STUDENT GUIDE FOR BACHELOR'S DEGREE

Higher Institute of Engineering at El Shorouk Academy

Biomedical Engineering and Systems Program

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Part One Governing Rules

First: Introduction

The science of biomedical engineering is one of the latest engineering sciences that arose with the development of modern medicine, after the doctor alone performed all the tasks of diagnosis and treatment and even the manufacture of medicine, the medical device became an essential companion for the doctor in diagnosis, treatment and monitoring of patients, and because there is an urgent need to develop medical devices and equipment to serve the health of patients and the speed of their recovery, it was necessary to intervene specialists from fields other than medicine to design these devices such as electrical engineers, mechanics, computer engineers and others. As it was These engineers must also be familiar with the medical sciences of the anatomy and physiology of the human body and to understand the mechanism of work of each system in it and harness their knowledge and specialization in what develops these devices, and therefore the need arose for an engineer who knows all these specialties on the one hand and can deal with doctors on the other hand, with attention that it is not a substitute for any of them.

Medical engineering is not limited to medical devices and maintenance, but there are other areas of medical engineering such as hospital management, prostheses, prostheses and others. Medical Engineering Harnesses physics, chemistry, mathematics and the basics of engineering to study biology, i.e. the human body mostly to reach advanced stages in the study of this body and the study of diseases it faces to work to provide better ways for good health and help treat these diseases.

Second: Establishment of the program

The Department of Biomedical Engineering and Systems was established among the first scientific departments that were established at the Higher Institute of Engineering, where it was established in 1995 by the ministerial decision issued by the Ministry of Higher Education No. 1712 on 22/11/1995 and the headquarters of the Institute at the time (Tenth of Ramadan City) and the number of departments of the Institute was five scientific departments (Communications and Computer Engineering - Medical Engineering - Chemical Engineering – Power and Electrical Machines Engineering –

Architecture – in addition to the Department of Physics and Engineering Mathematics). The Higher Institute of Engineering moved to its new headquarters in the suburb of Al-Nakheel in El Shorouk City at the beginning of the second semester of the academic year 1999/2000 after the approval of the Ministry of Higher Education on the transfer by Ministerial Resolution No. 712 dated 31/5/2000. The equivalency of the bachelor's degree granted by the Higher Institute of Engineering in Al-Shorouk in the field of biomedical engineering and systems was renewed by the ministerial decision issued by the Ministry of Higher Education No. 189 on 29/7/2020. The Department of Biomedical Engineering and Systems has met the program accreditation standards, and was approved by the Authority's Board of Directors Resolution No. 226 dated June 21 , 2023.

Third: General Components of the Program

The Biomedical Engineering and Systems program is characterized by the elements that qualify it to be one of the competing programs at the level of the Institute and the level of other competing programs in various universities and institutes nationwide.

Vision of the Institute:

To become one of the best institutes and colleges locally and regionally

Mission of the Institute:

Preparing engineers capable of creativity through various academic programs, graduating distinguished engineers in different disciplines that meet the needs and requirements of the labor market, developing scientific research to integrate with the requirements of industry and the local community

Program Vision:

The Department of Biomedical Engineering and Systems seeks to maintain the community's confidence in its graduates and take its place among the corresponding departments in other colleges and institutes.

Program Mission:

Preparing creative engineers capable of meeting the needs of the labor market in the field of medical engineering and developing scientific research to raise the level of medical services provided in the Egypt.

General objectives of the program:

1- Providing an advanced, efficient and quality-assured academic program.

- Developing and raising the efficiency of courses (theoretical and practical)
- Developing and raising the efficiency of study laboratories
- Developing and raising the efficiency of teaching and learning methods
- Develop and raise the credibility of evaluation methods
- Implementing a system to ensure the quality of the educational process

2- Providing students and graduates of the program with skills and capabilities compatible with the requirements of the labor market and appropriate to its developments.

- Developing the student's scientific, practical and personal skills in accordance with the requirements of the labor market.
- Motivating and developing students' creativity and talents

3- Supporting and developing scientific research.

- Encouraging and strengthening cooperation in the field of graduate studies with Egyptian and international universities for faculty members and members of the supporting body
- Developing and raising the efficiency of the capabilities of research laboratories
- Encouraging the use of funded research projects (scientific and applied)
- Encouraging and strengthening participation in the publication of research in scientific journals and international scientific conferences

Educational Objectives of the Program:

The study in the department qualifies its graduates to do the following:

1- Designing medical and prosthetic devices and their components and linking them to hospital networks and the Internet

2- Designing medical software, bioinformatics, medical imaging fields, archiving, compressing, storing and transferring various medical data, radiology images, heart, brain and muscle drawings, according to international standards in representing data and transferring it to and from hospitals and medical units and communicating via the Internet, whether central or local.
3- Setting the required specifications for medical devices required by hospitals and medical units.
4- Diagnosis, maintenance and repair of medical devices.
5- Training, design and implementation in the fields of medical programming and systems
6- Hospital design , planning, installation, supervision and follow-up of all hospital equipment
7- Systems Design for Medical Devices
8- Identify and control the impact of biomedical engineering on society from an environmental, economic, social and cultural point of view.
9- Planning and carrying out research work, evaluating results and drawing conclusions.

Career Opportunities:-

- Research and development (at the academic level in universities and research centers and at the level of companies producing medical devices and equipment (development engineer).
- Installation, operation and maintenance of medical devices and equipment in companies and hospitals (maintenance engineer)
- Selection and calibration of medical devices and quality assurance of health hospitals (laboratory testing and calibration engineer of medical devices in hospitals)
- Marketing and technical support for customers of doctors and technicians in healthcare hospitals (after-sales technical support engineer)
- Design and programming of hospital information systems software packages, medical image analysis and patient medical data analysis (software engineer in bioinformatics).

Distinctive features of the Biomedical and Systems Engineering Program

1- Geographical location: The Department of Biomedical Engineering at the Higher Institute of Engineering in El Shorouk is distinguished by a privileged location, as students are sent to it from multiple governorates in Egypt, and buses transport students to different governorates.
2- All the Institute's educational programs obtained the accreditation of the National Authority for Quality Assurance of Education No. 166 on May 29, 2017 and for a period of five years from this date as the first private engineering institute to obtain this accreditation and membership of the Association of Arabic Universities.
3- Compatibility with the needs of the labor market, where the graduates of the department work in prestigious local and international companies, hospitals, private companies, research and academic centers - and participation with local or international universities
4- Increasing number of students in the department
5- The increasing number of international students and transfers to the department and there is a mechanism to attract international students
6- The Biomedical and Systems Engineering program is a rare major because it is found in a limited number of engineering colleges.
7- Providing distinctive curricula, including:
   - The use of artificial intelligence and its applications in the medical field.
   - The use of nanotechnology and lasers in biomedical engineering applications.
   - The use of biomechanics through prosthetic applications.
   - Use information in bioinformatics analysis to sequence genes.
8- It has a competitive ability at the international level , as the teaching assistants registered in the department were granted a scholarship to study master's degrees abroad

9- Faculty members publish scientific research in international journals

10- The Biomedical Engineering Program won the first place on the Egyptian Engineer's Day in 2019

11- Participation of faculty members in arbitration in international competitions

12- Participation of faculty members and the assisting body in the arbitration of research in international journals and as editors in scientific journals

13- . Submission of a faculty member on a patent in the field of nanotechnology

14- Participation of faculty members and supporting staff in funded research projects.

Graduate Specifications

Specifications of the graduate of the program in both Arabic and English (academic standards (NARS 2018according to the national

	Program General Graduate Attributes	***General specifications for the graduate of the program***
1.	*Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations related to healthcare challenges.*	Mastered a wide range of engineering knowledge and specialized skills and is able to apply them using scientific theories and abstract thinking in real-life situations related to challenges and problems in .the field of *healthcare*
2.	*Apply analytic critical and systemic thinking to identify, diagnose and solve medical problems of wide range of complexity and variation with engineering tools and techniques.*	Able to apply structured critical analytical thinking to identify, diagnose, and solve changing and complex problems in healthcare using engineering .techniques and tools

3.	*Behave professionally and adhere to engineering ethics and standards.*	Behaves professionally and adheres to the ethics and .standards of the profession
4.	*Work in and lead a heterogeneous team of professionals from different engineering specialties and healthcare workers and assume responsibility for own and team performance;*	- Able to lead - or work from within a team of professionals with different engineering disciplines and health care workers and take responsibility for his work or the work of the .team he leads
5.	*Recognize his/her role in promoting the engineering and healthcare fields and contribute in the development of the profession and the community;*	Appreciates his role in the development of the fields of engineering work and health care and contributes to the development of the .profession and society
6.	*Value the importance of the environment, both physical and natural, and work to promote sustainability and safety principles;*	He values the environment around him and works to uphold the principles of .sustainability and safety
7.	*Use techniques, skills and modern engineering tools necessary for engineering practice;*	Able to use modern engineering techniques and skills necessary to practice .engineering professions
8.	*Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;*	Takes responsibility for self-education and development, is able to ,learn during his/her career and demonstrates the ability to participate in post-.graduate research studies
9.	*Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;*	Communicates efficiently in different situations and with tools and languages with those around him in the

		work environment and deals with academic and professional challenges creatively.
10.	*Demonstrate leadership qualities, business administration and entrepreneurial skills.*	Possess the qualities of leadership, business management, initiation and project management skills.
	Program Specific Graduate Attributes	***Specialized specifications of the program graduate***
11.	*Work to maintain health and promote human wellbeing.*	It is keen to maintain public health and promote the well-being of humanity.
12.	*Provide -quality and safe patient-centered care, focusing on primary health care and dealing with common health problems in his/her community.*	Ensures work to provide safe, quality, patient-centered care that focuses on healthcare problems in their community.
13.	*Work effectively with other health care professionals respecting their roles and their contribution to the team.*	Works efficiently with healthcare professionals and values their role and contributions to work.

Fourth: General Provisions

Clause (1) Academic Degree

The bachelor's degree in biomedical engineering and systems is awarded and the bachelor's degree is equalized based on the decisions to grant the equivalency certificate in accordance with the decisions of the Supreme Council of Universities as follows:

- Decision of the President of the Supreme Council of Universities No. (3) dated 5/2/2002 equalizing the bachelor's degree in engineering granted by the Institute with the bachelor's degree granted by Egyptian universities subject to the Universities Organization Law No. (49) of 1972 in the corresponding disciplines.
- Decision of the President of the Supreme Council of Universities No. (77) dated 17/5/2007 to renew the equivalency of the bachelor's degree.
- Decision of the President of the Supreme Council of Universities No. (184) dated 8/8/2010 to renew the equivalency of the bachelor's degree.
- Decision of the President of the Supreme Council of Universities No. (7) dated 10/1/2013 to renew the equivalency of the bachelor's degree.
- Decision of the President of the Supreme Council of Universities No. (163) dated 8/7/2015 to renew the equivalency for the bachelor's degree.
- Decision of the President of the Supreme Council of Universities No. (233) dated 25/7/2017 to renew the equivalency for a bachelor's degree.
- Decision of the President of the Supreme Council of Universities No. (189) dated 29/7/2020 to renew the equivalency for a bachelor's degree.

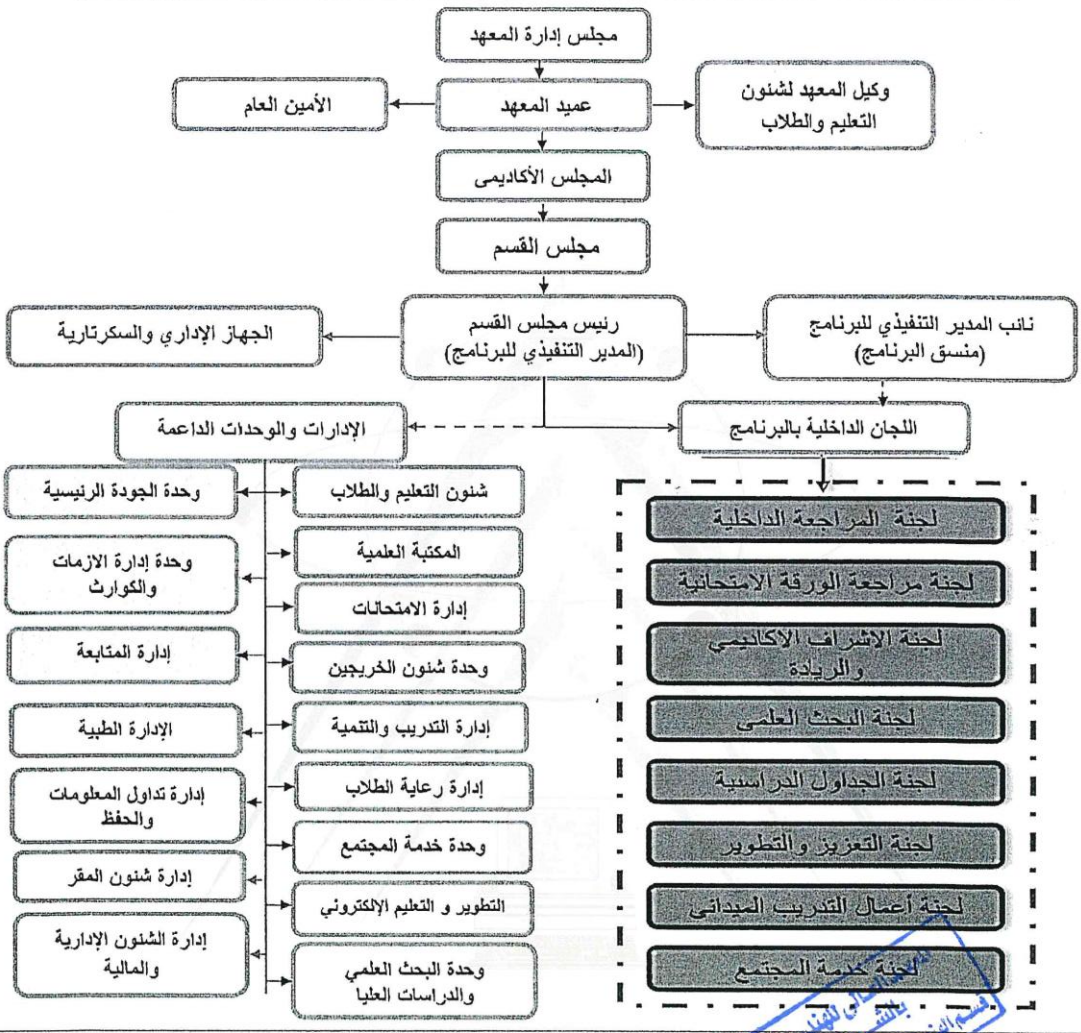
Clause (2) Study System

The study system is the semester and the student is required to complete the necessary academic requirements in accordance with the announced study regulations to obtain a bachelor's degree, provided that the study is in English.

Item (3) Organizational Structure of the Program

The figure below shows the organizational structure of the program, explaining the leadership of the program and the various committees emanating from it.

المعهد العالى للهندسة
الهيكل التنظيمى
الهندسة الحيـــوية الطبيـــة و المنظومات



Chapter Two Faculty Members and Assisting Body

First: Faculty Members

The program has appointed faculty members and seconded members with a total number of 18 faculty members according to the academic year 2023/2024. The following table shows the assigned faculty members.

Second: Members of the Assisting Body

The program has appointed supporting staff members and delegated members, with a total number of 18 supporting staff members according to the academic year 2023/2024. The following table shows the designated associate staff.

Part Three

Coefficients and Courses

First: Coefficient

The Biomedical Engineering and Systems program is characterized by the presence of a variety of laboratories that serve different courses that give the student scientific skills that meet the graduation requirements and help the student to experience the practical reality. The program currently has 7 different laboratories:

- Physiology & Anatomy lab (203)

- Electrical Measurements lab (209)

- Computer & Signal Processing lab (210)

- Embedded Systems & IoT lab (303)

- Electronic Systems lab (306)

- Biomechanics lab (307)

- PCB lab

Second: Courses

Regulation 2013–1

Year:- First **Program:- Systems and Biomedical Engineering**

Course Code	Course Name	First Semester								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
PHM112	Mathematics (3)	4	4	-	6	180	120	-	3	300
UP TO 152	Electrical Engineering (2)	2	-	2	2	40	30	30	2	100
PHM 121	Physics (3)	2	1	1	2	40	30	30	2	100
THAT 101	Chemistry (2)	2	-	2	2	40	30	30	2	100
TO 141	Biology (1)	2	-	2	2	40	30	30	2	100
UP TO 121	Computer (1)	2	-	2	2	40	30	30	2	100
TO 131	Mechanical Engineering (1)	2	-	2	2	40	30	30	2	100
		16	5	11	18					900
Total First Semester Hours		32			Total Semester Marks					

Bear Code	Course Name	Second Semester								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO132	Mechanical Engineering (2)	2	-	2	2	40	30	30	2	100
UP TO 122	Computer (2)	2	-	2	2	40	30	30	2	100
TO 113	Physical Engineering	2	1	1	2	40	30	30	2	100
TO 143	Biochemistry	2	-	2	2	40	30	30	2	100
TO 153	Electronic devices and circuits (1)	2	-	2	2	40	30	30	2	100
UP TO 142	Biology (2)	2	-	2	2	40	30	30	2	100
HUM 113	Technical English language (3)	2	1	-	2	70	30	-	2	100
		14	2	11	14					700
Total Second Semester Hours		27			Total Semester Marks					

Course Code	Course Name	Summer Training Course								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO181	Site Summer Training (1)	-	-	3	1	-	25	25	-	50
TO 191	Site Practical Training (1)	-	-	3	1	-	25	25	-	50
		-	-	6	2					100
Total Third Semester Hours		6			Total Semester Marks					

* Humanities, Technical language (3) & (4) courses not accounted for in the articles of failure and can carry the student in addition to the subjects of retardation

*Training courses not accounted for in the articles of failure and can carry the student in addition to the subjects of retardation

*Mathematics (3),(4), Biology (1),(2), Computer (1),(2), Mechanical Engineering (1),(2) are continuous subjects

Year:- Second Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	Total Course Marks
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO261	Electrical signals and systems	4	-	2	4	140	60	-	3	200
UP TO 252	Electronic devices and circuits (2)	2	-	2	2	40	30	30	2	100
TO 241	Physiology (1)	2	1	-	2	60	40	-	2	100
UP TO 242	Anatomy (1)	2	1	-	2	60	40	-	2	100
TO 221	Computer (3)	4	2	2	5	100	75	75	3	250
TO 211	Engineering Mathematics	2	-	2	2	40	30	30	2	100
		16	4	8	17					850
Total First Semester Hours		28			Total Semester Marks					

Course Code	Course Name	Second Semester								
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	Total Course Marks
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
HUM2xx	Elective Humanity Course (1)	2	1	-	2	70	30	-	2	100
UP TO 245	Anatomy (2)	2	1	-	2	60	40	-	2	100
TO 244	Physiology (2)	2	1	1	2	40	30	30	2	100
TO 253	Electrical Measurements	4	-	2	4	120	40	40	3	200
TO 233	Mechanical Engineering (3)	2	-	2	2	40	30	30	2	100
UP TO 215	Bio-Statistics	2	-	2	2	40	30	30	2	100
		14	3	7	14					700
Total Second Semester Hours		24			Total Semester Marks					

Course Code	Course Name	Summer Training Course								
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	Total Course Marks
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO282	Site Summer Training (2)	-	-	3	1	-	25	25	-	50
TO 292	Site Practical Training (2)	-	-	3	1	-	25	25	-	50
		-	-	6	2					100
Total Third Semester Hours		6			Total Semester Marks					

*Electrical signals and systems (1),(2), Physiology (1),(2), Anatomy (1),(2) are continuous subjects

Year:- Third Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO371	Bioelectronics and Measurements (1)	2	2	1	3	60	45	45	2	150
TO 361	System Dynamics (1)	2	2	–	3	90	60	–	2	150
UP TO 372	Medical Equipment (1)	2	2	–	3	90	60	–	2	150
TO 311	Electromagnetic Waves	2	2	–	3	90	60	–	2	150
UP TO 3XX1	Elective Specialized Course (1)	2	2	–	3	90	60	–	2	150
HUM 3xx	Elective Humanity Course (2)	2	1	–	2	70	30	–	2	100
		12	11	1	17					850
Total First Semester Hours		24				Total Semester Marks				

Course Code	Course Name	Second Semester								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO373	Bioelectronics and Measurements (2)	2	2	2	3	60	45	45	2	150
TO 362	System Dynamics (2)	2	2	-	3	90	60	-	2	150
TO 374	Medical Equipment (2)	2	2	-	3	90	60	-	2	150
UP TO 324	Computer (4)	2	-	2	2	40	30	30	2	100
TO 391	Training project	2	2	2	3	-	100	50	-	150
HUM 3xx	Elective Humanity Course (3)	2	1	-	2	70	30	-	2	100
		12	9	6	16					800
Total Second Semester Hours		27				Total Semester Marks				

Course Code	Course Name	Summer Training Course								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO383	Site Summer Training (3)	-	-	3	1	-	25	25	-	50
		-	-	3	1					50
Total Third Semester Hours		3				Total Semester Marks				

*Bioelectronics and Measurements (1),(2), System Dynamics (1),(2), Medical Equipment (1),(2) are continuous subjects

Year:- Fourth Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO471	Medical Equipment (3)	2	-	2	2	40	30	30	2	100
TO 461	Digital Electronic Systems (1)	2	2	1	3	60	45	45	2	150
UP TO 462	System Engineering	2	2	1	3	60	45	45	2	150
HUM 451	Projects Management	2	1	-	2	70	30	-	-	100
UP TO 4yy	Distinction Course (1)	2	-	2	2	40	30	30	2	100
UP TO 4XX2	Elective Specialized Course (2)	2	2	-	3	90	60	-	2	150
TO 491	Graduation Project (1)	2	2	2	3	-	75	75	-	150
		14	9	8	18					900
Total First Semester Hours		31			Total Semester Marks					

Course Code	Course Name	Second Semester								Total Course Marks
		Weekly Hours			Equiv. Credit Hours	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO472	Medical Equipment (4)	2	-	2	2	40	30	30	2	100
TO 463	Digital Electronic Systems (2)	2	2	1	3	60	45	45	2	150
UP TO 425	Computer (5)	2	-	2	2	40	30	30	2	100
UP TO 464	Digital Signal Processing	2	-	2	2	40	30	30	2	100
UP TO 4yy	Distinction Course (2)	2	1	-	2	60	40	-	2	100
UP TO 4XX3	Elective Specialized Course (3)	2	1	-	2	60	40	-	2	100
TO 492	Graduation Project (2)	2	2	3	4	-	100	100	-	200
		14	6	10	17					850
Total Second Semester Hours		30			Total Semester Marks					

*Medical Equipment (3), (4), Digital Electronic Systems (1), (2), Graduation Project (1), (2) are continuous subjects

Regulation 2019–2

Year:- First Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	Total Course Marks
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO 151	Electrical Eng. (1)	2	1	1	4	75	30	20	2	125
TO 153	Mechanical Eng. (1)	2	1	-	3	60	40	-	2	100
UP TO 155	Computer Basics	1	1	2	4	60	20	20	2	100
PHM 161	Engineering Mathematics	2	2	-	4	60	40	-	2	100
PHM 163	Physics of Medical Waves	2	1	1	4	60	40	-	2	100
UP TO 145	Chemistry (2)	2	1	-	3	60	40	-	2	100
HUM 161	Int. Biomedical Engineering	1	1	-	2	60	40	-	2	100
		12	8	4						725
Total First Semester Hours		24			Total Semester Marks					

Course Code	Course Name	Second Semester								
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	Total Course Marks
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
UP TO 152	Electrical Eng. (2)	2	1	1	4	75	30	20	2	125
TO 154	Mechanical Eng. (2)	2	1	-	3	60	40	-	2	100
TO 156	Programming & Algorithms	1	1	2	4	60	20	20	2	100
PHM 162	Diff. Equations & Transforms	2	2	-	4	60	40	-	2	100
PHM 164	Physics of Radiation	2	2	-	4	60	40	-	2	100
UP TO 158	Electronic Dev. & Systems (1)	2	1	1	4	50	30	20	2	100
TO 148	Biology	2	-	1	3	60	40	-	2	100
		13	8	5						725
Total First Semester Hours		26			Total Semester Marks					

* Electrical Eng. (1),(2)- Mechanical Engineering (1),(2)- Engineering Mathematics and Diff. Equations & Transforms are continuous subjects.

Year:- Second Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								Total Course Marks
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO 251	Elect. Signals & Systems (1)	2	1	1	4	50	30	20	2	100
TO 253	Elect. Measurements (1)	2	1	1	4	50	30	20	2	100
UP TO 255	Data Structure	2	1	-	3	50	30	20	2	100
TO 257	Electronic Dev. & Systems (2)	2	1	1	4	50	30	20	2	100
TO 241	Physiology (1)	2	-	1	3	60	20	20	2	100
TO 243	Anatomy	2	-	1	3	60	20	20	2	100
TO 261	Field Training (1)	-	-	2	2	25	15	10	1	50
Hum 261	Elect. Humanity (1)	2	1	-	3	60	40	-	2	100
		14	5	7						750
Total First Semester Hours		26			Total Semester Marks					

Course Code	Course Name	Second Semester								Total Course Marks
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
UP TO 252	Elect. Signals & Systems (2)	2	1	1	4	50	30	20	2	100
UP TO 254	Elect. Measurements (2)	2	1	1	4	50	30	20	2	100
TO 256	Computer Networks	2	1	2	5	50	30	20	2	100
UP TO 242	Physiology (2)	2	-	1	3	60	20	20	2	100
TO 244	Biochemistry	1	-	1	2	60	20	20	2	100
HUM 262	Comm. Skills	2	1	-	3	60	40	-	2	100
HUM 263	Elect. Humanity (2)	2	1	-	3	60	40	-	2	100
		13	5	6						700
Total First Semester Hours		24			Total Semester Marks					

*Electrical Signals and Systems (1),(2)- Elect. Measurements (1),(2)- Physiology (1),(2) are continuous subjects

Year:- Third Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								Total Course Marks
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO 371	Bioelectronics (1)	2	2	1	5	50	30	20	2	100
TO 373	Syst. Dynamics (1)	2	2	1	5	50	30	20	2	100
UP TO 375	Med. Labs Equipment	2	2	-	4	60	40	-	2	100
UP TO 38A	Elect. Specialty (1)	2	1	-	3	75	50	-	2	125
TO 351	Bioinformatics	2	1	-	3	60	40	-	2	100
HUM 363	Business Management.	2	1	-	3	60	40	-	2	100
TO 361	Field Training (2)	-	-	2	2	25	10	15	1	50
HUM 361	Elect. Humanity (3)	2	1	-	3	60	40	-	2	100
		14	10	4						775
Total First Semester Hours		28			Total Semester Marks					

Course Code	Course Name	Second Semester								Total Course Marks
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
UP TO 372	Bioelectronics (2)	2	2	1	5	50	30	20	2	100
TO 374	Syst. Dynamics (2)	2	2	1	5	50	30	20	2	100
TO 376	Basic Medical Equipment	2	2	-	4	60	40	-	2	100
UP TO 38b	Elect. Specialty (2)	2	1	-	3	75	50	-	2	125
TO 352	Artificial Intelligence	2	1	-	3	60	40	-	2	100
HUM364	Project Management.	2	1	-	3	60	40	-	2	100
HUM362	Elect. Humanity (4)	2	1	-	3	60	40	-	2	100
		14	10	2						725
Total First Semester Hours		26			Total Semester Marks					

*****Bioelectronics and Measurements (1),(2)- System Dynamics (1),(2)- Med. Labs Equipment , Basic Medical Equipment are continuous subjects.

Year:- Fourth Program:- Systems and Biomedical Engineering

Course Code	Course Name	First Semester								Total Course Marks
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO 471	Digital Electronic Syst. (1)	2	1	1	4	50	30	20	2	100
TO 473	System Engineering	2	1	1	4	50	30	20	2	100
UP TO 475	Med. Imaging Equipment	2	1	-	3	60	40	-	2	100
UP TO 49x	Elect. Distinct. (1)	2	1	-	2	75	50	-	2	125
UP TO 48c	Elect. Specialty (3)	2	1	-	3	75	50	-	2	125
TO 461	Field Training (3)	-	-	2	2	25	10	15	1	50
TO 463	Graduation . Project (1)	1	1	3	5	50	50	-	-	100
HUM 461	Clinical Syst. Management.	2	1	-	3	60	40	-	2	100
		13	7	7						800
Total First Semester Hours		27			Total Semester Marks					

Course Code	Course Name	Second Semester								Total Course Marks
		Weekly Hours			Total	Total Marks Score			Exam duration (hr)	
		Reading	Tutorial	Practical		Written	Periodic Assess.	Practical/ Oral		
TO 472	Digital Electronic Syst. (2)	2	1	1	4	50	30	20	2	100
TO 474	Digital Signal Processing	2	2	1	5	50	30	20	2	100
TO 476	Specialized Med. Equipment	2	1	-	3	60	40	-	2	100
BIS 49y	Elect. Distinct. (2)	2	1	-	2	75	50	-	2	125
UP TO 48d	Elect. Specialty (4)	2	1	-	3	75	50	-	2	125
UP TO 464	Graduation. Project (2)	2	1	3	5	90	60	-	-	150
HUM 462	Hospital Design	2	1	-	2	60	40	-	2	100
		14	8	5						800
Total First Semester Hours		27			Total Semester Marks					

* Digital Electronic Systems (1),(2)- Med. Imaging Equipment, Specialized Med. Equipment are continuous subjects
*Graduation Project (1), (2) are continuous subjects and the evaluated by the end of second semester.

Part IV Department Achievements

The department applies external cooperation protocols with major companies and hospitals of the medical sector in the Republic of Egypt Arabic to help students of different stages to receive practical and scientific experiences and keep pace with the rapid changes of the labor market and appoint them after graduation, for example (International Medical Center - Saudi German Hospital - Baheya Hospital - Egyptian Group Company - ....)

The department graduated 24 batches with a total number of 1832 graduates who designed graduation projects to solve the problems facing the medical sector in Egypt from the design of prosthetic, diagnostic and therapeutic devices in addition to the use of programming languages and artificial intelligence for early diagnosis and automatic detection of diseases. The department's graduates hold many prestigious administrative and political positions in all areas of specialization to serve the community.

The department has paid attention to applied projects and the participation of students in various competitions such as:

- Obtaining the first place in the eighteenth Egyptian Engineering Day in the field of biomedical engineering 2019
- The student team of the (Breast Cancer Detection Based on Bioelectrical Impedance) project in the fourth year won third place with a prize of 2000 pounds in the activities of the exhibition of student projects in medical engineering, the fourth edition, held at the Faculty of Electronic Engineering in Menouf.
- The student team of the (Automotive Robotic Neck) project in the fourth year won the third place in the award for the best project idea based on the public vote in the activities of the Student Projects Exhibition of Medical Engineering, the fourth edition, held at the Faculty of Electronic Engineering in Menouf.
- The team of students of the (A Game-based Rehabilitation System) project in the fourth year won second place with a prize of 6000 pounds in the activities of the (The 4th Egyptian Junior Researcher

Competition) held at Nile University under the supervision of.Dr. Ahmed Al-Baili and Mr.mDr. Nevin Saleh

- The student team of the (Breast Cancer Detection Based on Bioelectrical Impedance) project in the fourth year won a prize of 15,000 pounds in the activities of the Made in Egypt 2023 competition held at the American University in Egypt

First: Training and recruiting students in various companies

Second: Graduation Projects Exhibition

Third: A sample of the department's graduates

Fourth: Community Participation