###### COURSE SYLLABUS

###### Semester: Year: 2013

**Mission Statement:**

Richard J. Daley College provides high-quality education which leads to academic success, career development, and personal enrichment that fulfill diverse community needs.

###### Course (Discipline): Manufacturing Technology Number: 111-1 Section:       IAI#:

**Course Title:** Machining Processes I **Length of Course (Weeks):** 16

**Credit Hours:** 3 **Lecture Hours:** 1 **Lab Hours:** 4 **Contact Hours:** 5

**Meeting Day(s):**       **Times:**       **Building:**       **Classroom #:**

**Syllabus can be found on Blackboard website at** [**https://ccc.blackboard.com/webapps/login/**](https://ccc.blackboard.com/webapps/login/)**.**

###### Dean, College to Careers in Advanced Manufacturing \_\_Ray Prendergast\_\_\_\_\_\_\_

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**Course Description**:

This course is an introduction to machine tools and metal-cutting processes used in manufacturing. Students complete projects that require precision layout, set-up, machining, and inspection. These projects require students to perform various operations on engine lathes, drill presses and power saws. Students are also prepared to take the NIMS Level 1 Measurement, Materials and Safety test, and the MSSC Safety test. Writing assignments, as appropriate to the discipline, are part of the course.

**Course Prerequisites**:

Eligibility for Reading 99, or Consent of Department Chairperson.

**Students Course is Expected to Serve:**

Students enrolled in the Manufacturing Technology program. This course is a requirement of the AAS in Manufacturing Technology.

**Course Objectives**:

1. Increase knowledge of applied math for manufacturing.
2. Develop basic knowledge of job process planning.
3. Develop basic skills with hand tools in bench work, layout and measuring.
4. Develop basic knowledge of metal cutting and the safe operation of machine tools.
5. Use charts and Machinery’s handbook to obtain information needed for machining.
6. Understand and follow OSHA safety rules and regulations in the shop.
7. Complete students projects demonstrating planning, layout and machining skills.
8. Earn the NIMS Measurement, Materials and Safety credential.
9. Earn the MSSC Safety module for the Certified Production Technician credential.

**Student Learning Outcomes:**

Upon completion of this the student will be able to:

1. Apply shop mathematical formulas to problems such as calculating feeds and speeds for lathe operations.
2. Solve shop math word problems such as calculating the number of bars of stock needed to make enough parts to fill an order.
3. Calculate production tolerances from final tolerances given on prints.
4. Plan lathe projects using job process planning.
5. Create workpieces for bench operations and machining projects by using hand tools, layout tools, semi-precision and precision measuring tools.
6. Turn, face, drill, bore, thread and countersink with a lathe.
7. Cut external threads with a single point cutting tool on an engine lathe.
8. Produce parts using engine lathe, drill press and hand tools that conform to print requirements.
9. Verify parts to print specifications using precision measuring instruments.

**Recommended Texts and Course Materials:**

***Text:***

Hoffman, P.J., Hopewell, E.S., James, B, and Sharp, K.M. (2012). *Precision Machining Technology*. Independence, KY: Delmar Cengage: ISBN: 978-14354-4767-7

***Materials:***

Project sheets for machine shop projects and classroom exercise.

Safety glasses.

Machine tools including engine lathes, pedestal grinders, drill presses, horizontal bandsaws, vertical bandsaws.

Hand tools including precision measuring tools, and semi-precision measuring and layout tools.

Consumable tooling for metalworking including drills, HSS lathe bits, and taps.

Metal stock.

**Additional Course Requirements:**

N/A

**Recommended Method of Instruction:**

The method of instruction will include lecture, small group work in the machine shop lab, and project-based learning.

**Recommended Methods of Evaluation:**

Student learning will be assessed through written exams, and shop projects.

The shop project will be evaluated according to the following criteria:

Process Planning

Complexity

Accuracy

Workmanship

Your midterm and final course grades will be based on the following assessments.

Chapter tests

Projects

Final examination

Attendance

Earning the NIMS Measurement, Materials and Safety credential

Grading Scale:

90-100% = A

80-89 = B

70-79 = C

60-69 = D

Below 60 = F

See the Policy on grade designations and grade appeals at:

<http://www.ccc.edu/colleges/daley/departments/Pages/Grade-Appeal-Policy-and-Procedure.aspx>

**NOTE:** Type or copy and paste the link above into a web browser to view its content.

### Topical Outline / Course Calendar:

1. Orientation and Safety (*OSHA Standards 29 CFR 1910*)
   1. Safety Rules and regulations. Safety videos
   2. Personal Protective Equipment (PPE)
   3. Fire extinguisher, location and uses
   4. All exits, route and aisle markings
   5. Lock Out/Tag Out
   6. Machine and Tool Guarding
   7. Electrical Safety
   8. Hazardous Materials
   9. Blood borne pathogens
2. Understanding Prints
   1. Shop math for print reading
   2. Orthographic views and the alphabet of lines
3. Basic Hand Tools
   1. Layout and Benchwork
   2. Measuring: semi-precision and precision
4. Grind lathe tool bits: facing tool and turning tool.
5. Manufacturing Materials
   1. Selection and identification of steels
   2. Selection and Identification of Nonferrous metals
   3. Introduction to Machinery’s Handbook.
6. Turning Processes
   1. Setup
   2. Operations
   3. Finishing the product

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