

CAD/CAM (21-342)

*Advanced Manufacturing Laboratory
Department of Industrial Engineering
Sharif University of Technology*

Session # 21



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*

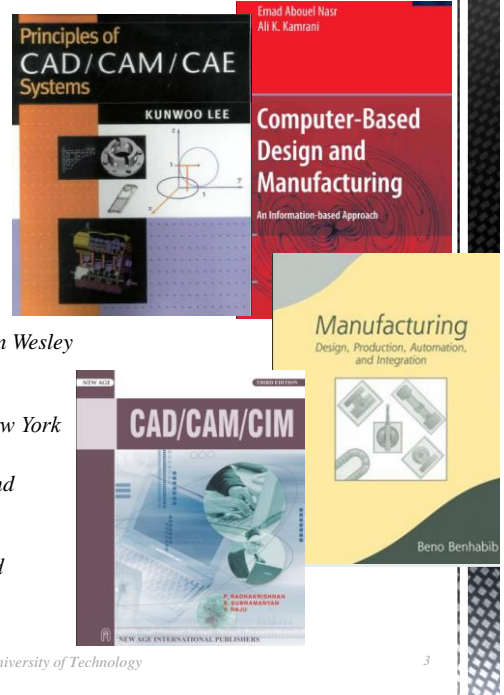
- *Saturday- Monday* *10:30-12:00*

▪ *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:**
 - Lee, Kunwoo; "Principles of CAD/CAM/CAE systems", 1999, Addison Wesley
 - Abouel Nasr, Emad; Kamrani, Ali K.; "Computer-Based Design and Manufacturing: An Information-Based Approach", 2007, Springer, New York
 - Benhabib, Beno; "Manufacturing: Design, Production, CAD/CAM, and Integration", 2003, Marcel Dekker Inc, New York
 - Radhakrishnan, P.; Subramanian, S.; Raju, V.; "CAD/CAM/CIM", 3rd edition, 2005, New age international (P) limited publishers, New York



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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)

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Course Description (Continued..)

▪ Contents:

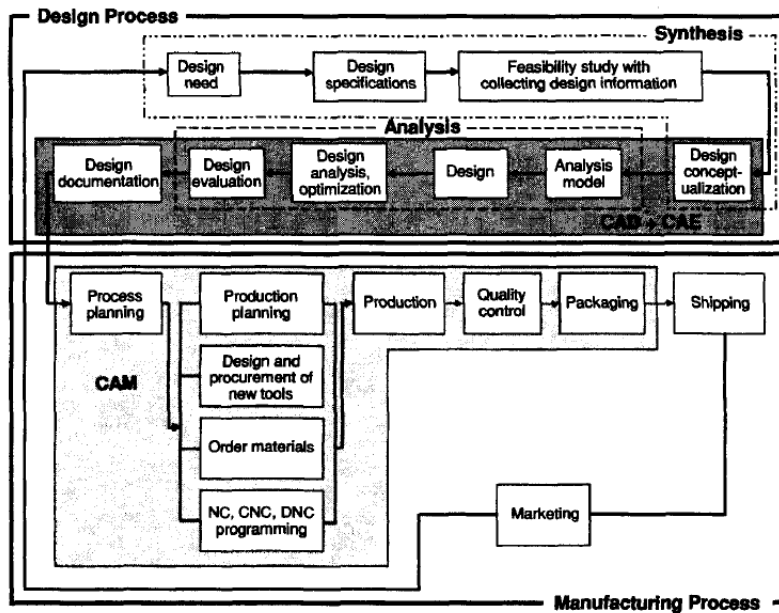
- Collaborative Engineering
- Product Design and Development Process
- Integrated Product Development (IPD)
- The Principles of IPD

(2 sessions)

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Introduction to CAD/CAM/CAE systems



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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.*

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*

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Collaborative Engineering

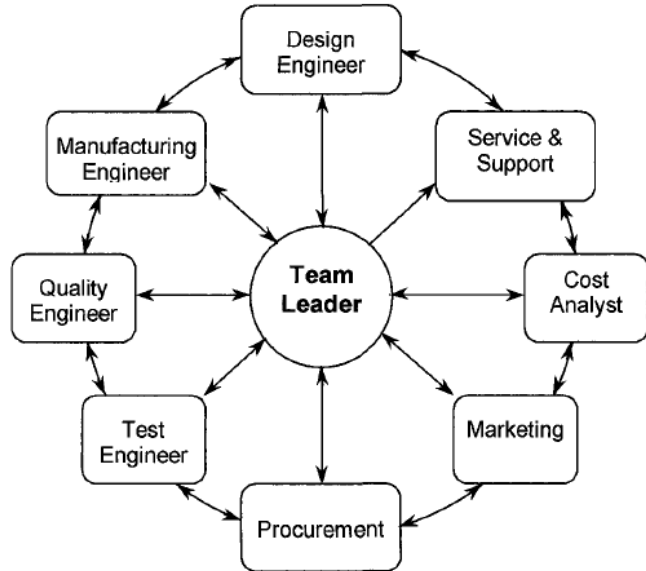
- *Collaborative Engineering Approach*
 - *Collaborative engineering is an innovative method for product development, which integrates the widely distributed engineers for virtual collaboration.*
 - *The reasons for widely geographically dispersed teams are various, such as:*
 - *locality of certain 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.*

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Collaborative Engineering

- Collaborative Engineering Approach

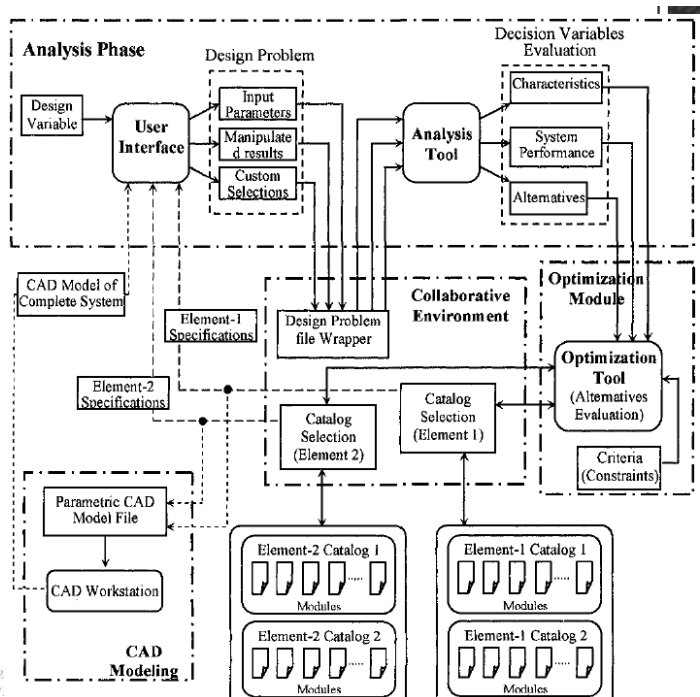


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Collaborative Engineering

- Collaborative Engineering Approach



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