basic**	√	√			√	√	√	√	√			√
second	WBM-22-03	Engineering Mechanics II	**Basic**	√	√			√	√	√	√	√		√	√
second	WBM-22-04	Electronics II	**Basic**	√	√	√		√	√	√	√	√	√	√	√
second	WBM-22-05	Electromagnetic fields	**Basic**	√	√			√	√	√	√	√		√	√
second	WBM-22-06	The Limbs Anatomy	**Basic**	√			√			√	√				
second	WBM-22-07	Network	**Basic**	√	√			√	√	√	√	√		√	√
Third	WBM-31-01	Engineering Analysis	**Basic**	√	√			√	√	√	√	√			√
Third	WBM-31-02	Mechanics of Materials I	**Basic**	√	√			√	√	√	√	√		√	√
Third	WBM-31-03	The Trunk Anatomy	**Basic**	√			√		√	√					

Third	WBM-31-04	Physiology I	**Basic**	√	√		√		√	√		√	√	√	
Third	WBM-31-05	Histology	**Basic**	√	√				√	√		√	√	√	
Third	WBM-31-06	Medical Equipment	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
Third	WBM-31-07	Fiber Optics	**Basic**	√	√			√	√	√	√	√	√	√	√
Third	WBM-32-01	Engineering Statistics	**Basic**	√	√			√	√	√	√	√			√
Third	WBM-32-02	Numerical Analysis	**Basic**	√	√			√	√	√	√	√			√
Third	WBM-32-03	Mechanics of Materials II	**Basic**	√	√			√	√	√	√	√		√	√
Third	WBM-32-04	Neck & Nervous Anatomy	**Basic**	√			√		√	√					
Third	WBM-32-05	Physiology II	**Basic**	√	√		√		√	√		√	√	√	
Third	WBM-32-06	Electronics III	**Basic**	√	√	√		√	√	√	√	√	√	√	√
Third	WBM-32-07	Bone Injury and Fractures	**Basic**	√			√		√	√			√	√	
fourth	WBM-41-01	Biomechanics I	**Basic**	√	√	√	√	√	√	√	√	√	√	√	

fourth	WBM-41-02	Biomaterials I	**Basic**	√	√		√		√	√	√	√	√	√	
fourth	WBM-41-03	Communications I	**Basic**	√	√	√	√		√	√	√	√	√	√	√
fourth	WBM-41-04	Medical Instrumentation	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fourth	WBM-41-05	Thermo-Fluid Mechanics I	**Basic**	√	√			√	√	√	√	√		√	√
fourth	WBM-41-06	Digital Electronics I	**Basic**	√	√	√		√	√	√	√	√	√	√	√
fourth	WBM-41-07	Pathology	**Basic**	√			√		√	√			√	√	
fourth	WBM-42-01	Biomechanics II	**Basic**	√	√	√	√	√	√	√	√	√	√	√	
fourth	WBM-42-02	Biomaterials II	**Basic**	√	√		√		√	√	√	√	√	√	√
fourth	WBM-42-03	Communications II	**Basic**	√	√	√		√	√	√	√	√	√	√	√
fourth	WBM-42-04	Analytical Mechanics	**Basic**	√	√			√	√	√	√	√		√	√

fourth	WBM-42-05	Therapeutic Instrumentation	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fourth	WBM-42-06	Digital Electronics II	**Basic**	√	√	√		√	√	√	√	√	√	√	√
fourth	WBM-42-07	Thermo-Fluid Mechanics II	**Basic**	√	√			√	√	√	√	√		√	√
fifth	WBM-51-01	Project	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-51-02	Elective I	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-51-03	Diagnostic Instrumentation	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-51-04	Control I	**Basic**	√		√	√	√	√	√	√	√	√	√	√
fifth	WBM-51-05	Image Processing	**Basic**	√		√	√	√	√	√	√	√	√	√	√
fifth	WBM-51-06	Microprocessor	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-51-07	Hospital System & Design	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-52-01	Project	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

fifth	WBM-52-02	Elective II	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-52-03	Elective III	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√
fifth	WBM-52-04	Control II	**Basic**	√		√	√	√	√	√	√	√	√	√	√
fifth	WBM-52-05	Computer Network	**Basic**	√	√	√		√	√	√	√	√	√	√	√

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation**