

2023-2024 Catalog

Mechanical Engineering

Bachelor of Science
Academic Department
Physics and Engineering

Note: Students earning this degree will follow the [31-hour core curriculum for Engineering/Physics BS students](#).

The Mechanical Engineering degree prepares students for a career in industry, either directly following their undergraduate studies or after additional graduate studies in engineering. The degree encompasses a rigorous course of study with a strong foundation in general engineering and other STEM subjects as well as specialized upper division classes in Mechanical Engineering. Early courses focus on the fundamentals of being a successful engineer such as complex problem solving, critical thinking, and self-driven learning. Upper division courses further the students' knowledge with in-depth courses covering specialized topics in Mechanical Engineering, and unique electives allow the students to tailor the curriculum to their desired career goals. Due to the versatile nature of studies encompassing areas in fluid mechanics, control systems, and heat transfer, Mechanical Engineers are in high demand in industry, and employment opportunities range from the petrochemical and chemical industry to Aerospace.

Total Credits 98

Major Coursework

Complete all of the following courses.

Item #	Course Title		Credits
☐ ENGR 1300	Introduction to Engineering		3
☐ ENGR 1100	Intro to Engineering Lab	ENGR 1100 Prerequisite: ENGR 1300	1
☐ ENGR 1314	Fundamentals of Computer-Aided Design		3
☐ ENGR 2100	Introduction to Engineering Design	ENGR 2100 Prerequisites: ENGR 1300, 1100	1
☐ PHYS 2333	University Physics I	PHYS 2333 Corequisites: PHYS 2111, MATH 1431	3
☐ PHYS 2111	University Physics I Laboratory	PHYS 2111 Corequisite: PHYS 2333	1
☐ PHYS 2334	University Physics II	PHYS 2334 Prerequisite: PHYS 2333; Pre/Corequisite: MATH 1432.	3
☐ PHYS 2112	University Physics II Lab	PHYS 2112 Corequisite: PHYS 2334	1
☐ PHYS 3337	Modern Physics	PHYS 3337 Prerequisites: PHYS 2334/2112; Corequisites: PHYS 3137.	3
☐ PHYS 3137	Modern Physics Laboratory	PHYS 3137 Prerequisites: PHYS 2334/2112; Corequisite: PHYS 3337	1
☐ ENGR 3341	Statics	ENGR 3341 Prerequisites PHYS 2333, MATH 1432	3
☐ ENGR 3342	Dynamics	ENGR 3342 Prerequisites ENGR 3341	3

☐	ENGR 3343	Mathematical Methods for Physics and Engineering	ENGR 3343 Prerequisites: PHYS 2334, MATH 1432	3
☐	ENGR 3333	Electrical Circuits I	ENGR/PHYS 3333 Prerequisites: PHYS 2334 or Instructor Permission	3
☐	ENGR 3133	Electrical Circuits Lab	ENGR/PHYS 3133 Prerequisites: PHYS 2334, 2112. Corequisite: ENGR/PHYS 3333.	1
☐	ENGR 3335	Thermodynamics	PHYS/ENGR 3335 Prerequisites: CHEM 1342; MATH 1432; PHYS 2334	3
☐	ENGR 3130	Junior/Senior Seminar in Physics and Engineering	ENGR 3130 Prerequisites: PHYS 2334, 2112; Junior or Senior Standing.	1
☐	ENGR 3138	Advanced Mechanical Lab I	ENGR 3138 Prerequisites: PHYS 3337, 3137.	1
☐	ENGR 3347	Strength of Materials	ENGR 3347 Prerequisites: ENGR 3341, MATH 1432.	3
☐	ENGR 3348	Fluids	ENGR 3348 Prerequisites: ENGR 3343	3
☐	ENGR 3305	Heat Transfer	ENGR 3305 Prerequisites: PHYS 3336, ENGR 3348	3
☐	ENGR 3306	Applications in Heat Transfer	ENGR 3306 Prerequisite: ENGR 3305.	3
☐	ENGR 3310	Mechanical Elements	ENGR 3310 Prerequisites: ENGR 3347	3
☐	ENGR 4343	Computational Methods for Engineering	PHYS/ENGR 4343 Prerequisites: PHYS 3337, ENGR/PHYS 3343, or instructor permission.	3
☐	ENGR 4360	Properties of Materials	ENGR 4360 Prerequisite: ENGR 3347.	3
☐	ENGR 4312	Engineering Communications	ENGR 4312 Prerequisites: ENGR 3333, Junior or Senior Standing	3
☐	ENGR 4364	Fundamentals of Nanotechnology	ENGR 4364 Prerequisites: ENGR/PHYS 3337; Junior-level standing.	3
☐	ENGR 4305	Dynamic Systems and Controls	ENGR 4305 Prerequisites: ENGR 3342, ENGR 3343	3
☐	ENGR 4320	Mechanical Engineering Design Capstone	ENGR 4320 Prerequisites: ENGR 2100, 3342; Senior Standing.	3
☐	ENGR 4120	Mechanical Engineering Design Capstone Laboratory	ENGR 4120: Prerequisites: ENGR 4320; Senior Standing.	1

PHYS/ENGR Electives

Complete 6 PHYS/ENGR elective hours. Consult with Academic Advisor for options.

Chemistry

Complete all of the following courses. Must take in order.

Item #	Course Title		Credits
☐ CHEM 1341	General Chemistry I	CHEM 1341 Corequisite: CHEM 1141	3
☐ CHEM 1141	General Chemistry I Laboratory	CHEM 1141 Corequisite: CHEM 1341	1

☐	CHEM 1342	General Chemistry II	CHEM 1342 Prerequisite (C or better): CHEM 1341/1141. Corequisite: CHEM 1142	3
☐	CHEM 1142	General Chemistry II Laboratory	CHEM 1142 Corequisite: CHEM 1342	1

Mathematics

Complete all of the following courses. Must take in order.

Item #	Course Title		Credits
☐ MATH 1431	Calculus I	MATH 1431 Prerequisite: MATH 1430 or department consent.	4
☐ MATH 1432	Calculus II	MATH 1432 Prerequisite: Grade of 'C' or Better in MATH 1431	4
☐ MATH 2431	Calculus III	MATH 2431 Prerequisite: MATH 1432 with a grade of "C" or better	4