



## **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 success 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.

### **Attendance:**

Attendance will be taken and although it is not intended to be use for grading purposes, it may be used for decision on the part of the final grade.

### **Grading Policy:**

It is usually expected that students will spend approximately 2 hours of study time outside of class for every one hour in class. Since this is a 3 credit class, you should expect to study an **average of 6 hours** outside of class each week. Some students may need more outside study time and some less. Several exams will be given during the semester. The dates of the exams are noted in the Lecture Schedule. Approximately one hour of the class meeting will be devoted for each exam. Final grades will be based on a normal distribution of all students taking the course based on the following weighting:

Exam Average	20%
LearnMate CNC Milling/Lathe	20%
LearnMate BluePrint Reading	20%
Sketching	20%
Ethics Case Study Discussion	20%

**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. The last day to withdraw from classes is 11May2015.

**Disabilities Statement:**

If you have a question regarding a disability that may affect your progress in this course, please contact one of the college's Disability Service Providers as soon as possible. Chris Scarborough (860/215-5751) generally works with students who have learning disabilities or attention deficit disorder. Kathleen Gray (860/210-9248) generally works with students who have physical, visual, hearing, medical, mobility, and psychiatric disabilities. Matt Liscum (860/215-9265) also works with students who have disabilities.

If you will need accommodations for this class, you must contact the Disabilities Counseling Services. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. *The instructor cannot provide accommodations until an accommodation letter from the Disabilities Counselor is received.*

Date	Class #	Topic	Lab	Comments
26-Jan	1	Introduction to Manufacturing	Safety/ Orientation/ Measurement Tools/	
2-Feb	2	Material Removal - Mechanical	Lathe Orientation/ Lathe Familiarization	
9-Feb	3	Material Removal - Other	Lathe Work I	
23-Feb	4	Ethics	Lathe Work II	
2-Mar	5	<b>Exam I</b>	Mill Orientation/ Mill Familiarization	
9-Mar	6	CNC	Mill Work I	
23-Mar	7	CNC	Mill Work II	
30-Mar	8	Sketching	Sketching Exercise/CNC	
6-Apr	9	Sketching	Sketching Exercise/CNC	
13-Apr	10	<b>Exam II</b>	CNC	
20-Apr	11	Silicone Casting & Molding	Silicone Mold Making/Machine Tool Competencies	
27-Apr	12	3d Scanning	Silicone Mold Making/Machine Tool Competencies	
4-May	13	Additive Manufacturing	Silicone Mold Making/Machine Tool Competencies	
11-May	14	Presentations	Presentations	
18-May	15	<b>Exam III</b>	Make-up	

**Digication:**

All students are required to maintain an online learning portfolio in Digication that uses the college template. Through this electronic tool students will have the opportunity to monitor their own growth in college-wide learning. The student will keep his/her learning portfolio and may continue to use the Digication account after graduation. A Three Rivers General Education Assessment Team will select and review random works to improve the college experience for all. Student work reviewed for assessment purposes will not include names and all student work will remain private and anonymous for college improvement purposes. Students will have the ability to integrate learning from the classroom, college, and life in general, which will provide additional learning opportunities. If desired, students will have the option to create multiple portfolios.

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