

IME 576 ADVANCED COMPUTER INTEGRATED MANUFACTURING SYSTEMS

SPRING 2009

Catalog Data:	Advanced topics in manufacturing system integration using computer including automation, optimization, data collection, device monitoring, and software development.
Prerequisite(s):	IME 476 or consent of instructor
Textbook(s):	Groover MP (2007), Automation, Production Systems, and Computer Integrated Manufacturing, 3/e, Prentice-Hall: Englewood Cliffs, N.J.
Reference(s):	Chang TC, Wysk RA, Wang HP (2006), Computer-Aided Manufacturing, 3/e, Prentice-Hall: Englewood Cliffs, N.J.
Coordinator:	Shoyung Cho, PhD, Assistant Professor Industrial & Manufacturing Engineering Office: EB 3077 ☎: 650-2817 ✉: scho@siue.edu Office hours: TR Noon – 2pm
Objectives:	<ol style="list-style-type: none">1. Develop an understanding of classical and state-of-the-art manufacturing systems, control systems, management technology, cost systems, and evaluation techniques.2. Develop an understanding of computer-integrated manufacturing (CIM) and its impact on productivity, product cost, and quality.3. Obtain an overview of computer technologies including computers, database and data collection, networks, machine control, etc, as they apply to factory management and factory floor operations.4. Describe the integration of manufacturing activities into a complete system
Topics:	<ol style="list-style-type: none">1. Introduction to CIM Technology2. Industrial Robotics in CIM3. Discrete Control using PLC and Computers4. Computer Networks for Manufacturing5. Numerical Control6. Industrial Control Systems7. Automatic Identification Technology8. Review and Project presentations
Grading:	Homework.....20% Tests50% (25% each) Project.....30%

Description of Topics (Lecture)

1. Introduction to CIM Technology
 - a. Definition of CIM;
 - b. Functional relationship in CIM;
 - c. Example of CIM in real life
 - d. Layout CIM system design

2. Industrial Robots in CIM
 - a. Forward and inverse kinemactis
 - b. Control of industrial robots
 - c. Dynamics of robots
 - d. Trajectory planning
 - e. Programming robots

3. Discrete Control using PLC and Computers
 - a. Boolean algera
 - b. Ladder logic
 - c. Programming of PLC

4. Computer Networks for Manufacturing
 - a. Simplex and duplex
 - b. Serial and parallel communication,
 - c. Networking for CIM

5. Numerical Control
 - a. Computer numneric control (CNC)
 - b. Application of NC

6. Industrial Control Systems
 - a. Open and closed loop control systrems
 - b. Conintuous and discrete control systems
 - c. Shop floor control systems

7. Automatic Identification Technology
 - a. Overview of automatic identification technology
 - b. Bar code technology
 - c. RFID technology

Description of Topics (Hands-on)

1. Build your own robot using robot constructional sets
2. PLC programming using AB SLC 505
3. Integration of robots and PLC using communication
4. Building computer integrated systems (CIM)