

COMPUTER SCIENCE MAJOR: LIBERAL ARTS TRACK

The Computer Science (liberal arts track) program supports the mission of the University by providing a flexible curriculum focusing on the advanced practices of computer science grounded in a strong liberal arts core curriculum. Students have the flexibility to choose a wider range of elective courses, which can also allow them to pursue a variety of minors or even double majors (such as the Computer Science / Mathematics double major). Students may obtain a concentration in Computer Engineering or Software Engineering.

The Program Educational Objectives (PEOs) are broad statements that describe what alumni do within a few years following graduation. The Computer Science (liberal arts track) Program is committed to our alumni who, within a few years of their graduation, are expected to:

1. Be employed in fields of computer science.
2. Continue the process of life-long learning through formal and informal education.
3. Communicate effectively.
4. Practice professional ethics with social responsibility.

The program emphasizes the complete development of computing-based solutions. Students learn how to gather requirements, design, develop, test, deploy, and maintain software using rigorous computing practices. They are taught how to leverage technology to create flexible and scalable applications and to address the challenges that arise during the development process. Also, the program exposes students to a range of other disciplines, such as the physical sciences, social sciences, languages and literature, and the arts, so they gain a broad understanding of the computer science environment.

Fairfield's computer science curriculum encompasses a truly unique combination of experiences:

- **Experiential Hands-On Learning:** A unique curriculum guarantees computer science students the equivalent of 20 months of real-world experience through a sophomore year service-learning initiative, a junior year entrepreneurial experience, and an industry-based senior capstone project.
- **Cross-Disciplinary Engineering Exposure:** As part of the School of Engineering, computer science students have access to other engineering disciplines and engineering-heavy industries, which expands career opportunities exponentially.
- **Student Mentoring:** By volunteering as high school mentors, students learn valuable management skills, they become comfortable explaining highly technical concepts simply and clearly, and they experience the satisfaction of sharing their knowledge to help others.
- **Liberal Arts Core:** A strong foundation in the liberal arts encourages engineers to think critically, design imaginatively, communicate clearly and collaborate productively.
- **Academic/Research Activities and Internship:** Companies from a variety of domains, such as The Weather Company (visualization), Servo-Robot (artificial intelligence and user interface design), Federal Aviation Administration (software engineering and data mining), Saugatuck Energy (artificial intelligence) have an on-campus presence and provide computer science students opportunities to interact with industry leaders.

Requirements

Bachelor of Science in Computer Science: Liberal Arts Track

121 credits

Core Curriculum

Computer science majors follow the Engineering Core Curriculum with the following prescribed courses:

Code	Title	Credits
Area I: Mathematics and Natural Sciences		
MA 0145	Calculus I for Chemistry, Engineering, and Physics Majors	4
or MA 0171	Calculus I	
MA 0146	Calculus II for Chemistry, Engineering, and Physics Majors	4
or MA 0172	Calculus II	
MA 0231	Discrete Mathematics	3
	Select one elective in science with lab (any level)	4
	Select one additional elective in science (any level)	3
Area II: History and Social/Behavioral Sciences		
	Select one 100-level history course	3
	Select one 200- or 300-level history course	3
EC 0011	Introduction to Microeconomics (recommended; or another Social/Behavioral Science elective)	3
	Select one additional social science elective	3
Area III: Philosophy and Religious Studies		
PH 0101	Introduction to Philosophy	3
	Select one 200-level philosophy course	3
RS 0101	Exploring Religion (Shell)	3
	Select one 200-level religious studies course	3
	Select one additional elective course in Applied Ethics, Philosophy, or Religious Studies	3
Area IV: English and Visual and Performing Arts		
EN 0011	Texts and Contexts I: Writing as Craft and Inquiry	3
EN 0012	Texts and Contexts II: Writing About Literature	3
	Select one 100-level English course ¹	3
	Select one history-focused course in Visual and Performing Arts	3
	Select EG 0130 or one additional course in Visual and Performing Arts	3
Area V: Modern and Classical Languages		
	Select two courses at the Intermediate level of Modern and Classical Languages	6
Free Electives		
	Select four elective courses ²	12
Total Credits		78

¹ Writing courses (ENW) do not fulfill the core literature requirement. Selected courses offering literature in translation may also fulfill this requirement; see listings under Classical Studies (<https://catalog.fairfield.edu/undergraduate/arts-sciences/classical-studies>) as well as Modern Languages and Literatures (<https://catalog.fairfield.edu/undergraduate/arts-sciences/modern-languages-literatures>).

² The Computer Science program provides various general elective courses and it is recommended that computer science students choose general electives from the computer science, software engineering, or related courses to bring the students depth in the computing fields.

Major Requirements

For a 43-credit major in computer science, students complete the following:

Code	Title	Credits
Foundation Courses		
CS 0101	Introduction to Computing	3
CS 0131	Fundamentals of Programming	3
CS 0231	Programming Workshop	3
CS 0232	Data Structures	3
CR 0245 & 0245L	Digital Design I and Digital Design I Lab	4
Computing and Software Depth		
CS 0343	Design and Analysis of Algorithms	3
CS 0354	Theory of Programming Languages	3
SW 0300	Software Engineering Methods	3
SW 0301	Software Design Methods	3
SW 0304	Web Development	3
Select four major elective courses ⁴		12
Total Credits		43

Computer Science and Software Engineering Electives

Possible electives may include:

Code	Title	Credits
Clinic Experiences		
CS 0250L	Computer Science Sophomore Clinic	1
CS 0350L	Computer Science Junior Clinic I	1
CS 0351L	Computer Science Junior Clinic II	1
Database Concepts		
SW 0355	Database Management Systems	3
SW 0505	Advanced Database Concepts	3
SW 0508	Data Warehouse Systems	3
Data Science and Analytics		
CS 0355	Artificial Intelligence	3
SW 0461	Pattern Recognition	3
SW 0518	Data Mining and Business Intelligence	3
SW 0521	Information Visualization	3
Computer Engineering		
CR 0246	Digital Electronics Design II	3
CR 0325	Computer Graphics	3
CR 0346	Computer System Architecture	3

CS 0333	Introduction to Cybersecurity	3
EE 0346 & 0346L	Embedded Microcontrollers and Microcontroller Lab	4
Information Security		
SW 0530	Introduction to Information Security	3
SW 0531	Applications and Data Security	3
SW 0599	Information Security Measures and Countermeasures	3
Network Administration		
SW 0314	Network Concepts	3
SW 0596	Network Routing and Switching	3
Programming and Web Technology		
CS 0331	Operating Systems	3
CS 0343	Design and Analysis of Algorithms	3
SW 0304	Web Development	3
SW 0305	Mobile Application Development	3
SW 0312	Agile Software Engineering	3
SW 0320	Software Testing and Maintenance	3
SW 0321	Software Project Management	3
SW 0409	Advanced Programming in Java	3
SW 0410	Enterprise Java	3
SW 0512	Web Development II with ASP.NET	3
SW 0516	PHP/MySQL	3

Plan of Study

A typical, full-time, four-year plan of study appears below. Some variation may be possible. Students should always discuss their individual plan of study with their advisor prior to registering for courses.

Course	Title	Credits
First Year		
Fall		
CS 0101 or EG 0031	Introduction to Computing (placement based) or Fundamentals of Engineering I	3
EN 0011	Texts and Contexts I: Writing as Craft and Inquiry	3
MA 0171 or MA 0145	Calculus I or Calculus I for Chemistry, Engineering, and Physics Majors	4
PH 0101	Introduction to Philosophy ¹	3
Intermediate Language 1 ¹¹		3
Credits		16
Spring		
CS 0131	Fundamentals of Programming	3
EN 0012	Texts and Contexts II: Writing About Literature	3
MA 0172 or MA 0146	Calculus II or Calculus II for Chemistry, Engineering, and Physics Majors	4
RS 0101	Exploring Religion (Shell) ¹	3
Intermediate Language 2 ¹¹		3
Credits		16

Second Year**Fall**

CS 0231 & 0231P	Programming Workshop and Programming Workshop PLG	3
HI 0100	Origins of the Modern World Since 1500	3
MA 0231	Discrete Mathematics	3
SW 0304	Web Development (and PLG)	3
Science Elective with lab (any level) ⁷		4
Credits		16

Spring

CR 0245	Digital Design I	3
CR 0245L	Digital Design I Lab	1
CS 0232 & 0232P	Data Structures and Data Structures PLG	3
Core Philosophy 200-level ¹		3
Core Social Sciences course ³		3
General Elective 1 ⁵		3
Credits		16

Third Year**Fall**

CS 0343	Design and Analysis of Algorithms	3
SW 0300	Software Engineering Methods (and PLG)	3
Science Elective without lab (any level) ⁸		3
Core Visual/Performing Arts 1 ⁹		3
Core English 100 level Literature course ¹		3
Credits		15

Spring

SW 0301	Software Design Methods (+ PLG)	3
CS 0354	Theory of Programming Languages	3
Core History 200 level ¹		3
Core Visual/Performing Arts History 2 ⁶		3
Core Religious Studies 200-level		3
Credits		15

Fourth Year**Fall**

General Elective 2 ⁵		3
Major Elective 1 ⁴		3
Major Elective 2 ⁴		3
Core RS, PH or Ethics Option ¹⁰		3
Core Social Sciences course ³		3
Credits		15

Spring

Major Elective 3 ⁴		3
Major Elective 4 ⁴		3
General Elective 3 ⁵		3
General Elective 4 ⁵		3
Credits		12
Total Credits		121

- ⁴ Major electives are chosen from the department, but may be chosen with approval of advisory from among other courses offered in the School of Engineering.
- ⁵ General Electives may be chosen from any courses offered at the university, and are frequently chosen to help fulfill requirements toward a chosen minor.
- ⁶ Visual and Performing Art History courses can be chosen from Art History, Music, Film/Television/Media, Theater, etc. that fulfill the VPA History requirement
- ⁷ Lab science elective is typically met by 100-level or higher course in Physics, Biology or Chemistry plus lab.
- ⁸ Lab science elective is typically met by any level science course, no lab required.
- ⁹ Can be Applied or History or EG 0130.
- ¹⁰ Any PH/RS/AE 200-level or higher will fulfill requirement.
- ¹¹ Two courses at the intermediate level in the same language.

¹ Choose any appropriate Core course.

³ Core Social Science course may be filled by appropriate courses in Communication, Economics, Psychology, Politics, Sociology and Anthropology, etc.