

B.S. in Software Engineering

The Bachelor of Science in Software Engineering is offered in person at Embry-Riddle's residential campuses in Florida and Arizona or fully online through the Worldwide & Online Campus. Students will develop practical software and systems skills in an aviation-focused community, supported by experienced faculty and industry-connected learning environments.

The **Daytona Beach Campus** B.S. in Software Engineering at the is housed in the Department of Electrical Engineering and Computer Science in the College of Engineering, and allows students to utilize the Cybersecurity Engineering Lab, the Digital Systems Lab, and the Real-Time Systems Lab. Students have broad opportunities for hands-on learning in designing embedded systems for aviation and aerospace applications and in exploring software architecture and design. Students develop the knowledge, skills and ways of thinking required to design and implement systems for aerospace software. The Bachelor of Science in Software Engineering is accredited by the Engineering Accreditation Commission (<https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2025-2026/>) of ABET (<https://www.abet.org/>), under the commission's General Criteria and Program Criteria for Software and Similarly Named Engineering Programs.

The **Prescott Campus** B.S. in Software Engineering, housed in the Department of Computer, Electrical, and Software Engineering in the College of Engineering, will give students a chance to create, test, and evaluate software applications and systems. With real-world, hands-on projects such as flight control for autonomous aircraft or power line collision avoidance using computer vision, students will be prepared for software development positions in tech-driven industries around the globe. The Bachelor of Science in Software Engineering is accredited by the Engineering Accreditation Commission (<https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2025-2026/>) of ABET (<https://www.abet.org/>), under the commission's General Criteria and Program Criteria for Software and Similarly Named Engineering Programs.

The **Worldwide & Online Campus** Software Engineering program, housed in the School of Engineering in the College of Aviation, provides students with many growth opportunities in aerospace control systems, web development, mobile app development, artificial intelligence, and cybersecurity.

Program-Level Student Learning Outcomes

Students will:

- Have an ability to communicate effectively with a range of audiences.
- Have an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
- Have an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

- Have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Daytona Beach Program Requirements

General Education Requirements	39
Core Requirements	65
Program Support Courses	7
Electives	9
Total Credits	120

Program Details

The Bachelor of Science in Software Engineering program requires successful completion of a minimum of 120 semester hours. The program may be completed in eight regular semesters, assuming appropriate background and full-time enrollment. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University.

General Education Requirements

Communication	9
COMM 122	English Composition
COMM 219	Speech
COMM 221	Technical Communication
Humanities - Lower Level	3
Social Sciences - Lower Level	3
Humanities/Social Sciences - Lower or Upper Level	3
Humanities/Social Sciences - Upper Level	3
Computer Science/Information Technology	3
ENGR 115	Introduction to Computing for Engineers
or CPSC 118	Fundamentals of Computer Programming
or CPSC 223	Scientific Programming in C
Mathematics	8
MATH 241	Calculus and Analytical Geometry I
MATH 242	Calculus and Analytical Geometry II
Physical/Life Sciences *	7
Total Credits	39

* To satisfy the Physical and Life Science 7 credit hours requirement, choose one course from the following list (3 credits):

- CHEM 111
- GEOS 215
- WEAX 201
- PHYS 150
- PHYS 227

And one lecture course from the following, plus its corresponding lab (4 credits):

- BIOL 120 and BIOL 120L
- CHEM 110 and CHEM 110L
- ASTR 224 and ASTR 224L
- PHYS 226 and PHYS 226L
- PHYS 250 and PHYS 250L

Core Requirements

CESC 220	Digital Circuit Design	3
CESC 220L	Digital Circuit Design Laboratory	1
CESC 320	Microprocessor Systems	3
CESC 320L	Microprocessor Systems Laboratory	1
CESC 450	Real-Time Embedded Systems	3
CESC 470	Computer Architecture	3

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CPSC 222	Introduction to Discrete Structures	3
CPSC 315	Data Structures and Analysis of Algorithms	3
CPSC 317	Files and Database Systems	3
CPSC 332	Organization of Programming Languages	3
CPSC 362	Computing Theory	3
CPSC 415	Human-Computer Interfaces	3
or HFCT 310	Human-Computer Interaction	
CPSC 420	Operating Systems	3
CPSC 432	Information and Computer Security	3
MATH 412	Probability and Statistics	3
SFTW 300	Software Engineering Practices	3
SFTW 310	Analysis and Design of Software Systems	3
SFTW 320	Software Construction	3
SFTW 420	Software Quality Assurance	3
SFTW 450	Software Team Project I	3
SFTW 451	Software Team Project II	3
MATH 300/400 (not MATH 305)		3
CESC/CPCS/ELEC/SFTW/SYSE	Upper Level Elective	3
Total Credits		65

Program Support Courses

UNIV 101	College Success	1
ENGR 101	Introduction to Engineering	2
CPSC 225	Computer Science II	3
CPSC 225L	Computer Science II Laboratory	1
Total Credits		7

Electives

Specified Electives	9
Courses to be selected, with the approval of the program coordinator, to support acquiring a minor, an identified concentration of domain knowledge (aerospace, aviation, business, communications, human factors, mathematics, etc.), or further depth in computer science or related disciplines.	
Total Credits	9

Suggested Plan of Study

Year One

Requirements	Credits
MATH 241 - Calculus and Analytical Geometry I	4
ENGR 101 - Introduction to Engineering	2
UNIV 101 - College Success	1
CPSC 223 - Scientific Programming in C	3
COMM 122 - English Composition	3
Social Sciences - Lower Level	3
Semester Hours	16

Requirements	Credits
MATH 242 - Calculus and Analytical Geometry II	4
CPSC 225 - Computer Science II	3
CPSC 225L - Computer Science II Laboratory	1
CPSC 222 - Introduction to Discrete Structures	3

Physical/Life Sciences	3
Semester Hours	14

Total Credits

Total Hours for All Requirements: 30

Year Two

Requirements	Credits
CESC 220 - Digital Circuit Design	3
CESC 220L - Digital Circuit Design Laboratory	1
COMM 219 - Speech	3
SFTW 300 - Software Engineering Practices	3
Humanities - Lower Level	3
Humanities/Social Sciences - Lower or Upper Level	3
Semester Hours	16

Requirements	Credits
CESC 320 - Microprocessor Systems	3
CESC 320L - Microprocessor Systems Laboratory	1
COMM 221 - Technical Communication	3
MATH 412 - Probability and Statistics	3
Physical/Life Sciences	3
Physical/Life Sciences Lab	1
Semester Hours	14

Total Credits

Total Hours for All Requirements: 30

Year Three

Requirements	Credits
CESC 470 - Computer Architecture	3
CPSC 315 - Data Structures and Analysis of Algorithms	3
CPSC 332 - Organization of Programming Languages	3
CPSC 420 - Operating Systems	3
SFTW 320 - Software Construction	3
Semester Hours	15

Requirements	Credits
CPSC 317 - Files and Database Systems	3
CPSC 415 - Human-Computer Interfaces or HFCT 310 - Human-Computer Interaction	3
SFTW 310 - Analysis and Design of Software Systems	3
Specified Elective	3
Humanities/Social Sciences - Upper Level	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
SFTW 450 - Software Team Project I	3
CPSC 362 - Computing Theory	3
CPSC 432 - Information and Computer Security	3
Specified Elective	3
Specified Elective	3
Semester Hours	15

Requirements	Credits
CESC 450 - Real-Time Embedded Systems	3
SFTW 420 - Software Quality Assurance	3
SFTW 451 - Software Team Project II	3
Mathematics Elective Upper Level	3
Technical Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Prescott Program Requirements

General Education Requirements	43
Core Requirements	59
Program Support Courses	17
Electives	6
Total Credits	125

Program Details

The Bachelor of Science in Software Engineering program requires successful completion of a minimum of 125 credit hours. The program may be completed in eight semesters, or four years, assuming appropriate background and full-time enrollment. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University. In addition, students must have a minimum cumulative GPA of 2.00 in all required CESC, CPSC, ELEC, ENGR, and SFTW courses that fulfill Software Engineering degree requirements. The courses necessary to earn this degree are listed below.

Students should be aware that many courses have prerequisites and/or corequisites. Students must earn a grade of C or better in all prerequisite courses for courses with the CESC, CPSC, ELEC, ENGR, ESCI, or SFTW prefixes. Students are responsible for ensuring that all prerequisite and degree requirements are met prior to enrollment in advanced coursework.

General Education Requirements

Communication	9
COMM 122 English Composition	
COMM 219 Speech	
COMM 221 Technical Communication *	
Humanities - Lower Level	3
Social Sciences - Lower Level	3
Humanities/Social Sciences - Lower or Upper Level	3
Humanities/Social Sciences - Upper Level	3
Computer Science/Information Technology	6
CPSC 223 Scientific Programming in C	
ENGR 115 Introduction to Computing for Engineers or CPSC 111 Fundamentals of Computer Programming	

Mathematics	8
MATH 241 Calculus and Analytical Geometry I	
MATH 242 Calculus and Analytical Geometry II	
Physical/Life Sciences	8
PHYS 161 Physics with Calculus I and II	
PHYS 250 Physics with Calculus III	
PHYS 250L Physics with Calculus III Laboratory	
Total Credits	43

* Must earn a C or better to pass COMM 221.

Core Requirements

CESC 220	Digital Circuit Design	3
CESC 220L	Digital Circuit Design Laboratory	1
CESC 320	Microprocessor Systems	3
CESC 320L	Microprocessor Systems Laboratory	1
CESC 450	Real-Time Embedded Systems	3
CESC 470	Computer Architecture	3
CPSC 222	Introduction to Discrete Structures	3
CPSC 315	Data Structures and Analysis of Algorithms	3
CPSC 317	Files and Database Systems	3
CPSC 332	Organization of Programming Languages	3
CPSC 415	Human-Computer Interfaces	3
or HFCT 310	Human-Computer Interaction	
CPSC 420	Operating Systems	3
CPSC 432	Information and Computer Security	3
MATH 412	Probability and Statistics	3
SFTW 300	Software Engineering Practices	3
SFTW 310	Analysis and Design of Software Systems	3
SFTW 320	Software Construction	3
SFTW 420	Software Quality Assurance	3
SFTW 450	Software Team Project I	3
SFTW 451	Software Team Project II	3
Technical Elective		3
ENGR 200, ENGR 201, GSIS 365, Coop/Internship, or AERO, CESC, CPSC, ELEC, ENGP, ESCI, MATH, MECH, PHYS, SFTW, SYSE any 300 level or above. Other courses may be approved by CESE department chair.		
Total Credits		59

Program Support Courses

UNIV 101	College Success	1
ENGR 101	Introduction to Engineering	2
CPSC 225	Computer Science II	3
CPSC 425	Net-Centric Computing	3
MATH 243	Calculus and Analytical Geometry III	4
MATH 345	Differential Equations and Matrix Methods	4
Total Credits		17

Electives

Open Electives	6
Total Credits	6

Suggested Plans of Study

Year One

Requirements	Credits
COMM 122 - English Composition	3
ENGR 101 - Introduction to Engineering	2
ENGR 115 - Introduction to Computing for Engineers or CPSC 118 - Fundamentals of Computer Programming	3
MATH 241 - Calculus and Analytical Geometry I	4
UNIV 101 - College Success	1
CESC 220 - Digital Circuit Design	3
CESC 220L - Digital Circuit Design Laboratory	1
Semester Hours	17

Requirements	Credits
COMM 219 - Speech	3
CPSC 223 - Scientific Programming in C	3
MATH 242 - Calculus and Analytical Geometry II	4
PHYS 161 - Physics with Calculus I and II	4
Semester Hours	14

Total Credits

Total Hours for All Requirements: 31

Year Two

Requirements	Credits
COMM 221 - Technical Communication	3
CPSC 225 - Computer Science II	3
CPSC 315 - Data Structures and Analysis of Algorithms	3
CPSC 222 - Introduction to Discrete Structures	3
Humanities - Lower Level	3
Semester Hours	15

Requirements	Credits
MATH 243 - Calculus and Analytical Geometry III	4
PHYS 250 - Physics with Calculus III	3
PHYS 250L - Physics with Calculus III Laboratory	1
SFTW 300 - Software Engineering Practices	3
HUMN 330 - Values and Ethics or 335 - Technology and Modern Civilization	3
Humanities/Social Sciences - Lower or Upper Level	3
Semester Hours	17

Total Credits

Total Hours for All Requirements: 32

Year Three

Requirements	Credits
CESC 320 - Microprocessor Systems	3
CESC 320L - Microprocessor Systems Laboratory	1
CPSC 317 - Files and Database Systems	3
CPSC 420 - Operating Systems	3
MATH 412 - Probability and Statistics	3
Technical Elective	3
Semester Hours	16

Requirements	Credits
CESC 470 - Computer Architecture	3
MATH 345 - Differential Equations and Matrix Methods	4
SFTW 310 - Analysis and Design of Software Systems	3
SFTW 320 - Software Construction	3
SFTW 420 - Software Quality Assurance	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 32

Year Four

Requirements	Credits
CESC 450 - Real-Time Embedded Systems	3
CPSC 415 - Human-Computer Interfaces	3
ECON 225 - Engineering Economics	3
SFTW 450 - Software Team Project I	3
Open Elective	3
Semester Hours	15

Requirements	Credits
CPSC 332 - Organization of Programming Languages	3
CPSC 425 - Net-Centric Computing	3
CPSC 432 - Information and Computer Security	3
SFTW 451 - Software Team Project II	3
Open Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Worldwide Program Requirements

General Education Requirements	43
Core Requirements	62
Program Support Courses	16
Total Credits	121

Program Details

The Bachelor of Science in Software Engineering requires successful completion of a minimum of 121 credit hours. Students enrolled in the Worldwide Undergraduate Online program may complete the degree in 20 terms, or approximately four years, assuming full-time enrollment and continuous progress. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University. The courses required to earn this degree are listed below.

Students should be aware that many courses have prerequisites and/or corequisites. Students are responsible for ensuring that all prerequisite and degree requirements are satisfied prior to enrollment in advanced coursework. The suggested plan of study is provided as a guide. A student's actual plan of study may vary based on term of admission, course availability, transfer credit, and other academic considerations. Students should consult with their academic advisor to develop an individualized plan of study.

The curriculum provides a comprehensive foundation in software engineering, computer science, computer engineering, and mathematics, culminating in a two-course software engineering capstone experience. Students should work closely with their academic advisor to ensure prerequisite requirements are met and courses are completed in the recommended sequence.

General Education Requirements

Communication	9
COMM 122 English Composition	
COMM 219 Speech	
COMM 221 Technical Communication	
Humanities - Lower Level	3
Social Sciences - Lower Level	3
Humanities/Social Sciences - Lower or Upper Level	3
Humanities - Upper Level	3
Computer Science/Information Technology	3
CPSC 223 Scientific Programming in C	
Mathematics	8
MATH 241 Calculus and Analytical Geometry I	
MATH 242 Calculus and Analytical Geometry II	
Physical/Life Sciences	11
PHYS 150 Physics with Calculus I	
PHYS 160 Physics with Calculus II	
PHYS 250 Physics with Calculus III	
PHYS 250W Physics with Calculus III Laboratory	
Total Credits	43

Core Requirements

CESC 220	Digital Circuit Design	3
CESC 220L	Digital Circuit Design Laboratory	1
CESC 320	Microprocessor Systems	3
CESC 320L	Microprocessor Systems Laboratory	1
CESC 450	Real-Time Embedded Systems	3
CESC 470	Computer Architecture	3
CPSC 222	Introduction to Discrete Structures	3
CPSC 315	Data Structures and Analysis of Algorithms	3
CPSC 317	Files and Database Systems	3
CPSC 332	Organization of Programming Languages	3
CPSC 362	Computing Theory	3
CPSC 420	Operating Systems	3
CPSC 432	Information and Computer Security	3
MATH 412	Probability and Statistics	3
SFTW 300	Software Engineering Practices	3

SFTW 310	Analysis and Design of Software Systems	3
SFTW 320	Software Construction	3
SFTW 420	Software Quality Assurance	3
SFTW 450	Software Team Project I	3
SFTW 451	Software Team Project II	3
MATH 300/400 Elective		3
CESC/CPSC/ELEC/SFTW Upper Level Elective		3
Total Credits		62

Program Support Courses

ENGR 101W	Introduction to Engineering	3
CPSC 225	Computer Science II	3
CPSC 225L	Computer Science II Laboratory	1
CESC 300	Computing in Aerospace and Aviation	3
CPSC 335	Introduction to Computer Graphics	3
SFTW 410	Software Modeling	3
Total Credits		16

Suggested Plan of Study

Year One

Requirements	Credits
ENGR 101W - Introduction to Engineering	3
CPSC 222 - Introduction to Discrete Structures	3
CPSC 223 - Scientific Programming in C	3
Semester Hours	9

Requirements	Credits
CPSC 225 - Computer Science II	3
CPSC 225L - Computer Science II Laboratory	1
MATH 241 - Calculus and Analytical Geometry I	4
Semester Hours	8

Requirements	Credits
MATH 242 - Calculus and Analytical Geometry II	4
COMM 122 - English Composition	3
PHYS 150 - Physics with Calculus I	3
Semester Hours	10

Requirements	Credits
COMM 219 - Speech	3
PHYS 160 - Physics with Calculus II	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 33

Year Two

Requirements	Credits
PHYS 250 - Physics with Calculus III	3
PHYS 250W - Physics with Calculus III Laboratory	2

SFTW 300 - Software Engineering Practices	3
Semester Hours	8

Requirements	Credits
CESC 220 - Digital Circuit Design	3
CESC 220L - Digital Circuit Design Laboratory	1
MATH 412 - Probability and Statistics	3
Semester Hours	7

Requirements	Credits
CESC 320 - Microprocessor Systems	3
CESC 320L - Microprocessor Systems Laboratory	1
Upper Level MATH Elective (MATH 392)	3
Semester Hours	7

Requirements	Credits
COMM 221 - Technical Communication	3
Social Sciences - Lower Level	3
Humanities - Lower Level	3
Semester Hours	9

Total Credits

Total Hours for All Requirements: 31

Year Three

Requirements	Credits
CPSC 315 - Data Structures and Analysis of Algorithms	3
CPSC 362 - Computing Theory	3
CPSC 317 - Files and Database Systems	3
Semester Hours	9

Requirements	Credits
CPSC 332 - Organization of Programming Languages	3
SFTW 310 - Analysis and Design of Software Systems	3
CPSC 420 - Operating Systems	3
Semester Hours	9

Requirements	Credits
CESC 470 - Computer Architecture	3
SFTW 320 - Software Construction	3
Semester Hours	6

Requirements	Credits
CESC 300 - Computing in Aerospace and Aviation	3
Humanities - Upper Level	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
CPSC 432 - Information and Computer Security	3
CESC 450 - Real-Time Embedded Systems	3
SFTW 420 - Software Quality Assurance	3
Semester Hours	9

Requirements	Credits
CPSC 335 - Introduction to Computer Graphics	3
SFTW 410 - Software Modeling	3
CESC/CPSC/ELEC/SFTW Upper Level Elective (CPSC 462)	3
Semester Hours	9

Requirements	Credits
SFTW 450 - Software Team Project I	3
Semester Hours	3

Requirements	Credits
SFTW 451 - Software Team Project II	3
Humanities/Social Sciences - Lower or Upper Level	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 27

Estimated Cost of Attendance

Estimated Cost of Attendance: California Student Information (<https://catalog.erau.edu/student-life/student-affairs/california-student/>)