Engineering Broad Field AS DEGREE

Program Overview

Engineering is a profession that uses basic knowledge from the mathematical and natural sciences and utilizes the materials and forces of nature to develop systems that will perform optimally and economically for the benefit of mankind. The Engineering Broad Field program is designed to provide for a student's first two years of a four-year Engineering degree. The curriculum is designed to meet the needs of those students who have not yet decided on a specific engineering field. The program focuses on developing a fundamental knowledge of physics, chemistry, and mathematics.

Career Opportunities

Engineering occupations are expected to grow by more than 10% through 2020 according to the Bureau of Labor Statistics. Engineering includes careers with branches in civil, agricultural, chemical, electrical, mechanical, and aerospace sciences to name a few. This degree is part of a state-wide articulation program and designed to transfer easily.

Program Outcomes

1. Apply knowledge of mathematics, science, and engineering in the solution of engineering problems.
2. Design and conduct experiments as well as analyze and interpret results.
3. Design and engineering system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. Understand professional and ethical responsibility.
5. Recognize the need for and develop an ability to engage in life-long professional development and learning.
6. Utilize techniques, skills, and modern engineering tools necessary for engineering practice.

Program Faculty

Pam Schumacher pam.schumacher@saintpaul.edu

Part-Time/Full-Time Options

This program can be completed by using a combination of day, evening, Saturday, hybrid, and online courses. Part-time and full-time options are available.

Program Requirements

☑ Check off when completed

Course	Cr
☐ ENGR 1707 Introduction to Engineering	3
Choose a focus:	
Electrical	
☐ CHEM 1712 Principles of Chemistry 2	4
☐ ENGR 1709 Digital Electronics	3
☐ ENGR 1717 Circuit Analysis 1	4
☐ ENGR 2705 Statics	3
☐ ENGR 2710 Dynamics	3
Mechanical or Manufacturing or Composite	
☐ CHEM 1712 Principles of Chemistry 2	4
☐ ENGR 1717 Circuit Analysis 1	4
☐ ENGR 2705 Statics	3
☐ ENGR 2710 Dynamics	3
☐ ENGR 2712 Deformable Body Mechanics	3
Civil	
☐ CHEM 1712 Principles of Chemistry 2	4
☐ ENGR 2705 Statics	3
☐ ENGR 2710 Dynamics	3
☐ ENGR 2712 Deformable Body Mechanics	3
☐ ENGR 2715 Thermodynamics	3
☐ ENGR Elective	1
Computer	
☐ CSCI 1410 Comp. Science & Info Systems	4
☐ CSCI Electives	6
☐ ENGR 1709 Digital Electronics	3
☐ ENGR 1717 Circuit Analysis 1	4
Integrated	
☐ CHEM 1712 Principles of Chemistry 2	4
☐ ENGR 1717 Circuit Analysis 1	4
☐ ENGR 2705 Statics	3
☐ ENGR 2710 Dynamics	3
☐ ENGR Elective	3
Subtotal	**20**

Information is subject to change.
This Program Requirements Guide is not a contract.

General Education/MnTC Requirements	Cr
Refer to the Minnesota Transfer Curriculum Course List for each Goal Area	
☐ Goal 1: Communication ENGL 1711 Composition 1 – 4cr	4
☐ Goal 3: Natural Sciences CHEM 1711 Principles of Chemistry 1 – 4 cr PHYS 2700 General Physics 1 – 5 cr PHYS 2710 General Physics 2 – 5 cr	14
☐ Goal 4: Mathematical/Logical Reasoning MATH 2749 Calculus 1 – 4 cr MATH 2750 Calculus 2 – 4 cr MATH 2753 Multivariable Calculus – 4 cr MATH 2760 Differential Equations & Linear Algebra – 4 cr	16
☐ Goal 5: History, Social Science and Behavioral Sciences	3
☐ Goal 6: Humanities and Fine Arts. *The course selected for goal area 5 or 6 must also satisfy goal 7, 8, 9, or 10.	3
General Education Requirements	**40**
Total Program Credits	**60**

Course Sequence

The course sequence listed on the back of this guide is recommended for a full-time student. Not all courses are offered every semester. Students should consult with the Program Faculty each semester.

See back of this guide for Course Sequence and Transfer Opportunities

Minimum Program Entry Requirements

Students entering this program must meet the following minimum program entry requirements:

Reading: Score of 78+ or grade of "C" or better in READ 0722

Writing: Score of 78+ or grade of "C" or better in ENGL 0922

College Level Mathematics: Score of 50+ or grade of "C" or better in MATH 0920

Assessment Results and Prerequisites: Students admitted into Saint Paul College programs may need to complete additional courses based on assessment results and course prerequisite requirements. Certain courses in the program have additional prerequisites.

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SAINT PAUL COLLEGE
A Community & Technical College
235 Marshall Avenue
Saint Paul, MN 55102
TEL: 651.846.1600
www.saintpaul.edu

MINNESOTA STATE
Saint Paul College,
A member of Minnesota State

Engineering Broad Field AS DEGREE *(continued)*

Program Start Dates

Fall, Spring, Summer

Course Sequence

This course sequence is recommended for a full-time student. Not all courses are offered every semester. Students should consult with the Program Faculty each semester.

First Semester

ENGR 1707 Introduction to Engineering 3
Goal 1: ENGL 1711 Composition 1. 4
Goal 3: CHEM 1711 Principles of Chemistry 1 4
Goal 4: MATH 2749 Calculus 1 4
Total Semester Credits. 15

Second Semester

Goal 3: CHEM 1712 Principles of Chemistry 2 4
Goal 3: PHYS 2700 General Physics 1. 5
Goal 4: MATH 2750 Calculus 2 4
Goal 5: History, Social Science and Behavioral Sciences 3
Total Semester Credits. 16

Third Semester

ENGR 2705 Statics 3
Goal 3: PHYS 2710 General Physics 2. 5
Goal 4: MATH 2753 Multivariable Calculus 4
Goal 6: Humanities and Fine Arts 3
Total Semester Credits. 15

Fourth Semester

ENGR 1717 Circuit Analysis 4
ENGR 2710 Dynamics 3
ENGR 2712 Deformable Body Mechanics 3
Goal 4: MATH 2760 Differential Equations & Linear Algebra 4
Total Semester Credits. 14

Total Program Credits 60

Transfer Opportunities

Saint Paul College has a transfer articulation agreement between the following program and post-secondary institution for the baccalaureate degree program listed below.

For more information please go to saintpaul.edu/Transfer.

Engineering Broad Field AS

BS	Composite Materials Engineering Winona State University
BS	Computer Engineering Saint Cloud State University
BS	Electrical Engineering Saint Cloud State University
BS	Manufacturing Engineering Saint Cloud State University
BS	Mechanical Engineering Saint Cloud State University
BSCE	Civil Engineering Minnesota State University, Mankato
BSE	General Engineering Minnesota State University, Mankato
BSE	Integrated Engineering Minnesota State University, Mankato *offered at Normandale location
BSEE	Electrical Engineering Minnesota State University, Mankato
BSEC	Computer Engineering Minnesota State University, Mankato
BSME	Mechanical Engineering Minnesota State University, Mankato