

III. ENGINEERING

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Students with Advanced Placement credit:

Requirements for some courses in mathematical sciences can be met through Advanced Placement exam credit. Messiah College credit for various AP exams can be found at the following link, or through the registrar's website:

http://www.messiah.edu/info/21351/transfer_ap_clep_courses/2107/apclepib_equivalencies/3

Degree Programs and Curriculum Details

Bachelor of Science in Biomedical Engineering (BSBME)
131 CR

Bachelor of Science in Civil Engineering (BSCE)
131 CR

Bachelor of Science in Electrical Engineering (BSEE)
131 CR

Bachelor of Science in Mechanical Engineering (BSME)
131 CR

Engineering Minors
*Available to majors in
another Engineering discipline*

Biomedical Engineering
Civil Engineering
Electrical Engineering
Environmental Engineering
Mechanical Engineering

The BSE degree has been continuously accredited by ABET since 1993. That accreditation will be maintained indefinitely according to the typical ABET review cycle.

The BSBME, BSCE, BSEE, and BSME degrees are new at Messiah College beginning in Fall 2019. Students graduating May 2022 or later may choose these degree paths. Accreditation of new degree programs is not possible until the program has at least one graduate. Successful accreditation at that point would be retroactive to those graduates. Messiah College anticipates applying for accreditation in these programs in the Spring of 2022 with notification of official action by Summer 2023. All concentrations will be maintained within the BSE program through the transition and will also benefit from the curricular enhancements of the new programs.

Bachelor of Science in Engineering (BSE)

Biomedical Concentration
128 CR

Civil Concentration
128 CR

Electrical Concentration
128 CR

Mechanical Concentration
128 CR

Computer Concentration
128 CR

Environmental Concentration
128 CR

General Engineering
123 CR

*Consider pairing with a Messiah
College minor (samples below) or with
courses recommended for Pre-Med or
Pre-Health careers by our MC Pre-
Health Professions Advising Service.*

Physics
Chemistry
Business Administration
Leadership
Computer Science
Economic Development
Spanish
Music
Pre-Law

8 Semester Plans

Biomedical Engineering (BSBME)

*QuEST (General Education) requirement

Course #	Course Name	Credits	Course #	Course Name	Credits
First Year – Fall			First Year – Spring		
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
COMM 105	Fundamentals of Oral Communication*	3	IDCR 151	Created and Called for Community*	3
IDFY 101	First Year Seminar**	3	Varies	1st Language requirement*	3
		Total	16		
			Total		
			16		
Sophomore – Fall			Sophomore – Spring		
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	ENGR 323	Mechanics II	3
Varies	2nd Language requirement*	3	MATH 270	Linear and Differential Methods	3
			PHIL or RELI	Philosophy or Religion meeting QuEST*	3
		Total	18		
			Total		
			16		
Junior – Fall			Junior – Spring		
ENGR 213	Engineering Statistics	3	ENGR 332	BME Laboratory Techniques	3
ENGR 301	Seminar I	1	ENGR 377	Fluid Dynamics	4
ENGR 331	Biomechanics	4	ENGR 415	Engineering Project	1
ENGR 415	Engineering Project	1	ENGR 431	Biomedical Instrumentation	4
WELL 1xx	Wellness*	1	Varies	Social Science/History meeting QuEST*	3
Varies	Biomedical Science Elective	3	ENGL 1xx	Literature meeting QuEST*	3
HIST 1xx	History meeting QuEST*	3			
		Total	16		
			Total		
			18		
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 324	Control Systems	4
ENGR 371	Thermodynamics	3	ENGR 415	Engineering Project	2
ENGR 415	Engineering Project	2	ENGR 432	Design of Medical Devices	4
Varies	Biomedical Science Elective	4	THEO 2xx	Christian Beliefs*	3
Varies	3rd Language/NonWestern/CC*	2	Varies	Ethics/WV/Pluralism*	3
BIBL 2xx	Bible*	3			
		Total	15		
			Total		
			16		

Civil Engineering (BSCE) 8 Semester Plan

*QuEST (General Education) requirement

Course #	Course Name	Credits	Course #	Course Name	Credits
First Year – Fall			First Year – Spring		
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
		Total:			16
Sophomore – Fall			Sophomore – Spring		
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 213	Engineering Statistics	3
GEOL 201	Foundations of Geology	4	ENGR 214	Materials Engineering	4
Varies	2nd Language*	3	ENGR 323	Mechanics II	3
			MATH 270	Linear and Differential Methods	3
			WELL 1xx	Wellness*	1
		Total:			18
					Total: 17
Junior – Fall			Junior – Spring		
ENGR 301	Seminar I	1	ENGR 344	Construction Methods and Materials	4
ENGR 341	Structural Design I	4	ENGR 345	Fluid Mechanics	4
ENGR 353	Environmental Engineering	4	ENGR 415	Engineering Project	1
ENGR 415	Engineering Project	1	ENGR 441	Structural Design II	4
Varies	Social Science/History*	3	BIBL 2xx	Bible*	3
PHIL or RELI	Philosophy or Religion meeting QuEST*	3			
		Total:			16
					Total: 16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 346	Water Resources Engineering	3
ENGR 347	Transportation Engineering	3	ENGR 415	Engineering Project	2
ENGR 415	Engineering Project	2	ENGR 444	Civil Engineering Design	3
ENGR 443	Soil Mechanics and Foundation Design	4	Varies	3rd Language/NonWestern/CC*	2
HIST 1xx	History*	3	THEO 2xx	Christian Beliefs*	3
ENGL 1xx	Literature*	3	Varies	Ethics/WV/Pluralism*	3
		Total:			16
					Total: 16

Electrical Engineering (BSEE) 8 Semester Plan

*QuEST (General Education) requirement

Course #	Course Name	Credits	Course #	Course Name	Credits
First Year – Fall			First Year – Spring		
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
		Total:			16
Sophomore – Fall			Sophomore – Spring		
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	ENGR 361	Circuits II	4
Varies	2nd Language*	3	MATH 270	Linear and Differential Methods	3
			PHIL or RELI	Philosophy or Religion meeting QuEST*	3
		Total:			18
Junior – Fall			Junior – Spring		
ENGR 301	Seminar I	1	ENGR 213	Engineering Statistics	3
ENGR 362	Analog Electronics	3	ENGR 364	Electrical Devices	4
ENGR 363	Embedded Systems Design	4	ENGR 365	Linear Systems	3
ENGR 415	Engineering Project	1	ENGR 415	Engineering Project	1
WELL 1xx	Wellness*	1	HIST 1xx	History*	3
ENGL 1xx	Literature*	3	THEO 2xx	Christian Beliefs*	3
BIBL 2xx	Bible*	3			
		Total:			16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 415	Engineering Project	2
ENGR 324	Control Systems	4	ENGR 421	Robotic Systems	4
ENGR 367	Electromagnetics	3	ENGR 461	Communication Systems	3
ENGR 415	Engineering Project	2	ENGR 462	Power Systems Engineering	4
Varies	Social Science/History*	3	Varies	Ethics/WV/Pluralism*	3
Varies	3rd Language/NonWestern/CC*	2			
		Total:			15
Total:			Total:		
16			16		

Mechanical Engineering (BSME) 8 Semester Plan

*QuEST (General Education) requirement

Course #	Course Name	Credits	Course #	Course Name	Credits
First Year – Fall			First Year – Spring		
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
		Total:			16
Sophomore – Fall			Sophomore – Spring		
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	ENGR 323	Mechanics II	3
Varies	2nd Language*	3	MATH 270	Linear and Differential Methods	3
			ENGL 1xx	Literature*	3
		Total:			18
Junior – Fall			Junior – Spring		
ENGR 213	Engineering Statistics	3	ENGR 371	Thermodynamics	3
ENGR 301	Seminar I	1	ENGR 376	Dynamics and Vibrations	4
ENGR 324	Control Systems	4	ENGR 377	Fluid Dynamics	4
ENGR 373	Instrumentation and Measurement	3	ENGR 415	Engineering Project	1
ENGR 415	Engineering Project	1	Varies	Social Science/History*	3
WELL 1xx	Wellness*	1	BIBL 2xx	Bible*	3
PHIL or RELI	Philosophy or Religion meeting QuEST*	3			
		Total:			16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 415	Engineering Project	2
ENGR 378	Manufacturing Processes	3	ENGR 421	Robotic Systems	4
ENGR 415	Engineering Project	2	ENGR 471	Heat Transfer and Design	4
ENGR 472	Mechanical Design	4	HIST 1xx	History*	3
Varies	3rd Language/NonWestern/CC*	2	Varies	Ethics/WV/Pluralism*	3
THEO 2xx	Christian Beliefs*	3			
		Total:			15
					16

Engineering (BSE) with Computer Concentration 8 Semester Plan

*QuEST (General Education) requirement

Course #	Course Name	Credits	Course #	Course Name	Credits
First Year – Fall			First Year – Spring		
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
		Total:			Total:
		16			16
Sophomore – Fall			Sophomore – Spring		
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	ENGR 361	Circuits II	4
Varies	2nd Language*	3	MATH 270	Linear and Differential Methods	3
			CIS 284	Computer Programming II	3
		Total:			Total:
		18			17
Junior – Fall			Junior – Spring		
ENGR 213	Engineering Statistics	3	ENGR 365	Linear Systems	3
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 362	Analog Electronics	3	Varies	Computer Engineering Elective	3
ENGR 363	Embedded Systems Design	4	Varies	Social Science/History*	3
ENGR 415	Engineering Project	1	ENGL 1xx	Literature*	3
WELL 1xx	Wellness*	1	PHIL or RELI	Philosophy or Religion meeting QuEST*	3
CIS 384	Elements of Computer Systems	3			
		Total:			Total:
		16			16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 324	Control Systems	4
ENGR 415	Engineering Project	2	ENGR 415	Engineering Project	2
MATH 180	Discrete Mathematics	3	HIST 1xx	History*	3
CIS 385	Data Structures and Algorithms	3	THEO 2xx	Christian Beliefs*	3
Varies	3rd Language/NonWestern/CC*	2	Varies	Ethics/WV/Pluralism*	3
BIBL 2xx	Bible*	3			
		Total:			Total:
		14			15

Engineering (BSE) with Environmental Concentration 8 Semester Plan

*QuEST (General Education) requirement

Course #	Course Name	Credits	Course #	Course Name	Credits
First Year – Fall			First Year – Spring		
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
		Total	16		
			Total 16		
Sophomore – Fall			Sophomore – Spring		
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	MATH 270	Linear and Differential Methods	3
			CHEM 106	Chemistry* II	4
			Varies	2nd Language*	3
		Total	15		
			Total 17		
Junior – Fall			Junior – Spring		
ENGR 213	Engineering Statistics	3	ENGR 345	Fluid Mechanics	4
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 353	Environmental Engineering	4	ENGR 451	Water and Wastewater Management	3
ENGR 371	Thermodynamics	3	GIS 245	Intro to Geographical Info Sys	3
ENGR 415	Engineering Project	1	ENGL 1xx	Literature*	3
WELL 1xx	Wellness*	1	Varies	3rd Language/NonWestern/CC*	2
Varies	Social Science/History*	3			
		Total	16		
			Total 16		
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 346	Water Resources Engineering	3
ENGR 415	Engineering Project	2	ENGR 415	Engineering Project	2
Varies	Environmental Elective	3	ENGR 452	Hazardous Waste and Air Pollution Mgmt	3
Varies	Environmental Science Elective	3	HIST 1xx	History*	3
PHIL or RELI	Philosophy/Religion meeting QuEST*	3	THEO 2xx	Christian Beliefs*	3
BIBL 2xx	Bible*	3	Varies	Ethics/WV/Pluralism*	3
		Total	15		
			Total 17		