

GENERAL ENGINEERING (EGN)

EGN 110. Innovation and Entrepreneurship in Engineering. 3 Credit Hours.

Student engagement using real-world ideas and global solutions under the scaffolding umbrella in applying prescriptive entrepreneurial fundamentals blended with engineering and design-thinking precepts. The goal is to deliver real, commercially viable solutions by bringing together multiple majors, with diverse backgrounds, and a myriad of skill sets from across campus, from across disciplines. There will be complimentary and hands-on aspects of the course that use project-based learning to engage students in team work, generation of ideas, develop concepts of feasibility, human factored design, and practical aspects of moving from concept to a product. The class will be team taught with highly accomplished researchers, educators, and entrepreneurs and open to all Engineering and Business freshmen.

Components: LEC.

Grading: GRD.

Typically Offered: Fall & Spring.

EGN 114. Global Challenges Addressed by Engineering and Technology. 3 Credit Hours.

This course will cover historical aspects and current topical areas being worked on by engineers including climate change, space exploration, medicine, energy and environment, pandemics, disasters. The class will also highlight through case studies the important fundamentals necessary, along with the interdisciplinary reach to humanities, social sciences and communication. Topics such as inclusion and diversity, and ethical issues will also be woven through the topics. This course is designed to appeal to students in engineering and other majors and will encourage a collaborative and multidisciplinary approach to understanding and resolving global challenges. Students taking this course will be able to fine tune their understanding of the ways in which engineering can contribute to the greater good of humanity.

Corequisite: freshman standing.

Components: LEC.

Grading: GRD.

Typically Offered: Fall & Spring.

EGN 123. Computing and Digital Solutions for the future. 3 Credit Hours.

The goal of this course is to provide an essential idea of computers to an audience with no prior computer science experience. It aims to provide students with an understanding of the role computation can play in solving problems and to help students, regardless of their major, feel justifiably confident of their ability to write small programs and access appropriate resources that allow them to accomplish useful goals. The course also exposes students to some of the latest topics in technology in different areas of engineering through case studies.

Components: LAB.

Grading: GRD.

Typically Offered: Fall & Spring.

EGN 181. Resilience. 3 Credit Hours.

Climate adaptation is moving quickly and requires new forms of collaboration and thinking, breaking down traditional siloes, and replacing them with multi-faceted and collaborative approaches to arrive at informed, responsible, and innovative solutions. To train students to those ends, a problem-solving learning format will be utilized, and the course will mirror emerging interdisciplinary modalities both professionals and researchers alike are increasingly embracing to more effectively define and address resilience objectives. Students will apply those modalities, methods, and lessons to their weekly reflections and their stream and final capstone projects.

Components: LEC.

Grading: GRD.

Typically Offered: Fall & Spring.

EGN 233. Electromagnetics and Its Engineering Applications. 3 Credit Hours.

This course covers electric and magnetic fields to prepare students for advanced engineering courses, with a focus on engineering applications. The topics to be covered will include vector analysis, static and time-varying electric and magnetic fields, boundary conditions, Maxwell's equation, and basic propagating electromagnetic waves. A focus will be made on applications of electricity and magnetism, such as data storage and logic devices, display, sensors, optical communication systems, wireless energy charging.

Prerequisite: PHY 221, And Pre Or Co-Requisite: MTH 162, Or MTH 172.

Components: LEC.

Grading: GRD.

Typically Offered: Fall & Spring.

EGN 318. Engineering Mathematics I. 3 Credit Hours.

Students will be presented with fundamental mathematical concepts such as Vectors, matrix algebra, systems of linear equations. Fundamentals of vector analysis, determinants, eigenvalues, and eigenspaces, vectors in space. All the problems will be contextualized across different engineering areas.

Prerequisite: MTH 162 or MTH 172.

Components: LEC.

Grading: GRD.

Typically Offered: Fall & Spring.

EGN 319. Engineering Mathematics II. 3 Credit Hours.

Students will be presented with fundamental mathematical concepts such as ordinary differential equations, partial differential equations and multiple integration. Advanced mathematical tools for the solution of complex mathematical problems, such as transform methods (Fourier and Laplace) will be introduced. All the problems will be contextualized across different engineering areas

Prerequisite: MTH 162 or MTH 172.

Components: LEC.

Grading: GRD.

Typically Offered: Fall.

EGN 381. Climate Challenges: Integrating Science, Health and Engineering. 3 Credit Hours.

This course will guide students to explore the sources of, impacts from and solutions to climate challenges through integration of natural sciences, health management and engineering. Students get just-in-time exposure to chemistry, biology, earth science and engineering relevant to the selected topics.

Components: MOD.

Grading: GRD.

Typically Offered: Offered by Announcement Only.

EGN 523. Advanced Computing for Engineers. 3 Credit Hours.

In this course, you will be exposed to various computing environments (from local computing: desktop/laptops to parallel and distributed computing accessible through IDSC and cloud computing platforms such as Azure, Google, and AWS) and one or more of engineering applications drawn from both public and research datasets. Knowledge of Python recommended

ISE 224 or Permission of Instructor.

Components: LEC.

Grading: GRD.

Typically Offered: Fall.

EGN 623. Advanced Computing for Engineers. 3 Credit Hours.

In this course, you will be exposed to various computing environments (from local computing: desktop/laptops to parallel and distributed computing accessible through IDSC and cloud computing platforms such as Azure, Google, and AWS) and one or more of engineering applications drawn from both public and research datasets. Knowledge of Python recommended.

Components: LEC.

Grading: GRD.

Typically Offered: Fall.