

Silabi Teori Proses Pemesinan Lanjut
ADVANCED THEORY OF METAL CUTTING PROCESSES

Program Studi	: Pendidikan Teknik Mesin/Teknik Mesin
Kode Matakuliah	: MES 236
Jumlah SKS	: 2 SKS Teori
Semester	: Genap/Tahun 2010/2011
Dosen	: Sutopo, MT.

I. Deskripsi Mata Kuliah

Mata kuliah ini merupakan kelanjutan dari teori pemesinan dasar yang membahas proses terbentuknya permukaan baru pada material benda kerja yang terbuat dari bahan logam secara lebih mendalam khususnya pada aspek mekanisme terbentuknya tatal, keausan pahat atau alat potong, umur pahat, cairan pemotongan, dan optimasi waktu produksi. Beberapa aplikasi proses pemesinan yang relevan akan dikaji untuk memperkaya pengetahuan mahasiswa.

II. Kompetensi Mata Kuliah

UNIT - 1

Mechanics of Metal Cutting: Mechanism of chip formation, Orthogonal & Oblique cutting, Determination of shear plane angle, forces on the chips, forces in orthogonal cutting, merchant circle diagram and analysis, co-efficient of friction, power & energy relationship, velocity relationship, shear-strain, factors affecting forces and power, types of chips, built-up edge.

8 Jam

UNIT - 2

TOOLS WEAR, TOOL LIFE: Mechanisms of tool wear, crater wear, flank wear, tool failure criteria, tool life equations, effect of process parameters on tool life, tool life tests.

4 Jam

UNIT - 3

CUTTING FLUIDS: Basic actions of cutting fluids, properties of cutting fluids, selection of cutting fluids, application of cutting fluids, filtration of fluids, RECOMMENDED cutting fluids.

2 Jam

UNIT - 4

OPTIMIZATION OF MACHINING PROCESSES (ECONOMIC OF MACHINING): Introduction, Work Planing (WP), elements of total production cost, optimum cutting speed and tool life for minimum cost, optimum cutting speed and tool life for maximum production, problems.

6 Jam

UNIT - 5

MULTIPLE START THREADS: DEFINITIONS, APLICATIONS, TOOL SHARPENING, SETTING UP AND CUTTING, RELATED PROBLEM

4 Jam

UNIT - 6

EXTERNAL CYLINDRICAL GRINDING: PARAMETER OF GRINDING WHEELS, CHARACTERISTICS OF GRINDING WHEELS, WORK PREPARATION AND HOLDING, GRINDING SPINDLE PARALLEL, GRINDING A SHOULDER, AND TAPER GRINDING

4 Jam

UNIT - 7

HELICAL MILLING: PRINCIPLE OF HELICAL MILLING, ASSEMBLE CHANGE GEARS, CUTTER SELECTION, SETTING MACHINE TABLE AND CUTTER SETTING.

2 Jam

III. STRATEGI PEMBELAJARAN

1. TATAP MUKA, TERMASUK DISKUSI KELAS, DAN PRESENTASI TUGAS
2. TUGAS MANDIRI
3. TUGAS KELOMPOK

IV. SUMBER BAHAN

TEXT BOOKS:

1. Applied Machining Technology- Heinz Tschätsch-Springer-2009*
2. Machining Technology: Machine Tools and Operations-Helmi A. Youssef & Hassan El-Hofy-CRC Press-2008*
3. Teori & Teknologi Proses Pemesinan- Taufik Rochim-HEDSP-1993**
4. Fitting and Machining-3rd Volume -Metric Eds.-Technical School Devision-Education Department of Victoria, Australia-1976**

REFERENCE BOOKS:

1. Cutting Tool Technology:Industrial Handbook-Graham T. Smith-Springer-2008*
2. Metal Cutting theory- Black P.H, MC Hraw Hill – 1996.**
3. Metal Cutting and Tool design- Dr. B.J.Ranganath Vikas Publishing house - 1993**

Keterangan: * = tersedia dalam bentuk soft copy
**= tersedia dalam bentuk hard copy

V. Sistem Penilaian

Kredit untuk matakuliah ini akan diberikan berdasarkan akumulasi kinerja mahasiswa pada:

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|---|-------|----------------------|
| 1. Partisipasi dan kehadiran dalam tatap muka | : 100 | } Total = 1000 point |
| 2. Presentasi dan tugas Kelompok | : 200 | |
| 3. Tugas Mandiri | : 200 | |
| 4. Ujian Mid Semester | : 200 | |
| 5. Ujian Semester (Wajib) | : 300 | |