

CALENDAR DESCRIPTION

THEORY — SECOND YEAR MACHINE SHOP

MCH 236

Course Name

Course Number

PHILOSOPHY/GOALS:

To reinforce trade theory calculations and formula that were covered in year one, plus involve the student in more advanced topics and aspects of the trade to give the students a more in depth knowledge of the machinist trade so as to better equip them for work in this field or one related to it.

METHOD OF ASSESSMENT {GRADING METHOD):

Students will be assessed on attendance, initiative, co-operation and ability. Good attendance is of vital importance on any job and for this reason we stress attendance in this program. Generally, good attendance is directly related to a student's other qualities and abilities.

Theory Tests	40%
Lab Assignments	40%
Attendance	20%

TEXTBOOK(S):

ADVANCED MACHINE TECHNOLOGY, C. Thomas.

OBJECTIVES:

To bring the students to a level of competency in the knowledge and skills required in the trade. To prepare them for an apprenticeship or some related work. To give a student the confidence required to take that step down a long and sometimes rough road to a rewarding vocation in the metal removing industry.

TOPIC DESCRIPTIONS

1. MEASUREMENT TOOLS AND OPERATIONS - 4 HOURS

- a. Gear Tooth Measurement
- b. Operate Profilemeter
- c. Surface Roughness Measurement
- d. Limit Snap Gauges
- e. Cylindrical Plug Gauges (Straight)
- f. Cylindrical Plug Gauges (Taper)
- g. Limit Thread Gauges
- h. Check Thread Pitches
- i. Checking with Radius Gauges
- j. Checking with Feeler Gauges
- k. Precision Height Gauges
- l. Operate Optical Comparator

2. OCCUPATIONAL REFERENCE TABLES AND CHARTS - 1 HOUR

Types
Format
Accuracy

3. HEAT TREATING - 4 HOURS

- a. Safety
- b. Types of Furnaces
- c. Hardening Ferrous Metals
- d. Carburizing Ferrous Metals
- e. Tempering Ferrous Metals
- f. Annealing Ferrous Metals
- g. Normalizing Ferrous Metals
- h. Flame Hardening
- i. Hardness Testing

4. ENGINE LATHE - 4 HOURS

- a. Taper Turning
- b. Contoured Surfaces
- c. Threads (Acme, Square)
- d. Multi-Start Threads
- e. Boring in a Lathe
- f. Using a Steady Rest
- g. Using a Follower Rest

HORIZONTAL MILLING

- a. Plain Type
- b. Universal Type
- c. Type of Work Suited for Horizontal Mill
- d. Locating and Aligning Work
- e. Fastening Devices to Hold Work
- f. Types of Cutters
- g. Types of Mounting Arbours
- h. Insert Selection
- i. Rotary Table Attachment
- j. Universal Dividing Head
- k. Cutter Rotation Relative to Feed Direction
- l. Feed and Speed Selection
- m. Drilling and Boring on Horizontal Mill
- n. Fly Cutting
- o. Slide Locks
- p. Climb and Conventional Milling
- q. Digital Readout
- r. Cutting Fluids and Applications

VERTICAL MILL - 4 HOURS

- a. Types
- b. Type of Work Suited for Vertical Mill
- c. Locating and Aligning Work
- d. Fastening and Clamping Devices
- e. Cutter Selection
- f. Types of Mounting Arbours
- g. Insert Selection
- h. Manually Operated Rotary Table
- i. Cutter Rotation Relative to Feed Direction
- j. Feed and Speed Selection
- k. Drilling Boring, Boring and Spot Facing
- l. Slide Locks
- m. Milling Angular Surfaces
- n. Rigidity of Set Up

SURFACE GRINDER - 4 HOURS

- a. Safety
- b. Operate Sine Chucks
- c. Use Laminated Chuck Blocks
- d. Operate Radius/Tangent Wheel Dressers
- e. Form Dressing a Wheel
- f. Grinding Wheel Selection
- g. Index Grinding
- h. Coolant Application
- i. Distortion of Work
- j. Feed and Depth of Cut

CYLINDRICAL GRINDER - 4 HOURS

- a. Safety
- b. Type (Plain, Universal, Internal, External)
- c. Methods of Holding and Driving Work
- d. Wheel of Selection
- e. Radius/Tangent Wheel Dressers
- f. Form Dressing
- g. Taper Grinding
- h. Plunge Grinding
- i. Follower Rest
- j. Table Direction Trips Dogs
- k. Adjusting for Parallel Grinding

TOOL AND CUTTER GRINDER - 2 HOURS

- a. Set Up
- b. Safety
- c. Wheel Selection
- d. Cutting Tool Angles and Clearances
- e. Where to Sharpen
- f. How Much to Remove
- g. Tooth Indexing
- h. Table Stops

JIG BORE - 2 HOURS

- a. Set Up
- b. Tool Selection
- c. Methods of Locating and Positioning
- d. Accuracy Obtainable
- e. Feed and Speed Settings
- f. Inspection and Checks
- g. Machining Sequence

ELECTRICAL DISCHARGE MACHINING - 1 HOUR

- a. Application
- b. Electrode Selection
- c. Feed Speed Amperage and Voltage Settings
- d. Fastening Work
- e. Function of Electrolyte
- f. Electrode Breakdown and Wear