

ENGINEERING (ENGR)

ENGR-OSU Engineering Economy

3 credits, Spring

ENGR-390 through Oregon State University (OSU)

ENGR-111 Introduction to Engineering

3 credits, Fall/Winter/Spring

Introduction to the basic ideas and tools of the engineering profession. An exploration of career and education options within the field, and the skills needed to achieve career goals. Methods of engineering analysis, design, and problem solving culminating in a design project. The class will cover all facets of engineering design, including background research, requirement specification and prioritization, development, prototype construction, testing, and evaluation for future redesigns. Prerequisite or Corequisite: MTH-111Z or higher

ENGR-112 Engineering Programming

3 credits, Fall/Winter/Spring

Introduction to basic scientific and engineering computing. Covers methods of engineering analysis, design, and problem solving with computational tools. Emphasis on developing proficiency in writing functions and programs.

Prerequisite or Corequisite: MTH-112Z or higher

ENGR-115 Engineering Graphics

3 credits, Spring

This course will emphasize the practical application of engineering graphics techniques for the design, maintenance, and modification of mechanical parts and assemblies. Students will both generate new models based on design intent and translate existing physical objects into graphical 3D models, documenting their work with 2D engineering drawings according to ASME standards. Includes isometric views, dimensioning, and simulation.

Prerequisites: MTH-060 or higher

ENGR-171 Digital Logic

4 credits, Winter

Introduction to digital design fundamentals. Covers basic logic gates, number systems, logic circuit simplification techniques, combinational logic devices, flip-flops, and basic state machines. Uses computer-based tools for logic system development and simulation. Reinforces systemic design methodology.

Prerequisites: MTH-111Z

ENGR-201 Electrical Fundamentals

4 credits, Spring

A study of basic electrical circuit theory. Analysis of voltage and current relationships. Covers circuit parameters of resistance, inductance, and capacitance. Includes basic DC, AC, and natural response of circuits. This course is not intended for Electrical or Computer Engineering majors.

Prerequisites: MTH-252Z

Corequisites: ENGR-201L

ENGR-211 Statics

4 credits, Fall

First term of engineering mechanics sequence. This course focuses on the analysis of forces acting on structures and machines under equilibrium conditions.

Prerequisites: MTH-252Z

Prerequisite or Corequisite: PH-211

ENGR-212 Dynamics

4 credits, Winter

Kinematics, kinetics, work-energy, and impulse-momentum relationships of engineering systems. The course examines the fundamental principles of Newton's laws of motion, with applications to basic particles and rigid bodies in one, two, and three dimensions.

Prerequisites: ENGR-211 and PH-211

ENGR-213 Strength of Materials

4 credits, Spring

Introduces the relation of externally applied loads and their internal effects on deformable bodies, such as columns, shafts, beams and statically indeterminate structures or systems made up of such members.

Prerequisites: ENGR-211

ENGR-221 Electrical Circuit Analysis I

4 credits, Fall

Designed to give the student a thorough understanding of basic electrical circuit theory, this course covers voltage and current relationships and fundamental methods of circuit analysis. Electrical circuit parameters such as resistance, inductance, and capacitance will be examined through theory and laboratory experiments.

Prerequisites: MTH-252Z

Recommended Prerequisite or Corequisite: ENGR-112

Corequisites: ENGR-221L

ENGR-221L Electrical Circuit Analysis I Lab

0 credits, Fall

Lab Course for ENGR-221

Recommended Prerequisite or Corequisite: ENGR-112

Corequisites: ENGR-221

ENGR-222 Electrical Circuit Analysis II

4 credits, Winter

Expands upon the techniques of circuit analysis begun in ENGR-221 through theory and laboratory experiments. The course covers the time response of first- and second-order circuits, the steady-state circuit behavior of circuits driven by sinusoidal sources, AC power, and three phase circuits.

Prerequisites: ENGR-221

Recommended Prerequisite or Corequisite: ENGR-112

Corequisites: ENGR-222L

ENGR-223 Electrical Circuit Analysis III

4 credits, Spring

Final course in the electrical circuits sequence. The main emphases of the course are frequency response of circuits, the design and analysis of filters, Laplace transform analysis, and the Fourier series. The laboratory portion of the course will consist of one project involving significant design and analysis.

Prerequisites: ENGR-222

Recommended Prerequisite or Corequisite: MTH-256

Corequisites: ENGR-223L

ENGR-231 Properties of Materials

4 credits, Winter

This course is an introduction to materials science, a field that describes the behavior of materials by utilizing principles of chemistry and physics to engineer new materials and predict their resultant properties. Materials processing methods and the resulting microscopic structures and macroscopic thermal, electrical, and mechanical properties will be investigated.

Prerequisites: CH-221Z and CH-227Z

ENGR-271 Digital Systems

4 credits, Spring

The second course in digital design. Explores synchronous state machine and memory system design and analysis. Timing analysis and design for test techniques are introduced. Uses computer-based tools for logic system development and simulation. Reinforces systemic design methodology.

Prerequisites: ENGR-171

Recommended Prerequisites: ENGR-112