ENGINEERING AREA OF CONCENTRATION WITHIN STEM A.S. (TRANSFER)

Program website (https://www.frederick.edu/programs/science,-technology,-engineering,-and-math-(stem)/engineering.aspx)

Program Description

Provides the basis for transfer to a four-year college engineering course of study. Every course is not applicable to all engineering fields, and schools vary in their transfer requirements. Students entering the program who lack precalculus must satisfy this requirement before taking MATH 185 Calculus I. Therefore, it is imperative that each student meets regularly with an advisor to establish and/or confirm a personal direction for future study.

Program Learning Objectives

- Solve engineering problems, individually and as part of team, using engineering tools and knowledge, including computer modeling.
- Articulate ideas and solutions using oral, visual, and written presentations.
- Apply professional and ethical guidelines of the engineering profession in the formulation of engineering designs.

Program Requirements

- Students must complete their credit **English and Mathematics** within the first 24 credits.
- One course must meet the cultural competence graduation requirement **(**https://frederick-public.courseleaf.com/general-education-core/#cultural**).**
- **CORE: The General Education CORE** is that foundation of the higher education curriculum providing a coherent intellectual experience for all students. Students should check with an advisor or the transfer institution (ARTSYS) before selecting General Education CORE requirements. http://artsys.usmd.edu/
- In some General Education categories (Mathematics, Biological & Physical Sciences), a 4-credit course selected from the GenEd course list will satisfy the requirement in place of a 3-credit course. Students should check with an advisor before selecting these courses.
- For the Physical Education, Health, or Nutrition requirement, a 3-credit PHED, HLTH, or NUTR course may satisfy the requirement in place of a 1-credit course. Students should check with an advisor before selecting this course.
- Students must earn a grade of "C" or better in ENGL 101 English Composition.
- Students must complete a minimum of nine credits at the 200-level.

Code	Title	Credits
English		
ENGL 101	English Composition	3
Mathematics		
MATH 185	Calculus I	4
Social & Behavioral Sciences		
Social & Behavioral Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#social-behavioral) - select two courses from different disciplines		6
Arts & Humanities		
Arts Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#arts)		3
Humanities Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#humanities)		3
Communication Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#communication)		3
Biological & Physical Sciences		
CHEM 101	General Chemistry I	4
PHYS 151	General Physics I	4
General Education Elective		
General Education Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#general)		3
Physical Education, Health, or Nutrition Requirement		
Select one PHED, HLTH, or NUTR course		1
Concentration Courses		
CHEM 102	General Chemistry II	4
ENGR 100	Introduction to Engineering Design	3
MATH 195	Calculus II	4
MATH 275	Differential Equations (Spring)	3
MATH 220	Introduction to MATLAB	1
STEM Electives [1]		
Recommended courses may include:		8
ENGR 110	Engineering Statics (Fall)	
ENGR 210	Mechanics of Materials (Spring)	
ENGR 212	Engineerng Dynamics (Spring)	
MATH 285	Calculus III	
PHYS 252	General Physics II	
PHYS 253	General Physics III	
Electives		
Select a course in consultation with an advisor.		3
Total Credits		60

1

Select courses in consultation with an advisor depending on a student's transfer goals. STEM Electives must be from Biology, Chemistry, Computer & Information Sciences, Engineering, Mathematics, or Physics.

Transfer Note

For more information on careers and transfer, contact the Career and Academic Planning Services office at 301.846.2471 or visit Transfer Services (https://www.frederick.edu/student-resources/counseling-advising/transfer-services.aspx).

Guided Pathway to Success (GPS)

Suggested schedules map your path to degree completion.

Students should meet with an advisor each semester to carefully select and sequence courses based on their specific academic goals and interests. Visit Jefferson Hall or call 301.846.2471 for advising.

Recommended First Semester		Credits
ENGL 101	English Composition [1]	3
MATH 185	Calculus I [1]	4
ENGR 100	Introduction to Engineering Design (Milestone) [2]	3
Social & Behavioral Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#social-behavioral)		3
Arts Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#arts)		3
	Credits	16

Recommended Second Semester		
CHEM 101	General Chemistry I	4
Social & Behavioral Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#social-behavioral) (in a different discipline from first)		3
MATH 195	Calculus II (Milestone)	4
MATH 220	Introduction to MATLAB	1
Communication Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#communication)		3
	Credits	15
Recommended Third Semester		
Select a STEM elective in consultation with an advisor [3]		4
PHYS 151	General Physics I (Milestone)	4
CHEM 102	General Chemistry II	4
Select a STEM elective in consultation with an advisor [3]		4
	Credits	16
Recommended Fourth Semester		
Humanities Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#humanities)		3
MATH 275	Differential Equations (Spring)	3
Physical Education, Health, or Nutrition Requirement		1,3
General Education Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#general)		3
Select a free elective in consultation with an advisor (credits may vary to fulfill 60 credits for degree) [4]		3
	Credits	13-15
	Total Credits	60-62

1

Take this course within the first 24 credits.

2

Students who have not taken MATH 165 Precalculus should take it as an elective in the first semester before starting the Calculus sequence.

3

Choose a course from Biology (BSCI), Chemistry (CHEM), Computer & Information Sciences (CMIS), Engineering (ENGR), Mathematics (MATH), or Physics (PHYS). A minimum of 6 credits must be in the same discipline.

4

Depending on transfer institution, electives may include ENGR 110 Engineering Statics (fall only), ENGR 212 Engineerng Dynamics (spring only), ENGR 210 Mechanics of Materials (spring only), MATH 285 Calculus III, PHYS 252 General Physics II, or PHYS 253 General Physics III.

Part-time Students

Part-time students should complete courses in the order listed on the pathway. Please contact program manager for questions about part-time status.

Students who take fewer than 15 credits each semester or who require developmental English or Math coursework will need additional semesters to complete their degrees. Summer term and January session classes may help students to make faster progress.

Pathway Legend

Milestone - courses with the Milestone notation should be taken within the recommend credit range to stay on track for program completion.

Fall, Spring, Summer - courses with a Fall, Spring, or Summer notation indicate the course is offered in the specified semester only.