Course Description

- **Instructor**
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- **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
  - Feature-Based Process Planning and Techniques (3 sessions)
  - Collaborative Engineering (2 sessions)
Course Description (Continued.)

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

Introduction to CAD/CAM/CAE systems
**Collaborative Engineering**

*Product Design and Development Process*

*Product development is the process of creating a new product to be sold by a business or enterprise to its customers*

*The task of developing evident products is difficult, time-consuming, and costly.*

*The impulse for a new product normally comes from a perceived market opportunity or from the development of a new technology.*

*New products are broadly categorized as either market-pull products or technology-push products.*

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**Collaborative Engineering**

*Integrated Product Development (IPD)*

*Development is normally done by a design team as an integrated approach.*

*As a general rule, the cost of a development effort is a factor of the number of people involved and the time required fostering the initial concept into a fully refined product.*

*Integrated product development (IPD) practices are recognized as critical to the development of competitive products in today's fast-paced global economy.*

*A hierarchical organization structure with enterprise activities directed by functional managers becomes incapable of coordinating the many cross-functional activities required to support product development as the enterprise moves toward parallel design of product and process and a focus on time-to-market.*
Collaborative Engineering

- **The Principles of IPD**
  - Understand Customer Needs and Manage Requirements.
  - Plan and Manage Product Development.
  - Use Product Development Teams
  - Involve Suppliers and Subcontractors Early
  - Integrate CAD/CAM and CAE Tools
  - Simulate Product Performance and Manufacturing Processes Electronically.
  - Improve the Design Process Continuously

Collaborative Engineering

- **Collaborative Engineering Approach**
  - Collaborative engineering is an innovative method for product development, which integrates the widely distributed engineers for virtual collaboration.

  - The reasons for widely geographically dispersed teams are various, such as:
    - locality of certain resources and competence, or
    - Different production costs.

  - Computer modeling is used in the whole engineering design process resulting in virtual prototypes.

  - The high edge technology is required to ensure real time, interactive engineering process. This includes
    - high performance workstations with advanced visualization and modeling software,
    - high-speed networks for data transfer,
    - compatible data exchange
    - medium and appropriate standards including those for product data representation.
Collaborative Engineering

* Collaborative Engineering Approach