

# The Department of Engineering

## Mechanical Engineering, B.S.

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## About

- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Mechanical Engineering, Honors

Mechanical Engineers apply the principles of solid mechanics, thermal fluid sciences, dynamics and control, material science and manufacturing science to the analysis and design of systems of all types. In applying this technical knowledge to fields such as energy systems, nanomanufacturing and robotics, the mechanical engineer must consider economic constraints and the social and ecological implications of solutions imposed. The mechanical engineering curriculum offers the student an opportunity to pursue educational objectives within the framework of this broad theme.

## Mission Statement

We are committed to providing a rigorous educational experience in the discipline of mechanical engineering, graduating well-rounded leaders and life-long learners, who aspire to achieving professional excellence. We are *equally* committed to the discovery, dissemination, advancement and application of cutting-edge research. Inspired by the Augustinian tradition, we value an inclusive and diverse community in which we prepare our students to demonstrate the highest ethical conduct and contribute to the well-being of humankind.

## Program Educational Objectives

Our graduates will:

- Be valued members of their organizations because of their skills and abilities as mechanical engineers;
- Solve complex technical problems and/or design systems that are useful to society by applying the fundamental scientific principles that underpin the mechanical engineering profession;
- Advance in their chosen career paths by utilizing technical, leadership, communication, and interpersonal skills, with the highest ethical standards;
- Apply their knowledge and skills to successfully practice professions of their choice;

- Demonstrate professional and personal growth by pursuing or successfully completing an advanced degree, professional development courses, and/or engineering certification;
- Be actively engaged in service to their professions and communities, consistent with the tradition of St. Augustine.

The first year of the mechanical engineering program is devoted to laying a foundation of mathematics, physical science, and the general engineering sciences. The final three years are devoted primarily to mechanical engineering topics. The required courses span the field of mechanical engineering, and electives provide the opportunity to pursue specific areas of mechanical engineering in greater depth through technical concentrations which include Mechanics and Materials, Thermal/Fluid Systems, and Dynamic Systems. A student opting for a technical concentration will first take an elective in the junior year which corresponds to their selected technical concentration. Each student will then customize the program of study by choosing four courses (12 credit hours) of technical electives in the senior year. To complete the technical concentration, two of these mechanical engineering technical electives must be selected from the designated set of concentration classes. In addition, the student must take the senior laboratory course from their technical concentration. A student who completes a technical concentration will have the concentration indicated on the final transcript. Students who do not opt for a concentration will still take a junior year restricted elective and a senior lab; the four senior year mechanical engineering electives can be chosen freely from all offerings.

The engineering design process is emphasized throughout the program and culminates with a senior year project that requires a synthesis of basic principles learned in previous courses.

Throughout the curriculum the technical courses are balanced by a careful selection of humanities courses to ensure that the effects of technology on society are given due consideration in design.

A faculty advisor is assigned to each student at the beginning of their first-year to provide academic and career guidance for the remainder of the student's years in the program until graduation. The advisor should be consulted regarding such topics as electives, minors or concentrations, graduate studies, undergraduate research, and completion of degree requirements for graduation.

## Freshman Year

### First Semester

Course	Title	Credits
ACS 1000	Ancients	3
THL 1000	Faith, Reason, and Culture	3
CHM 1103	General Chemistry Lab I	1
CHM 1151	General Chemistry I	4
MAT 1500	Calculus I	4
EGR 1200	Engineering Design Cornerstone	3
EGR 1001	Career Compass IA	0.5

### Second Semester

Course	Title	Credits
ACS 1001	Moderns	3
MAT 1505	Calculus II	4
PHY 2400	Physics I Mechanics	3
ME 1201	Intro to Comp Aid Design&Draft	1
ME 1205	Computer Program for Mech Engr	3
	Elective	3
EGR 1002	Career Compass IB	0.5

# Sophomore Year

## First Semester

Course	Title	Credits
MAT 2500	Calculus III	4
ME 2100	Statics	3
ME 2505	M.E. Analysis & Design	4
PHY 2402	Physics II Elec & Magnet	3
PHY 2403	Phy Lab for Engineering	1
EGR 2003	Career Compass IIA	0.5

## Second Semester

Course	Title	Credits
MAT 2705	Diff Equation with Linear Alg	4
ME 2900	ME Laboratory I	1
ME 3100	Thermodynamics	3
ME 2103	Mechanics of Materials	3
ME 2101	Dynamic Systems I	3
COM 1102	COM Foundations for Engrs	3
EGR 2004	Career Compass IIB	0.5

# Junior Year

## First Semester

Course	Title	Credits
ECE 2030	Electric Circuits Fundamentals	3
ECE 2031	Elect Circuit Fundamentals Lab	1
ME 3102	Dynamic Systems II	3
ME 3402	Solid Mechanics & Design I	3
ME 3600	Fluid Mechanics	3
ME 3950	Heat Transfer I	3
EGR 3005	Career Compass IIIA	0.5

## Second Semester

Course	Title	Credits
ME 3300	Materials Science I	3
ME 3333	Manufacturing Engineering	3
ME 3900	ME Laboratory II	1
	Elective - Restricted ME	3
	Elective	3
	Elective	3
EGR 3006	Career Compass IIIB	0.5

# Senior Year

## First Semester

<b>Course</b>	<b>Title</b>	<b>Credits</b>
ME 5005	Capstone Design I	2
	Elective - ME/Concentration	3
	Elective - Career/ME	3
	Elective - Restricted ME Lab	1
	Elective	3
	Elective	3

## Second Semester

<b>Course</b>	<b>Title</b>	<b>Credits</b>
ME 5006	Capstone Design II	2
	Elective - ME/Concentration	3
	Elective - Career/ME	3
	Elective	3
	Elective	3