

SYLLABUS

Date / Revision : 04 September 2017/ 03
Faculty : Engineering
Study Program : MEE

SUBJECT: Computer Aided Manufacturing - CAM

1 Basic Information

1.01	Subject Name	Computer Aided Manufacturing - CAM
1.02	Semester	4
1.03	Level	3
1.04	SKS	3
1.05	Mandatory / Curriculum	Mandatory / D-07
1.06	Subject Code	CAMA
1.07	Subject Code	MEE-D-CAMA-4107
1.08	Year	2017 (7)
1.09	Quality Control	Final Test, see evaluation
1.10	Limitations	Min 12, Max 32 students in a class
1.11	Combined with	--
1.12	Perquisite	Manufacturing Process, CAD 2
1.13	Responsible	Dipl.-Ing. Erry G Wiriaatmadja NDS CAD/CAM
1.14	Revision	04 September 2017

2 Description of Subject

Computer aided manufacturing is the norm in modern engineering, this course is designed to introduce the students to fundamental theory and application of computer aided manufacturing technology. The students will be equipped with the knowledge of manufacturing processes and system, as basic knowledge required in understanding how the computer supports manufacturing processes; the principles of automation and control technology; industrial robotics and numerical controlled machines, the principles of CNC; and the knowledge of CNC Programming.

3 Objectives

- Introduces the application of CAM in manufacturing process
- Introduce the how computer support the manufacturing process
- Introduce the principle of automation and control technology
- Introduce the principles of CNC and CNC programming.

4 Competency

After finished the course, students are expected to:

- understand the concept of Computer Aided Manufacturing,
- be able to identify manufacturing processes,
- be able to identify the automation and control technologies applied in manufacturing processes (the use of industrial robotics, numerical control),
- understand the principles of CNC and the use of CNC machines in industry,
- be able to create CNC program written for simple lathe work piece,
- be able to create CNC program written for simple milling work piece.

5 Learning Approach / Methodology

- Approach : Combination of Expository - inquiry and colaborative
- Method : Discussion, question answer, sample problem, group work
- Student Task : Presentation, homework
- Media : LCD projector, film.

6 Evaluation

5.1	Absence maximum	25%
5.2	Participation in Discussion	05 Points
5.3	Homework / Classwork	05 Points
5.4	Presentation /Simulation	10 Points
5.5	Daily Quiz	20 Points
5.6	Final Examination	60 Points
	Total	100 Points

7 Text Book and Reference

1	<p>Main Text Book:</p> <ul style="list-style-type: none"> Hand-outs → for internal use only, compiled from several books
2	<p>Supplementary Text books:</p> <ul style="list-style-type: none"> Computer-Aided Manufacturing, Third Edition, Tien-Chien Chang, Richard A. Wysk, Hsu-Pin Wang, ISBN-10: 0131429191, ISBN-13: 9780131429192, ©2006 • Pearson Automation Production System and Computer Integrated Manufacturing, Third Edition Mikell P. Groover, ISBN-10: 0-13-207073-1, ISBN-13: 978-0-13-207073-7, ©Pearson Education 2008 Fundamentals of Modern Manufacturing, Fourth Edition, Mikell P. Groover, ISBN-13: 978-0-47-046700-2, JOHN WILEY & SONS, INC. Einfuehrungskurs in die numerische Steuerung von Werkzeugmaschinen, 3. Auflage, © 1985 by Aciera SA, Aciera SA Werkzeugmaschinenfabrik CH-2400 Le Locle

8 Content / Topics of Lecture

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1	<p>Course Organization Introduction to Computer-Aided Manufacturing:</p> <ul style="list-style-type: none"> Understanding CAM, Technology related to CAM, Component of CAM, CAM Software 	Hand-out Week 1	
2	<p>Overview of Manufacturing:</p> <ul style="list-style-type: none"> What Is Manufacturing?, Manufacturing Processes, Production Systems, Manufacturing Support System, Components of a Manufacturing Systems 	Hand-out Week 2	
3	<p>Automation and Control Technology for Manufacturing Systems :</p> <ul style="list-style-type: none"> Automation and Control Technology, Basic Elements of Automated System, Advances of Automation, Level of Automation 	Hand-out Week 3	
4	<p>Industrial Control Systems:</p> <ul style="list-style-type: none"> Hardware Components Automation and Process Control 	Hand-out Week 4	Quiz 1 (week 1 up to week 3)
5	<p>Industrial Robotics</p> <ul style="list-style-type: none"> Computer Numerical Control Machines 	Hand-out Week 5	
6	<p>The use of computer technology to support manufacturing processes</p>		

7	The use of computer technology to support manufacturing processes		Quiz 2 (week 4 up to week 6) Group Presentation
8	MIDTERM SEMESTER BREAK		
9	Computer Numerical Control <ul style="list-style-type: none"> Principles of CNC Machines, CNC Component and architecture, CNC Control mechanism, Direct Numerical Control, Coordinate System 	Hand-out Week 9	
10	Industrial Applications of CNC Machines: <ul style="list-style-type: none"> The use of CNC Machines in various industries 	- Hand-out Week 10	Quiz 3 (week 7 and week 9)
11	Introduction to CNC Programming: <ul style="list-style-type: none"> CNC Part Programming, Programming Systems, Point-to-Point or Continuous Path, Interpolation, Programming Format, Programming for Positioning 	Hand-out Week 11	
12,13	CNC Programming : <ul style="list-style-type: none"> Work Settings and Offsets, CNC Bench-Top Milling and Turning Centres, CNC Programming Hints — Milling, Milling and Drilling Programming, CNC Programming Hints – Turning, Turning Programming 	Hand-out Week 12	Quiz 4: week 10, 11 and 12
14	Exercises (CNC Lathe Programming) Exercises (CNC Milling Programming, CNC Drilling)	Hand-out CNC Lathe, Milling and Drilling Programming	Practical Exercise
15	Wrap up the whole semester course / Review the Semester		Discussion
16	Final Examination		