



جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

COLLEGE OF ENGINEERING

B.Sc. PROGRAM

BIOMEDICAL ENGINEERING

CURRICULUM & COURSE DESCRIPTION

JUMADA'II, 1438H (MARCH, 2017G)



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Table 1: Biomedical Engineering B.Sc. Curriculum
Total Credit Hours 166: (30 Preparatory + 136 Program)

1st Year: Preparatory		2nd Year: Freshman		3rd Year: Sophomore		4th Year: Junior		5th Year: Senior	
1st Semester	2nd Semester	1st Semester	2nd Semester	1st Semester	2nd Semester	1st Semester	2nd Semester	1st Semester	2nd Semester
English Language I (5 Cr)	English Language II (5 Cr)	Faith Morals (2 Cr)	Calculus II (4 Cr)	Economic System in Islam (2 Cr)	Political System in Islam (2 Cr)	Technical Writing (2 Cr)	Research Methodology (1 Credit)	Professional Practice & Ethics (2 Cr)	Social System in Islam (2 Cr)
Math I (3 Cr)	Math II (3 Cr)	Library Skills (1 Cr)	Physics II (4 Cr)	Oral Communication & Public Speaking (1 Cr)	Physiology & Anatomy (3 Cr)	Probability and Statistics (3 Cr)	Engineering Economics (2 Cr)	Project Management (1 Credit)	Global Business Culture (2 Cr)
Basic Design Studio I (2 Cr)	Basic Design Studio II (2 Cr)	English Composition (3 Cr)	Computer Programming (2 Cr)	Differential Equations & Numerical Methods (3 Cr)	Linear Algebra (3 Cr)	Fluid Dynamics (2 Cr)	Intr. To Communication Systems & Networks (2 Cr)	Design of Medical Devices (2 Cr)	Senior Design Project II (4 Cr)
Learning & Searching Skills (2 Cr)	Physics (3 Cr)	General Chemistry (3 Cr)	Engineering Drawings (3 Cr)	General Biology (3 Cr)	Biochemistry and Molecular Biology (2 Cr)	Digital Design (3 Cr)	Biomedical Instrumentation Design (3 Cr)	Senior Design Project I (2 Cr)	Elective III ** (3 Cr)
Physical Education (1 Cr)	Communication Skills (2 Cr)	Calculus I (4 Cr)	Statics (3 Cr)	Dynamics (2 Cr)	Electronic Devices & Circuits (3 Cr)	Biomaterials (2 Cr)	Microprocessors (3 Cr)	Control Systems in BME (3 Cr)	Elective IV ** (3 Cr)
	Computer Skills (2 Cr)	Physics I (4 Cr)		Electrical Circuits (3 Cr)	Thermodynamics (3 Cr)	Biomed. Electronics & Measurement (3 Cr)	Safety & Maintenance in Healthcare (2 Cr)	Elective I ** (3 Cr)	Elective V ** (3 Cr)
		Introduction to Engineering (1 Cr)		Advanced Computer Programming (2 Cr)	Foundation of Biomechanics (2 Cr)	Signals & Systems in BME (3 Cr)	Biomedical Equipment (4 Cr)	Elective II ** (3 Cr)	
(13 Cr)	(17 Cr)	(18 Cr)	(16 Cr)	(16 Cr)	(18 Cr)	(18 Cr)	(17 Cr)	(16 Cr)	(17 Cr)
					Summer Training I * (0 Credit)		Summer Training II * (0 Credit)		

Out of 136 Credits:

Humanities: 20 Credits (15%)

Basic Sciences: 36 Credits (26%)

Engineering: 80 Credits (59%)

* Taken during following summer

** The selection of technical elective course should be done under the supervision of the student advisor.



Table 2-1: Biomedical Engineering Curriculum - First Year – Preparatory

1st Semester			
Course #	Course Title	Cr & Cont Hrs Cr ; Lc ; Tr/Lb	Pre- Requisite
ENGL 101	English Language I	5 ; 15 ; 5	Admission
MATH 111	Math I	3 ; 3 ; 0	Admission
ARCH 121	Basic Design Studio I	2 ; 0 ; 4	Admission
LRSK 141	Learning & Searching Skills	2 ; 2 ; 0	Admission
PHEDU 162	Physical Education	1 ; 0 ; 2	Admission
Total Credits & Contact Hours:		13 ; 20 ; 11	
2nd Semester			
Course #	Course Title	Cr & Cont Hrs Cr ; Lc ; Tr/Lb	Pre- Requisite
ENGL 102	English Language II	5 ; 15 ; 5	ENGL 101
MATH 112	Math II	3 ; 3 ; 0	MATH 111
ARCH 122	Basic Design Studio II	2 ; 0 ; 4	ARCH 121
PHYS 132	Physics	3 ; 3 ; 0	Admission
LRSK 142	Communication Skills	2 ; 2 ; 0	Admission
COMP 131	Computer Skills	2 ; 0 ; 4	Admission
Total Credits & Contact Hours:		17 ; 23 ; 13	

Cr: Credit Hours

Lc: Lecture Hours;

Tr: Tutorial Hours;

Lb: Laboratory Hours



Table 2-2: Biomedical Engineering Curriculum - Second Year – Freshman

1st Semester			
Course #	Course Title	Cr & Cont Hrs Cr ; Lc ; Tr/Lb	Pre-Requisite
ISLM 271	Faith Morals	2 ; 2 ; 0	None
HUMN 201	Library Skills	1 ; 0 ; 2	None
ENGL 211	English Composition	3 ; 3 ; 0	None
CHEM 221	General Chemistry	3 ; 2 ; 2	None
MATH 261	Calculus I	4 ; 3 ; 2	None
PHYS 271	Physics I	4 ; 3 ; 2	None
ENG 251	Introduction to Engineering	1 ; 0 ; 2	None
Total Credits & Contact Hours:		18 ; 13 ; 10	
2nd Semester			
Course #	Course Title	Cr & Cont Hrs Cr ; Lc ; Tr/Lb	Pre-Requisite
MATH 262	Calculus II	4 ; 3 ; 2	MATH 261
PHYS 272	Physics II	4 ; 3 ; 2	PHYS 271
COMP 212	Computer Programming	2 ; 1 ; 2	None
ENG 222	Engineering Drawings	3 ; 1 ; 4	None
ENG 232	Statics	3 ; 3 ; 0	PHYS 271
Total Credits & Contact Hours:		16 ; 11 ; 10	

Cr: Credit Hours

Lc: Lecture Hours;

Tr: Tutorial Hours;

Lb: Laboratory Hours

Table 2-3: Biomedical Engineering Curriculum - Third Year – Sophomore

1st Semester			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre-Requisite
ISLM 273	Economic System in Islam	2 ; 2 ; 0	None
HUMN 301	Oral Communication & Public Speaking	1 ; 0 ; 2	None
MATH 331	Differential Equations & Numerical Methods	3 ; 2 ; 2	MATH 262
ENG 311	Dynamics	2 ; 2 ; 0	ENG 232
BIOL 341	General Biology	3 ; 2 ; 2	CHEM 221
ENG 331	Electrical Circuits	3 ; 2 ; 2	PHYS 272
COMP 361	Advanced Computer Programming	2 ; 1 ; 2	COMP 212
Total Credits & Contact Hours:		16 ; 11 ; 10	
2nd Semester			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre-requisite
ISLM 274	Political System in Islam	2 ; 2 ; 0	None
MATH 302	Linear Algebra	3 ; 2 ; 2	MATH 262
BIOL 302	Physiology & Anatomy	3 ; 2 ; 2	BIOL 341
BIOL 342	Biochemistry and Molecular Biology	2 ; 1 ; 2	CHEM 221
ENG 322	Electronic Devices & Circuits	3 ; 2 ; 2	ENG 331
ENG 352	Thermodynamics	3 ; 3 ; 0	ENG 311
BIOEN 312	Foundation of Biomechanics	2 ; 1 ; 2	BIOL 341
Total Credits & Contact Hours:		18; 13 ; 10	
1st Summer Training – One Month			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre-Requisite
BIOEN 333	Summer Training I	0 ; 0 ; 0	Dpt Consent

Cr: Credit Hours

Lc: Lecture Hours;

Tr: Tutorial Hours;

Lb: Laboratory Hours

Table 2-4: Biomedical Engineering Curriculum - Fourth Year – Junior

1st Semester			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre-Requisite
ENG 401	Technical Writing	2 ; 2 ; 0	ENGL 211
MATH 411	Probability & Statistics	3 ; 2 ; 2	None
BIOEN 441	Fluid Dynamics	2 ; 1 ; 2	ENG 352
ENG 451	Digital Design	3 ; 2 ; 2	ENG 322
BIOEN 421	Biomaterials	2 ; 2 ; 0	BIOL 341
BIOEN 431	Biomed. Electronics & Measurement	3 ; 2 ; 2	CR: BIOEN 461
BIOEN 461	Signals & Systems In BME	3 ; 2 ; 2	ENG 322
Total Credits & Contact Hours:		18 ; 13 ; 10	
2nd Semester			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre-requisite
HUMN 402	Research Methodology	1 ; 1 ; 0	HUMN 201
ENG 412	Engineering Economics	2 ; 2 ; 0	None
ENG 442	Introd to Commnctn Systems & Networks	2 ; 2 ; 0	ENG 322
BIOEN 432	Biomed Instrumentation Design	3 ; 2 ; 2	BIOEN 461
BIOEN 442	Microprocessors	3 ; 2 ; 2	ENG 451
BIOEN 452	Safety & Maintenance in Healthcare	2 ; 2 ; 0	None
BIOEN 462	Biomedical Equipment	4 ; 3 ; 2	BIOEN 431
Total Credits & Contact Hours:		17 ; 14 ; 6	
2nd Summer Training – Two Months			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre-Requisite
BIOEN 444	Summer Training II	0 ; 0 ; 0	Dpt Consent

Cr: Credit Hours

Lc: Lecture Hours;

Tr: Tutorial Hours;

Lb: Laboratory Hours



Table 2-5: Biomedical Engineering Curriculum - Fifth Year – Senior

1 st Semester			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre- Requisite
HUMN 501	Professional Practice and Ethics	2 ; 2 ; 0	ENG 251
BIOEN 511	Project Management	1 ; 1 ; 0	None
BIOEN 521	Design of Medical Devices	2 ; 1 ; 2	BIOEN 432
BIOEN 531	Senior Design Project I	2 ; 0 ; 4	HUMN 402
BIOEN 541	Control Systems in BME	3 ; 2 ; 2	ENG 331
BIOEN 5xx	Technical Elective I*	3 ; Varies	**
BIOEN 5xx	Technical Elective II*	3 ; Varies	**
Total Credits & Contact Hours:		16 ; Varies	
2 nd Semester			
Course #	Course Title	Cr Cont Hrs Cr ; Lc ; Tr/Lb	Pre- requisite
ISLM 272	Social System in Islam	2 ; 2 ; 0	None
HUMN 502	Global Business Culture	2 ; 2 ; 0	None
BIOEN 532	Senior Design Project II	4 ; 0 ; 8	BIOEN 531
BIOEN 5xx	Elective III*	3 ; Varies	**
BIOEN 5xx	Elective IV*	3 ; Varies	**
BIOEN 5xx	Elective V*	3 ; Varies	**
Total Credits & Contact Hours:		17 ; Varies	

Cr: Credit Hours Lc: Lecture Hours; Tr: Tutorial Hours; Lb: Laboratory Hours

* Selection of technical electives should be done under the supervision of the student advisor.

** Specific course pre-requisite should be fulfilled.

Table 2-6: Biomedical Engineering Curriculum – Electives (All are 3 Credit Hours)

Electives (All are 3 Credit Hours)		
Course #	Course Title	Pre-Requisite
BIOEN 503	Digital System Design	Dpt Consent
BIOEN 513	Biomedical Digital Signal Processing	Dpt Consent
BIOEN 533	Digital Control Systems	Dpt Consent
BIOEN 523	Biomedical Electromagnetic	Dpt Consent
BIOEN 585	Medical Laser	Dpt Consent
BIOEN 595	Entrepreneurial Issues in Biomedical Engineering	Dpt Consent
BIOEN 506	Advanced topics in Biomedical Engineering	Dpt Consent
BIOEN 553	Biomedical Imaging Systems	Dpt Consent
BIOEN 563	Medical Image Processing & Communication	Dpt Consent
BIOEN 573	MRI	Dpt Consent
BIOEN 583	Ultrasound	Dpt Consent
BIOEN 593	X-ray and CT	Dpt Consent
BIOEN 504	Introduction to Biomedical Optics	Dpt Consent
BIOEN 514	Bio-Optical Imaging	Dpt Consent
BIOEN 554	Software Engineering	Dpt Consent
BIOEN 564	Networks & Distributed Processing	Dpt Consent
BIOEN 594	Introduction to Safety Engineering	Dpt Consent

* Selection of technical electives should be done under the supervision of the student advisor.

** Specific course pre-requisite should be fulfilled.