COURSE SYLLABUS

MAN 110  Manufacturing Processes I

CREDIT HOURS: 3.00  CONTACT HOURS: 45.00

COURSE DESCRIPTION:
A theoretical and practical introduction to conventional precision machine tools, including drill presses, engine and turret lathes, shape milling and grinding machines. Emphasis will be given on turning, threading, drilling, honing, shaping, and broaching.

PREREQUISITES: MAN 100

EXPECTED COMPETENCIES
Upon successful completion of this course, the student will:

1. Identify safe machining practices and safe shop conditions
2. Demonstrate the use of the most common precision tools; micrometers, height gages, decimal rules, dial indicators
3. Explain the meaning of various lines, symbols, and circles on engineering drawings
4. Understand the importance of part processing
5. Explain the physics of metal removal and chip production
6. Know the difference between high speed and carbide cutting tools
7. Know the effects of different cutting tool materials on different metals
8. Describe the factors that affect machining costs
9. Explain the use of shadowgraphs and hardness testers
10. Understand the geometry, shape, grades, and types of carbide inserts
11. Recognize the different manufacturing methods
12. Understand formulas for RPM (revolution per minute) for different metals on the lathe
13. Know how to use feed charts for drilling and lathe work
14. Identify the main components of lathe
15. Know the purpose and how to use cutting speed charts for lathes
16. Recognize and state the purpose of the most common thread forms
17. Understand the method of thread chasing on the lathe
18. Explain the geometry of different tool bits for the lathe
19. State and explain three different ways of measuring external threads
20. Know the inch and metric formulas for finding thread depth and overall thread size
21. Describe the lathe operations for turning, cutting-off, threading, knurling, drilling, tapering, chamfering, and forming
22. Know the process on the lathe for center drilling, drilling, deep hole drilling, boring a hole, and chamfering a hole
23. Distinguish the different lathe taper setups using the tailstock, telescope attachment, plain attachment, form tapering, and tapering with the compound rest
24. Understand the scribed line, dial indicator, and shadow graph methods of checking lathe tapers and threads
25. Describe radii forming on the lathe
26. Calculate the lathe tapers with the tail stock shifting and with taper attachments
ASSESSMENT METHODS:
Student performance may be assessed by examination, quizzes, case studies, oral conversation, group discussion, oral presentations. The instructor reserves the option to employ one or more of these assessment methods during the course.

GRADING SCALE:
90%-100% = A
80%-89.9% = B
70%-79.9% = C
60%-69.9% = D
<60% = E