ME 576 SYLLABUS - SPRING 2021
Computer Control of Manufacturing Processes

Course Web Site: http://engineering.purdue.edu/ME576/

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Office Hours:	Mon. and Wed., 11:00am-12:00pm
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Course Objective: Automation and control of manufacturing processes have been vigorously pursued in modern manufacturing to cope with the demand of increased productivity and quality. This trend toward computerization and integration leads to a demand for appropriately trained engineers. The purpose of this course is to introduce essential knowledge in the control of manufacturing systems and processes.

Required Texts: *Computer Control of Machines and Processes*
by J. Bollinger and N. Duffie, Addison Wesley, 1988

Suggested Reference *Computer Control of Manufacturing Systems*
by Y. Koren, McGraw-Hill, 1983

Grading: midterm = 30 %
final = 30 %
labs. = 30 %
homework = 10 %

Course outline:

Number of Lectures	Topic
1	Introduction on manufacturing and automation
5	Computer Numerical Control and Part programming
2	Computers and CNC architecture
4	Logics and Programmable Logic Controllers
7	Discrete control system design
3	Command generation for motion control
4	Actuators (DC, AC and Stepping Motors)
2	Motion control systems
1	Midterm
1	Final examination

References: (Please read these books as necessary to gain an additional understanding of the material)

- *Handbook of Machine Tools*, by M. Weck, John Wiley & Sons, 1984.
- *Microcomputer Applications in Manufacturing*, by A.G. Ulsoy and W.R. DeVries, John Wiley & Sons, 1989.
- *Discrete-time Control Systems,* by K. Ogata, Prentice Hall, 1987.
- *Computer Automation in Manufacturing,* by T.O. Boucher, Chapman & Hall, 1996.

Note: Homework solutions will be posted on the course web site after the homework is turned in.

ME 576 Laboratory Schedule

Lab. experiment	week
No Lab.	1
CNC demonstration and introduction of architecture (MEG28)	2
CNC manual part programming (MEG28)	3
CNC part programming (MEG28)	4
CNC parametric part programming (MEG28)	5
Automatic programming (MEG28)	6
CAM-CNC (MEG28)	7
CAM-CNC (MEG28)	8
PLC programming (MEG28)	9
PLC programming (MEG28)	10
CNC-PLC integration & Introduction to Siemens (MEG28)	11
PLC programming with Siemens (MEG28)	12
Motion control (MEG28)	13-14
AC motor principles (MEG28)	15
Final Exam	16