The Engineering Technology Department, in cooperation with the Office of Disability Accommodation, complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request to the instructor prior to the fourth day.

SAFETY CATEGORY: 3

This course provides opportunities for students to take advantage of one or more of several software packages supported by the department in the classroom or in lab experiments, in simulation studies, homework assignments, or in projects.
DATE PREPARED: 8/21/18
PREPARED BY: Ali S Nouri
Email: nouri@unt.edu
Phone: 940 891 6779
Office: F115S
Office Hours: Monday: 9:30 am – 11:00 pm
  Tuesdays, Wednesday, Thursday:  1:00 pm – 2:30 pm
  OR by appointment

COURSE NUMBER, TITLE, CREDIT HOURS:
MFET 3110, Machining Principles and Processes. 3 hours (3;3)

DESCRIPTION:
Machine tool manufacturing techniques emphasizing sequence of operations, cutting tool
gometry, tooling systems, tool materials and performance characteristics, cutting forces, speeds,
feeds, surface finish, horsepower calculation and cutting fluids.

COURSE PHILOSOPHY
A Chinese proverb says that,
”teachers open the door, but you must enter by yourself.”

A western sage (Karl Jaspers) said,
”University life is no less dependent on students than on professors. The best professors flounder helplessly at a school where the student body is unfit. Hence it is all up to young people who are supposedly entitled to study. They must show themselves worthy of this privilege to the best of their ability.”

This course has been organized on the premise that you are worthy of this privilege and that the teacher only opens the door.
The success of this course depends entirely on your continued and sustained participation.
Therefore, I ask that you be agile participants and intervene as often as possible in the class discussion. Please keep in mind that in this course you will be exposed to wide range of alternative processes, some of which may force you to question, rethink
Participation:

In addition to being physically present, I expect you to be mentally present as well! As such, you should complete all assigned readings before each class meeting so that you are familiar with the concepts, facts, figures and theories.

PREREQUISITES:

MATH 1650

REQUIRED TEXTBOOKS:


SUPPLEMENTAL TEXTS AND MATERIALS:

Working Syllabus, Standard Stock

COURSE OBJECTIVES: At the conclusion of this course, the student will (be able to):

1. Acquire functional skills in operation of conventional manufacturing equipment.
2. Understand terminology and nomenclature used in manufacturing industries.
3. Explore, from computational and theoretical points of view, those concepts prerequisite to the study of advanced manufacturing systems.

APPROPRIATE PROGRAM OUTCOMES:

Technology Accreditation Commission of ABET, Inc.: An engineering technology program must demonstrate that graduates have:

1. An appropriate mastery of the knowledge, techniques, skills and tools of their disciplines,
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology problems that require the application of principles and applied procedures or methodologies
3. An ability to apply creativity in the design of systems, components or processes for broadly defined engineering technology problems appropriate to program educational objectives,
4. An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.
5. An ability to conduct standard test and measurements; to conduct, analyze, and interpret experiments; and apply experimental result to improve processes.
6. An ability to function effectively as a member or a leader on a technical team
STUDENT LEARNING OUTCOMES: (ETAC Student Outcomes Addressed)

Upon completion of this course, students will be able to do the following activities, given the appropriate parameters:
1. List and describe the components of single point tool geometry. (b,d,f) (Abet 1)
2. Collect at least five different types of tool wear and evaluate their individual and collective impact on tool life. (b) (Abet 1)
3. Cite at least eight cutting fluids and describe their application and performance characteristics. (b) (Abet 1)
4. Calculate appropriate machine tool horsepower requirements, spindle speeds and feed rates. (d,f,l) (Abet 1)
5. Cite at least four synthetic abrasive materials and describe their application and performance characteristics. (b) (Abet 1)
6. Demonstrate competence in the operation of selected machine tools and hand tools. (a)
7. Formulate tools to be used and sequence of operations. (a) (Abet 1)
8. Calculate the maximum and minimum limits of size and clearance/interference for shafts and bores. (d,f,l) (Abet 1)

INSTRUCTIONAL OBJECTIVES

1. Projects are to be completed, adhering to the drawing in the working syllabus, and submitted at the designated date.
2. Tech briefs are to be completed, adhering to the format in the working syllabus, and submitted at designated dates.
3. Quizzes shall consist of free response items from the previous week or previous weeks lecture (as announced by the professor).
4. The two examinations will be non-cumulative with reference to semester's content. The items will solicit detailed technical information as well as more broadly-based generalizations regarding processing capabilities, advantages and disadvantages.

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3. Quizzes shall consist of free response items from the previous week or previous weeks lecture (as announced by the professor).
4. The two examinations will be forced response items and non-cumulative with reference to semester's content. The items will solicit detailed technical information as well as more broadly-based generalizations regarding processing capabilities, advantages and disadvantages.
5. The oral presentation assignment shall be prepared, adhering to the instructions in the working syllabus, and presented to the class.
LEARNING STRATEGIES: Lecture, Démonstration, hands-on Laboratory Activity

COURSE OUTLINE:

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Assignments</th>
</tr>
</thead>
</table>
| 1.   | Introduction, Organization of Course, Policies, Primary Materials  
      Lab #1: System of measurement | C (unit 1-6), D(1-6) |
| 2.   | Metal Removal Tool Materials, Performance, Specifications | F- 67-82; B(6-7) |
|      | Lab #2 Milling machine, Drill Press | J (1-5), H(unit 1-7) |
| 3.   | Metal Saw Tooth Construction and Specification Files  
      Lab #3  Turning Machine, Blue print Reading | G (unit 1-6); B (unit 2) |
| 4.   | Abrasives, Specifications, Grinding Machines | I (Unit4-9) |
| 5.   | Sin Bar & Gage Blocks | L (unit 1-10) |
| 6.   | Reaming & Broaching | C (unit 6-7) |
| 7.   | Specification and Interpretation of Tolerances | B (unit 5), H (unit 6) |
| 8.   | Jigs & Fixtures/Work holding devises & gages | C (unit 8), |
| 9.   | Carbide Fundamentals | PPT |
| 10.  | Mechanics of Chip Formation | F (unit 4), K (unit 6) |
| 11.  | Orthogonal Cutting Forces | PPT |
| 12.  | Milling Machines, Horsepower Calculation | PPT |
| 13.  | Horsepower Calculation | PPT |
|      | Computer Numerical Control | M (unit 1-4) |

WRITTEN COMMUNICATION USAGE: Paper (5 point)

GRADING ELEMENTS AND WEIGHTS: Lab. Project 25%  
Homework 20%  
Attendance 5%  
Quizzes 30%  
Final Examination 20%  
TOTAL 100%
GRADING POLICIES:

Timetable for submission of assignments is provided on page 1 of the working syllabus; no late assignments are accepted. Quiz and examination performance interpretations are based on maximum scores accrued by students, not maximum points possible. Letter grades are determined using the following scale:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% to 100%</td>
<td>A</td>
</tr>
<tr>
<td>80% to 89.99%</td>
<td>B</td>
</tr>
<tr>
<td>70% to 79.99%</td>
<td>C</td>
</tr>
<tr>
<td>60% to 69.99%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

DISABILITIES ACCOMMODATION:

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodations of their disabilities. If you believe that you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940 565-4343 during the first week of class.

CLASS POLICIES:

1. All rules relating to academic dishonesty will be enforced in accordance with University policies. Cheating on quizzes, examinations and laboratory assignments, and plagiarism on various papers and reports are types of disciplinary misconduct for which penalties are assessed under the UNT Code of Student Conduct and Discipline.

2. Be advised that the instructor of this course supports and fully implements this policy. The following actions will be taken when evidence of such misconduct is observed. The student will be presented with the evidence of misconduct and given an opportunity to explain same. Based on the outcome of this private conference, the matter will be either dropped or the student will be given a grade of "F" in the course and be referred to the Dean of Students for further action.

3. During the course, handouts will be provided to enhance the presentation of certain concepts. These materials are provided strictly for instructional purposes and may otherwise be restricted.

4. This syllabus is subject to change at any time during the semester with changes to be announced in class.

5. Each student should retain graded lecture notes, pop quizzes, homework, tests, software-generated files, and laboratory reports to document errors in recorded grades.
6. Requests for review of graded work must be submitted during the lecture in which such work is returned to the students. The request should be accompanied by a written justification of the request including any supporting data.

7. There is no limit to the use of calculators for lecture, labs, quizzes, tests, or examinations. No computers/Cell phone are permitted in any quiz, test or examination.

8. Should you have a complaint regarding an aspect of this course, you should first discuss your complaint with the instructor. If you wish to carry it further, contact the Program Coordinator by calling (940) 565-2022. To further pursue your complaint, contact the Department Chair at (940) 565-2022, but ONLY after first discussing your concern with the previous two individuals.

9. Material Safety Data Sheets (MSDS) are maintained on file in the department for your review. Access to these documents may be provided by the instructor of this course, or the Program Coordinator. Seek initial access through the instructor.

Notice of Safety Regulations

1. All students are required to purchase their own eye protection, which is to be worn at all times while in the laboratory (with the exception of cleanup).

2. Suitable footwear has non slip soles and hard uppers which completely enclose the foot. Sandals are inappropriate.

3. It is strongly advised that jewelry not be worn on fingers or wrists while working on or around machinery.

4. Long, loose hair styles must be constrained to prevent engagement in moving machinery, tools work, etc.

5. Neckties, necklaces and other similar items must be removed or tucked into the shirt to prevent engagement in moving machinery, tools work, and wearing long pants is a must.

6. Compressed air may be used to clean parts and small tools only during designated laboratory work periods. Compressed air may, under no circumstances, be used during cleanup periods, nor to clean machinery, clothing or any part of one’s body.

7. Consult with the instructor prior to attempting to lift or move heavy objects.

8. One student only may operate a machine tool at a given time.

9. Metal chips may be removed with a brush; never use fingers.

10. Non essential conversation with students operating machinery is prohibited.
11. Do not to stop or slow revolving tools, chucks or work using fingers or hands.
12. Unusual machine setups must be approved by the instructor prior to machining.
13. Only official assignments may be undertaken during laboratory periods.
14. Any liquid spills are to be wiped up immediately.
15. Running and any horseplay are expressly forbidden.
16. Only officially enrolled students may enter and work in the laboratory.
17. No food or beverages are permitted in the laboratory.
18. Machine guards/safety devices may not be removed or rendered inoperative.
19. Equipment with faulty guards/safety devices is not to be used.
20. Personal audio/visual devices, including cell phones, will not be used in the laboratory.
21. Students with hidden medical conditions or handicaps, which may impact on their safe functioning in the laboratory, are requested to consult with the instructor.
22. Any accident, regardless of severity, will be reported promptly to the instructor.

XXX If you don’t follow safety rules of shop:
  a. Warning,
  b. Written notice
  c. Expel from the lab

Life teaches us to make good use of time
Time teaches us the value of life.