

**CAMPUS NAME:** Ankeny

**COURSE TITLE:** Hand and Bench Machine Tools

**COURSE NUMBER:** MFG 276

**SECTION NUMBER & CRN:** Section 1 CRN 11038

### **INSTRUCTOR INFORMATION**

**NAME:** Mark Rosenberry

**EMAIL ADDRESS:** merosenberry@dmacc.edu

**PHONE NUMBER:** 515-964-6452

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**OFFICE LOCATION:** Building 3E Room 103A

**OFFICE HOURS/APPOINTMENTS:** Posted outside my office

### **COURSE INFORMATION**

**SEMESTER/YEAR:** Fall 2016

**DATE SYLLABUS CREATED AND/OR REVISED:** 2016

**DAYS & TIME & LOCATION:** BLDG 3E Room 121

8/25/16 - 12/15/16 Monday – Thursday 8:00am – 8:30am

Midterm date: 10/19/16

**COURSE DESCRIPTION & CREDITS:** <http://www.dmacc.edu/courses/crsrod.asp>

**PREREQUISITES:** None

**COURSE COMPETENCIES:** <https://go.dmacc.edu/competencies>

During this course, the student will be expected to:

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- 1.0 Explain what shop safety means.
  - 1.1 Identify common shop hazards.
  - 1.2 Demonstrate knowledge of procedure for using an Arbor and shop press.
  - 1.3 Identify various types of vises, their use and maintenance.
  
- 2.0 Identify basic hand tools and their uses.
  - 2.1 Determine the proper tool for a given job.
  - 2.2 Determine the correct use of a selected tool.
  - 2.3 Describe the correct method of using a hacksaw.
  - 2.4 Identify the two basic categories of hacksaw blades.
  - 2.5 Differentiate among eight common files and their uses.
  - 2.6 Identify five types of hand reamers.
  - 2.7 Describe the functional details of hand reamers.

- 3.0 Demonstrate an understanding of the appropriate use of hand tools.
  - 3.1 Use hand files to:
    - 3.1.1 Square a block of steel.
    - 3.1.2 File radii on corners of block.
    - 3.1.3 File to layout lines.
    - 3.1.4 File to a specified dimension.
    - 3.1.5 File compound radii.
  - 3.2 Saw along layout lines.
  - 3.3 Broach keyseat.
  - 3.4 Use pedestal grinder.
  - 3.5 Use disc sander.
  - 3.6 "Off-Hand" grind cutting tools - drill bits
- 4.0 Demonstrate knowledge of the proper care and use of pedestal grinding machines.
  - 4.1 Describe how the pedestal grinder is used.
  - 4.2 Explain the term "ring test" on grinding wheel.
  - 4.3 Discuss the safety steps in using a pedestal grinder.
- 5.0 Demonstrate knowledge of the parts of the Horizontal and Vertical Band sawing machines.
  - 5.1 Define saw blade terminology.
  - 5.2 Describe the conditions that define blade selection.
  - 5.3 Identify the major parts of the reciprocating and horizontal band cutoff machine.
  - 5.4 Describe abrasive and cold saws.
  - 5.5 Identify abrasive wheel materials.
  - 5.6 Explain wheel bonds.
  - 5.7 Describe the blade end grinding procedure.
  - 5.8 Explain how to weld a band blade.
  - 5.9 Describe the weld grinding procedure.
  - 5.10 Explain the purpose of the band blade guide.
  - 5.11 Describe how to adjust blade guides.
  - 5.12 Explain the purpose of annealing the band weld.
  - 5.13 Describe the annealing process.
  - 5.14 Demonstrate a knowledge of how to set the tracking of band sawing machines.
  - 5.15 Name three saw blade sets and their application.
  - 5.16 Explain what information is found on the Job Selector.
  - 5.17 Identify how band saw velocities are measured.
  - 5.18 Explain the operating principle of the variable speed pulley.
  - 5.19 Describe what band pitch has to do with sawing efficiency.
- 6.0 Operate vertical and horizontal band saws.
  - 6.1 Use a band saw blade welder.
  - 6.2 Install blades on band saws.
  - 6.3 Select feeds and speeds for various materials.
- 7.0 Explain how to use Drilling Machines.
  - 7.1 Identify three basic drill press types, their uses and differences.
  - 7.2 Identify the major parts of the sensitive drill press.
  - 7.3 Describe the major parts of the radical arm drill press.
  - 7.4 Identify the various features of a twist drill.
  - 7.5 Explain the procedure for sharpening a twist drill.

- 7.6 Determine the correct drilling speeds for five given drill diameters.
  - 7.7 Calculate the correct feed in 1018 steel.
  - 7.8 Explain the correct uses for several work-holding and locating devices.
  - 7.9 Identify tools for countersinking and counterboring.
  - 7.10 Describe what relationship exists between pilot size and hole size.
  - 7.11 Explain what a spot face is.
  - 7.12 Demonstrate a knowledge of what the difference is between a spot face and counterbore.
  - 7.13 Identify how a machine reamer is identified.
  - 7.14 Demonstrate a knowledge of the difference between a chucking and rose reamer.
  - 7.15 Describe how the surface finish of a hold affects its accuracy.
  - 7.16 Explain how the cutting speeds compare between drilling and reaming for the same size and material.
  - 7.17 Explain why vibration is harmful to carbide-tipped reamers.
- 8.0 Operate vertical and horizontal drill presses.
    - 8.1 Select feeds and speeds for various materials.
    - 8.2 Work holding.

## TEXTBOOKS & MATERIALS

**REQUIRED TEXTBOOKS & ISBN:** Machine Tool Practices 10th edition ISBN 0-13-291265-5  
 Students may use an earlier addition if they wish. Page numbers and Figure references will be different requiring extra effort to follow class discussions.

**REQUIRED MATERIALS:** Three ring binder and safety glasses

## COURSE POLICIES

### ATTENDANCE/PARTICIPATION:

- A) Attendance will be taken at the start of each class and optionally during the class to determine one of two conditions.
  - 1) Present for class
  - 2) Absent for class the student must attend all scheduled hours of a class session to avoid an absence.
- B) Break times are scheduled and everyone must abide by the listed times. If someone must leave an area they must inform their instructor. Failure to do so may result in an absence being recorded.
- C) Attendance records will be maintained by the instructor and will be made available to authorized individuals who request this information. Penalties for absenteeism will occur as follows: Five percent of the final grade for any Tool & Die class will be determined by attendance. The calculation will involve determining the number of clock hours of missed class and converting that into a percentage of the total hours of that semesters class. Credit for the five percent will be issued by the following:
  - 4% of missed class time or less = 100% of the available attendance points (5% of final grade)
  - 5% of missed class time or less = 90% of the available attendance points (5% of final grade)
  - 6% of missed class time or less = 75% of the available attendance points (5% of final grade)
  - 7% of missed class time or less = 55% of the available attendance points (5% of final grade)
  - 8% of missed class time or less = 30% of the available attendance points (5% of final grade)

9% of missed class time or less = 10% of the available attendance points (5% of final grade)  
over 9% of missed class time = 0% of the available attendance points (5% of final grade)

Exceptions: When all projects and objectives for a class are met the student, with the instructor's approval may be excused from remaining class sessions.

- D) Students are provided with a maximum of two occasions to make-up test(s). On either occasion there will be a reduction of the make-up test grade by 10 percent. Any make-up test will be scheduled at the convenience of the instructor. If an unavoidable absents is known in advance, the student may take the scheduled exam prior to its regularly scheduled time, without incurring a grade penalty.  
Unannounced quizzes issued during class cannot be made-up.

**GRADING CRITERIA:**

Projects

See Tool and Die policy handout: Safety and Organizational Rules

All projects must be completed before they will be graded.

All check off projects must be completed to pass.

Students may not restart a project without permission from instructor; if a student restarts without permission the student will receive a zero for that project.

Graded	5-25 pt	quizzes	quizzes as needed
Graded	25pts/worksheet		section b units 1, through 9
Graded	25pts/worksheet		section a units 1,2
Graded	25pts/worksheet		section g units 1-4
Graded	25pts/worksheet		section h units 1-6
Graded	20pts	project 1	1x1x2" rectangle - squaring
Graded	20pts	project 2	1x1x2" rectangle - radii
Graded	175pts	project 3	tool gage - angles
Graded	20pts	project 5	saw blades welded
Graded	115pts	project 6	c-clamps
Graded	125pts	project 7	vise base
Graded	125pts	project 8	sharpen drill bits
Graded	115pts	project 9	broaching
Graded	200pts	project 10	performance test

The following grading scale will be used for all MFG courses:

A	= 96.00% - 100%
A-	= 94.00% - 95.99%
B+	= 91.90% - 93.99%
B	= 89.80% - 91.89%
B-	= 87.80% - 89.79%
C+	= 85.70% - 87.79%
C	= 81.80% - 85.69%
C-	= 79.80% - 81.79%
D+	= 77.70% - 79.79%
D	= 74.81% - 77.69%
D-	= 72.80% - 74.80%

**CLASSROOM CONDUCT:** <https://go.dmacc.edu/handbook>

**MISSED EXAMS:** See item "D" in the attendance section

**LATE ASSIGNMENTS:** Late assignments must be turned in within 5 class days of the due date, or of a student's return to class.

**EXTRA CREDIT:** Determined by instructor

**STUDY EXPECTATIONS:** Some study time will be provided during class. Students are expected to spend additional study time as required to maintain the goals he or she has set.

**WEATHER POLICY:** Individual circumstances such as health, childcare, rural roads, distance from the College, etc. can vary greatly among students and staff. It is always DMACC's goal to provide safe learning conditions, as well as provide the opportunity for students to attend classes when the vast majority is able to safely attend. The final decision to come to College can only be made by the individual student based on their specific extenuating circumstances that may make it unsafe for them to travel. During adverse weather, DMACC faculty is considerate of students who are unable to attend classes due to unique extenuating circumstances. Notification of Campus/College closures will be sent out through the DMACC RAVE Alert System, posted to the DMACC webpage at [www.dmacc.edu](http://www.dmacc.edu), and where possible sent to local media.

Click & delete row if addendum being used with weather information.

**CLASS CANCELLATION PROCEDURE:** Tool and Die classes are seldom cancelled unless the college is closed. If it becomes necessary to cancel a class students will be notified via their DMACC e-mail.

**ACADEMIC DISHONESTY/PLAGIARISM:** Cheating by copying or any electronic device will not be tolerated. See Tool & Die Syllabus Addendum and Program Policies

It is important for you to be familiar with and follow DMACC's Academic Misconduct policy. Students are encouraged to review DMACC's Academic Misconduct Policy on-line at <https://go.dmacc.edu/handbook/polprocedures/pages/academicmisconduct.aspx> or in the DMACC Student Handbook.

**COURSE SPECIFIC (LAB) SAFETY PROCEDURES:** See Tool & Die Syllabus Addendum and Program Policies

## DMACC INFORMATION

**INSTRUCTOR HOME PAGES:** <http://www.dmacc.edu/instructors>

**ADD/DROP DATES:** [https://go.dmacc.edu/registration/pages/add\\_drop.aspx](https://go.dmacc.edu/registration/pages/add_drop.aspx)

**REFUND POLICY:** <https://go.dmacc.edu/registration/Pages/refund.aspx>

## SUPPORT SERVICES

**SERVICES FOR STUDENTS WITH DISABILITIES:**  
[https://go.dmacc.edu/student\\_services/disabilities](https://go.dmacc.edu/student_services/disabilities)

Any student with a documented disability who requires reasonable accommodation should contact the Disability Services Coordinator at **515-964-6850** or the counseling & advising office on any campus to apply for services.

## COURSE SYLLABUS

**DISCLAIMER:** “This syllabus is representative of materials that will be covered in this class; it is not a contract between the student and the institution. It is subject to change without notice. Any potential exceptions to stated policies and requirements will be addressed on an individual basis, and only for reasons that meet specific requirements. If you have any problems related to this class, please feel free to discuss them with me.”

**NONDISCRIMINATION POLICY:** Des Moines Area Community College shall not engage in or allow discrimination covered by law. This includes harassment based on race, color, national origin, creed, religion, sex (including pregnancy and marital status), sexual orientation, gender identity, age, disability and genetic information. Veteran status in educational programs, activities, employment practices, or admission procedures is also included to the extent covered by law. Individuals who believe they have been discriminated against may file a complaint through the College Discrimination Complaint Procedure (ES4645). Complaint forms may be obtained from the Campus Provost's office, the Academic Dean's office, the Judicial Officer, or the EEO/AA Officer, Human Resources. For Title IX questions and concerns contact 515-964-6850.

Students who wish additional information or assistance may refer to Student Services procedure ES 4645 located at [https://go.dmacc.edu/student\\_services/int](https://go.dmacc.edu/student_services/int). Click Policies & Procedures.

Employees and applicants who wish additional information or assistance may contact the **EEO/AA Officer**, Human Resources, Bldg. 1 on the Ankeny Campus, or refer to HR Procedures 3000, 3005, 3010, 3015, and 3020 at <http://www.dmacc.edu/hr/hrpp.asp>

**Accommodations:** The Program Development/Academic Support Services Director is the official Student Accommodation Officer/Section 504/ADA Coordinator for DMACC. The ADA Coordinator's office is located in Bldg. 6-10E on the Ankeny Campus and may be contacted by voice (515-964-6857). The ADA Coordinator is responsible for ensuring that the college complies with federal regulations that guarantee qualified students with disabilities equal access to all programs and services. Any student, faculty, or staff member may contact the ADA Coordinator's office for clarification of federal regulations, appeal of a grievance, or resolution of a disability-related problem.

## SYLLABUS ADDENDUM

To access additional information related to DMACC policies and procedures that impact the classroom (i.e. use of technology, weather-related cancellations, classroom conduct, etc.), the DMACC student handbook, registration information (including add/drop dates and refund dates), student service information (including counseling and advising), the DMACC academic calendar, and campus-specific resources (i.e. Academic Achievement Center, library, computer, labs, etc.), go to <https://go.dmacc.edu/handbook> and click “Syllabus Addendum” in the left navigation.

If you do not have access to a computer and need a printed version of any of the information described above, contact your instructor.

<b>COURSE SCHEDULE</b>		
<b>Week or Date</b>	<b>Assignment</b>	<b>Due Date</b>
First half of term	Starting with the second day of classes and continuing until midterm, a work sheet will be due at the beginning of each class. For a list of these work sheets see the grading criteria listed above.	
Week 3	Project 1	End of semester
Week 4	Project 2	End of semester
Week 7	Project 3	End of semester
Week 8	Project 5	End of semester
Week 9	Project 6	End of semester
Week 10	Project 7	End of semester
Week 11	Project 8	End of semester
Week 12	Project 9	End of semester
Week 13 - 15	Project 10	End of semester

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