



# COURSE OUTLINE

## MCH0121

Prepared: Neal Moss    Approved:

<b>Course Code: Title</b>	MCH0121: MACHINE SHOP THEORY AND MEASUREMENT
<b>Program Number: Name</b>	1120: COMMUNITY INTEGRATN
<b>Department:</b>	C.I.C.E.
<b>Semester/Term:</b>	17F
<b>Course Description:</b>	<p>This course is designed to give the students an understanding of the theoretical aspects of machining and manufacturing including feeds, speeds, threading and gear cutting formulas. This course is also designed to strengthen the student's ability to measure and inspect to precise tolerances. Tools using micrometer and vernier scales for linear and angular measurement will be used. There will be a basic introduction to Statistical Process Control (SPC), including interpretation and recording of data.</p>
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	45
<b>Essential Employability Skills (EES):</b>	<p>#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.                  #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.                  #3. Execute mathematical operations accurately.                  #4. Apply a systematic approach to solve problems.                  #5. Use a variety of thinking skills to anticipate and solve problems.                  #10. Manage the use of time and other resources to complete projects.</p>
<b>General Education Themes:</b>	Science and Technology
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	Due to the safety concerns of this course, students who do not attend a minimum of 75% (12) of the scheduled classes will be given an F grade for this course. After 3 missed classes students lose the full 20% for the Attendance/housekeeping portion of marks.



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### Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Attendance/participation	20%
Homework/assignments	30%
Tests	50%

### Books and Required Resources:

Machining Fundamentals by John R Walker / Bob Dixon  
Publisher: Good heart- Willcox Edition: ninth  
ISBN: 987-1-61960-209-0

Machining Fundamentals (Workbook) by John R Walker  
Publisher: Good heart- Willcox Edition: ninth  
ISBN: 987-1-61960-214-4

### Course Outcomes and Learning Objectives:

Upon successful completion of this course, the CICE student, with the assistance of a Learning Specialist will acquire varying levels of skill development relevant to the following learning outcomes:

#### Course Outcome 1.

Show an awareness of safety in the operation of machines and tools used in the mechanical trades.

#### Learning Objectives 1.

Potential Elements of the Performance:

- Gain an understanding of shop safety.
- Develop safe work habits.
- Recognize and correct unsafe work conditions.
- Identify hazards when operating machine shop equipment.
- Identify hazards while working with hand, electric and air powered hand tools.

#### Course Outcome 2.

Recognize the importance of precise measurement and how it affects product and workmanship in industry.



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### **Learning Objectives 2.**

Potential Elements of the Performance:

- Describe the role of the technician in measurement
- Use of standards and the need for standards
- Recognize the importance of maintaining accuracy
- Show how non precise measurement techniques affect companies

### **Course Outcome 3.**

Accurately layout using drawings and sketches.

### **Learning Objectives 3.**

Potential Elements of the Performance:

- Explain importance of layouts.
- Identify common layout tools.
- Safe use of layout tools while performing layouts.

### **Course Outcome 4.**

Understand safety features all the auxiliary equipment used in the Machine Shop.

### **Learning Objectives 4.**

Potential Elements of the Performance:

- Explain the safety features of various types of grinders.
- Explain the safety features of various types of drills.
- Explain the safety features of various types of Saws.

### **Course Outcome 5.**

Use of measuring tools



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### **Learning Objectives 5.**

Potential Elements of the Performance:

- Discuss the use and care of measurement tools
- Identify comparative measuring equipment such as:

Telescopic gauges

Inside and Outside calipers

Fillet and radius gauges

Screw pitch gauge

Thickness/ feeler gauge

- Be able to interpret imperial and metric readings on:

Inside and Outside Micrometers,

Depth Micrometers

Pi Tapes

Vernier Calipers

Vernier height gauge

Vernier protractor

- Recognize sources of error in the measuring process
- Correctly adjust, maintain and store measuring to

### **Course Outcome 6.**

Be knowledgeable in various modern measuring equipment

### **Learning Objectives 6.**

Potential Elements of the Performance:

- Discuss modern computerized measuring equipment available today that enhance precise measurement
- Demonstrate the basic use of laser equipment
- Discuss measuring equipment available today that is used in vibration analysis, hydraulic testing.

### **Course Outcome 7.**

Select and use proper hand tools based on application



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### **Learning Objectives 7.**

Potential Elements of the Performance:

- Hand tool safety.
- Identify the correct sized wrenches.
- Identify the correct screwdriver style
- Identify different types of files.
- Identify hand tools used in Mechanical trades.
- Care and maintenance of hand tools.

### **Course Outcome 8.**

The lathe, determine speeds, feeds and calculate thread parameters and tapers using formulas.

### **Learning Objectives 8.**

Potential Elements of the Performance:

- Lathe safety & operation.
- Identify parts of the lathe.
- Identify various work holding devices on a lathe.
- Calculate speeds and feeds.
- Calculate thread parameters using formulas.
- Calculate information required to cut tapers.

### **Course Outcome 9.**

The Milling machine, determine speeds, feeds and type of cutting tool to suit the application.

### **Learning Objectives 9.**

Potential Elements of the Performance:

- Milling machine safety.
- Milling machine operation.
- Identify parts of the Milling machine.
- Identify various work holding devices on a Milling machine.



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- Calculate speeds and feeds.
- Identify various cutting tools for the correct application.
- Explain the principle of a dividing head.

### **Course Outcome 10.**

Understand the types, properties and applications of lubricants

### **Learning Objectives 10.**

Potential Elements of the Performance:

- Identify lubricants used in different machines.
- Identify the different types of lubricants.
- Importance of viscosity in lubricants.
- Identify lubricants used in machining operations
- Practice safe handling of lubricants.

### **Course Outcome 11.**

Discuss the use of Statistical Process Control in industry

### **Learning Objectives 11.**

Potential Elements of the Performance:

- Discuss Statistical Process Control
- Discuss the advantages of using Statistical Processes
- Perform assignments in Statistical Process Control

#### **CICE Modifications:**

#### **Preparation and Participation**

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will



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always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

**A.** Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and must be discussed with and agreed upon by the instructor.

**B. Tests may be modified in the following ways:**

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

**C. Tests will be written in CICE office with assistance from a Learning Specialist.**

***The Learning Specialist may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

**D. Assignments may be modified in the following ways:**

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

***The Learning Specialist may:***

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional



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time to process information

5. Formally summarize articles and assigned readings to isolate main points for the student

6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

### **E. Evaluation:**

Is reflective of modified learning outcomes.

**NOTE:** Due to the possibility of documented medical issues, CICE students may require alternate methods of evaluation to be able to acquire and demonstrate the modified learning outcomes

**Date:**

Wednesday, September 6, 2017

Please refer to the course outline addendum on the Learning Management System for further information.