



## MASTER COURSE OUTLINE

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Date: June 2014

## COURSE TITLE

Machining II

## GENERAL COURSE INFORMATION

Dept.: IST

Course Num: 182

(Formerly: )

CIP Code: 47.0303

Intent Code: 21

Program Code: 768

Credits: 5

Total Contact Hrs Per Qtr.: 77

Lecture Hrs: 33

Lab Hrs: 44

Other Hrs:

Distribution Designation:

## COURSE DESCRIPTION (as it will appear in the catalog)

Fundamentals of machining processes on lathes and vertical mills. Precision measurement with micrometers, vernier calipers, and dial indicators.

## PREREQUISITES

IST 180 or Instructor Permission

## TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: *Machining Fundamentals*, by John R. Walker)

## COURSE LEARNING OUTCOMES

*Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills.*

- 1) Observe appropriate safety rules as pertaining to general machine shop practices.
- 2) Use reference guides such as the "Machinist Handbook" to calculate various machining functions.
- 3) Use precision tools.
- 4) Demonstrate the basic skills to safely operate a Engine Lathe, the Vertical Milling machine, and various other shop tools.

## INSTITUTIONAL OUTCOMES

### COURSE CONTENT OUTLINE

Measure & Inspect parts with precision measuring tools:

Verify dimensions

Verify alignments

Verify clearances

Inspect machined parts

Perform Layouts:

Analyze specifications

Perform precision layouts from blueprints

Use of reference material such as the Machinist Handbook

Operation of Bench Grinders:

- Grind lathe tools
- Sharpen carbide tools
- Sharpening drill bits

Operation of Lathes:

- Set up Engine Lathe
- Calculate and set lathe speeds, feeds and depth of cut
- Indicate and machine parts in 4-jaw chuck
- Machine parts using collet chucks
- Machine parts using faceplate
- Perform forming operations
- Perform knurling operations
- Center drill and drill parts
- Bore, face and recess internal diameters
- Ream holes to specifications
- Undercut diameters and shoulders
- Machine eccentric diameters
- Cut off parts
- Calculate tapers
- Turn tapers
- Thread external diameters
- Plan sequence of lathe operations

Operation of the Vertical Milling Machine:

- Set up the Vertical Mill for manual and automatic operations
- Calculate and set speeds, feeds, and depth of cut
- Change tool holders and cutters
- Establish zero reference point on workpiece
- Machine techniques using conventional and climb milling
- Machine closed pockets
- Machine angles
- Machine radii using form milling cutter
- Machine T slots
- Machine Dovetails
- Center drill, drill and ream holes
- Tap holes on the Vertical Mill
- Identify milling problems
- Perform basic milling machine maintenance
- Plan sequence of Vertical Mill operations

Metric conversion

The use of the Arbor Press:

- Broaching process
- Straightening shafts
- Press fits

The use of the Drill Press:

- Drilling and Tapping

Reaming and Boring operations  
Performing Housekeeping Activities

**DEPARTMENTAL GUIDELINES** *(optional)*

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**DIVISION CHAIR APPROVAL**

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**DATE**