Bachelor of Science in Computer Science
Applied Option: Software Engineering
Applied Option: Software Entrepreneurship
2023-24 Catalog Year
subject to change and catalog regulations.

Program Overview

Computer science is the study of the theory, design, development and application of computational systems, especially in the form of software. It includes artificial intelligence, human-computer interaction, computer graphics, cybersecurity, and more. Computer science on the Cascades campus emphasizes two specific areas: software engineering, and web & mobile software development. In this program you will learn the foundations of computer science theory, and the skills necessary for building scalable, long-lasting software systems. Graduates of the program typically achieve employment as software engineers, a rewarding, creative, and highly-sought area of expertise.

What is the Software Engineering applied option? The Software Engineering path is a predefined set of courses that guide students in becoming a successful software engineers. The courses are very hands-on, and students take a second-year course in software development, three software engineering courses, and a senior-year experience of building software products. In addition, students may choose electives such as mobile application development, cloud application development, machine learning, and network security.

What is the Software Entrepreneurship applied option? The Software Entrepreneurship path cultivates an entrepreneurial mindset, with business-oriented knowledge needed by startups and innovation divisions within larger organizations. Students take business courses in entrepreneurship, project management, and finance. In addition, students may choose electives such as mobile application development, cloud application development, machine learning, and network security.

Computer Science Learning Goals and Objectives
The outcomes describe the knowledge and capabilities expected of each computer science graduate:

1. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
2. Ability to function effectively on teams to accomplish a common goal.
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
4. An ability to function effectively on teams to accomplish a common goal.
5. An understanding of professional, ethical, legal, security and social issues and responsibilities.
6. An ability to communicate effectively with a range of audiences.
7. An ability to analyze the local and global impact of computing on individuals, organizations, and society.
8. Recognition of the need for and an ability to engage in continuing professional development.
9. An ability to use current techniques, skills, and tools necessary for computing practice.
10. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
11. An ability to apply design and development principles in the construction of software systems of varying complexity.

Degree Requirements

Students completing the CS major complete the following requirements.

University Graduation Requirements
College of Engineering Requirements
Baccalaureate Core
CS major courses
Specialty Option (track)

Program Requirements

OSU Graduation Requirement:

Students are required to meet the University Graduation requirements as well as complete course work required for their major to graduate with a Bachelor of Science in Energy Systems Engineering. *All catalog and course selection information is subject to change pending catalog declaration year. catalog.oregonstate.edu/regulations/#text*

- 180 minimum = total number of credits required to graduate
- 60 minimum = number of upper division credits required
- 45 of last 75 credits must be OSU credits
- Max 135 credits transferred to OSU
- Max 18 W grades (withdraw)
- Max 11 credits PAC (Physical Activity Course)

College of Engineering Academic Standing

Progression Model

- **Grades of C or better** and a minimum of 2.50 cumulative OSU GPA
- Maintain 2.50 term and/or cumulative OSU GPA and 65% of courses completed
  - Warning: OSU term GPA is below a 2.50 and/or completion is under 65%
  - Probation: After 24 OSU credits attempted, if both term and cumulative standards are not met
  - Suspension: If on probation and have a subsequent term OSU GPA under 2.50 and/or pace under 65%
- **S/U Grading:** CS students may not take for S/U grading (Satisfactory/Unsatisfactory) any course listed as a requirement for the major.

Academic Progression Model Information: https://engineering.oregonstate.edu/current-students/advising/progression

Important Notes:
- **It is the student's responsibility to double check that all requirements are met**. The advisor can suggest courses and assist the student in constructing a plan of study, but the student in the end is responsible for assuring all requirements for graduation are met.
- Degree requirements are subject to change and dependent on catalog year of admission and major declaration.

Students will work with their Academic Advisor and use the Bacc Core approved list for OSU-Cascades to choose courses for the Bacc Core requirements. To find information about Bacc Core or for the approved list, visit: https://admissions.oregonstate.edu/course-articulations

Student Name: _____ ID#:_____

Baccalaureate Core:

Use the OSU-Cascades Bacc Core course guide to plan courses osucascades.edu/advising/baccalaureate-core

An ASOT-Business or an AAOT has completed all Skills & Perspectives requirements in the Bacc Core.

Skills Requirements		Course	Grade
	Health/Fitness		
	Mathematics	MTH 251 in major	
	Writing I^	WR 121z in major	
	Writing II^	WR 214 in major	
	Speech^	COMM 111z or 114 in major	
Perspective Requirements: *no more than 2 from 1 department*			
	Cultural Diversity		
	Literature & the Arts		
	Social Processes & Institutions - *(ECON 201 recommended)*		
	Western Culture		
	Physical Science		
	Biological Science		
	Additional Science (Physical or Biological)		
	Difference, Power & Discrimination		
Synthesis Requirements: *cannot be from the same department*			
	Contemporary Global Issues		
	Science, Technology & Society	CS 391 **in major**	

Major Requirements

First & Second year courses: All courses must be completed with a C grade or better

x	Course	Title	Pre-requisites	Credits	Term Offered*	Grade
	COMM 111z or COMM 114	Public Speaking or Argument & Critical Discourse		4 or 3	F, W, SP	
	CS 162	Introduction to Computer Science II	ENGR 103 or CS 161	4	F	
	CS 261	Data Structures	CS 162 & MTH 231	4	W	
	CS 271	Computer Architecture & Assembly Language	ENGR 103 or CS 161	4	F	
	CS 290	Web Development	CS 162	4	SP	
	ENGR 100	The OSU Engineering Student		3	F	
	ENGR 102	Design Engineering and Problem Solving		3	W	
	ENGR 103	Engineering Computation and Algorithmic Thinking	ENGR 102 & MTH 112z	3	SP	
	MTH 231	Discrete Mathematics	MTH 111z	4	SP	
	MTH 251	Differential Calculus	MTH 112z	4	F, W, SU	
	MTH 252	Integral Calculus	MTH 251	4	W, SP, SU	
	ST 314	Introduction to Statistics for Engineers	MTH 252	3	SP, SU	
	WR 121z	Composition I		4	F, W, SP	
	WR 214	Writing in Business	WR 121z^	3	TBD	
	WR 227z	Technical Writing	WR 121z^	4	W, SP, SU	

Third & Fourth year courses: All courses must be completed with a C grade or better

x	Course	Title	Pre-requisites	Credits	Term Offered*	Grade
	CS 325	Analysis of Algorithms	CS 261, & MTH 231	4	SP	
	CS 340	Introduction to Databases	CS 290 (request pre-req override)	4	W	
	CS 374	Operating Systems I	CS 261, CS 271, & C programming	4	W	
	CS 352	Introduction to Usability Engineering	ENGR 103 or CS 161	4	F	
	CS 361	Software Engineering I	CS 261	4	F	
	CS 362	Software Engineering II	CS 261 (CS 361 recommended)	4	W	
	CS 372	Introduction to Computer Networks	CS 261, CS 271, C programming, & Unix	4	F	
	CS 381	Programming Language Fundamentals	CS 261 & MTH 231	4	SP	
	CS 391	Social and Ethical Issues in CS	CS 101 or computer literacy	3	F	
	CS 474	Operating Systems II	CS 344 & CS 271	4	SP	
	CS 461 (WIC)	Senior Software Engineering Project	CS 361, CS 325, & CS 362 Co-requisite: CS 466	3	F	
	CS 462 (WIC)	Senior Software Engineering Project	CS 362 & CS 461	3	W	
	CS 463	Senior Software Engineering Project	CS 462	2	SP	
	Restricted Elective	Choose (1) course in applied option (**except for CS 401**). Includes most 300/400 level CS courses.	See course restrictions. *See Academic Advisor for Restricted Elective information.* Restricted Electives cannot be used to meet both Applied Option & Restricted Elective requirement.	3-4	Varies	
	Restricted Elective	Choose (1) course in applied option (**except for CS 401**). Includes most 300/400 level CS courses.	See course restrictions. *See Academic Advisor for Restricted Elective information.* Restricted Electives cannot be used to meet both Applied Option & Restricted Elective requirement.	3-4	Varies	

Completion of an approved applied option is required for the Computer Science degree.

The Software Engineering and Software Entrepreneurship applied options are unique options available only at the Cascades campus. Students interested in applied options offered only on the main (Corvallis) campus should plan to transfer to the main campus, or speak with an advisor on creating a custom applied option plan.

Applied Option: **Software Engineering** (32 credits): C grade or better

x	Course	Title	Pre-requisites	Credits	Term Offered*	Grade
Required courses (16 credits)						
	SE 303	Software Engineering III * **SE303 may be replaced by either:* 1. *one of the non-required CS electives listed in the table (below) or* 2. *an alternate upper-level CS course with advisor's approval.*	CS 362	4	TBD	
	CS 466	Web-based Start-up Project	Co-requisite: CS 461	4	F	
	CS 492	Mobile Software Development	CS 344	4	W	
	CS 493	Cloud Application Development	CS 290, CS 340, & CS 372	4	SP	
Choose (16 credits) from the following:						
	CS 331	Introduction to Artificial Intelligence	CS 325	4	SP	
	CS 373	Defense Against the Dark Arts	CS 344, CS 340, & CS 372	4	Online only	
	CS 406	Projects	Instructor Approval	1-16	Varies	
	CS 434	Machine Learning & Data Mining	CS 325 & ST 314	4	F	
	CS 440	Database Management Systems	CS 261 & CS 340	4	TBD	
	CS 447	Wireless Embedded Systems	CS 344	4	TBD	
	CS 475	Introduction to Parallel Programming	CS 261	4	SP	

x	Course	Title	Pre-requisites	Credits	Term Offered*	Grade
	CS 478	Network Security	CS 372	4	W	
	CS 401	Research (Not allowed as Restricted CS Core Elective)	Instructor Approval	1-16	Varies	
	CS 370	Introduction to Security	CS 344	4	Online only	
	CS 464	Open-Source Software	CS 261 & 361	4	Online only	
	CS 450	Introduction to Computer Graphics	CS 261	4	Online only	
	CS 427	Cryptography	CS 261	4	Online only	

Applied Option: **Software Entrepreneurship** (32 credits): C grade or better

x	Course	Title	Pre-requisites	Credits	Term Offered*	Grade
Required courses (16 credits)						
	BA 260	Introduction to Entrepreneurship	Sophomore standing	4	F, SP	
	CS 466	Web-based Start-up Project	Co-requisite: CS 461	4	F	
	CS 492	Mobile Software Development	CS 344	4	W	
	CS 493	Cloud Application Development	CS 290, CS 340, & CS 372	4	SP	
Choose (16 credits) from the following:						
	BA 315	Accounting for Decision Making	Junior standing	4	SP	
	BA 352 or BA 351	Individual & Team Performance or Managing Organizations (online only)	COMM 111z or 114, 227z, & Junior Standing	4	F, SP	
	BA 360	Introduction to Financial Management	BA 315 & ECON 201	4	F, SP	
	CS 406	Projects	Instructor Approval	1-16	Varies	
	CS 434	Machine Learning and Data Mining	CS 325 & ST 314	4	F	
	CS 440	Database Management Systems	CS 261 & CS 340	4	TBD	
	CS 478	Network Security	CS 372	4	W	
	CS 401	Research (Not allowed as Restricted CS Core Elective)	Instructor Approval	1-16	Varies	

Choose Your Own Path: In addition to the two paths above, students may also design their own "applied option." Students may take up to 32 credits representing a cohesive area of focused study ((20 of the 32 credits must upper division (300-400) credits)). Some examples include server-side game development, computational biology, geographic information systems, and generative art. Students interested in designing their own applied option should speak with their advisor.
https://engineering.oregonstate.edu/Academics/Degrees/computer-science

* All projected course term offering is subject to change.
All info is subject to change at catalog policy.
See Academic Advisor for Restricted Elective (RE) information.
Restricted Electives cannot be used to meet both Applied Option & Restricted Elective requirement.