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MCH 101.01: Intro to Manufacturing Processes

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DATE REVISED: Autumn 2017
SEMESTER CREDIT: 3
PREREQUISITES: None
INSTRUCTOR: Jeffrey J. John
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PHONE: 406-243 7646
OFFICE LOCATION: Machining Lab
OFFICE HOURS: 8:00 am – 4:00 pm

COURSE DESCRIPTION: Instruction to a career as a machinist, the importance of being a machinist, professionalism in the trade, the opportunities that exist as a machinist, types of materials, surface finish on materials. Fraction to decimal conversion, inch to metric conversion, lean manufacturing principals, and the importance of safety.

STUDENT PERFORMANCE OUTCOMES:
Occupational Performance Objectives
Upon completion of this course, the student will be able to correctly:

1. Understand the importance of the trade.
2. Understand the importance of professionalism.
3. What opportunities will be available.
4. The importance of working smarter not harder (lean manufacturing principals).
6. Identifying different types of machines.
7. Identifying different types of tools.

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:

STUDENT EXPECTATIONS:
Students are expected to treat the class as they would a job in their field of study which means:
- Follow all safety rules and classroom or laboratory procedures
- Pay attention, take notes, and read and refer to the textbook
- Bring all required materials daily, or lose a percentage point per occurrence
- Participate in lab clean-up, which begins 30 minutes before the scheduled class end
- Participate in semester end lab clean-up, or lose all of the professionalism grade
- No food or drink, smoke-breaks, cell-phones or other personal multimedia in or during class
- Utilize online resume builder and create a one page letter of intent
- Practice interview and work on interview skills

Each student will be responsible for cleaning the lab area in a team effort.

COURSE GRADING SCALE:  
A = 90% - 100%
B = 80% - 89%
C = 70% - 79%
D = 60% - 69%
F = <60%

IMPLIED FEATURE GRADING SCALE:
A ± .000” - .002” of design specifications*
B ± .0021” - .004” of design specifications*
C ± .0041” - .007” of design specifications*
D ± .0071” - .011” of design specifications*
F > .011” of design specifications*

NOTE: Courses must be passed with a ‘C minus (C-)’ or greater to count toward degree/certificate requirements.
The following criteria will be used for grading. Grades will be posted periodically and will be available to students upon request during office hours.

1. **Assignments: 20%**
   a. **Due Assignments** are to be turned in before 5 minutes after the class is scheduled to begin, otherwise it will be considered Late Work*.
   b. **Late Work** will not be accepted unless absences are excused; and are due the following day.
   c. **Corrected Assignments** will be returned the Monday after they are corrected. If you are absent, acquire corrected assignments before or after class.
   d. **Missed Assignments** will be made available to students with excused absences only.

2. **Tests: 15%**
   a. Tests, quizzes, and pop quizzes will not be made up if missed.
   b. Written test’s:
      i. 3 attempts total*
      ii. >90% Score required to operate machinery
      iii. Available every Monday at 8:00 AM
      iv. Due every Friday at 12:00 AM

3. **Lab: 40%**
   a. Quality of project workmanship (see Feature Grading Scale)
   b. Quality of project measurement, processes, and quality control

4. **Professionalism: 10%**
   a. Work ethic (safety, work done on time, care of tools and equipment, etc.)
   b. Interpersonal skills (cooperation, leadership, participation, attitude, etc.)

5. **Attendance: 15%**
   a. 3 unexcused absence = one letter grade drop
   b. See attendance policy and student expectations

**ATTENDANCE POLICY:**
It is the student’s responsibility to utilize class time to acquire and maintain skills in preparation for quizzes, exams, and completion of assignments and projects. Students must attend all lab and equipment safety/training days to be allowed access to the lab. Failure to do so may result in removal from the course.

Three unexcused absence will result in one letter grade drop.

Notify the instructor of absence(s) before scheduled class time, via phone or email listed above. Absences are considered an “unexcused absence” unless a doctor’s note is received. There will be no “make-up” for quizzes, tests, or assignments missed due to unexcused absences. “Excused absences” will receive a matching number of days excusal period as absent starting immediately upon your return. It is the student’s responsibility to get caught-up before course work is due.

**REQUIRED TEXTBOOKS**


REQUIRED MATERIALS AND TOOLS: (Failure to bring required materials results in -1% professionalism)

- Basic scientific calculator
- 1” Dial Indicator
- .030 test indicator
- 6” decimal scale (Starrett or equivalent)
- 0-1 O.D. Micrometer (non digital)
- Pocket scribe
- Standard allen wrench set
- Short sleeve smock
- Paddle lock (for locker)
- Safety glasses
- Standard thread pitch gauge
- Small dead blow mallet
- Lathe turning tool set
- ½” carbide end mill (2 or 4 fluted)
- 4” or 6” Dial Caliper (no plastic)
- 3 ring binder
- Tool bag or small box

ACADEMIC INTEGRITY: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://www.umt.edu/SA/VPSA/index.cfm/page/1321.

DISABILITY ACCOMMODATION: Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disability Services website at http://www.umt.edu/dss/ or call 406.243.2243 (Voice/Text).

NOTE: Faculty reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances.

COURSE OUTLINE:

1. Safety
   - Eye, ear, hand, lung, and other body protection
   - Proper use of hand and power tools
   - Shop and machine maintenance

2. Measuring
   - Gage Blocks
   - Calipers
   - Micrometers
   - Dial indicators

3. Metals and Metal Identification
   - Steel Classifications
     - Ferrous
     - Non-ferrous
   - Heat treating

4. Machine Shop Layout
   - Surface preparation
   - Layout tools
   - Layout procedures

5. Cutoff
   - Band saws
   - Abrasive saws

6. Grinding
   - Abrasive types

7. Drills and drilling
Drill press identification
Drill press processes
Twist drills
Speeds and feeds
Hold downs and fixtures

8. Engine Lathe Operation
    Introduction and Safety
    Setup and Operation

9. Milling Machine Operation
    Introduction and Safety
    Setup and Operation

10. Fasteners
    Cap screws and Machine Screws
    Cotter and roll pins
    Taper pins
    Press pins
    Keys
    Liquid locking products

11. Threads and Threading
    Bolt strength classification
    Thread size and classification
    Thread terms and definitions
    Hand taps and dies
    Bolt and nut extraction
    Tap extraction

GENERAL LAB SAFETY RULES
All students must agree to follow this non-inclusive list of safety rules and professional behavior guidelines.

Work Safely:
1. Never work unsupervised. All students must notify the instructor before and after working in the lab.

2. Never work when impaired, due to inadequate sleep or under the influence of alcohol or other substances.

3. Never operate machinery without receiving proper instruction. This includes but is not limited to passing Blackboard safety tests and the proper management of machine setup, speeds, feeds, and depths of cut, for any given process.

4. Exercise as many safety precautions as possible, including wearing safety glasses and other protective clothing and accessories at all times when working in the lab, including demonstrations and cleanup.

5. Clean spills IMMEDIATELY!

Know what to do in case of an EMERGENCY:

1. Know the locations of machine and laboratory emergency shut-off switches and/or power boxes.

2. Know the locations, eyewash station, fire extinguishers, fire exits, and first aid kits.

3. Report all personal injuries immediately.

4. Prevent chemical accidents by familiarizing yourself with the chemical(s) in the MSDS.

Violations of General Lab Safety Rules:

> 1st offense: Verbal warning.
- **2nd offense OR any serious infraction**: Student is unable to use the facility for one (1) full day of scheduled lab time immediately following the offense.

- **3rd offense OR any offense creating a dangerous situation**: Student may be subject to termination from the course.
My signature below indicates that I have read and understand the descriptions, policies and procedures stated in the syllabus for MCH 101 Introduction to Manufacturing Processes:

Student Name (Print): __________________________________________________________

Student Signature: ____________________________________________________________

Date Signed: ________________________________________________________________