

4+1 Engineering (with Penn)

Prerequisite requirements for the **Scientific Computing** program:

- Math 101 (Calculus I)
- Math 102 (Calculus II)
- Math 201 (Multivariable Calculus)
- Math 203 (Linear Algebra)
- Math 210 (Differential Equations with Applications)
- Math 301 (Real Analysis I) or Math 303 (Abstract Algebra I) or CS 231 (Discrete Mathematics with Applications)
- Math 311 (Partial Differential Equations)
- Data structures and algorithms course
- Background in some physical, chemical, or biological science (many of the advanced courses in the Scientific Computing program involve the application of computing to the sciences)

Undergraduate courses that will strengthen application for Scientific Computing program:

- An introductory course on scientific computing
- Additional programming experience beyond the introductory CS sequence

Prerequisite requirements for the **Systems Engineering** program:

- **Math**, Computer Science, Physics, or Economics with Mathematical Economics Concentration.
- Math 101 (Calculus I)
- Math 102 (Calculus II)
- Math 201 (Multivariable Calculus)
- Math 203 (Linear Algebra)
- Math 205 (Theory of Probability with Applications) or Math H218 (Probability)
- Experience with a programming language.

Recommended (but not strictly required) courses for the Systems Engineering program:

- An introductory statistics course;
- An introductory economics course.

Undergraduate courses that are useful background for the Systems Engineering program:

- Math 210 (Differential Equations with Applications)
- A course on optimization.

Here are the prerequisite requirements for the **Bioengineering** program:

- Biology, Chemistry, Computer Science, **Math**, or Physics major required.
- Math 101 (Calculus I)
- Math 102 (Calculus II)
- Math 201 (Multivariable Calculus)
- One year of physics with calculus and laboratory
- One year of biology with lab
- One year of chemistry with lab
- Minimum Science GPA of 3.0

Other Highly Recommended Courses for the Bioengineering program:

- Math 203 (Linear Algebra)
- Math 210 (Differential Equations with Applications)
- One 300-level course in physics
- At least one semester of organic chemistry
- Engineering Mechanics 006 course at Swarthmore

Note: A GPA of 3.5 is highly recommended to be competitive in the application pool.

Chemical and Biomolecular Engineering Program: Chemistry major required.

Computer and Information Science Program: Computer Science major required.

Computer and Information Technology Program: Limited or no prior experience in Computer Science required.

Computer Graphics and Game Technology Program: Any major with a computer science minor required.

Electrical Engineering Program: Physics major required

Embedded Systems Program: Any major with a computer science minor required.

Materials Science and Engineering Program: Physics or Chemistry major required.

Mechanical Engineering and Applied Mechanics Program: Physics major required.

Nanotechnology Program: Physics or Chemistry major required.

Robotics Program: Computer Science or Physics major required.