

SOFTWARE ENGINEERING, B.S.

Begin Campus: Any Penn State Campus

End Campus: Erie, World Campus

Degree Requirements

For the Bachelor of Science degree in Software Engineering, a minimum of 126 credits is required:

| Requirement | Credits |
|----------------------------|---------|
| General Education | 45 |
| Electives | 0-1 |
| Requirements for the Major | 101-102 |

21 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GWS courses; 3 credits of GS courses.

Per Senate Policy 83.80.5, the college dean or campus chancellor and program faculty may require up to 24 credits of coursework in the major to be taken at the location or in the college or program where the degree is earned.

Requirements for the Major

A student enrolled in this major must earn a grade of C or better in each 300- and 400-level course in the major.

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

| Code | Title | Credits |
|---|--|---------|
| Prescribed Courses | | |
| CHEM 111 | Experimental Chemistry I | 1 |
| CMPEN 275 | Digital Design Laboratory | 1 |
| CMPSC 121 | Introduction to Programming Techniques | 3 |
| MATH 220 | Matrices | 2 |
| MATH 250 | Ordinary Differential Equations | 3 |
| PHYS 212 | General Physics: Electricity and Magnetism | 4 |
| <i>Prescribed Courses: Require a grade of C or better</i> | | |
| CHEM 110 | Chemical Principles I | 3 |
| CMPEN 271 | Introduction to Digital Systems | 3 |
| CMPEN 351 | Microprocessors | 3 |
| CMPEN 441 | Operating Systems | 3 |
| CMPEN 461 | Communication Networks | 3 |
| CMPSC 122 | Intermediate Programming | 3 |
| CMPSC 360 | Discrete Mathematics for Computer Science | 3 |
| CMPSC 431W | Database Management Systems | 3 |
| CMPSC 461 | Programming Language Concepts | 3 |
| CMPSC 465 | Data Structures and Algorithms | 3 |
| ENGL 202C | Effective Writing: Technical Writing | 3 |
| MATH 140 | Calculus With Analytic Geometry I | 4 |

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| MATH 141 | Calculus with Analytic Geometry II | 4 |
| MGMT 301 | Basic Management Concepts | 3 |
| PHYS 211 | General Physics: Mechanics | 4 |
| STAT 318 | Elementary Probability | 3 |
| SWENG 311 | Object-Oriented Software Design and Construction | 3 |
| SWENG 411 | Software Engineering | 3 |
| SWENG 421 | Software Architecture | 3 |
| SWENG 431 | Software Verification, Validation, and Testing | 3 |
| SWENG 452W | Embedded Real Time Systems | 3 |
| SWENG 480 | Software Engineering Design | 3 |
| SWENG 481 | Software Engineering Project | 3 |

Additional Courses

| | | |
|-------------|--|-----|
| ECON 102 | Introductory Microeconomic Analysis and Policy | 3 |
| or ECON 104 | Introductory Macroeconomic Analysis and Policy | |
| EE 210 | Circuits and Devices | 3-4 |
| or EE 211 | Electrical Circuits and Power Distribution | |

Supporting Courses and Related Areas

| | |
|--|---|
| Select 9 credits of technical elective courses from school-approved list | 9 |
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General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Knowledge Domains

- **Arts (GA):** 6 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 6 credits
- **Social and Behavioral Sciences (GS):** 6 credits
- **Natural Sciences (GN):** 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)

- **Inter-Domain or Approved Linked Courses:** 6 credits

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.