

# INDUSTRIAL DESIGN ENGINEERING (IDE)

## IDE 110 Design Foundation-Visual Literacy

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Corequisite:** IDE 120 and IDE 130

A portfolio-based course that explores sketching, rendering and physical sketch-modeling techniques based on formal design concepts and principles. Promotes efficient communication between designers, engineers, clients and users through rapid, focused concept and form development.

## IDE 120 Introduction to CAD

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Corequisite:** IDE 110 and IDE 130

Computer Aided Design (CAD) applications and design processes used in industrial design and manufacturing. A portfolio-based course that requires students to generate industry standard CAD drawings used for manufacturing.

## IDE 130 Introduction to Shop Processes

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Corequisite:** IDE 110 and IDE 120

Methods and tools used for creating production prototypes, breadboards, and mock-ups used for fabrication and manufacturing industries. Focus is on tool and process selection, safety, and mastery of machine operation skills and techniques.

## IDE 150 Design Foundation II

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Prerequisite:** IDE 110 and IDE 120 and IDE 130

**Corequisite:** IDE 160 and IDE 170

Intermediate form development and visual communication skills used to create and convey complex design and manufacturing concepts. Focuses on design solutions for conceptual and structural problems with an emphasis on sketch modeling, intermediate design principles, rapid visualization, and Computer Assisted Design (CAD) techniques required for effective visual communication in industry.

## IDE 160 Intermediate CAD

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Prerequisite:** IDE 110 and IDE 120 and IDE 130

**Corequisite:** IDE 150 and IDE 170

Applications, methods, theories, and industrial design processes used in engineering and industrial design fields. A portfolio-based course that develops skills in sketching, communicating, constructing mock ups and displays, prototyping, and 2D and 3D Computer Assisted Design (CAD) parametric solid modeling.

## IDE 170 Introduction to Prototyping

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Prerequisite:** IDE 110 and IDE 120 and IDE 130

**Corequisite:** IDE 150 and IDE 160

Processes and materials typically employed when creating high fidelity proof of concept models, form studies and production-intent prototypes. Provides hands-on experience with fabrication techniques including laser cutting, manual and cnc machining, 3D printing, related tools and machinery. Emphasis is placed how the design process is influenced by material and manufacturing limitations.

## IDE 210 Advanced Media

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Prerequisite:** IDE 150 and IDE 160 and IDE 170

**Corequisite:** IDE 220 and IDE 230

Design methods used for creating and presenting 2D and 3D industrial product concepts and manufacturing details. Develops illustration and conceptualization skills using media and technology such as computer aided design (CAD) software, digital photography, 2D scanners, sketch tablets, and presentation and illustration software. Emphasis is placed on form development and completion of a comprehensive portfolio.

## IDE 220 Advanced CAD

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Prerequisite:** IDE 150 and IDE 160 and IDE 170

**Corequisite:** IDE 210 and IDE 230

Complex surface modeling in hybrid surface and solid environments using rapid modeling methods. Integrates manufacturing technologies, materials, and machine design with an emphasis on translating concepts from visualization manufacturing projects generated using computer aided manufacturing (CAM) and rapid prototyping technologies.

## IDE 230 Introduction to Mechanical Principles

**3 Units** (Degree Applicable, CSU)

Lecture: 36 Lab: 54

**Prerequisite:** IDE 150 and IDE 160 and IDE 170

**Corequisite:** IDE 210 and IDE 220

Mechanical devices, concepts and principles common to manufactured products and manufacturing processes. Analysis, discussion, and problem solving related to mechanical design scenarios and supported by computer aided design (CAD). Exploration of inherent strengths and weaknesses of specific devices and various design approaches. Emphasis on the way mechanical principles affect design strategies.

## IDE 250 Product Design and Viability

**6 Units** (Degree Applicable, CSU)

Lecture: 54 Lab: 162

**Prerequisite:** IDE 210 and IDE 220 and IDE 230

**Corequisite:** IDE 270

Product life cycle from design through manufacturing and distribution. Portfolio-based course that includes fabrication of a viable product and incorporates every stage of project management including research, graphic presentation, parts sourcing, material choices and fabrication of prototype.

**IDE 270 Manufacturing Processes and Materials**

**3 Units** (Degree Applicable, CSU)

Lecture: 9 Lab: 135

**Prerequisite:** *IDE 210 and IDE 220 and IDE 230*

**Corequisite:** *IDE 250*

Overview of common manufacturing processes and associated materials and their impact on the design process. Covers sourcing, costing, bills of materials, project documentation and presentation. Reverse engineering and computer aided design (CAD) model construction assists with understanding common design approaches and real-world manufacturing problems and solutions.