

B.S. in Mechanical Engineering

Worldwide Program Requirements

General Education Requirements	42
Core Requirements	53
Area of Concentration	29
Electives	6
Total Credits	130

Program Details

The Bachelor of Science in Mechanical Engineering requires successful completion of a minimum of 130 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 includes a Robotics track that integrates advanced coursework in robotics, mechatronics, control systems, and mechanical engineering design. Students should work closely with their academic advisor to ensure prerequisite requirements are met and courses are completed in the recommended sequence to support successful completion of the Robotics track and the engineering curriculum.

General Education Requirements

Communication	9
COMM 122 English Composition	
COMM 221 Technical Communication	
COMM 219 Speech	
Humanities - Lower Level	3
Social Sciences - Lower Level	3
ECON 225 Engineering Economics	
Humanities/Social Sciences - Lower or Upper Level	3
Humanities/Social Sciences - Upper Level	3
HUMN 330 Values and Ethics	
Computer Science/Information Technology	3
ENGR 115 Introduction to Computing for Engineers	
Mathematics	8
MATH 241 Calculus and Analytical Geometry I	
MATH 242 Calculus and Analytical Geometry II	
Physical/Life Sciences	10
CHEM 110 General Chemistry I	
CHEM 110L General Chemistry I Laboratory	
PHYS 150 Physics with Calculus I	
PHYS 160 Physics with Calculus II	
Total Credits	42

Core Requirements

MATH 243	Calculus and Analytical Geometry III	4
MATH 345	Differential Equations and Matrix Methods	4
ENGR 101W	Introduction to Engineering	3
ENGR 120	Graphical Communications	3
ESCI 201	Statics	3
ESCI 202	Solid Mechanics	3
ESCI 204	Dynamics	3
ESCI 208	Thermodynamics	3
MECH 201L	Computer-Aided Manufacturing Laboratory	1
ESCI 206	Fluid Mechanics	3
ESCI 320	Engineering Materials Science	2
ESCI 320L	Engineering Materials Science Laboratory	1
MECH 304	Introduction to Machine Design	3
MECH 400	Mechanical Vibrations	3
ESCI 403	Heat Transfer	3
ELEC 327	Electrical Engineering Fundamentals	3
AERO 430	Control System Analysis and Design	3
PHYS 250	Physics with Calculus III	3
PHYS 250W	Physics with Calculus III Laboratory	2
Total Credits		53

Area of Concentration

ROBOTICS

MECH 470	Mechatronics	3
MECH 478	Robotic Systems Preliminary Design	4
MECH 479	Robotic Systems Detail Design	4
MECH 304L	Machine Design Laboratory	1
CESC 220	Digital Circuit Design	3
CESC 220L	Digital Circuit Design Laboratory	1
CPSC 125	Computer Science I	3
CPSC 125L	Computer Science I Laboratory	1
MECH 370	Introduction to Robotics	3
MECH 370L	Introduction to Robotics I Laboratory	1
MECH 470L	Mechatronics Laboratory	1
MECH 471	Robotics II	3
MECH 471L	Robotics II Laboratory	1
Total Credits		29

Electives

ESCI 324	Measurements and Instrumentation	2
ESCI 324L	Measurements and Instrumentation Laboratory	1
MECH 404	Advanced Machine Design	3
Total Credits		6

Suggested Plan of Study

Year One

Requirements	Credits
COMM 122 - English Composition	3
ENGR 101W - Introduction to Engineering	3
Semester Hours	6

Requirements	Credits
MATH 241 - Calculus and Analytical Geometry I	4
ENGR 115 - Introduction to Computing for Engineers	3

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Humanities - Lower Level	3
Semester Hours	10

Requirements	Credits
MATH 242 - Calculus and Analytical Geometry II	4
PHYS 150 - Physics with Calculus I	3
Semester Hours	7

Requirements	Credits
CHEM 110 - General Chemistry I	3
CHEM 110L - General Chemistry I Laboratory	1
ECON 225 - Engineering Economics	3
ENGR 120 - Graphical Communications	3
Semester Hours	10

Total Credits

Total Hours for All Requirements: 33

Year Two

Requirements	Credits
COMM 221 - Technical Communication	3
MATH 243 - Calculus and Analytical Geometry III	4
PHYS 160 - Physics with Calculus II	3
Semester Hours	10

Requirements	Credits
ESCI 201 - Statics	3
MATH 345 - Differential Equations and Matrix Methods	4
MECH 201L - Computer-Aided Manufacturing Laboratory	1
Semester Hours	8

Requirements	Credits
COMM 219 - Speech	3
ESCI 202 - Solid Mechanics	3
ESCI 204 - Dynamics	3
Semester Hours	9

Requirements	Credits
ESCI 206 - Fluid Mechanics	3
PHYS 250 - Physics with Calculus III	3
PHYS 250W - Physics with Calculus III Laboratory	2
Semester Hours	8

Total Credits

Total Hours for All Requirements: 35

Year Three

Requirements	Credits
ELEC 327 - Electrical Engineering Fundamentals	3
ESCI 208 - Thermodynamics	3
ESCI 320 - Engineering Materials Science	2

ESCI 320L - Engineering Materials Science Laboratory	1
Semester Hours	9

Requirements	Credits
ESCI 403 - Heat Transfer	3
CESC 220 - Digital Circuit Design	3
CESC 220L - Digital Circuit Design Laboratory	1
Semester Hours	7

Requirements	Credits
ESCI 324 - Measurements and Instrumentation	2
ESCI 324L - Measurements and Instrumentation Laboratory	1
MECH 370 - Introduction to Robotics	3
MECH 370L - Introduction to Robotics I Laboratory	1
Semester Hours	7

Requirements	Credits
CPSC 125 - Computer Science I	3
CPSC 125L - Computer Science I Laboratory	1
MECH 304 - Introduction to Machine Design	3
MECH 304L - Machine Design Laboratory	1
Semester Hours	8

Total Credits

Total Hours for All Requirements: 31

Year Four

Requirements	Credits
MECH 470 - Mechatronics	3
MECH 470L - Mechatronics Laboratory	1
MECH 471 - Robotics II	3
MECH 471L - Robotics II Laboratory	1
Semester Hours	8

Requirements	Credits
AERO 430 - Control System Analysis and Design	3
MECH 400 - Mechanical Vibrations	3
MECH 404 - Advanced Machine Design	3
Semester Hours	9

Requirements	Credits
HUMN 330 - Values and Ethics	3
MECH 478 - Robotic Systems Preliminary Design	4
Semester Hours	7

Requirements	Credits
MECH 479 - Robotic Systems Detail Design	4

Humanities/Social Science - Lower or Upper Level	3
Semester Hours	7

Total Credits

Total Hours for All Requirements: 31

Estimated Cost of Attendance

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