SYLLABUS: MANUFACTURING PROCESS

Date / Revision August 22, 2017 / 22.08.17 / MaS
Faculty Engineering
Study Programm All Engineering Study Program

SUBJECT: Manufacturing Process

1 Basic Information

1.01	**Subject Name**	**Manufacturing Process**
1.02	**Semester**	3
1.03	**Level**	1
1.04	**SKS**	2
1.05	**Mandatory / Curriculum**	Mandatory / F-10
1.06	**Subject Code**	MFPR
1.07	**Subject Code**	ENG-F-MFPR-3110
1.08	**Year**	2017 (7)
1.09	**Quality Control**	Final Test, see evaluation
1.10	**Limitations**	Min 12 and Max 32 students in one class
1.11	**Combined with**	AVE, MEE, INE
1.12	**Perquisite**	Statics and Mechanic of Materials
1.13	**Responsible**	Dean of Engineering Faculty
1.14	**Revision**	22-08-2017/MaS

2 Description of Subject

The manufacturing processes and systems course is designed to give students a solid foundation in understanding of engineering processes with significant coverage of engineering materials and production systems. The course will begin with an introduction of engineering materials and its properties and attributes. The students will next learn about theory of machining, machining operations and machine tools. This will be completed by information about material removal processes

3 Objectives

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- to learn the engineering processes based on materials and its properties
- to learn the machining processes of products.
- to study the conventional and computerized machine tools

4 Competency

After having the course, students are expected have to:

a) Identify several type of engineering material and its properties and attributes.
b) Understand about theory of metal machining.
c) Understand about machining operations and machine tools.
d) Understand about cutting tool technology.
e) Understand about economic and product design considerations in machining.
f) Understand about grinding and other abrasive processes.
g) Understand about nontraditional machining and thermal cutting processes.

5 Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers;
- Tutorial/ Practice Classes: preview of materials, revision;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.

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 Poins
5.5	**Daily Quiz**	20 Points
5.6	**Final Examination**	60 Points
	Total	100 Points

7 Text Book and Reference

1	**Main Text Book:** "Principles of Modern Manufacturing, 5th Edition, SI Version 2013", **Authors**: Mikell P. Groover, **Publisher**: John Wiley & Sons, Inc
2	**Supplementary Text books:** • "Manufacturing Engineering and Technology, 6th Edition in SI Units, 2009", **Authors**: Serope Kalpakjian, Steven R. Schmid, Hamidon Musa, **Publisher**: Pearson – Prentice Hall.

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8 Content / Topics of Lecture

Week	Content/ Topics of Lecturing	Text Book	Remark
1	**Introduction and Overview:** What is manufacturing, materials in manufacturing; manufacturing processes; production systems; trends in manufacturing; and organization of lecturing.	Ch1 [1]	
2	**The Nature of Materials:** Atomic Structure and the Elements; Bonding between Atoms and Molecules; Crystalline Structures; Non-crystalline (Amorphous) Structures; Engineering Materials.	Ch2 [1]	Homework
3	**Mechanical Properties of Materials:** Stress–Strain Relationships; Hardness; Effect of Temperature on Properties; Fluid Properties; Viscoelastic Behavior of Polymers.	Ch3 [1]	Quiz
4	**Physical Properties of Material; Metals:** Volumetric and Melting Properties; Thermal Properties; Mass Diffusion; Electrical Properties; Electrochemical Processes; Alloys and Phase Diagrams; Ferrous Metals; Nonferrous Metals; Super-alloys; Guide to the Processing of Metals.	Ch4,5 [1]	Pak Ketut
5,6	**Theory of Metal Machining:** Overview of Machining Technology; Theory of Chip Formation in Metal Machining; Force Relationships and the Merchant Equation; Power and Energy Relationships in Machining; Cutting Temperature.	Ch17 [1]	Pak Ketut
7	**Machining Operations and Machine Tools:** Machining and Part Geometry; Turning and Related Operations; Drilling and Related Operations;	Ch18 [1]	Pak Ketut
8	**MIDTERM SEMESTER BREAK**		
9	**Machining Operations and Machine Tools (Cont'd):** Milling; Machining Centers and Turning Centers; Other Machining Operations; Machining Operations for Special Geometries; High-Speed Machining.	Ch18 [1]	Pak Ketut
10	**Cutting Tool Technology:** Tool Life; Tool Materials; Tool Geometry; Cutting Fluids.	Ch19 [1]	Pak Ketut
11	**Economic and Product Design Considerations in Machining:** Machinability; Tolerances and Surface Finish; Selection of Cutting Conditions; Product Design Considerations in Machining.	Ch20 [1]	Homework
12	**Grinding and Other Abrasive Processes:** Grinding; Related Abrasive Processes.	Ch21 [1]	Quiz
13	**Nontraditional Machining and Thermal Cutting Processes:** Mechanical Energy Processes; Electrochemical Machining Processes; Thermal Energy Processes; Chemical Machining; Application Considerations.	Ch22 [1]	

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14	**Group presentation:** Groups of students will present their assignment in front of class to be challenged by other students.		Group presentation
15	**Rehearsal and Tutorial:** Rehearsal of all subject and students can ask for more detail.		
16	**Final Examination**		

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