

B.S. in Computer Engineering

The Bachelor of Science in Computer Engineering degree gives the student the opportunity to acquire a broad background in computer design, including embedded control systems, real-time systems, telecommunication systems, and software engineering. The curriculum includes courses in general education, computer science, software engineering, and electrical engineering, and features a capstone senior design. The program's emphasis on real-time embedded control systems and hardware/software interfaces give program graduates employment opportunities beyond graduates of traditional computer engineering programs, including positions in the aerospace and defense industries.

In a few years of completing their undergraduate degree, graduates of the Bachelor of Science in Computer Engineering:

- Have established themselves in successful engineering careers in aviation, aerospace, and related fields and/or are pursuing advanced degrees.
- Are serving society and their professions as involved and responsible citizens, leaders, and role models.
- Are problem solvers, systems thinkers, and innovators.

The program curriculum is designed to facilitate accomplishment of these objectives by program graduates. The program includes significant project work designed to prepare students to work as part of a team on the development of complex systems involving both software and hardware. It allows the student opportunities to develop capabilities in teamwork, designing to requirements, and quality assurance techniques. The Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Degree Requirements

The Bachelor of Science in Computer Engineering can be earned in eight semesters assuming appropriate background and full-time enrollment. Successful completion of a minimum of 127 credit hours is required. A minimum cumulative grade point average of 2.0 is needed for all required CEC, CS, EE, SYS and EGR courses that fulfill any degree requirement. To enter this program, students should have demonstrated competence in mathematics, physics, and computer programming in high school, and they should be prepared to enter Calculus and Analytical Geometry I and Computer Science I. If necessary, students can prepare for the program by taking MA 143 before taking MA 241. Students should check the course descriptions before registering for classes to ensure requisite sequencing.

See the Common Year One outline in the Engineering Fundamentals Program Introduction. CS 223 is a required course for this degree program.

Combined MSECE Program Option

Exceptional students in undergraduate engineering programs, including the Bachelor of Science in Computer Engineering program, are invited to apply to the Combined Master of Science Option in Electrical and Computer Engineering. This program enables students to pursue a MSECE degree with only one additional year of studies beyond the BS degree. For additional details, see the Combined MSECE section of the catalog.

Students will:

- Have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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 communicate effectively with a range of audiences.
- 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 function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- 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.

General Education Requirements

For a full description of Embry-Riddle General Education guidelines, please see the General Education section of the catalog. These Minimum requirements are applicable to all degree programs.

Communication Theory & Skills (COM 122, COM 219, COM 221)	9
Lower-Level Humanities	3
Lower-Level Social Sciences	3
Lower or Upper-Level Humanities or Social Sciences	3
Upper-Level Humanities or Social Sciences	3
Mathematics (MA 241 & MA 242)	8
Computer Science (CS 223)	3
Physical and Life Sciences (PS 150, PS 160 & PS 253)	7
Total Credits	39

Professional Preparation

EGR 101	Introduction to Engineering	2
UNIV 101	College Success	1

Mathematics

MA 243	Calculus and Analytical Geometry III	4
MA 345	Differential Equations and Matrix Methods	4
MA 412	Probability and Statistics	3

Physical Science

PS 250	Physics for Engineers III	3
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Computer Engineering

CEC 220	Digital Circuit Design	3
CEC 222	Digital Circuit Design Laboratory	1
CEC 300	Computing in Aerospace and Aviation	3
CEC 315	Signals and Systems	3
CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1
CEC 330	Digital Systems Design with Aerospace Applications	4
CEC 330L	Digital Systems Design Laboratory	0
CEC 410	Digital Signal Processing	3
CEC 411	Digital Signal Processing Laboratory	1
CEC 420	Computer Systems Design I	3
CEC 421	Computer Systems Design II	3
CEC 450	Real-Time Embedded Systems	3
CEC 470	Computer Architecture	3

Computer Science

CS 222	Introduction to Discrete Structures	3
CS 225	Computer Science II	4
CS 225L	Computer Science II Laboratory	0
CS 420	Operating Systems	3

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CS 462	Computer Networks	3
Electrical Engineering		
EE 223	Linear Circuits Analysis I	3
EE 224	Electrical Engineering Laboratory I	1
EE 300	Linear Circuits Analysis II	3
EE 302	Electronic Devices and Circuits	3
EE 304	Electronic Circuits Laboratory	1
EE 401	Control Systems Analysis and Design	3
EE 402	Control Systems Laboratory	1
Systems Engineering		
Required Electives		
SYS 320	Systems Engineering Practices	3
Specified Electives		6
Total Credits		127

* Approved by Program Coordinator

Students should be aware that several courses in each academic year may have prerequisites and/or corequisites (check the course descriptions before registering for classes to ensure requisite sequencing).

See the Common Year One outline in the Engineering Fundamentals Program Introduction. CS 223 is a required course for this degree program.

Year One

	Credits
See the Common First-Year outline in the College of Engineering introduction.	33
Credits Subtotal	33.0

Year Two

COM 221	Technical Report Writing	3
CS 222	Introduction to Discrete Structures	3
CS 225	Computer Science II (and CS 225L)	4
MA 243	Calculus and Analytical Geometry III	4
PS 160	Physics for Engineers II	3
CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1
EE 223	Linear Circuits Analysis I	3
EE 224	Electrical Engineering Laboratory I	1
MA 345	Differential Equations and Matrix Methods	4
PS 250	Physics for Engineers III	3
PS 253	Physics Laboratory for Engineers	1
Credits Subtotal		33.0

Year Three

CEC 470	Computer Architecture	3
CEC 330	Digital Systems Design with Aerospace Applications (4 credits lecture, 0 credit laboratory)	4
EE 302	Electronic Devices and Circuits	3
EE 304	Electronic Circuits Laboratory	1
EE 300	Linear Circuits Analysis II	3
	Specified Elective ***	3
CEC 300	Computing in Aerospace and Aviation	3
CEC 315	Signals and Systems	3
	Lower or Upper-Level Humanities or Social Sciences	
MA 412	Probability and Statistics	3
SYS 320	Systems Engineering Practices	3
Credits Subtotal		29.0

Year Four

CEC 420	Computer Systems Design I	3
CS 462	Computer Networks	3
	Specified Elective ***	3
CS 420	Operating Systems	3
CEC 410	Digital Signal Processing	3
CEC 411	Digital Signal Processing Laboratory	1
CEC 421	Computer Systems Design II	3
CEC 450	Real-Time Embedded Systems	3
EE 401	Control Systems Analysis and Design	3
EE 402	Control Systems Laboratory	1
	Upper-Level Humanities or Social Sciences	3
Credits Subtotal		29.0
Credits Total:		124.0

* Students in the Computer Engineering program are encouraged to take CS 225 during the first year, postponing COM 219 until the second year.

** EE 401/EE 402, CEC 410/CEC 411, other CEC/EE (300-400) with the approval of the program coordinator.

***Specified electives are courses to be selected, with the approval of the program coordinator, to support acquiring a minor, an identified concentration of domain knowledge (for example, aerospace, aviation, business, communications, human factors, mathematics, etc.) or further depth in computer engineering or related disciplines.