

# BACHELOR OF SCIENCE IN COMPUTER SCIENCE

The Computer Science program at Youngstown State University equips students with the technical expertise, analytical skills, and ethical grounding required to excel in the dynamic field of computing. With a comprehensive curriculum encompassing computing systems, programming languages, software engineering, artificial intelligence, operating systems, and algorithms, students gain the knowledge and practical experience needed to design, develop, implement, and test complex software solutions.

The program emphasizes adaptability, teamwork, and effective communication, preparing graduates to navigate uncertainty, embrace emerging technologies, and solve intricate problems with professionalism and integrity. In addition to fostering career readiness, the program provides a strong foundation for post-baccalaureate studies in areas such as computer architecture and the theory of computation. Graduates are equipped to make meaningful contributions to individuals, society, and the profession through innovative and responsible computing practices.

The work of computer scientists falls into three categories:

- Designing and building software
- Developing effective ways to solve computing problems, such as storing information in databases, sending data over networks, providing new approaches to security problems,
- Devising new and better ways of using computers and addressing particular challenges in areas such as artificial intelligence, robotics, computer vision, or digital forensics

Like most Computer Science programs, the YSU Computer Science major requires a significant mathematical background. The program's flexibility allows the student many choices, including a second minor.

This degree may be earned in eight semesters if students average 15 hours per semester.

**The benefits of a Computer Science bachelor's degree include:**

- The median annual salary of **\$120,730** for software developers
- **25% projected job growth** for software developers through 2031

**The advantages of pursuing a Computer Science bachelor's degree at YSU include:**

- Multiple terms throughout the year to help you start anytime and complete your degree.
- Access to full-time faculty at any time
- Full-time faculty coverage of core courses
- One of the lowest tuition rates in the nation
- Intensive project-oriented courses

Computer Science spans the range from theory through programming to cutting-edge development of computing solutions. Computer Science offers a foundation that permits graduates to adapt to new technologies and new ideas. The work of computer scientists falls into three categories:

- designing and building software
- developing effective ways to solve computing problems, such as storing information in databases, sending data over networks, or providing new approaches to security problems
- devising new and better ways of using computers and addressing particular challenges in areas such as robotics, computer vision, or digital forensics

Like most Computer Science programs, the YSU Computer Science major requires significant mathematical background.

The Computer Science program leads to the degree of Bachelor of Science. The flexibility of the program allows the student many choices including a second minor.

This degree may be earned in eight semesters if students average 16 hours per semester.

In addition to completing all general University requirements, students wishing to receive the Bachelor of Science in computer science must complete the following:

COURSE	TITLE	S.H.
<b>FIRST YEAR REQUIREMENT - STUDENT SUCCESS</b>		
YSU 1500	Success Seminar	1-2
or YSU 1500S	Youngstown State University Success Seminar	
or HONR 1500	Intro to Honors	
<b>General Education Requirements</b>		
ENGL 1550	Writing 1	3-4
or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
<b>Mathematics Requirement</b>		
MATH 1571	Calculus 1	4
<b>Arts and Humanities (1 course)</b>		
PHIL 2625	Introduction to Professional Ethics	3
<b>Natural Sciences (2 courses; one course must include a lab)</b>		
<b>Social Science (2 courses)</b>		
<b>General Education Electives (9 s.h.)</b> <sup>Any Gen Ed Courses</sup>		
<b>Major Requirements</b>		
CSIS 2610 & 2610L	Programming and Problem-Solving and Programming and Problem-Solving Lab	4
CSIS 3700 & 3700L	Data Structures and Objects and Data Structures and Objects Lab	4
CSIS 3701	Advanced Object-oriented Programming	3
CSIS 3740	Computer Organization	4
CSCI 3710	Introduction to Discrete Structures	3
CSCI 5806	Operating Systems	3
CSCI 5801	Software Engineering	3
CSCI 5870	Data Structures and Algorithms	3
CSCI 4890	Computer Projects <sup>At least 2 s.h.</sup>	2-4
ENGL 3743	Introduction to Public, Professional and Technical Writing	3
or INFO 3704	Business Communication	
Select at least 12 additional semester hours from CSCI or CSIS courses, or STEM 4890. This must include at least 9 s.h. from the following courses:		
CSIS 3722	Development of Databases	
CSIS 3723	Networking Concepts and Administration	
CSIS 3755	Information Assurance	
CSCI 3770	Concepts of Programming Languages	
CSCI 5840	Automata Theory	
STEM 4890	STEM Internship	
<b>Mathematics Minor</b>		
MATH 1572	Calculus 2	4
MATH 3720	Linear Algebra and Matrix Theory	3
STAT 3743	Probability and Statistics	4
Additional MATH course <sup>To meet 18 hour minor</sup>		
		3

Free Electives	Any courses to meet 120 total hours	23
<b>Total Semester Hours</b>		<b>120-124</b>

**Year 1**

<b>Fall</b>		<b>S.H.</b>
YSU 1500	Success Seminar	1-2
or YSU 1500S	or Youngstown State University Success Seminar	
or HONR 1500	or Intro to Honors	
CSIS 2610	Programming and Problem-Solving	3
CSIS 2610L	Programming and Problem-Solving Lab	1
MATH 1571	Calculus 1	4
ENGL 1550	Writing 1	3-4
or ENGL 1549	or Writing 1 with Support	
Gen Ed Social Science		3
<b>Semester Hours</b>		<b>15-17</b>

**Spring**

CSIS 3700	Data Structures and Objects	3
CSIS 3700L	Data Structures and Objects Lab	1
MATH 1572	Calculus 2 (minor)	4
ENGL 1551	Writing 2	3
Gen Ed Natural Science + Lab		4
<b>Semester Hours</b>		<b>15</b>

**Year 2**

<b>Fall</b>		
CSIS 3701	Advanced Object-oriented Programming	3
CSIS 3740	Computer Organization	4
PHIL 2625	Introduction to Professional Ethics (AH)	3
Gen Ed Arts & Humanities	PHIL 2625 counts toward the remaining 3 or AH Gen Ed req.	3
Free Elective	Any YSU course	3
<b>Semester Hours</b>		<b>16</b>

**Spring**

CSCI 3710	Introduction to Discrete Structures	3
MATH 3720	Linear Algebra and Matrix Theory	3
ENGL 3743	Introduction to Public, Professional and	3
or INFO 3704	Technical Writing or Business Communication	
Gen Ed Social Science		3
Gen Ed Elective	Any Gen Ed course in AH, NS, or SS	3
<b>Semester Hours</b>		<b>15</b>

**Year 3**

<b>Fall</b>		
CSCI 5801	Software Engineering	3
CSCI/CSIS Upper Division Elective	or STEM 4890	3
STAT 3743	Probability and Statistics	4
Free Elective	Any YSU Course	3
Free Elective	Any YSU Course	3
<b>Semester Hours</b>		<b>16</b>

**Spring**

CSCI/CSIS Upper Division Elective	or STEM 4890	3
CSCI/CSIS Upper Division Elective	or STEM 4890	3
Math Minor Upper Division Elective		3
Gen Ed Natural Science		3
Gen Ed Elective	Any Gen Ed course in AH, NS, or SS	3
<b>Semester Hours</b>		<b>15</b>

**Year 4**

<b>Fall</b>		
CSCI 5870	Data Structures and Algorithms	3
CSCI 4890	Computer Projects	2-4
Free Elective	Any YSU course	3
Free Elective	Any YSU course	3
Gen Ed Elective	Any Gen Ed course in AH, NS, or SS	3
<b>Semester Hours</b>		<b>14-16</b>
<b>Spring</b>		
CSCI 5806	Operating Systems	3
CSCI/CSIS Upper Division Elective	or STEM 4890	3
Free Elective	Any YSU course	3
Free Elective	Any YSU course	3
Free Elective	Any course	2
<b>Semester Hours</b>		<b>14</b>
<b>Total Semester Hours</b>		<b>120-124</b>

Request a Graduation Evaluation after completing 80-85 s.h. from the STEM Advising Center, 2325 Moser Hall, (330) 941-2512.

## Learning Outcomes

Computer science students in the BS degree program will:

- be able to analyze, design, implement and test computer programs by using the appropriate data structures and algorithms.
- obtain full-time employment as programmers, systems analysts, computer specialists and in other closely related fields or/and acceptance to graduate programs.
- communicate effectively with written reports and presentations.