



LECTURE, Manufacturing Processes – MFG K102

LAB, Manufacturing Processes – MFG K103

Spring 2011 Syllabus

Tuesdays; Lecture Room B108 (5:30 – 8:15 PM); Lab Room B110 (8:16 – 9:55 PM)

Instructor: Prof. Wanda Short

Email: wshort@trcc.comnet.edu

Telephone: (860) 885.2349 office

Office Hours: 1:30 – 3:00 pm Mondays & Wednesdays; Alternate Days/Times by Appointment

Course Description:

Manufacturing methods of metals and plastics including metal casting, forming, machining, welding, and plastic processing. Through lecture, open discussion and practical hands on experience, this course will develop a working knowledge of machining practices for the manufacturing engineer.

MFG* K102; 3 CREDIT HOURS; MANUFACTURING PROCESSES

Co-requisite: MFG K103.*

This course studies manufacturing: making goods and wares by industrial processes. The course will provide theoretical experience in the scientific, engineering, and economic principles on which the various manufacturing processes are based.

MFG* K103; 1 CREDIT HOUR; MANUFACTURING PROCESSES LAB

Co-requisite: MFG K102, TCN* K105.*

This course provides laboratory emphasis on common metal cutting tools and lathe operations, as well as on associated precision measuring tools and instruments. The labs will involve set-ups and procedures for milling machines, lathes, grinders, drill presses, and some measuring instruments.

Text Books:

1. Manufacturing Processes (2e) – DuVall, J. ISBN 978-1-59070-780-7
2. Manufacturing Processes Lab – Knowles, P.H. ISBN 0-390-56824-4

Procedure:

The course will consist of a lecture followed by a lab. Both the lecture and lab will consist of open discussion, which the student is encouraged to ask questions and relate their own experiences. The discussions will be conducted around the reading assignments and the comprehension quizzes.

Lecture & Lab Outcomes:

- Students will practice the skills needed to work effectively in teams and as an individual.
- Students will demonstrate the ability to use appropriate mathematical and computational skills needed for engineering technology applications.
- Students will combine oral, graphical, and written communication skills to present and exchange information effectively and to direct manufacturing activities.
- Students will know of a professional code of ethics.
- Students will describe concepts relating to manufacturing quality, timeliness, and continuous improvement
- Students will describe how the concepts of metal manufacturing, statistics, process automation, computer-aided design and manufacturing, and organizational management affects manufacturing operations.
- Students will illustrate an ability to think critically and identify, evaluate and solve complex technical and non-technical problems; demonstrate creativity in designing problem solutions; and conduct and interpret experimental data and outcomes.
- Students will recognize the need to be lifelong learners.

Lab Lecture & Lab Performance Criteria:

The above outcomes will be assessed using these performance criteria:

- Working in teams-
 - ✓ Produce research information for a team
 - ✓ Demonstrate understanding of team roles when assigned
 - ✓ Share in work of team
 - ✓ Demonstrate good listening skills
- Mathematical and computational skills-
 - ✓ Ascertain problem conditions by identifying known and unknown quantities in formulating a problem for solution
 - ✓ Demonstrates the correct selection and application of pertinent formulae, principles and concepts.
 - ✓ Pursue solutions in a methodical, logical manner with results correctly explained with sufficient detail and properly documented
 - ✓ Submit problem solutions with a minimum of computational errors, identifying and selecting the correct dimensional units
- Use of communication skills-
 - ✓ Identify the reader / audience, assess their previous knowledge & information needs, and organize / design information to meet these needs
 - ✓ Provide content that is factually correct, supported with evidence, explained with sufficient detail and properly documented
 - ✓ Test reader /audience response to determine how well ideas have been relayed.
 - ✓ Submit work with a minimum of errors in spelling, grammar & usage
- Know Code of Ethics-
 - ✓ Demonstrate knowledge of a professional code of ethics / conduct
 - ✓ 2 Evaluate the ethical dimensions of professional engineering, mathematical and scientific practices
- Concepts relating to manufacturing quality, timeliness, and continuous improvement-
 - ✓ Identify the factors that influence manufactured products quality; cost, and timeliness
 - ✓ Demonstrate familiarity with concepts of 'waste' and waste reduction processes as related to manufacturing
 - ✓ Determine systems required to ensure products / services are designed & produced to meet / exceed customer requirements
 - ✓ Apply the fundamentals and concepts of lean, just-in-time and kanban during manufacturing system design
- Describe how the concepts affects manufacturing operations-
 - ✓ Identify the elements of manufacturing automation commonly found in manufacturing enterprises; including CAD/CAM, CNC, machine vision & automated inspection, automated material handling and storage, and robotics.
 - ✓ Demonstrate familiarity with typical manufacturing processes -integrated manufacturing systems;
 - ✓ Show knowledge of key drivers of manufacturing system performance
 - ✓ Perform geometric modeling using CAD software; prepare a simple CNC program and produce a sample part
- Illustrate an ability to think critically and identify-
 - ✓ Show the ability to evaluate the credibility of sources of information
 - ✓ Demonstrate the ability to refine generalizations, establish rational & pertinent assumptions, and avoid oversimplifications.
 - ✓ Exhibit the ability to generate, analyze / evaluate, and assess multiple engineering problem solution options
 - ✓ Produce documentation that reflects organization and application of engineering principles in specifying solution to an engineering problem
- Lifelong learning-
 - ✓ Demonstrate an awareness of what needs to be learned; formulate questions based on research need

- ✓ Develop a research plan appropriate to the investigative method
- ✓ Identify, retrieve and organize information
- ✓ Use a variety of methods and emerging technologies to keep current in the field

Instructor Assistance:

Seeking help from the instructor outside of class is encouraged if you are having difficulty understanding course material. Feel free to Email/call for an appointment during office hours.

Academic Integrity:

Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor.

Class Participation & Attendance:

This course is designed in such a way that a student should get more from the in-class activities than from the textbook alone. Therefore, students who are registered for this course are naturally expected to attend class regularly. Over the span of a semester the instructor expects to become familiar with the attendance habits of individual students. Therefore, these habits cannot help but be a factor in the evaluation of class participation and student contribution. Class Participation and Attendance will be noted for each class and although it is not intended to be used for grading purposes, it may be used for decision on the part of the final grade.

Assignments:

Assignments, Exams or Quizzes missed for any reason cannot be made up unless **prior** arrangements have been made with the instructor. Assignments not received on date due may result in alternate assignment with reduction of grade.

Grading Policy:

LECTURE: Assignments and Exams will be given during the semester and are noted in the LECTURE Schedule.

➤	40%	Homework Average
➤	60%	Exam Average
	100%	Total

LAB: Quizzes and a Semester will be given during the semester and are noted in the LAB Schedule. The quiz material is from the assigned reading and lectures. The quizzes will be posted on **Blackboard Vista**. Each quiz will have an expiration date by which it must be completed. The Semester Project consists of manufacturing a Machined Threaded Shaft and a Lab Report.

➤	40%	Quizzes Average
➤	20%	Cumulative Lab Quiz
➤	40%	Semester Project & Report
	100%	Total

Withdrawal:

A student who finds it necessary to discontinue a course must complete a "Withdrawal Request Form" available in the Registrar's office within the time limits of the semester calendar. Students who do not withdraw, but stop attending will be assigned an "F" signifying a failing grade.

Disabilities Statement:

If you are a student with a disability and believe you will need accommodations for this class, you must contact the Disabilities Counseling Services at 860/823-2830. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. The instructor cannot provide accommodations until and accommodation letter from the Disabilities Counselor is received.

LECTURE Schedule

**Manufacturing Processes – MFG K102
Room B108 – Tuesday, 5:30 – 8:15 PM**

Date	Class #	Topic	Reading	Homework
Jan 25	1	Introduction & Measurements		
Feb 01		Class Not In-Session (Weather)		
Feb 08	2	Introduction to Manufacturing; Material and Process Classification	Chap 1 – 2	
Feb 15	3	Behavior and Characteristics of Manufacturing Materials; Characteristics of Metallic and Plastic Materials	Chap 8 – 10	Homework #1 due (Chap 1-2)
Feb 22	4	Characteristics of Wood, Ceramic, and Composite Materials	Chap 11 – 13	Homework #2 due (Chap 8-10)
Mar 01	5	Processes Used to Form Metallic and Plastic Materials	Chap 14 – 15	Homework #3 due (Chap 11-13)
Mar 08	6	Exam I (Chap 1, 2, 8-13)		
Mar 15		Class Not In-Session (Spring Break)		
Mar 22	7	Processes Used to Form Wood, Ceramic, and Composite Materials	Chap 16 – 18	Homework #4 due (Chap 14-15)
Mar 29	8	Processes Used to Separate Metallic, Plastic, Wood, Ceramic, and Composite Materials	Chap 19 – 23	Homework #5 due (Chap 16-18)
Apr 05	9	Processes Used to Fabricate Metallic, Plastic, Wood, Ceramic, and Composite Materials	Chap 24 – 28	Homework #6 due (Chap 19-23)
Apr 12	10	Processes Used to Condition Metallic, Plastic, Wood, Ceramic, and Composite Materials	Chap 29 – 33	Homework #7 due (Chap 24-28)
Apr 19	11	Processes Used to Finish Metallic, Plastic, Wood, Ceramic, and Composite Materials	Chap 34 – 38	Homework #8 due (Chap 29-33)
Apr 26	12	Exam II (Chap 14-33)		
May 03	13	Planning for Production; Improving Manufacturing	Chap 3 – 4	Homework #9 due (Chap 34-38)
May 10	14	Automation	Chap 5 – 6	Homework #10 due (Chap 3-4)
May 17	15	Exam III (Chap 34-38, 3-6)		

*****NOTE: EXAMS ARE CLOSED BOOK and CLOSED NOTES**

LAB Schedule

Manufacturing Processes – MFG K103
Room B110 – Tuesday, 8:16 – 9:55 PM

Date	Class #	Topic	Reading	Quiz
Jan 25	1	Introduction & Orientation; Micrometers and Calipers		
Feb 01		Class Cancellation Due to Weather		
Feb 08	2	Lathe/Turning (pages 101-149) Basis Lathe Operations; How the Lathe Works; Work-Holding Methods	Units 11-1 thru 11-3	Lab Pre-Test Lab Quiz 1
Feb 15	3	Lathe/Turning (pages 149-176) Turning Tool Basics; Lathe Safety; Lathe Setups that Work Right	Units 11-4 thru 11-6	Lab Quiz 2
Feb 22	4	Lathe/Turning (pages 176-188) Single-Point Threading; Measuring Threads	Units 11-7 thru 11-8	Lab Quiz 3
Mar 01	5	Mills/Milling (pages 199-225) What Does a Mill Do? How Does a Mill Work?	Units 12-1 thru 12-2	
Mar 08	6	Mills/Milling (225-239) Setting Up Mill Cutters; Avoid These Errors – Great Setups and Safety	Units 12-3 thru 12-4	Lab Quiz 4
Mar 15		Class Not In-Session (Spring Break)		
Mar 22	7	Science of Measuring (pages 11-23) Dimensions and Tolerances; Managing Accuracy	Units 6-1 thru 6-2	
Mar 29	8	Science of Measuring (pages 23-50) The Five Most Useful Measuring Instruments	Unit 6-3	Lab Quiz 5
Apr 05	9	Measuring Tools (pages 55-68) Measuring with Inside and Depth Micrometers; Setup, Use and Care of Precision Gage Blocks	Units 7-1 thru 7-2	
Apr 12	10	Measuring Tools (pages 68-90) Gage Measuring; Measuring Angles	Units 7-3 thru 7-5	Lab Quiz 6
Apr 19	11	Cumulative Lab Quiz		Lab Quiz Final
Apr 26	12			
May 03	13			
May 10	14	Lab Project Submission & Lab Clean-Up		
May 17	15	Lab Project Submission & Lab Clean-Up Supplemental/Make-Up		

*****NOTES*****

THE QUIZZES ARE POSTED ON BLACKBOARD VISTA.

Each quiz will have an expiration date by which it must be completed.

Each LAB will consist of manufacturing the Semester Project which is due May 10th.

LAB Quiz Schedule

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Lab Pre-Test

Start: February 8, 2011 10:00 PM

End: February 16, 2011 11:59 PM



ManPro Lab Quiz 1

Start: February 8, 2011 10:00 PM

End: February 16, 2011 11:59 PM



ManPro Lab Quiz 2

Start: February 15, 2011 10:00 PM

End: February 23, 2011 11:59 PM



ManPro Lab Quiz 3

Start: February 22, 2011 10:00 PM

End: March 2, 2011 11:59 PM



ManPro Lab Quiz 4

Start: March 8, 2011 10:00 PM

End: March 23, 2011 11:59 PM



ManPro Lab Quiz 5

Start: March 29, 2011 10:00 PM

End: April 6, 2011 11:59 PM



ManPro Lab Quiz 6

Start: April 12, 2011 10:00 PM

End: April 20, 2011 11:59 PM



Lab Quiz Final

Start: April 19, 2011 10:00 PM

End: May 4, 2011 11:59 PM