



<http://www.dmacc.edu>

CAMPUS NAME: Ankeny

COURSE TITLE: Engine Lathe Theory

COURSE NUMBER: MFG 250 E1

SECTION NUMBER & CRN:15081

INSTRUCTOR INFORMATION

NAME: Dale E. Collins

EMAIL ADDRESS: decollins@dmacc.edu

PHONE NUMBER: 515-964-6845

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OFFICE LOCATION: Building 3E 104A

OFFICE HOURS/APPOINTMENTS: M-R Posted on office other times by appointment

COURSE INFORMATION

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SEMESTER/YEAR: Fall 2016

DATE SYLLABUS CREATED AND/OR REVISED: 1,10,2016

DAYS & TIME & LOCATION:

6:50PM- 7:55 PM MT

RM 3E 106

START / END DATES August 29-October 18 2016

COURSE DESCRIPTION & CREDITS: 1 Credit Class

PREREQUISITES: math skills,

CO-REQUISITES: MFG 251

COURSE COMPETENCIES:

During this course, the student will be expected to:

1. Explain the parts of the Turning Machines.
 - 1.1 Identify the most important parts of a lathe and their functions.
 - 1.2 List all of the lubrication points for a given type lathe.
 - 1.3 Identify standard, quick-change and turret-type tool holders mounted on a lathe carriage.
 - 1.4 Describe the type of tooling used on the tailstock.

2. Demonstrate an understanding of work holding devices.
 - 2.1 Explain the uses and care of independent and universal chucks.
 - 2.2 Explain the limitations and advantages of a collet.
 - 2.3 Describe how a collet is setup for use on a lathe.
 - 2.4 Explain the uses of, and differences between, drive and face plates.
3. Demonstrate an understanding of the carriage.
 - 3.1 Describe the relationship between longitudinal feeds and cross feeds.
 - 3.2 State the differences in types of cross feed screw micrometer collars.
 - 3.3 Describe the use of various feed levers.
 - 3.4 Explain how to set up to make facing cuts to a given depth and how to measure them.
4. Demonstrate knowledge of the proper care and use of pedestal grinding machines for tool grinding purposes.
 - 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. Demonstrate a knowledge of cutting tools.
 - 5.1 Explain the purpose of rake and relief angles.
 - 5.2 Explain the purpose of chip breakers.
 - 5.3 Describe the function of form tools.
 - 5.4 Name the advantages of using high-speed steel for tools.
 - 5.5 Explain when zero or negative rake should be used.
6. Demonstrate knowledge of center drilling in a lathe.
 - 6.1 Determine proper speed and feed for a given material and size.
 - 6.2 Name two reasons for center drilling a work piece in the lathe.
 - 6.3 Explain two causes of center drill breakage.
 - 6.4 Describe what happens when you drill too deeply with a center drill.
7. Demonstrate knowledge of turning in a lathe.
 - 7.1 Describe the correct setup procedure for turning between centers.
 - 7.2 Select correct feeds and speeds for turning operation.
 - 7.3 Detail the steps necessary for turning to size predictably.
 - 7.4 Explain the procedures for drilling, boring, reaming, knurling, recessing, parting and tapping in a lathe.

COURSE OVERVIEW:

An introductory level course explaining the basic operation and care of an engine lathe.

TEXTBOOKS & MATERIALS

REQUIRED TEXTBOOKS & ISBN:

Machine Tool Practices Edition: 10th

Machine Tool Practices

Author: Kibbe

ISBN: 9780135015087

REQUIRED MATERIALS: Pencils, **TI 30 Calculator / ipod, phone, etc. not acceptable for Calculator**

OPTIONAL OR RECOMMENDED BOOKS/MATERIALS:

SOFTWARE APPLICATIONS:

Software notice: "All the software used in this class is copyrighted; therefore, it is not for distribution, copying, or personal use. This software is the property of Des Moines Area Community College."

COURSE POLICIES

TOOL & DIE DEPARTMENT - SAFETY & ORGANIZATIONAL RULES

Contents:

- 1. Safety glasses**
- 2. Safety wear**
- 3. Safety practices**
- 4. Equipment maintenance and care**
- 5. Cell phones**
- 6. Computer usage**
- 7. Tool privileges**
- 8. General rules**
- 9. Attendance policy**
- 10. Grade scale**
- 11. Lab housekeeping**
- 12. Penalties**
- 13. Personal health and accident insurance**
- 14. Personal property**

The following is a list of guidelines that must be followed to promote safety issues & care for shop equipment. Failure to abide by the rules will result in penalties as listed in section 12.

1. Safety glasses Iowa code 280.20

All students will wear their safety glasses when in a lab environment. This will apply even if you are not running a machine. The only exception is in a classroom that is fully enclosed that has no hazardous equipment. Students must store their glasses in some place other than the lab. (locker, book bag, etc.) All glasses must be approved safety glasses by OSHA, sunglasses are not acceptable safety wear.

2. Safety wear

All students must remove watches, rings, bracelets, or any other jewelry that could pose a safety hazard while operating machinery. If hair is long enough to pose a hazard it must be tied back to prevent possible machine contact when a machine operator leans forward. Everyone must wear full length pants (no shorts or sweat pants allowed.) Footwear must be fully enclosed to the ankles (no sandals, etc.) All long sleeve shirts must be rolled up past the elbow while operating machinery. No hoodies or wear with long loose sleeves and/or neck tie strings allowed.

3. Safety practices

All work pieces must be retained in a manner that is appropriate for the type of machining incurred. No one shall try to overcome machine forces by physically holding the work piece. Some common work holding abuses are, but not limited to:

- A) Not properly blocking a work piece on a magnetic chuck.
- B) Not clamping or retaining drill press vise and/or work pieces.
- C) Cutting round stock on a band saw. (stock could roll and your fingers could be pinched)
- D) Leaving a chuck wrench in a chuck unattended.
- E) Creating long stringy chips.
- F) Using emery cloth on a lathe where the cloth could completely wrap around the diameter.

4. Equipment maintenance and care

- A) All equipment must have sufficient oil levels before operation. This would include activating manual oilers and checking sight glasses.
- B) Covering all wear surfaces on a machine when abrasive materials are being used.
 - 1) emery cloth on lathes and mills.
 - 2) tool post grinding.
 - 3) cutting fiber board or similar abrasive material.
 - 4) way covers on surface grinders.
- C) NO AIR HOSES may be used to clean off a machine. This results in fine chips and abrasive under way covers.
- D) NO equipment shall be placed on a surface plate that could cause damage to the surface itself. (e.g. hammers, clamps, grinding wheels, etc.)
- E) NO equipment or hand tools shall be placed on a precision surface or a mill table temporarily or otherwise. (e.g. hammers, C-clamps not used in the set-up, cutting tools, etc.)

- F) All work pieces, clamps, and vises that come in contact with a precision surface must be burr free. File, stone, or grind as necessary. (e.g. vise on a mill table)

5. Cell phones

Cell phones are to be on vibrate or off during lecture class. If a call comes in that is urgent in nature you are to completely leave the room. You will need to discuss the nature of the urgent call with the instructor at a later time; this should not be a daily occurrence. If there is a day that you know you will need to be contacted, inform your instructor prior to or at the beginning of class. Be sure your phone is on vibrate and quietly leave the room to answer call. This should also not be a daily occurrence. If you interact with the phone in class such as answering a call or returning a text you get one warning, after that you will be ask to leave as outlined in section 12.

If the instructor is giving a demonstration in lab the same rules apply as in a lecture class. Cell phones can be used in an open-lab class unless the usage becomes excessive as deemed by the instructor.

6. Computer Usage

- A) **School computers will not be used to check personal E-mail, Facebook, Ebay, play games, etc... Internet use will be directly related to class only, including breaks and open lab time.** If you bring your own laptop, I-PAD, etc, you have to be completely out of any classes and not in the classroom to use this for personal purposes.
- B) **It is student's responsibility to back up their work. DMACC and DMACC instructor's are not responsible for computer errors. Any time extensions or repercussions involved in the loss of data will be reviewed on a case-by-case basis. The student is not guaranteed recovery of data or extension of time.** Students are issued a "P:" drive that is the intended location of student data files. Local computer hard drives are frequently reimaged and any data stored on them will be wiped out.
- C) Displaying lewd and explicit material, pornography, or any other material that is indecent and not related to the subject matter shall be prohibited. Any student displaying said material shall be reported to the Dean of Student Affairs for expulsion from the program. Propaganda, from political to religious subject, shall not be distributed or shown to other students during class time.
- D) Only the programs that are displayed in the menus on the computer terminals in the lab may be used by the student. If a student attempts to add software to a terminal or steal a copy of software from a terminal, the student will be referred to the Dean of Industry & Technology office for disciplinary reasons.

7. Tool Privileges

- A) All tools & equipment must be returned in a like condition with only a reasonable amount of wear for the time the tool was checked out.
- B) Any tool that is broken must be replaced or repaired to a satisfactory condition depending on the extent of the damage, if the tool has been depreciated beyond the expected life of the tool, it will be discarded. All these decisions will be determined by the instructor.

YOU BREAK A TOOL FROM THE TOOL CRIB SEE YOUR INSTRUCTOR!

- A) All precision crib tools must be treated in a manner that will maintain the accuracy of the tool. All precision surfaces must be handled carefully.

8. General rules

- A) Materials may be used for lab projects ONLY! This would include steel, heat treat wrap, emery cloth, etc. An instructor may give you donated material with permission only.
- B) Students may not work on anything but lab projects unless it is cleared first with their instructor, and is in good standing with their lab projects.
- C) **Lectures will be given only once.** It is the responsibility of the student to obtain lecture information from other students if they miss a lecture. Any student that interferes with the delivery of a lecture by talking, walking around the room, making gestures, having cell phones on, etc. can be directed to leave. If, after being warned once, the student continues to disrupt the lecture, the student will have to leave and be counted absent and lose all the points possible for that class session. Continual display of actions that disrupt the class will result in the student being referred to the Dean of Industry and Technology for further discipline.
- D) **All tests must be original.** Any person(s) found guilty cheating or copying an exam shall be disciplined. Any allegation of cheating shall be investigated. Points for any test being investigated shall not be determined until the investigation is concluded. Any person aiding another person to copy shall also be disciplined. If guilty, the student(s) shall lose all the points for the exam. The accused student(s) shall report to the Dean of Industry & Technology during which time a decision will be made as to the extent of additional discipline the student(s) will receive. The student(s) can be put on probation or can be expelled from any of the machining programs. If the student(s) commits a second offense the student(s) will immediately be removed from the class and will have to report to the

Dean of Student Affairs to start procedures to expel the student(s) from the program. **All tests must be taken within 2 days of students return or a zero will be given.**

- E) Students must not manufacture anything that could be used as, or in conjunction with the following:
- a) firearms (or weapons of any type)
 - b) knives
 - c) Anything illegal not previously mentioned.
- F) Finals – last day to machine in a semester lab course is determined by the instructor. Any partially completed projects may not be given any credit at the discretion of the instructor. Final lab clean-up days at the end of the semester could be part of the semester grade and can be weighted by the instructor as deemed necessary.

9. **Attendance policy**

- A) Any student more than 10 minutes late will receive an absence. If a student demonstrates habitual tardiness, they will be referred to a student counselor and possibly be removed from the class. Any student entering the classroom 10 minutes late or later will not be allowed to start any test in progress. **Any student who leaves the lab or classroom early without consulting the instructor will be counted absent. The instructor will determine whether leaving early fits the conditions and does not count as an absence.** During lab course where a break is not generally scheduled students can take a 10 minute break per hour. Time observed missing in excess of this amount time will be counted as an absence. If you need to take care of related DMACC business and believe it will take a longer period consult with your instructor **before** leaving to avoid a deduction.
- B) Field trips do require attendance. Only excused absences will be accepted. See the instructor at least one school day prior to the field trip for an exclusion from attending the field trip
- C) Unannounced quizzes issued during class **can not** be made-up. Timed quizzes are likely to occur in the first two minutes of class.
- D) If a student that has been absent and does not arrange a new completion date for an assignment(s) on the day that they return to school, they will lose all of the points for any assignment(s) that they have missed while they have been gone.

10. **Grading Scale**

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

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%

11. Lab housekeeping

Lab(s) must be cleaned at the end of the class period. This would include cleaning the machine(s), sweeping and/or mopping the floors, emptying wastebaskets, returning crib tools, etc. This could result in a mandatory shut down of the lab to all students until housekeeping is regained. Poor housekeeping can create a hazardous work environment. Each student will be responsible for the mess they create; however the clean-up will be a group effort. No one will be dismissed from class until the clean up is complete. Any lab time lost will not be rescheduled.

12. PENALTIES

A) Any infractions will result in one verbal warning. Any additional infractions will result in the student leaving the class for the day, losing attendance and graded points for the day. It will also require you to visit the I&T Dean or associate Dean for a remedy. I will expect an e-mail from them to get you back in class.

Scott Ocken, Dean of Industry & Technology
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Building 3W-21
515-964-6364

Jenny Foster, Ph.D.
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Associate Dean, Industry and Technology
Building 3W-15
515.964.6692

13. Personal health and accident insurance

Des Moines Area Community College does not provide any health or accident insurance on students attending any program at DMACC. If you are not currently covered by adequate insurance, you may purchase health and accident insurance through the student activities office.

14. Personal property

Des Moines Area Community College does not provide any personal property insurance to cover theft or damage to tools, personal belongings, etc.

DMACC does not assume any liability for theft or damage to tools or any other personal property such as book bags left in the classrooms or at the college at anytime. Therefore, it is suggested that each student who plans to leave tools at the college on a regular basis, or just occasionally, should insure them with a rider on your homeowner's policy or by separate insurance. Lockers may be checked out each semester to store personal belongings.

CLASSROOM CONDUCT: <https://go.dmacc.edu/handbook>
Conduct/discipline policy/academic standards, etc.

MISSED EXAMS: Students who miss an exam can make up exam if the instructor was notified of the absence before the test. If student fails to notify the instructor before a test is taken and misses the exam, the exam cannot be made up. Missed quizzes cannot be made up. Excused exams can be made up at the instructor's discretion. Students can only make up 2 tests.

EXTRA CREDIT: None

STUDY EXPECTATIONS: Note taking is very much required since we are working with handouts and formal textbook and we will be working with a wide variety of subject matter.

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, and where possible sent to local media.

CLASS CANCELLATION PROCEDURE: It is the responsibility of each faculty member to notify their students (in addition to their dean or provost) through some predetermined means if they must postpone or cancel a specific class.

ACADEMIC DISHONESTY/PLAGIARISM: Students are required to do their own work. Students caught cheating or turning in someone else's work will receive a failing grade for that assignment.

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:

DMACC INFORMATION

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

ADD/DROP DATES: https://go.dmacc.edu/registration/pages/add_drop.aspx

Last day to drop classes: October 31, 2014

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

SUPPORT SERVICES

SERVICES FOR STUDENTS WITH 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. 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.

COURSE SCHEDULE		
Week or Date	Assignment	Due Date
1	UNIT 1 Self Test review	
1	UNIT 2 Self Test review	
2	UNIT 3,4 Self Test review	
3	UNIT 5,6 Self Test review	
3	UNIT 7,8,9 Self Test review	
2	UNIT TEST 1	
3	UNIT TEST 2	
3	UNIT TEST 3,4	
4	UNIT TEST 5,6	
4	UNIT TEST 7,8,9	
	Dates are approximate and may vary	

This workforce solution is funded by the IHUM Consortium which is 100% financed through a \$15,000,000 grant from the U.S. Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

