CAD/CAM (21-342)
Advanced Manufacturing Laboratory
Department of Industrial Engineering
Sharif University of Technology

Session # 1

Course Description

- Instructor
  - Omid Fatahi Valilai, Ph.D. Industrial Engineering Department, Sharif University of Technology
  - Email: FValilai@sharif.edu, Tel: 6616-5706
  - Website: Sharif.edu/~fvalilai

- Class time
  - Sunday-Tuesday 09:00-10:30

- Course evaluation
  - Mid-term  (25%)
  - Final exam (40%)
  - Quiz      (5%)
  - Exercise  (30%)
Course Description (Continued ...)

- **Mid-term session:**
  - Tuesday: 8th Ordibehesht 1394, 09:00 ~ 10:30

- **Final Exam:**
  - Tuesday: 19th Khordad 1394, 09:00 ~ 10:30

- **Reference:**
  - Benhabib, Beno; “Manufacturing: Design, Production, CAD/CAM, and Integration”, 2003, Marcel Dekker Inc, New York

Course Description (Continued..)

- **Contents:**
  - Introduction to CAD/CAM/CAE systems (5 sessions)
  - Components of CAD/CAM/CAE systems (2 sessions)
  - Geometric modeling systems (3 sessions)
  - Optimization in CAD (5 sessions)
  - Rapid prototyping and manufacturing (3 sessions)
  - Virtual engineering (2 sessions)
  - Product Life Cycle Cost Model (2 sessions)
  - Computer-Based Design and Features/Methodologies of Feature Representations (5 sessions)
  - Feature-Based Process Planning and Techniques (3 sessions)
  - Collaborative Engineering (2 sessions)
Course Description (Continued..)

- Contents:
  - Introduction to CAD/CAM/CAE systems
  - Definition of CAD/CAM/CAE
  - Integrating the Design and manufacturing processes (Case study)
  - Using CAD/CAM for product development (a practical example)

Course Description (Continued..)

- Contents:
  - Components of CAD/CAM/CAE systems
    - Hardware components
    - Hardware configurations
    - Software components
    - CAD/CAM systems
Course Description (Continued..)

★ Contents:
  ★ Geometric modeling systems (3 sessions)
  ★ Wireframe modeling systems
  ★ Surface modeling systems
  ★ Solid modeling systems
  ★ Non-manifold modeling systems
  ★ Assembly modeling systems

Course Description (Continued..)

★ Contents:
  ★ Optimization in CAD (5 sessions)
    ★ Optimization of optimization problems
    ★ Treatments of constraints
    ★ Search models
    ★ Simulated annealing
    ★ Genetic algorithms
    ★ Structural optimization
Course Description (Continued..)

- Contents:
  - Rapid prototyping and manufacturing (3 sessions)
    - RP primitives
    - Application of RP

Course Description (Continued..)

- Contents:
  - Virtual engineering (2 sessions)
    - Definition
    - Virtual design
    - Virtual prototyping
Course Description (Continued.)

* Contents:
  * Product Life Cycle Cost Model (2 sessions)
  * Cost Breakdown in Manufacturing Systems
  * Computer-Aided Cost Estimating in Manufacturing

Course Description (Continued.)

* Contents:
  * Computer-Based Design and Features/Methodologies of Feature Representations (5 sessions)
  * Feature-Based Technologies
  * The New Methodology Objectives
  * Variant Process Planning (VPP)
  * Generative Process Planning (GPP)
  * Assembly Planning
Course Description (Continued..)

* Contents:
  * Feature-Based Process Planning and Techniques (3 sessions)
  * Mapping the Extracted Manufacturing Features to Process Planning
  * Intelligent Feature Recognition Methodology (IFRM) Implementation

Course Description (Continued..)

* Contents:
  * Collaborative Engineering (2 sessions)
  * Product Design and Development Process
  * Integrated Product Development (IPD)
  * The Principles of IPD