

## Science and Engineering Technology AS DEGREE

### Program Overview

The Science and Engineering Technology degree is designed for students who are seeking employment in a science laboratory and/or who are seeking to transfer to a four-year program.

### Career Opportunities

Science and Engineering Technicians and Technologists work in many aspects of the laboratory industry from basic research to clean room facilities. They work in a variety of sub-fields, such as biotechnology, microbiology, nanotechnology, pharmaceutical research, chemical technology, science manufacturing, and materials engineering. Technicians operate many kinds of equipment and instrumentation, prepare samples for processing, monitor commercial production, test for product quality, and collect and analyze samples. They conduct a variety of laboratory procedures, from routine laboratory procedures to complex research projects. Students in this program take core courses in research and instrumentation and chose one of the three specialized tracks; biology, chemistry, or engineering. A solid background in science and math along with the skills in using advanced equipment is vital for success as a Science and Engineering Technician or Technologist.

### Program Outcomes

1. Design and conduct experiments as well as analyze and interpret the results.
2. Operate and safely use instrumentation in science and engineering laboratories.
3. Act professionally and with ethical responsibility.
4. Communicate the results of experiments using appropriate mathematical, scientific, and engineering principles.
5. Solve science technology problems within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

### 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](http://saintpaul.edu/Transfer).

### Science and Engineering Technology AS

BA Individualized Studies  
Metropolitan State University

### Program Faculty

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### Program Requirements

- Check off when completed  
Science and Engineering Core: Required

Course	Cr
<input type="checkbox"/> BIOL/CHEM 1755 Research Fundamentals	3
<input type="checkbox"/> CHEM 2730 Instrumental Analysis	4
<input type="checkbox"/> BIOL/CHEM/ENGR 2790 Research Project for Science and Engineering Technology	3
<b>Subtotal</b>	<b>10</b>

### Science and Engineering Focus (Select one focus area)

#### Chemistry

- CHEM 1712 Principles of Chemistry 2 . . . . . 4
- CHEM 2720 Organic Chemistry 1 . . . . . 5
- CHEM 2721 Organic Chemistry 2 . . . . . 5
- Science or Engineering Electives . . . . . 6

#### Biology

- BIOL 1740 General Biology 1 . . . . . 5
- BIOL 2750 Microbiology . . . . . 4
- BIOL 2755 Genetics . . . . . 4
- Science or Engineering Electives . . . . . 7

#### Engineering

- ENGR 1707 Introduction to Engineering . . . . . 3
- PHYS 1720 or 2700 Principles of Physics 1 OR General Physics 1 . . . . . 4-5
- PHYS 1722 Principles of Physics 2 OR 2710 General Physics 2 . . . . . 4-5
- Science or Engineering Electives . . . . . 7-9

**Focus Subtotal** . . . . . **20**

Note: Science/engineering electives must be taken from: BIOC, BIOL, CHEM, CSCI, ENGR, NSCI, PHYS. Consult with your advisor for information about 2, 3, and 4 credit course options.

### General Education/MnTC Requirements Cr

Refer to the Minnesota Transfer Curriculum Course List for each Goal Area

<input type="checkbox"/> Goal 1: Communication . . . . .	7
ENGL 1711 Composition 1 – 4 cr	
COMM 17XX – 3 cr	
<input type="checkbox"/> Goal 3: Natural Science . . . . .	4
CHEM 1711 Principles of Chemistry 1 – 4 cr	
<input type="checkbox"/> Goal 4: Mathematical/Logical Reasoning . . . . .	7
<input type="checkbox"/> Goal 5: History, Social Science and Behavioral Sciences . . . . .	3
<input type="checkbox"/> Goal 6: Humanities and Fine Arts . . . . .	3
<input type="checkbox"/> Goals 1-10 of the Minnesota Transfer Curriculum . . . . .	6

Students must select a minimum of 6 additional credits such that courses from at least six (6) goal areas of the Minnesota Transfer Curriculum are met.

**General Education Requirements . . . . . 30**

**Total Program Credits . . . . . 60**

*See back of this guide for Program Start Dates & Course Sequence*

### Minimum Program Entry Requirements

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

**Reading:** Score of 250+ or grade of "C" or better in READ 0722

**Writing:** Score of 250+ on Reading Comprehension or grade of "C" or better in ENGL 0922

**Adv. Algebra & Functions:** Score of 250+ 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 MATH, READ, and ENGL courses have additional prerequisites.

396S

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

# Science and Engineering Technology AS DEGREE *(continued)*

## Program Start Dates

Fall, Spring, Summer

## Course Sequence

This course sequence is recommended for a full-time student; however, this sequence is not required. Not all courses are offered each semester; a selection of courses is offered summer term. Students should consult with the Program Faculty each semester.

### First Semester

Goal 1: ENGL 1711 Composition 1 . . . . .	4
Goal 3: CHEM 1711 Principles of Chemistry 1 . . . . .	4
Goal 4: MATH XXXX . . . . .	3-4
Goal 5: History, Social Science and Behavioral Sciences . . . . .	3
<b>Total Semester Credits . . . . .</b>	<b>14-15</b>

### Second Semester

BIOL/CHEM 1755 Research Fundamentals . . . . .	3
Goal 4: MATH XXXX . . . . .	3-4
MnTC Elective: ENGL 1712 Composition 2 (Recommended) . . . . .	2
Chemistry Focus: CHEM 1712 Principles of Chemistry 2 . . . . .	4
Goal 6: Humanities and Fine Arts . . . . .	3
Biology Focus: BIOL 1740 General Biology 1 . . . . .	5
Goal 6: Humanities and Fine Arts . . . . .	3
Engineering Focus: PHYS 1720/2700 Physics 1 . . . . .	4-5
ENGR 1707 Introduction to Engineering . . . . .	3
<b>Total Semester Credits . . . . .</b>	<b>15-17</b>

### Third Semester

Goal 1: COMM 17XX . . . . .	3
Goal 3: CHEM 2730 Instrumental Analysis . . . . .	4
Chemistry Focus: CHEM 2720 Organic Chemistry 1 . . . . .	5
Science or Engineering Electives . . . . .	3-4
Biology Focus: BIOL 2755 Genetics . . . . .	4
Science or Engineering Electives . . . . .	3-4
Engineering Focus: PHYS 1722/2710 Physics 2 . . . . .	4-5
Science or Engineering Electives . . . . .	3
<b>Total Semester Credits . . . . .</b>	<b>14-16</b>

### Fourth Semester

Goal 3: BIOL/CHEM/ENGR 2790 Research Project for Science and Engineering Technology . . . . .	3
MnTC Elective . . . . .	4
Chemistry Focus: CHEM 2721 Organic Chemistry 2 . . . . .	5
Science or Engineering Electives . . . . .	3
Biology Focus: BIOL 2750 Microbiology . . . . .	4
Science or Engineering Electives . . . . .	3-4
Engineering Focus: Science or Engineering Electives . . . . .	4-6
Goal 6: Humanities and Fine Arts . . . . .	3
<b>Total Semester Credits . . . . .</b>	<b>14-16</b>

**Total Program Credits . . . . . 60**