EDMM 5070
Computer Integrated Manufacturing

Text:
Required:

1. Automation, Production Systems and Computer-Integrated Manufacturing, by Groover, M., Prentice Hall.
2. Selected papers from recent publications.

References:

1. Computer-Integrated Design and Manufacturing, by Bedworth, D. David, Henderson, R. Mark, Wolfe, M. Philip, McGraw-Hill, Latest Edition.
2. Robots and Manufacturing Automation by C.Ray Asfahl.
3. An Introduction to Automated Process Planning Systems, by Chang, T.C. and Wysk, R.A.
4. Group Technology, Ham, I., Hitomi, K., and Yoshida, T.

Schedule

Week	Topic	Reading
1	Introduction to CAD/CAM & CIM in 21st Century Agile Manufacturing, Manufacturing Vision for 2030 NAMII	Preface Paper #1a, b, c Ch#s 1 , 2, & 26
2	Continuous Improvement in Manufacturing Operation Kanban system in CIM – Requirements and Constraints	Quiz #1 (#1a, b, c) Ch 13 & 26, P# 2a, 2b
3	Mathematical models for Manufg. Lead Time (MLT) WIP determination: JIT, Types of Production Systems	Ch 3 H/W #1 P# 3a & 3b
4	Emerging Manufacturing Technologies Business Strategies & Time Compression Technologies in CIM	Paper #4a & 4b Quiz2 (Paper #2a, #3a,3b
5	Additive Manufacturing – Current Challenges & Opps Applications, Implementation Strategies & Dilemma	Quiz #3 (Paper# 4a &4b) Paper (8a)
6	Group Technology & Cellular Mfg. Virtual Manufacturing	Quiz #4 (#5a, 8a), Paper #5a. 5b. 9b_ H/W #2 Ch 18
7	Computer Numerical Control - NC/CNC	Ch 7 Quiz #5 (Chapter 7)
8	Mid Term Exam Computer-Aided Process Planning (CAPP)	Ch. 24
9	Automatic Identification, Data Capture & RFID	Chapter 12 (Paper #6)
10	Robotics Manufacturing Automation & WorkCell Design	Chapter 8 Paper #7
11	Manufacturing Control – Computer Control Open & closed loop control	Ch 4-5 & Notes (Paper #9)
12	Programmable Logic Controller Semester Project In-Class Presentation I	
13	Integrative Manufacturing Planning and Control(MRP/ERP) Semester Project In-class Presentation II	Ch 9 (Paper #10) Websearch:
14	ABC Costing and Economic Justification of CIM Semester Project In-class Presentation III	(Paper #11a & 11b) Quiz #6 (Paper 11a)

	Review for final exam	
15	Comprehensive Final Exam	

Possible Topics for Project:

1. Problems related to system integration aspects
2. Capability and functionality analysis of virtual manufacturing tools with possible applications in CIM environment. Implementing Lean and QRM principles in industry.
3. Mathematical and/or simulation modeling for classical problems related CIM environment.
4. Comprehensive literature review for a state-of-the-art in a selected topic of CIM.

NOTE: *Please refer to the supplementary sheet for details (available online)*

Grading:

Quizzes	10%
Homework & Assignments	15%
Mid Term	20%
In-class paper presentation	10%
Semester project & presentation	25%
Final Exam	20%

Quizzes:

There will be a short quiz (10-15 mins.) for some papers on the date indicated in the schedule.

Homework:

Homework assignments are expected for submission on the dates. Late assignments will NOT be graded.

Class Presentation:

The reading material assigned in the previous class will be summarized by a group of pre-assigned students in 15-20 mins.

Exams:

One midterm and a comprehensive final - closed book and notes. One 8.5" * 11" sheet with formulas and mathematical expressions is allowed.

Grading Scale:

≥ 90 A
≥ 85 BA
≥ 80 B
≥ 75 CB
≥ 70 C
≥ 65 DC
≥ 60 D

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