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**
  - Saturday- Monday: 10:30-12:00

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

- **Mid-term session:**
  - Monday: 8th Ordibehesht 1393, 10:30 ~ 12:30
- **Final Exam:**
  - Saturday: 24th Khordad 1393, 15:00 ~ 17:30
- **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 (5 sessions)
    - 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 (2 sessions)
    - 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