Bachelor of Science in Biomedical and Instruments Engineering

2023-2024

Major Sheet

1. General Program Presentation

Graduating with a Bachelor of Science in Biomedical and Instruments Engineering (BIE) necessitates the successful completion of a total of 132 credit hours (CH). These credit hours are distributed across different requirements, encompassing courses that are essential as well as those that can be chosen as elective courses. The table below shows how 132 credit hours are distributed across requirements:

Table 1: BIE credit hours distribution.

Requirements	Credit hours (CH)
General Education Requirements	36
College Requirements	43
Program Requirements	53 (Including 9 CH electives)
Total Credit Hours	132

2. General Education (36 Credits)

Students here are required to complete 36 credit hours distributed over five sections as follows:

2.1. Communication (9 Credits)

Table 2.1: Compulsory courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ENL101	English for Academic Studies	3	3	IEP099 or Equivalent	DPS095*
ENL102	English Composition	3	3	ENL101 DPS095	
ENL201	Writing and Research	3	3	ENL102	

*Preparatory Program; Digital and Professional Skills (DPS095).

2.2. Innovation and Creativity (6 Credits)

Table 2.2.1: Compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
GEN150	Professionalism and Ethics	3	3		

Table 2.2.2: Elective courses, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
GEN131	Creativity and Problem Solving	3	3		
BUS101	Entrepreneurship Essentials	3	3		
ENI110	Intro. to Innovation and Creativity	3	3		

ENI140	Design Thinking	3	3
ENI150	Innovation in Business Models	3	3
ENI160	Innovation and Globalization	3	3

2.3. Global Citizen (6 Credits)

Table 2.3.1: Compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
INF120	Computers and Information Systems	3	3	DPS095	

Table 2.3.2: Elective courses, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
GEN201	Globalization and Sustainability	3	3		
GEN202	Global Citizenship in the Digital Age	3	3		
BUS201	Global Economics and Trade	3	3		

2.4. Art and Humanities (9 Credits)

Table 2.4.1: Compulsory course.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
HST101	Islamic Culture and Values	3	3		

Table 2.4.2: Elective courses, group I, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
HST102	Kuwait History	3	3		
ARB101	Arabic Communication Skills	3	3		
ART101	Art Appreciation	3	3		
ART102	Intro. to Media and Communication	3	3		

Table 2.4.3: Elective courses, group II, students should select one course from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
PHL101	Introduction to Philosophy	3	3		
LAW101	Law and Society	3	3		
PSY101	Introduction to Psychology	3	3		
SOC101	Introduction to Sociology	3	3		

BUS300	Career Planning	3	3		

2.5. Math and Science (6 Credits)

Table 2.5: Compulsory courses.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
MAT101	Calculus I	3	3	IMP099* or Equivalent	
PHY101	Physics I	3	3		MAT101

*Preparatory Program; Precalculus (IMP099).

3. College Requirements (43 Credits)

Table 3.1: Compulsory courses for Math and Science (21 Credits).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
PHY105	Physics Lab I	1	3		PHY101
MAT102	Calculus II	3	3	MAT101	
MAT201	Calculus III	3	3	MAT102	
PHY102	Physics II	3	3	PHY101 MAT101	
PHY107	Physics II Lab	1	3	PHY105	PHY102
CHM101	Chemistry I	3	3	IMP099 or Equivalent	
CHM105	Chemistry I Lab	1	3		CHM101
MAT202	Linear Algebra	3	3	MAT101	
MAT240	Differential Equations	3	3	MAT102	

Table 3.2: Compulsory courses for Engineering (22 Credits).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
ENG205	Electrical and Electronic Circuits	3	3	PHY102 MAT102	
ENG206	Electrical and Electronic Circuits Lab	1	3	ENG205 PHY107	
ENG207	Programming	3	3	MAT202	
ENG208	Introduction to Energy and Sustainability	3	3	PHY102 CHM105	
ENG204	Engineering Mechanics	3	3	PHY102	
ENG304	Engineering Probability & Statistics	3	3	MAT102	
ENG308	Numerical Methods	3	3	MAT202 MAT240	

ENG309	Engineering Project Management and Economics	3	3	ENG207 ENG208	

4. Program Requirements (53 Credits)

Table 4.1: Compulsory courses (44 Credits).

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
BIE101	Human Biology for Engineers	3	3	CHM101	
BIE201	Biochemistry	3	3	CHM101 BIE101	
BIE202	Biochemistry Lab	1	3		BIE201
BIE203	Human Anatomy and Physiology	3	3	BIE101	
BIE301	Biofluids and Biomedical Transport Phenomena	3	3	ENG204 MAT240	
BIE302	Biomaterials	3	3	BIE203 BIE202	
BIE303	Biomaterials Lab	1	3		BIE302
BIE304	Biomechanics	3	3	BIE203 BIE301	
BIE350	Signal Measurement Principles and Control Systems	3	3	ENG205 ENG304	
BIE351	Signal Measurement Principles and Control Systems Lab	1	3		BIE350
BIE352	Instrumentation, Measurements, and Data Acquisition	3	3	BIE350	
BIE353	Instrumentation, Measurements, and Data Acquisition Lab	1	3		BIE352
BIE371	Medical Imaging Systems	3	3	MAT201 BIE350	
BIE451	Instrumentation Design	3	3	BIE352	
BIE452	Instrumentation Design Lab	1	3		BIE451
BIE401	Biomedical Molecular and Nano Devices	3	3	BIE304 BIE371	
BIE490	Capstone Design 1	3	3	Pass 96 CH	
BIE491	Capstone Design 2	3	3	BIE490	

Table 4.2: Elective courses, students should select three courses (9 Credits) from the following list.

Course Code	Course Title	Credit hours	Contact hours	Pre-requisite	Co-requisite
BIE453	Electromagnetics Principles & Applications	3	3	BIE350	
BIE454	Instrumentation Electronics	3	3	BIE350	
BIE460	Process Instrumentation	3	3	BIE352	
BIE461	Safety and Reliability	3	3	BIE451	
BIE462	Communication Protocols	3	3	BIE352	
BIE466	Sensors Design	3	3	BIE451	
BIE480	Internship	3	3	Program Approval	
BIE410	Biomechanics and Modelling of Human Movement	3	3	BIE302 BIE304	
BIE411	Cellular and Molecular Biomechanics	3	3	BIE201 BIE304	
BIE412	Rehabilitation Engineering	3	3	BIE304	
BIE413	Biomedical Algorithms and Solutions	3	3	BIE304	
BIE414	Image Processing	3	3	BIE371	
BIE415	Biomedical Optics	3	3	BIE302 BIE371	
BIE416	Medical Devices Design and Manufacturing	3	3	BIE302 BIE304	
BIE495	Special Topics in Biomedical Engineering	3	3	Program Approval	
BIE496	Special Topics in Instrumentation Engineering	3	3	Program Approval	

- **Students may take up to 3 credits of program electives from another college at the 300 level or above to replace one of their program electives, provided they obtain the approval of both the program and the college.**