

SYLLABUS

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

SUBJECT: Assembly and Manufacturing Support Techniques

1 Basic Information

1.01	Subject Name	Assembly and Manufacturing Support Techniques
1.02	Semester	5
1.03	Level	3
1.04	SKS	2
1.05	Mandatory / Curriculum	Mandatory / D-07
1.06	Subject Code	ASSY
1.07	Subject Code	MEE-D-ASSY-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	Dr. Ir. Prianggada Indra Tanaya, MME, Dipl.-Ing. Wahyu Guritno, M.Si, Isach W Zulfikar Karmiadji, ST, M.Sc
1.14	Revision	04 September 2017

2 Description of Subject

The assembly and manufacturing support technology course is a continuation of previous lecture on manufacturing/machining, and material and metal forming. This course focuses on joining and assembly processes, special process and assembly technologies, manufacturing systems, and manufacturing support systems.

3 Objectives

- Introduces the Joining methods of metal forming
- Introduce the assembly technology in manufacturing process
- Introduce the support technology in manufacturing process
- Introduce the material is handled in manufacturing process

4 Competency

After having the course, students are expected to:

- Understand the theory, application, and technology of assembly techniques; mechanical, chemical, physical processes
- Understand the fundamental of supporting technology for manufacturing settings
- Capable to perform analysis of trivial problems regarding assembly technology
- Understand the processes of special processing and assembly technology
- Introducing manufacturing systems – automation technology and integrated manufacturing systems
- Understanding the function of manufacturing support technology – manufacturing engineering, production planning and quality control & inspection

5 Learning Approach / Methodology

- Approach : Combination of Expository - inquiry and collaborative
- 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	Main Text Book: <ul style="list-style-type: none"> Mikell P. Groover, Principle of Modern Manufacturing, 5th Ed., SI Version, Wiley & Sons, 2013, 978-1-118-47420-4 Claude Gomez, et. Al, Engineering and Scientific Computing with Scilab, Birkhauser, 1999
2	Software & Manual: <ul style="list-style-type: none"> Scilab 5.5.2 download : http://www.scilab.org/download

8 Content / Topics of Lecture

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1	Introduction to Assembly and Manufacturing Support Technology Course and software tool to be used. <ul style="list-style-type: none"> Discussing the syllabus and rule of the course given (30 minutes) Introduction to Scilab for analytical work 	Chapter 1	Lecturer's presentation sheet Scilab software and manual
1,2	Fundamentals of Welding: <ul style="list-style-type: none"> Overview of welding technology, weld joint, physics of welding, features of a fusion-welded joint 	Chapter 25	
3	Welding Processes: <ul style="list-style-type: none"> Arc welding, resistance welding, oxyfuel gas welding, other fusion welding processes, solid-state welding, weld quality, weldability, design consideration in welding 	Chapter 26	Quiz 1
4	Brazing Soldering and Adhesive Bonding: <ul style="list-style-type: none"> Brazing, soldering and adhesive bonding 	Chapter 27	
5	Mechanical Assembly <ul style="list-style-type: none"> Threaded fasteners, rivets & eyelets, assembly and method based on interference fits, other mechanical fastening methods, molding insert and integral fasteners, design for assembly 	Chapter 28	Quiz 2
6	Rapid Prototyping and additive manufacturing <ul style="list-style-type: none"> Fundamentals of rapid prototyping and additive manufacturing, additive manufacturing processes, cycle time and cost analysis, additive manufacturing applications 	Chapter 29	

7	Processing of Integrated Circuits <ul style="list-style-type: none"> • Overview of IC Processing, Silicon Processing, Lithography, Layer Processes used in IC Fabrication, Integrating the Fabrication Steps, IC Packaging, Yields in IC Processing 	Chapter 30	Quiz 3
8	MIDTERM SEMESTER BREAK		
9,10	Electronic Assembly and Packaging <ul style="list-style-type: none"> • Electronic Packaging, Printed Circuits Boards, Printed Circuits Board Assembly, Electrical Connector Technology 	Chapter 31	
11	Microfabrication Technologies: <ul style="list-style-type: none"> • Nanotechnology Products and Applications, Introduction to Nanoscience, Nanofabrication Processes 	Chapter 32	Quiz 4
11	Automation Technologies for Manufacturing Systems <ul style="list-style-type: none"> • Automation Fundamentals, Hardware for Automation, Computer Numerical Control, Industrial Robots 	Chapter 33	
12	Integrated Manufacturing Systems: <ul style="list-style-type: none"> • Material Handling, Fundamentals of Production Lines, Manual Assembly Lines, Automated Production Lines, Cellular Manufacturing, Flexible Manufacturing Systems and Cells, Computer Integrated Manufacturing 	Chapter 34	Quiz 5
13	Process Planning and Production Control: <ul style="list-style-type: none"> • Process Planning, Other Manufacturing Engineering Functions, Production Planning and Control, Just-in Time Delivery Systems, Lean Production 	Chapter 35	
14	Quality Control and Inspection: <ul style="list-style-type: none"> • Product Quality, Process Capability and Tolerances, Statistical Process Control, Quality Programs in Mfg., Inspection Principles, Modern Inspection Technologies 	Chapter 36	Quiz 6
15	Overview of lectures		Discussion
16	Final Examination		