

**CAMPUS NAME:** Ankeny

**COURSE TITLE:** Mill Operations Theory

**COURSE NUMBER:** MFG 260

**SECTION NUMBER & CRN:** Section 1 CRN 11039  
Section 2 CRN 11037

### **INSTRUCTOR INFORMATION**

**NAME:** Mark Rosenberry

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

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

**FAX NUMBER:** 515-964-6815

**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 103

Section 2 Aug. 25 - Oct.19 Mon. – Thurs. 10:30am – 11:05am

Midterm date: 9/21/16

Section 1 Oct. 20 - Dec.15 Mon. – Thurs. 10:30am – 11:00am

Midterm date: 11/16/16

**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. Explain shop safety as it applies to the milling machines.
  - 1.1 Wear safety clothing appropriate for work with milling machine.
  - 1.2 Wear eye protection when needed.
  - 1.3 Explain what routine maintenance on the machine must be performed.
  
2. Identify basic tools used on the milling machines.
  - 2.1 Explain what kinds of cutters are mounted directly on the spindle nose.
  - 2.2 Discuss the two types of tapers found on milling machines.
  - 2.3 Explain the two basic kinds of milling cutters with reference to their tooth shape.
  - 2.4 Explain the difference between climb and conventional milling.

- 2.5 Describe the setup and operation of offset boring head in common boring operations.
- 3. Demonstrate knowledge of the parts of the vertical milling machines.
  - 3.1 Name the six major components of the vertical milling machine.
  - 3.2 Describe which parts are used to move the table longitudinally.
  - 3.3 Explain which parts are used to move the saddle.
  - 3.4 Identify the purpose of the table clamp.
  - 3.5 Explain the purpose of the spindle brake.
  - 3.6 Describe how a loose table movement is adjusted.
  - 3.7 Discuss the purpose of the quill clamp.
- 4. Explain how to set up and how to use the milling machines.
  - 4.1 Identify the important components and controls on the Vertical Milling Machines.
  - 4.2 Describe the functions of machine parts and controls.
  - 4.3 Perform routine maintenance on the machine.
  - 4.4 Describe how work pieces are aligned when they are clamped to the table.
  - 4.5 Discuss how a vise is aligned on a machine table.
  - 4.6 Describe how to check tool-head alignment.
  - 4.7 Provide an explanation of why it is important that the knee clamping bolts are tight before aligning a tool-head.
  - 4.8 Explain why the tool-head alignment needs to be checked again after all the clamping bolts are tightened.
- 5. Demonstrate knowledge of the proper care of milling cutters.
  - 5.1 Identify common cutters for the vertical mill.
  - 5.2 Select a proper cutter for a given machining task.
  - 5.3 Demonstrate knowledge of how a right--hand cut end mill is identified.
  - 5.4 Describe what characteristic of end mills allows them to be used for plunge cutting.
  - 5.5 Explain the main difference between a general purpose end mill and one designed to cut aluminum.
  - 5.6 Describe when carbide-tipped end mills are chosen over high-speed steel end mills.
  - 5.7 Identify what kind of end mill would be used to remove a considerable amount of metal.
  - 5.8 Explain what tapered end mills are used for.
- 6. Calculate speeds and feeds.
  - 6.1 Compute the rpm for a given size high speed mill cutter.
  - 6.2 Calculate the feed for a given type cutter and a given type steel.
  - 6.3 Explain when lower cutting speeds are recommended.
  - 6.4 Describe when cutting fluids are used.
  - 6.5 Discuss how the tool is affected by the chip thickness.
  - 6.6 Describe what the maximum depth of an end mill is.

## 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 semester's 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 absence 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:**

See Tool and Die policy handout: Safety and Organizational Rules

Quizzes: Daily / as needed 5 – 20 points

Test: minimum of 4 100 point tests

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>
Week 1	Section J introduction / video	End of course
Week 2	Section J general discussion / projects and safety	End of course
Week 3	Section J unit 1	End of course
Week 4	Section J unit 2	End of course
Week 5	Section J unit 3	End of course
Week 6	Section J unit 4	End of course
Week 7	Final test	End of course

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