

# BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING, BIOMEDICAL TRACK

## Summary for Biomedical Track

COURSE	TITLE	S.H.
Elec & Comp Engin		41
Science		32
Engineering <sup>1</sup>		11
Math <sup>1</sup>		18
Writing and Speech <sup>1</sup>		9
General Education Courses <sup>1</sup>		18
Total Semester Hours		129

<sup>1</sup> See Curriculum section for courses in these areas that are common to the three options.

COURSE	TITLE	S.H.
<b>General Education Requirement</b>		
Core Competencies 9		
ENGL 1550	Writing 1	
ENGL 1551	Writing 2	
CMST 1545	Communication Foundations	
Arts and Humanities 6		
Social Science 6		
Social and Personal Awareness 6		
<b>Major Requirements</b>		
ECEN 1521 & 1521L	Digital Circuits and Digital Circuits Laboratory	4
ECEN 2611	Instrumentation and Computation Lab 1	1
ECEN 2612	Instrumentation and Computation Lab 2	1
ECEN 2632	Basic Circuit Theory 1	3
ECEN 2633	Basic Circuit Theory 2	3
ECEN 3711	Intermediate Laboratory 1	1
ECEN 3712	Intermediate Laboratory 2	1
Select one of the following: 3		
ECEN 3710	Signals and Systems	
ECEN 3734	Computer Design	
ECEN 3772	Digital and Analog Circuits 2	
ECEN 3733	Digital Circuit Design	3
ECEN 3741	Electromagnetic Fields 1	3
ECEN 3742	Electromagnetic Fields 2	3
ECEN 3771	Digital and Analog Circuits 1	3
ECEN 4803	Linear Control Systems	4
ECEN 4811	Senior Laboratory	1
ECEN 4844	Electromagnetic Energy Conversion	3
ECEN 4899	Senior Design Project	4
<b>Engineering</b>		
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
ENGR 1560	Engineering Computing	2
MECH 2620	Statics and Dynamics	3
ISEN 3710	Engineering Statistics	3
<b>Science</b>		

CHEM 1515 & 1515L	General Chemistry 1 and General Chemistry 1 Laboratory	4
CHEM 1516 & 1516L	General Chemistry 2 and General Chemistry 2 Laboratory	4
CHEM 3719 & 3719L	Organic Chemistry 1 and Organic Chemistry 1 Laboratory	4
CHEM 3720 & 3720L	Organic Chemistry 2 and Organic Chemistry 2 Laboratory	4
BIOL 2601 & 2601L	General Biology: Molecules and Cells and General Biology: Molecules and Cells Laboratory	4
BIOL 2602 & 2602L	General Biology: Organisms and Ecology and General Biology: Organisms and Ecology Laboratory	4
PHYS 2610 & 2610L	General Physics 1 and General Physics laboratory 1	5
PHYS 3705	Thermodynamics and Classical Statistical Dynamics	3
The following two science courses are recommended for the biomedical option but do not count toward degree requirements:		
CHEM 3785	Biochemistry 1	
BIOL 3702	Microbiology	

<b>Math</b>	
Select 18 s.h. of MATH courses.	18
Total Semester Hours	129

## Courses Common to All Tracks

COURSE	TITLE	S.H.
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
ENGR 1560	Engineering Computing	2
MECH 2620	Statics and Dynamics	3
ISEN 3710	Engineering Statistics	3
Total Hours		11
<b>Mathematics</b>		
MATH 1571	Calculus 1	4
MATH 1572	Calculus 2	4
MATH 2673	Calculus 3	4
MATH 3705	Differential Equations	3
MATH 3715	Discrete Mathematics	3
Total Hours		18
<b>Writing &amp; Speech</b>		
CMST 1545	Communication Foundations	3
ENGL 1550	Writing 1	3
ENGL 1551	Writing 2	3
Total Hours		9
<b>General Education (codes)</b>		
ECON 2610	Principles 1: Microeconomics	3
PHIL 2626	Engineering Ethics	3
Arts and Humanities Elective		3
Social Science Elective		3
Social & Personal Awareness Elective		3
Total Hours		18

<b>Year 1</b>		S.H.
<b>Fall</b>		
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
CHEM 1515 & 1515L	General Chemistry 1 and General Chemistry 1 Laboratory	4

ENGL 1550	Writing 1	3
General Education Requirement		3
MATH 1571	Calculus 1	4
Semester Hours		17

**Spring**

MATH 1572	Calculus 2	4
ENGR 1560	Engineering Computing	2
CHEM 1516 & 1516L	General Chemistry 2 and General Chemistry 2 Laboratory	4
ENGL 1551	Writing 2	3
ECEN 1521 & 1521L	Digital Circuits and Digital Circuits Laboratory	4
Semester Hours		17

**Year 2****Fall**

MATH 2673	Calculus 3	4
ECEN 2632	Basic Circuit Theory 1	3
ECEN 2611	Instrumentation and Computation Lab 1	1
PHYS 2610 & 2610L	General Physics 1 and General Physics laboratory 1	5
PHIL 2626	Engineering Ethics	3
Semester Hours		16

**Spring**

MATH 3705	Differential Equations	3
MATH 3715	Discrete Mathematics	3
ECEN 2633	Basic Circuit Theory 2	3
ECEN 2612	Instrumentation and Computation Lab 2	1
MECH 2620	Statics and Dynamics	3
CMST 1545	Communication Foundations	3
Semester Hours		16

**Year 3****Fall**

ECEN 3711	Intermediate Laboratory 1	1
ECEN 3733	Digital Circuit Design	3
ECEN 3741	Electromagnetic Fields 1	3
ECEN 3771	Digital and Analog Circuits 1	3
BIOL 2601 & 2601L	General Biology: Molecules and Cells and General Biology: Molecules and Cells Laboratory	4
ISEN 3710	Engineering Statistics	3
Semester Hours		17

**Spring**

ECEN 3712	Intermediate Laboratory 2	1
ECEN 3734 or ECEN 3772 or ECEN 3710	Computer Design or Digital and Analog Circuits 2 or Signals and Systems	3
ECEN 3742	Electromagnetic Fields 2	3
ECEN 4844	Electromagnetic Energy Conversion	3
BIOL 2602 & 2602L	General Biology: Organisms and Ecology and General Biology: Organisms and Ecology Laboratory	4
ECON 2610	Principles 1: Microeconomics	3
Semester Hours		17

**Year 4****Fall**

ECEN 4811	Senior Laboratory	1
ECEN 4803	Linear Control Systems	4

PHYS 3705	Thermodynamics and Classical Statistical Dynamics	3
CHEM 3719 & 3719L	Organic Chemistry 1 and Organic Chemistry 1 Laboratory	4
General Education Requirement		3
Semester Hours		15

**Spring**

ECEN 4899	Senior Design Project	4
CHEM 3720 & 3720L	Organic Chemistry 2 and Organic Chemistry 2 Laboratory	4
General Education Requirement		3
General Education Requirement		3
Semester Hours		14
Total Semester Hours		129

## Student Outcomes

The following (1 through 7) Student Outcomes support the program educational objectives. Attainment of these outcomes by students by the time of their graduation prepares graduating students to enter the professional practice of engineering.

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. 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, environmental, and societal contexts.
5. 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.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.