Design and Fabrication 1202

Course Introduction

Design and Fabrication 1202

The course is comprised of six units

- Unit 1: Introduction to Design
- Unit 2: Fabrication Techniques
- Unit 3: Introduction to Shop Practices
- Unit 4: Graphical Communications
- Unit 5: Introduction to CAD/CAM
- Unit 6: The Design Project

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Unit 1: Introduction to Design (10 hours)

- Topic 1-1: History of Design (1 hour)
- Topic 1-2: The Design Process (4 hours)
- Topic 1-3: Social/Environmental Considerations (2 hours)
- Topic 1-4: Design in Fabrication (2 hours)
- Topic 1-5: Careers in Design (1 hour)

This unit introduces students to the engineering design process and provides the basis for the remaining units.

In particular, students will review the history of the design process and examine how it has evolved. You will also examine various fabrication techniques and discover how design and fabrication are interrelated. Finally, students develop an appreciation for the socio-environmental impacts of design and explore the various career opportunities available in the design field.

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Unit 2: Fabrication Techniques (11 hours)

- Topic 1: Shop Safety (2 hours)
- Topic 2: Metrology (2 hours)
- Topic 3: Machine Operation (4 hours)
- Topic 4: Environmental Protection (2 hours)
- Topic 5: Shop Related Careers (1 hour)

The purpose of this unit is to provide students with an introduction to the operation and environment of an industrial shop. Students will learn how to operate power and hand tools through the fabrication of simple projects in the shop accompanied by supporting activities in the classroom.

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Unit 3: Introduction to Shop Practices (17 hours)

- Topic 1: Material Types and Properties (4 hours)
- Topic 2: The Production Environment (4 hours)
- Topic 3: Processing of Materials (8 hours)
- Topic 4: Careers in Production (1 hour)

In this unit the student will be introduced to the physical/mechanical properties of wood, common metals and plastic and explore how these properties affect the cost, function and the required manufacturing processes.

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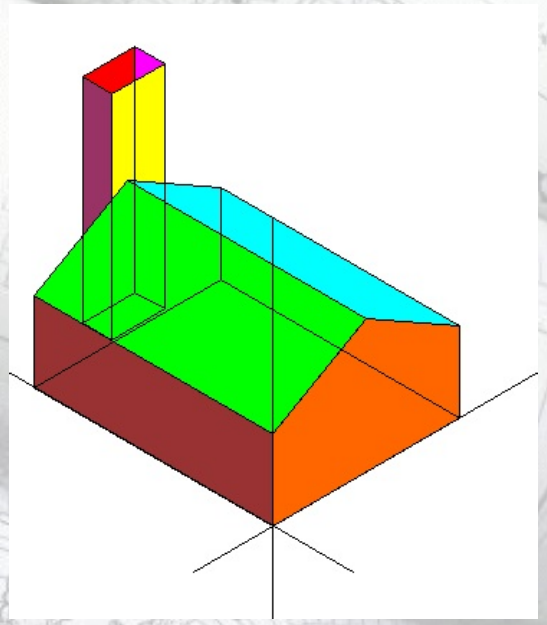
Unit 4: Graphical Communications (10 hours)

- Topic 1: Lettering and Sketching (2 hours)
- Topic 2: 2D Orthographic Views (4 hours)
- Topic 3: 3D Pictorial Drawings (1 hour)
- Topic 4: Working Drawings (2 hours)
- Topic 5: Drafting Related Careers (1 hour)

This unit is intended to provide students with a basic introduction to technical drawing and the related drafting conventions and standards. Students will learn how to sketch simple engineering drawings and review industrial blueprints required to produce a simple product.



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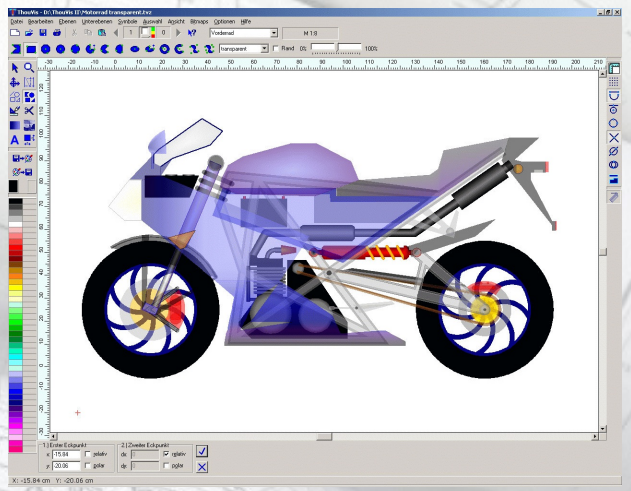
Unit 5: Introduction to CAD/CAM (16 hours)

- Topic 1: Creating Entities (4 hours)
- Topic 2: Display Manipulation (2 hours)
- Topic 3: Modifying Entities (2 hours)
- Topic 4: Dimensioning (3 hours)
- Topic 5: Plotting (1 hour)
- Topic 6: Computer Aided Manufacture (CAM) (4 hours)

This Unit provides students with the opportunity to develop an appreciation for the CAD/CAM process from concept sketch to manufactured part. In particular, students learn how to create, modify, and control the display of the basic shapes or entities that are used in CAD software to develop an engineering drawing.



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Unit 6: The Design Project (46 hours)

- Topic 1: The Design Portfolio (2 hours)
- Topic 2: Defining the Problem (2 hours)
- Topic 3: Generating Options (2 hours)
- Topic 4: Selecting the Best Option (2 hours)
- Topic 5: Developing the Solution (16 hours)
- Topic 6: Prototyping and Testing (20 hours)
- Topic 7: Evaluation and Redesign (2 hours)

The purpose of this unit is to allow the students to apply the knowledge and skills that they have acquired in the first five units through the completion of a group design project. The students will simulate the process actually followed in the field from the initial design concept through to development of the physical prototype.

Evaluation

Student assessment for Design and Fabrication 1212 reflects the problembased learning approach and emphasizes the importance of the design portfolio and prototype.

Given that Unit 6 accounts for approximately 42% of the course, the Design Project will account for a significant portion of thestudent's assessment with both the design portfolio documentation and the performance of the physical prototype being considered.

Student participation throughout the course will also be considered given the frequency of group work and related discussions in this course. Finally, the use of the more conventional class/lab assignments and unit quizzes will also be considered.

Participation	20%
Design Portfolio	30%
Prototype Performance	20%
Class/Lab Assignments	10%
Quizzes	20%

All the information covered here is summarized in the *course outline*