

Design and Innovation in Engineering, Minor

The design and innovation in engineering minor is designed for nonengineering undergraduate students who wish to explore and develop working solutions as an engineer to the National Academy of Engineering Grand Challenges (<https://www.engineeringchallenges.org/>) of the 21st century. The course requirements for the minor are designed to expose the student to the engineering elements necessary to solve the important problems facing society today and include value-sensitive design as well as the ethical and professional obligations of an engineer. The elective options offer a high degree of flexibility and exposure to the engineering design process, CAD, programming, micro-controllers-based projects, and mathematical computation. The aforementioned skills will be used for making interactive open-ended projects that address one of the NAE Grand Challenges. This provides more depth within the student's discipline and improves future career opportunities. Students have an opportunity to model and analyze designs, applying many techniques engineers utilize to create and test designs toward implementation. The student, upon successful completion of the minor, will be able to apply value-sensitive design principles to determine a societal need and propose and build or develop a solution. Students apply teamwork, project management, CAD, and algorithmic thinking to the conception of a particular solution and deliver effective team presentations on engineering projects and topics.

Minor Requirements

Note: This minor is for non-engineering majors.

Required Courses

Code	Title	Hours
GE 1110 or GE 1501	Engineering Design Cornerstone of Engineering 1	4
GE 1111 or GE 1502	Engineering Problem Solving and Computation Cornerstone of Engineering 2	4

Elective

Code	Title	Hours
Complete two of the following:		8-10
BIOE 2350	Biomechanics	
BIOE 2355	Quantitative Physiology for Bioengineers	
BIOE 2365 and BIOE 2366	Bioengineering Measurement, Experimentation, and Statistics and Lab for BIOE 2365	
CHME 2308	Conservation Principles in Chemical Engineering	
CHME 2204	History of Fluid Mechanics	
CHME 2310	Transport Processes 1	
CIVE 1200	How Cities Work: Experiencing Urban Infrastructure	
CIVE 2221 and CIVE 2222	Statics and Solid Mechanics and Recitation for CIVE 2221	
CIVE 2334	Environmental Engineering: Principles, Technology, and Sustainability	
CIVE 2335	Environmental Engineering Chemistry	
CIVE 2260 and CIVE 2261	Materials for the Built Environment and Lab for CIVE 2260	
CIVE 2300 and CIVE 2301	Environmental Measurements in Natural and Engineered Systems and Lab for CIVE 2300	
CIVE 2320 and CIVE 2321	Structural Analysis and Recitation for CIVE 2320	
CIVE 2331	Fluid Mechanics and Hydraulics	
EECE 2140	Computing Fundamentals for Engineers	
EECE 2150	Circuits and Signals: Biomedical Applications	
EECE 2160	Embedded Design: Enabling Robotics	
EECE 2210 and EECE 2211	Electrical Engineering and Lab for EECE 2210	
EECE 2300	Computational Methods for Data Analytics	
EECE 2322 and EECE 2323	Fundamentals of Digital Design and Computer Organization and Lab for EECE 2322	
EECE 2412 and EECE 2413	Fundamentals of Electronics and Lab for EECE 2412	

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EECE 2540	Fundamentals of Networks
EECE 2560	Fundamentals of Engineering Algorithms
EECE 2750	Enabling Engineering
GE 2010	Introduction to Customer-Driven Technical Innovation: Silicon Valley
GE 2030	Introduction to Product Prototyping: Silicon Valley
GE 2500	Design Analysis and Innovation
GE 2750	Enabling Engineering
GE 3300	Energy Systems: Science, Technology, and Sustainability
IE 2310 and IE 2311	Introduction to Industrial Engineering and Recitation for IE 2310
IE 3412	Engineering Probability and Statistics
IE 4510	Simulation Modeling and Analysis
ME 2350	Statics
ME 2380 and ME 2381	Thermodynamics and Recitation for ME 2380

GPA Requirement

Minimum 2.000 GPA required in the minor

Credit Requirement

16 hours required