

B.S. in Engineering Science

Engineering Science

Engineering science at St. Mary's University provides greater flexibility than traditional programs, especially in choosing engineering electives, so that students gain a tailored education.

The program prepares students to pursue careers in multidisciplinary fields such as biomedical engineering, environmental engineering, materials sciences, pre-medicine, or other secondary areas. Engineering science is the only engineering program that allows the student to have a minor in a variety of areas. Every engineering senior also completes a year-long design project, some of which have even been patented.

Unique facilities available to engineering science students include an electrical engineering laboratory accessible 24-hours a day; an energy conversion laboratory for motors, generators and transformers; a manufacturing and robotics laboratory; and a research laboratory equipped with both UNIX and Windows workstations.

Code	Title	Semester Hours
St. Mary's University Core ¹		
SMC 1301	Foundations of Civilization	3
SMC 1311	Foundations of Reflection:Self	3
SMC 1312	Foundations of Reflection: Nature	3
SMC 1313	Foundations of Reflection: Others	3
SMC 1314	Foundations of Reflection: God	3
SMC 2301	Foundations of Practice: Ethics	3
SMC 2302	Foundations of Practice: Civic Engagement and Social Action	3
SMC 2303	Foundations of Practice:Fine Arts and Creative Process	3
SMC 2304	Foundations of Practice: Literature	3
EG 4363	Senior Design Project II ²	3
School of Science, Engineering, and Technology Specific Core		
Rhetoric & Composition ³		3
EN 1311	Rhetoric and Composition	
Fine Arts		3
EG 1301	Engineering Graphics and Design	
Foreign Languages		6
6 hours of Second Year level (2311, 2312) in a language in which the student has prior knowledge or training, meaning he/she speaks the language or took it in high school		
6 hours of Introductory level (1311, 1312) in which he/she has no prior training or knowledge		
12 hours of CLEP/AP credit		
Social Science		3
EG 3334	Engineering Economy	
Speech		3
EG 4362	Senior Design Project I	
Theology		3
Select one of the following:		
Advanced Theology TH 33XX/43XX		
HU 3300	Perspectives and Themes in History, Philosophy and/or Theology	
B.S. Engineering Science Major Courses ⁴		
CH 1401	General Chemistry I	4
CH 1402	General Chemistry II	4
EG 1101	Introduction to Engineering	1
EG 1302	Programming for Engineers	3
EG 2306	Materials Science	3
EG 2307	Engineering Mechanics	3
EG 2308	Strength of Materials	3

EG 2309	Fluid Mechanics	3
EG 2385	Dynamics (Excluded for Pre-Med concentration)	3
EG 3145	Circuits and Systems Lab	1
EG 3345	Circuits and Systems	3
MT 2412	Calculus I	4
MT 2413	Calculus II	4
MT 3311	Differential Equations	3
MT 4331	Probability Theory	3
PY 1404	University Physics I	4
PY 2404	University Physics II	4
Engineering Electives/Concentration ⁵		24

Selection one of the following outlined below:

Engineering Science Electives

Pre-Med

Chemistry

Environmental Science

Mathematics

Proficiency in Information Technology and Information Literacy

For this major, this requirement will be fulfilled by passing coursework within the degree plan.

Total Semester Hours 128

- ¹ All St. Mary's Core SMC 13XX "Reflection" courses must be completed before registering for SMC23XX "Practice" courses, unless authorized by student's adviser.
- ² EG 4363 fulfills SMC 4301 requirement.
- ³ Grade of "C" or better is required. International students may be required to take EN 1313 to fulfill this requirement.
- ⁴ Engineering students must make a grade of "C" or better in all engineering courses and their prerequisites. One exception applies to the graduating senior who may petition his/her adviser to allow one grade of "D". Students are not permitted to take an engineering, science, or mathematics course unless all prerequisites are passed with a grade of "C" or better.
- ⁵ Engineering Science Electives may be replaced by a concentration in Pre-Med, Chemistry, Environmental Science, Mathematics or Physics.

Pre-Med Concentration

Code	Title	Semester Hours
Pre-Med Courses		
BL 1401	General Biology for Majors I	4
BL 1402	General Biology for Majors II	4
BL 2332	Cell Biology	3
BL 3430	General Physiology	4
BL 4451	Biochemistry I	4
BL 4452	Biochemistry II	4
CH 3411	Organic Chemistry I	4
CH 3412	Organic Chemistry II	4
Total Semester Hours		31

Chemistry Concentration

Code	Title	Semester Hours
Chemistry Courses		
CH 3411	Organic Chemistry I	4
CH 3412	Organic Chemistry II	4
CH 3423	Analytical Chemistry	4
CH 3424	Instrumental Analysis	4
CH 3433	Physical Chemistry I	4

CH 3434	Intermediate Physical Chemistry	4
Total Semester Hours		24

Environmental Science Concentration

Code	Title	Semester Hours
Environmental Science Courses		
ES 1300	General Geology	3
ES 1100	General Geology Laboratory	1
ES 1373	Intro. Environmental Science	3
ES 1173	Environmental Science Lab	1
ES 2450	Environmental Geology	4
ES 2325	Energy Resources and the Environment	3
Environmental Science Elective #1		3
Environmental Science Elective #2		3
Environmental Science Elective #3		3
Total Semester Hours		24

Mathematics Concentration

Code	Title	Semester Hours
Mathematics Courses		
MT 3311	Differential Equations	3
MT 3323	Discrete Math Structures	3
MT 3324	Linear Algebra	3
MT 3372	Math Modeling	3
MT 3392	Elementary Math Analysis	3
MT 3414	Calculus III	4
MT 4311	Complex Variables	3
MT 4332	Statistics	3
MT 4351	Numerical Analysis I	3
Total Semester Hours		28

B.S. Engineering Science - General

This is a recommended degree plan subject to changes. Please meet with your adviser on a regular basis.

First Year

Fall	Semester Spring Hours	Semester Hours
SMC 1301	3 SMC 1311	3
EN 1311	3 SMC 1312	3
EG 1101	1 EG 1301	3
EG 1302	3 MT 2413	4
MT 2412	4 PY 2404	4
PY 1404	4	
ND 0101	0	
18		17

Second Year

Fall	Semester Spring Hours	Semester Hours
SMC 1313	3 SMC 1314	3
CH 1401	4 EG 2385	3

EG 2307	3 CH 1402	4
MT 3311	3 EG 2308	3
Engineering Science Elective #1	3 Engineering Science Elective #2	3
16		16

Third Year

Fall	Semester Spring Hours	Semester Hours
EG 2306	3 SMC 2301	3
EG 3345	3 SMC 2302	3
MT 4331	3 SMC 2303	3
Engineering Science Elective #3	3 EG 3145	1
Engineering Science Elective #4	3 Engineering Science Elective #5	3
	Engineering Science Elective #6	3
15		16

Fourth Year

Fall	Semester Spring Hours	Semester Hours
SMC 2304	3 EG 4363	3
EG 4362	3 Advanced Theology	3
Foreign Language	3 Foreign Language	3
EG 2309	3 EG 3334	3
Engineering Science Elective #7	3 Engineering Science Elective #8	3
15		15

Total Semester Hours 128

B.S. Engineering Science - Pre-Med Concentration*This is a recommended degree plan subject to changes. Please meet with your advisor on a regular basis.***First Year**

Fall	Semester Spring Hours	Semester Hours
EN 1311	3 SMC 1301	3
EG 1302	3 CH 1402	4
CH 1401	4 EG 1301	3
MT 2412	4 MT 2413	4
PY 1404	4 PY 2404	4
ND 0101	0	
18		18

Second Year

Fall	Semester Spring Hours	Semester Hours
SMC 1311	3 SMC 1312	3
EG 1101	1 SMC 1313	3
EG 2307	3 EG 2308	3
MT 3311	3 BL 1402	4
BL 1401	4 CH 3412	4
CH 3411	4	
18		17

Third Year

Fall	Semester Spring Hours	Semester Hours
SMC 1314	3 SMC 2301	3
EG 2306	3 SMC 2303	3

MT 4332	3 SMC 2304	3
BL 2332	3 BL 3430	4
BL 4451	4 BL 4452	4
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		16
		17

Fourth Year

Fall	Semester Spring Hours	Semester Hours
SMC 2302	3 EG 4363	3
Foreign Language	3 Foreign Language	3
EG 4362	3 Advanced Theology	3
EG 2309	3 EG 3145	1
EG 3345	3 EG 3334	3
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		15
		13

Total Semester Hours 132

B.S. Engineering Science - Chemistry Concentration*This is a recommended degree plan subject to changes. Please meet with your adviser on a regular basis.***First Year**

Fall	Semester Spring Hours	Semester Hours
SMC 1301	3 SMC 1311	3
EN 1311	3 SMC 1312	3
EG 1101	1 EG 1301	3
EG 1302	3 MT 2413	4
MT 2412	4 CH 1402	4
CH 1401	4	
ND 0101	0	
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		18
		17

Second Year

Fall	Semester Spring Hours	Semester Hours
SMC 1313	3 SMC 2301	3
SMC 1314	3 SMC 2302	3
MT 3311	3 SMC 2303	3
PY 1404	4 PY 2404	4
CH 3411	4 CH 3412	4
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		17
		17

Third Year

Fall	Semester Spring Hours	Semester Hours
EG 2306	3 SMC 2304	3
EG 2307	3 EG 2308	3
EG 3345	3 EG 2385	3
MT 4331	3 EG 3145	1
CH 3423	4 CH 3424	4
	MT 4331	3
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		16
		17

Fourth Year

Fall	Semester Spring Hours	Semester Hours
Foreign Language	3 EG 4363	3
Advanced Theology	3 Foreign Language	3

EG 4362	3 EG 3334	3
EG 2309	3 CH 3434	4
CH 3433	4	
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16		13

Total Semester Hours 131

B.S. Engineering Science - Environmental Science Concentration

This is a recommended degree plan subject to changes. Please meet with your adviser on a regular basis.

First Year

Fall	Semester Spring Hours	Semester Hours
SMC 1301	3 SMC 1311	3
EN 1311	3 SMC 1312	3
EG 1101	1 EG 1301	3
EG 1302	3 MT 2413	4
MT 2412	4 PY 2404	4
PY 1404	4	
ND 0101	0	
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18		17

Second Year

Fall	Semester Spring Hours	Semester Hours
SMC 1313	3 SMC 1314	3
CH 1401	4 CH 1402	4
EG 2307	3 EG 2308	3
MT 3311	3 EG 2385	3
ES 1300	3 ES 1373	3
ES 1100	1 ES 1173	1
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17		17

Third Year

Fall	Semester Spring Hours	Semester Hours
EG 2306	3 SMC 2301	3
EG 2309	3 SMC 2302	3
EG 3345	3 EG 3145	1
MT 4331	3 ES 2325	3
Environmental Science Elective	3 ES 2450	4
	ES 2450L	
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15		14

Fourth Year

Fall	Semester Spring Hours	Semester Hours
SMC 2304	3 EG 4363	3
SMC 2303	3 Foreign Language	3
Foreign Language	Theology	3
EG 2309	3 EG 3334	3
EG 4362	3 Environmental Science Elective	3
Environmental Science Elective	3	
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15		15

Total Semester Hours 128

B.S. Engineering Science - Mathematics Concentration

This is a recommended degree plan subject to changes. Please meet with your adviser on a regular basis.

First Year

Fall	Semester Spring Hours	Semester Hours
SMC 1301	3 SMC 1311	3
EN 1311	3 SMC 1312	3
EG 1101	1 EG 1301	3
EG 1302	3 MT 2413	4
MT 2412	4 PY 2404	4
PY 1404	4	
ND 0101	0	
	18	17

Second Year

Fall	Semester Spring Hours	Semester Hours
SMC 1313	3 SMC 1314	3
CH 1401	4 CH 1402	4
EG 2307	3 EG 2385	3
MT 3311	3 MT 3324	3
MT 3323	3 MT 3414	4
	16	17

Third Year

Fall	Semester Spring Hours	Semester Hours
SMC 2302	3 SMC 2301	3
Foreign Language	3 Foreign Language	3
EG 2306	3 EG 2308	3
EG 3345	3 EG 3145	1
MT 4311	3 MT 3372	3
MT 4351	3 MT 4331	3
	18	16

Fourth Year

Fall	Semester Spring Hours	Semester Hours
SMC 2303	3 EG 4363	3
SMC 2304	3 Advanced Theology	3
EG 4362	3 EG 3334	3
EG 2309	3 MT 4332	3
MT 3392	3	
	15	12

Total Semester Hours 129