

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

Engineering

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
Sophomore – Fall			Sophomore – Spring		
ENGR 214	Materials Engineering	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers	2
MATH 211	Calculus III	4	ENGR 215	Circuits I	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
Junior – Fall			Junior – Spring		
ENGR 213	Engineering Statistics	3	ENGR 332	BME Laboratory Techniques	3
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 415	Engineering Project	1	Varies	Biomedical Science Elective	3
ENGR 432	Design of Medical Devices	4	BIBL 2xx	Bible*	3
HIST 1xx	History meeting QuEST*	3	ENGL 1xx	Literature meeting QuEST*	3
ENGR 331	Biomechanics	4	ENGR 371	Thermodynamics	3
WELL 1xx	Wellness*	1			
		Total			17
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 415	Engineering Project	2
ENGR 324	Control Systems	4	Varies	Biomedical Science Elective	4
ENGR 431	Biomedical Instrumentation	4	Varies	Social Science/History meeting QuEST*	3
ENGR 377	Fluid Dynamics	4	THEO 2xx	Christian Beliefs*	3
ENGR 415	Engineering Project	2	Varies	Ethics/WV/Pluralism*	3
Varies	3rd Language/NonWestern/CrossCultural*	2-3			
		Total			17-18
Senior – Spring			Senior – Spring		
		Total			15

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			Total
		16			16
Sophomore – Fall			Sophomore – Spring		
ENGR 214	Materials Engineering	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 215	Circuits I	4
MATH 211	Calculus III	4	ENGR 212	Programming for Engineers (J-term)	2
GEOL 201	Foundations of Geology	4	ENGR 213	Engineering Statistics	3
Varies	2nd Language*	3	ENGR 323	Mechanics II	3
			MATH 270	Linear and Differential Methods	3
			WELL 1xx	Wellness*	1
		Total			Total
		18			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			Total
		16			16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 347	Transportation Engineering	3
ENGR 346	Water Resources 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/Cross Cultural*	2-3
HIST 1xx	History*	3	THEO 2xx	Christian Beliefs*	3
ENGL 1xx	Literature*	3	Varies	Ethics/WV/Pluralism*	3
		Total			Total
		16			16-17

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 415	Engineering Project	1	ENGR 365	Linear Systems	3
ENGR 462	Power Electronics	4	ENGR 415	Engineering Project	1
BIBL 2xx	Bible*	3	HIST 1xx	History*	3
WELL 1xx	Wellness*	1	THEO 2xx	Christian Beliefs*	3
ENGL 1xx	Literature*	3			
		Total:			16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	ENGR 363	Embedded Systems Design	4
ENGR 324	Control Systems	4	ENGR 415	Engineering Project	2
ENGR 367	Electromagnetics	3	ENGR 421	Robotic Systems	4
ENGR 415	Engineering Project	2	ENGR 461	Communication Systems	3
Varies	Social Science/History*	3	Varies	Ethics/WV/Pluralism*	3
Varies	3rd Language/NonWestern/Cross Cultural*	2-3			
		Total:			15-16
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	Total:		16
Sophomore – Fall			Sophomore – Spring		
ENGR 214	Materials Engineering	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 215	Circuits I	4
MATH 211	Calculus III	4	ENGR 212	Programming for Engineers (J-term)	2
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	Total:		16
Junior – Fall			Junior – Spring		
ENGR 213	Engineering Statistics	3	ENGR 376	Dynamics and Vibrations	4
ENGR 371	Thermodynamics	3	ENGR 378	Manufacturing Processes	3
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 472	Mechanical Design	4	Varies	Social Science/History*	3
ENGR 415	Engineering Project	1	BIBL 2xx	Bible*	3
WELL 1xx	Wellness*	1	Varies	3rd Language/NonWestern/Cross Cultural*	2-3
PHIL or RELI	Philosophy or Religion meeting QuEST*	3			
Total:		16	Total:		16-17
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 373	Instrumentation and Measurement	3	ENGR 471	Heat Transfer and Design	4
ENGR 377	Fluid Dynamics	4	HIST 1xx	History*	3
ENGR 415	Engineering Project	2	Varies	Ethics/WV/Pluralism*	3
THEO 2xx	Christian Beliefs*	3			
Total:		17	Total:		16

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
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
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/Cross Cultural*	2-3
Varies	Social Science/History*	3			
		Total:			16
Senior – Fall			Senior – Spring		
ENGR 302	Seminar II	1	PHIL or RELI	Philosophy/Religion meeting QuEST*	3
ENGR 346	Water Resources Engineering	3	ENGR 415	Engineering Project	2
ENGR 415	Engineering Project	2	ENGR 453	Hazardous Waste and Air Pollution Mgmt	3
Varies	Environmental Elective	3	HIST 1xx	History*	3
Varies	Environmental Science Elective	4	THEO 2xx	Christian Beliefs*	3
BIBL 2xx	Bible*	3	Varies	Ethics/WW/Pluralism*	3
		Total:			16
Senior – Spring			Senior – Spring		
		Total:			17