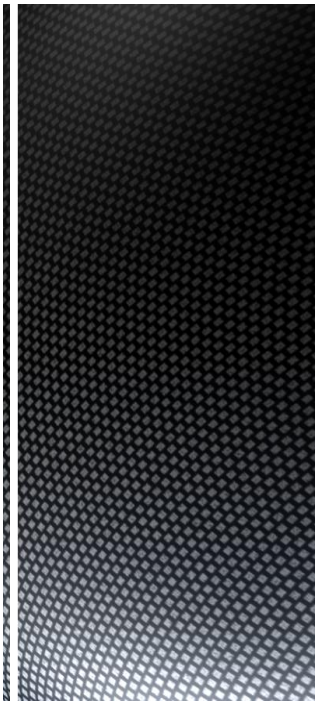


CIM (21-548)

Advanced Manufacturing Laboratory
Department of Industrial Engineering
Sharif University of Technology

Session # 19

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

Course Description *(Continued ...)*

- *Mid-term session:*
  - *Sunday: 16th Azar 1393, 09:00 ~ 10:30*
- *Final Exam:*
  - *Tuesday: 30th 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*

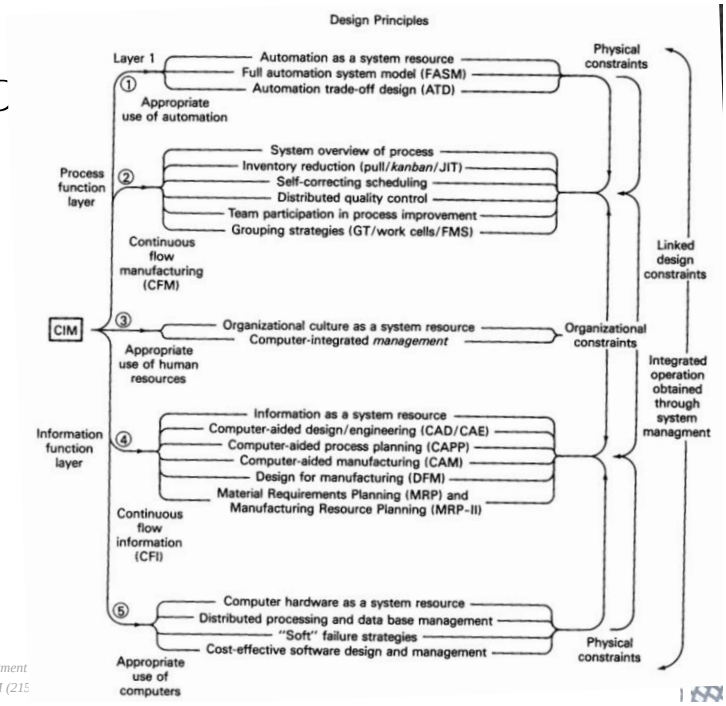
Course Description *(Continued..)*

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

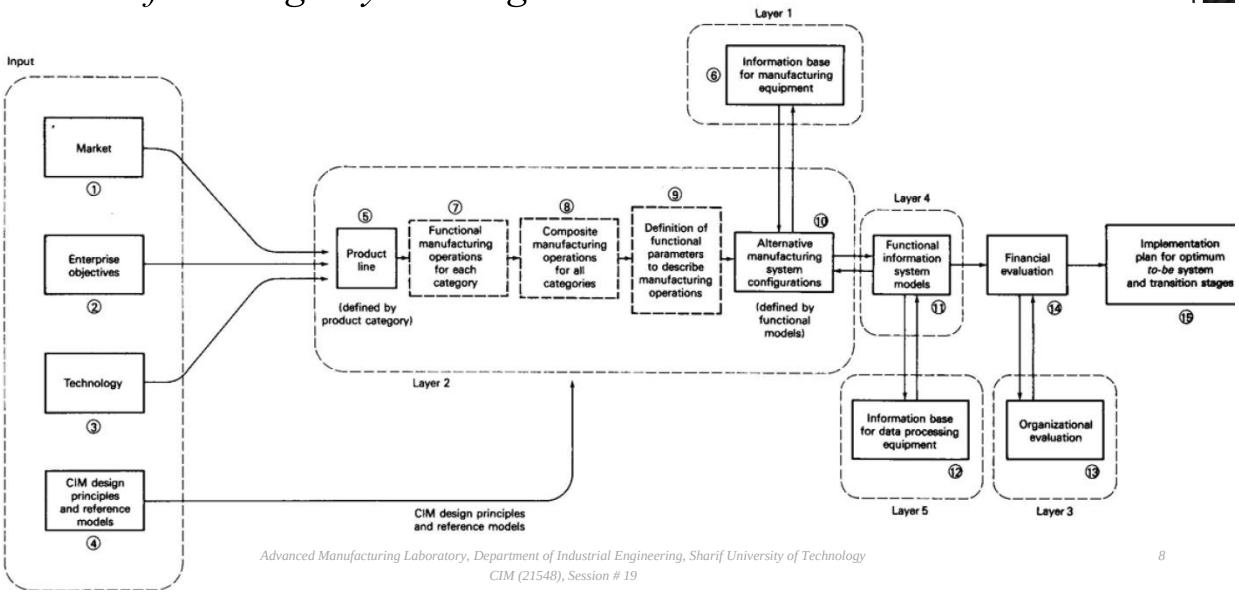
Course Description *(Continued..)*

- *Contents:*
  - *Manufacturing Layer Design* *(3 sessions)*
    - *Equipment unit parameters*
    - *Range of equipment technologies and automation available*
    - *Technology assessment*

Manufacturing System L

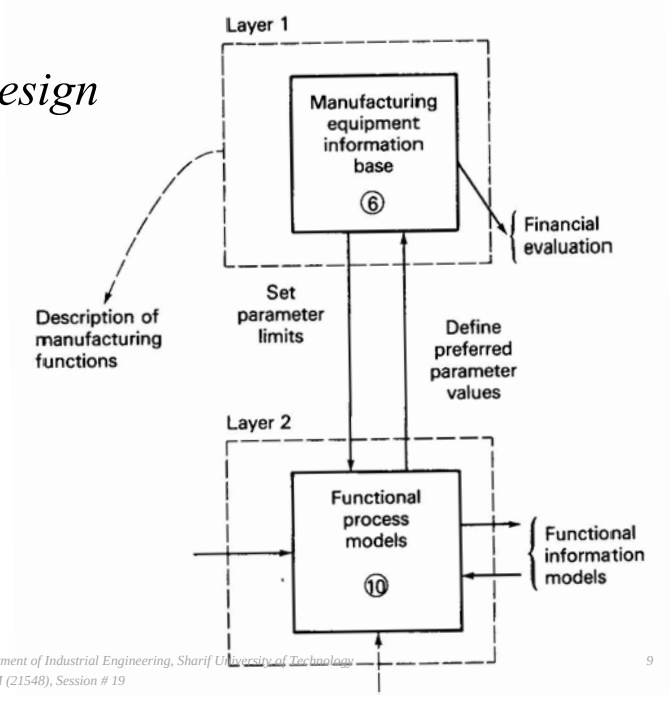


Manufacturing Layer Design



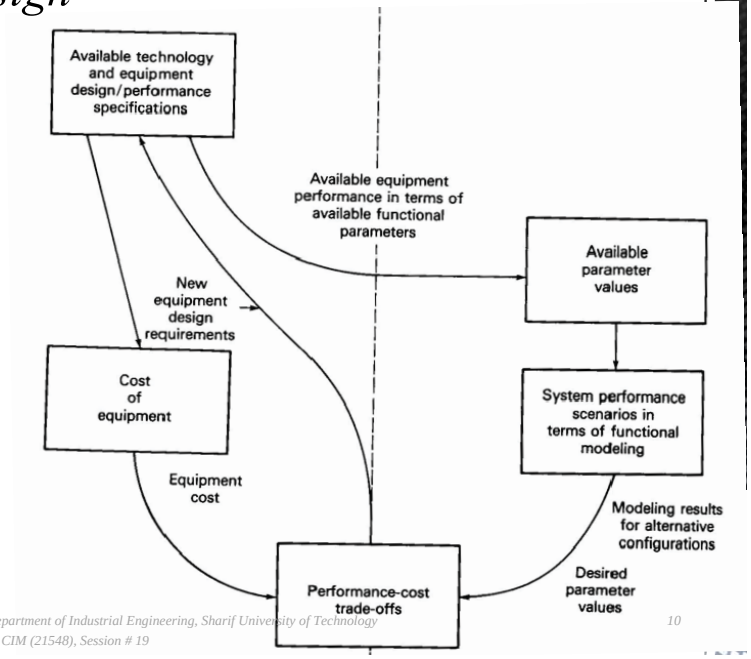
Manufacturing Layer Design

- *Manufacturing equipment*



Manufacturing Layer Design

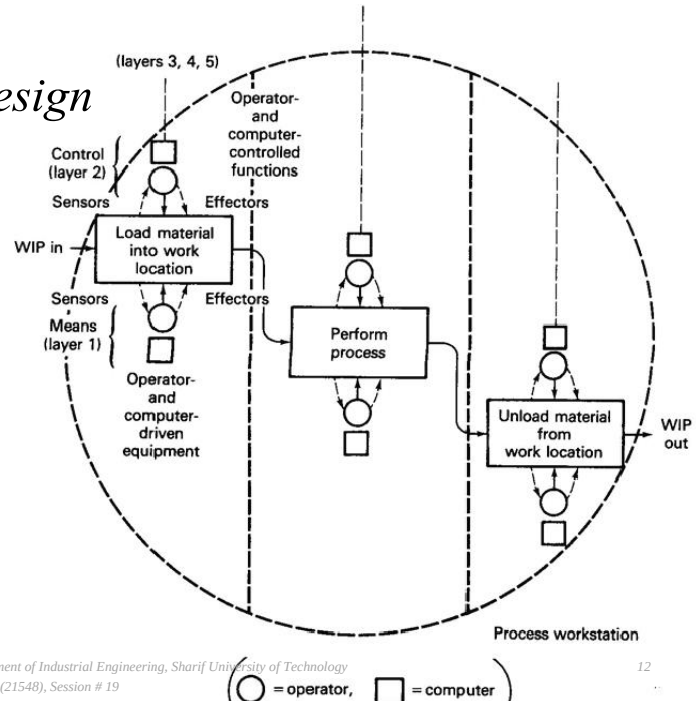
- *Manufacturing equipment*



Manufacturing Layer Design

- *These parameters should provide an adequate description of each equipment unit in the factory for the purposes of deciding on a preferred factory configuration.*
  - *Scope of operations: this parameter is measure of the flexibility of the equipment in terms of addressing the desired market environment and product line.*
  - *Mean time between operator interventions: Between setups, it is desirable that the factory operate with a preferred level of operator intervention.*
  - *Mean time of intervention: This parameter describes how long it will take, on the average, to provide the required servicing for the equipment each time an operator intervenes.*
  - *Product yield: The fourth parameter is the percentage of the product produced by each item of equipment that is of acceptable quality.*
  - *Processing time: The fifth and final parameter is the time required for each item of equipment to process the work-in-progress (WIP).*

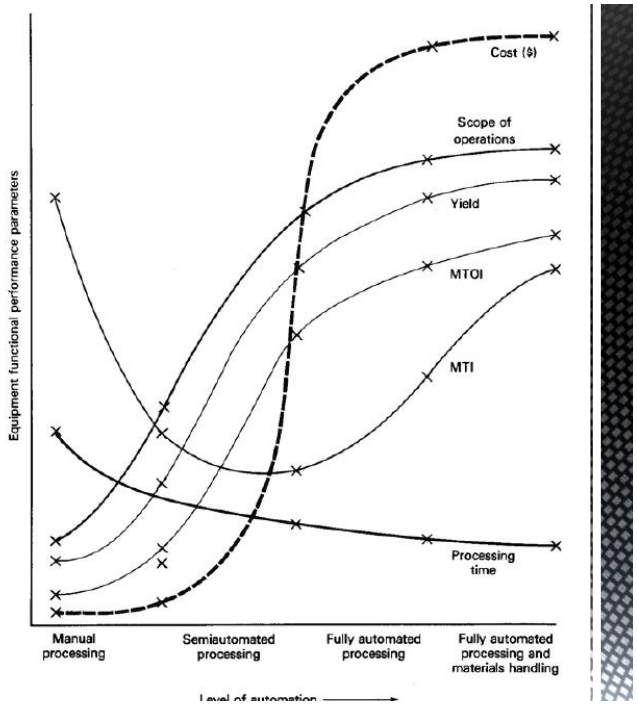
Manufacturing Layer Design



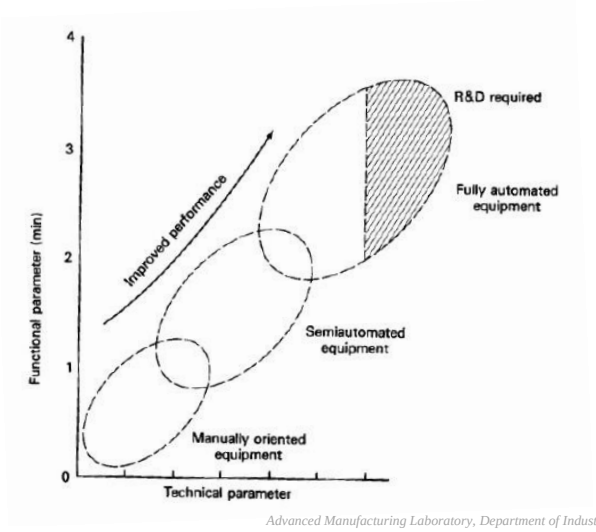
Manufacturing Layer Design

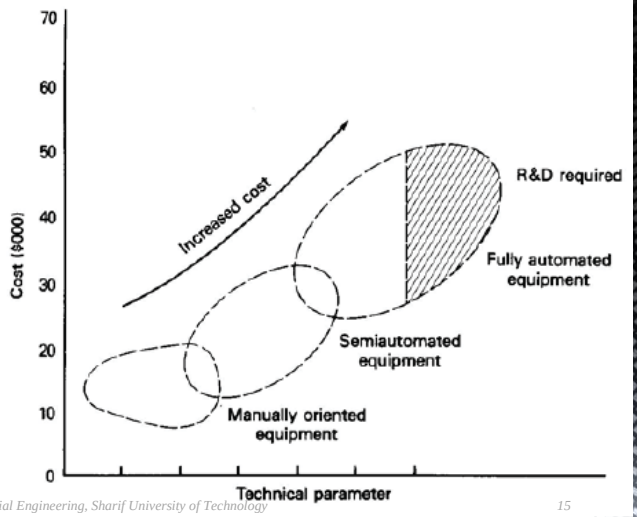
Type of Workstation	*Loading*	*Processing*	*Unloading*
Manual	Manually oriented equipment	Manually oriented equipment	Manually oriented equipment
Semiautomated process	Manually oriented equipment	Semiautomated equipment	Manually oriented equipment
Fully automated process	Manually oriented equipment	Fully automated equipment	Manually oriented equipment
Fully automated workstation	Fully automated equipment	Fully automated equipment	Fully automated equipment

Manufacturing Layer Desig

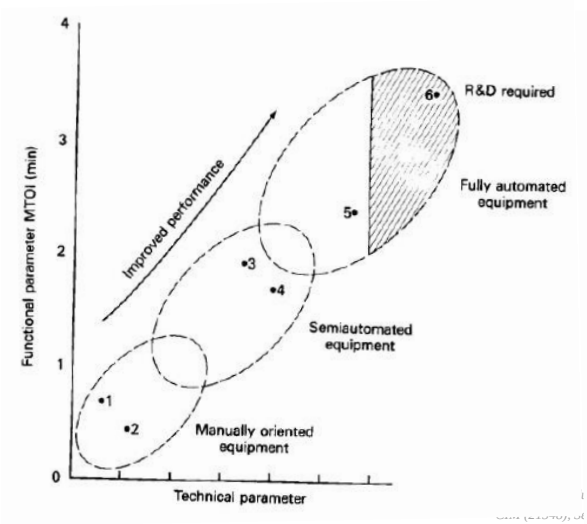


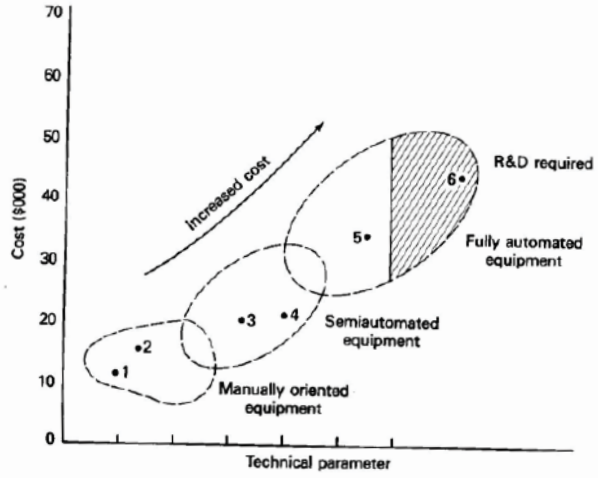
Manufacturing Layer Design





Manufacturing Layer Design





Manufacturing Layer Design

	Equipment Unit 1	2	3	4	5	6
MTOI (min)	0.75	0.50	1.85	1.75	2.50	3.50
Cost ($000)	10	14	22	23	35	43
MTOI/Cost (min/$000)	0.075	0.036	0.084	0.076	0.071	0.081
Value ranking based on figure of merit	4	6 (worst value)	1 (best value)	3	5	2