

## *CIM (21-548)*

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

*Session # 15*



## *Course Description*

### ▪ *Instructor*

- *Omid Fatahi Valilai, Ph.D. Industrial Engineering Department, Sharif University of Technology*
- *Email: [FValilai@sharif.edu](mailto:FValilai@sharif.edu), Tel: 6616-5706*
- *Website: [Sharif.edu/~fvalilai](http://Sharif.edu/~fvalilai)*

### ▪ *Class time*

- *Sunday-Tuesday*                      *09:00-10:30*

### ▪ *Course evaluation*

- *Mid-term*                                      *(30%)*
- *Final exam*                                    *(50%)*
- *Quiz*    *(5%)*
- *Exercise*                                        *(15%)*

## Course Description (Continued ...)

- **Mid-term session:**
  - Sunday: 16<sup>th</sup> Azar 1393, 09:00 ~ 10:30
- **Final Exam:**
  - Tuesday: 30<sup>th</sup> Dey 1393, 15:00 ~ 17:30
- **Reference:**
  - Schaefer, D., *Cloud-based Design and Manufacturing (CBDM): A Service-Oriented Product Development Paradigm for the 21st Century*, . London: Springer, 2014
  - Koren, Y., *"The Global Manufacturing Revolution"*, Wiley, 2010
  - Nasr, A., *"Computer-Based Design and Manufacturing An Information-Based Approach"*, Springer, 2007
  - Mitchell, F.H., *"CIM Systems: An Introduction to Computer-Integrated Manufacturing"*, Prentice Hall College Div; 1St Edition edition (January 1991), ISBN: 978-0131332997

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## Course Description (Continued..)

- **Contents:**
  - Globalization and Manufacturing Paradigms (8 sessions)
  - System Concepts (3 sessions)
  - Evolution of Manufacturing systems (2 sessions)
  - Manufacturing System Design (4 sessions)
  - Manufacturing Equipment Design (3 sessions)
  - Information flow in Manufacturing Systems (4 sessions)
  - Product design and Manufacturing System (3 sessions)
  - Manufacturing System Implementation (5 sessions)

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## Course Description (Continued..)

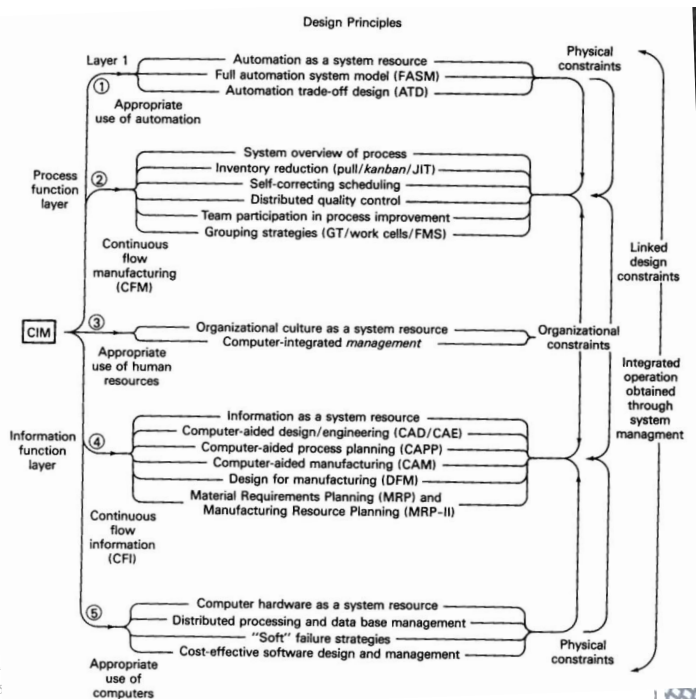
▪ **Contents:**

- *Manufacturing System Design* (4 sessions)
  - *Problem definition*
- *Computer Integrated Manufacturing*
- *Design principles*
- *A multi-layer model for study of design principles*
- *Implementing system design concept*

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## Manufacturing System I

- *A Multilayer Model for the Study of Design Principles*

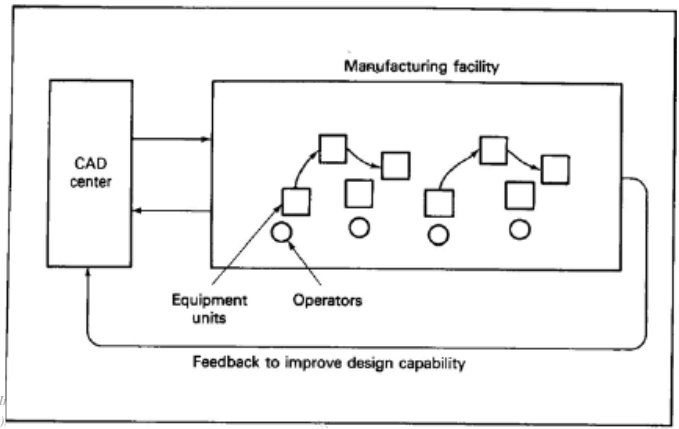


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## Manufacturing System Design

- A Multilayer Model for the Study of Design Principles
  - Many of the CIM design principles are formulated around the process function and information function aspects of the system (layers 2 and 4 of the multilayer)
  - The manufacturing operations include a Computer-Aided Design (CAD) capability that is linked to a CIM facility.

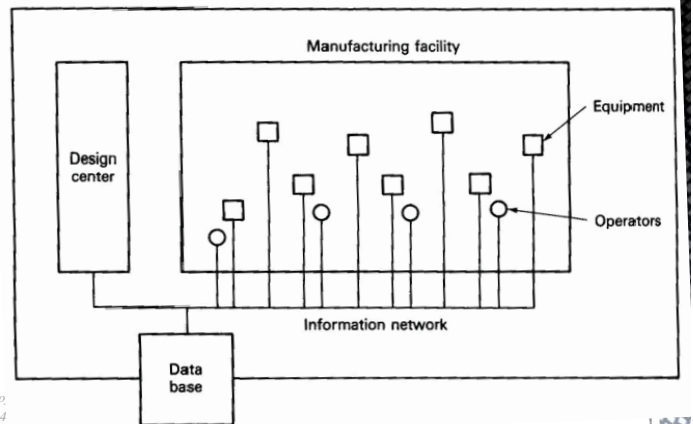
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## Manufacturing System Design

- A Multilayer Model for the Study of Design Principles
  - In the same way that continuous flow manufacturing (CFM) can be taken as a design principle for the process function layer (layer 2), continuous flow information (CFI) can be regarded as a design principle for the information function layer (layer 4).
  - The flow of information should be optimized to best achieve performance objectives for the facility

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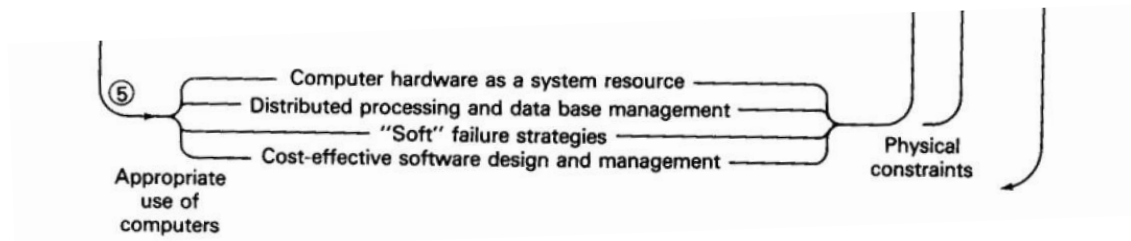


## Manufacturing System Design

- *A Multilayer Model for the Study of Design Principles*
  - *The computer stations and networks of layer 5 provide the hard ware implementation required to achieve information flow*
  - *To achieve a CIM-oriented manufacturing facility, it is necessary to obtain a free exchange of information among many system users*
  - *The computer implementation requirements are so specialized that the costs associated with hiring and maintaining the necessary personnel and retraining the existing work force can be substantial.*

## Manufacturing System Design

- *A Multilayer Model for the Study of Design Principles*



## *Manufacturing System Design*

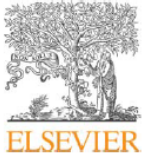
- *A Multilayer Model for the Study of Design Principles*
  - *The success or failure of CIM system implementation depends on the ways in which human resource issues are approached.*
  - *If the employees do not try to make the system work, it won't. A can-do team spirit must pervade the organization.*
  - *Successful implementation requires a major change in the organizational culture, not easily achieved.*
    - *Leadership must come from the top, and extensive changes in organizational communications, worker retraining, team building, and revised employment conditions may be required.*

## *Manufacturing System Design*

- *A Multilayer Model for the Study of Design Principles*
  - *It has been observed that the management of technology is a critical aspect of responding to competitive demands.*
    - *CIM could appropriately stand for computer-integrated management.*
  - *The feasibility of any CIM plan depends on how well management is able to motivate employee participation and cope with problems as they develop.*

# *Manufacturing System Design*

Robotics and Computer-Integrated Manufacturing 26 (2010) 39–45



Contents lists available at ScienceDirect

## Robotics and Computer-Integrated Manufacturing

journal homepage: [www.elsevier.com/locate/rcim](http://www.elsevier.com/locate/rcim)



### An agent-oriented approach to resolve scheduling optimization in intelligent manufacturing

Qing-lin Guo<sup>a,b,\*</sup>, Ming Zhang<sup>b</sup>

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