#### WILLIAM RAINEY HARPER COLLEGE CAREER AND TECHNICAL PROGRAMS DIVISION

**GENERAL COURSE OUTLINE**

Department Coordinator: Kurt J. Billsten Phone: 847-925-6149 Email: Kbillste@harpercollege.edu

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| Course Prefix | Course Number | Course Title | *Contact Hours* |
| MFT | 105 | MACHINING PROCESSES I | 1. .2. *Lecture/Demonstration*  2 . .4 *Lab/Studio*  3. 4 *Credit Hours* |

**Course Description**

Covers fundamentals of machine shop theory and safe practice. Provides familiarization with tools, equipment, and practices of tool, die, and precision metal working industries. Includes introduction to mills, drill press, lathes, and surface grinders. Students are provided classroom and laboratory learning experiences while making a working tool. Students may earn NIMS credentials in Lath, Drill Press, Benchwork and Layout.

#### Topical Outline

1. Introduction
   1. History
   2. Measuring Tools
      1. Reading semi-precision and precision measuring tools
      2. Layout
      3. Manual Speeds and Feeds
   3. Bench Tools
   4. Shop Safety
   5. Blueprint Reading
2. Metal Cutting
   1. Theory of Metal Cutting
   2. Single Point Tools

Ill. Drill Press and Turning Operations

1. Theory
2. Cutters
3. Production Machines
4. Workholding
5. Blueprint Reading
6. Manual Drill Sharpening
7. Abrasive Operations
   1. Materials
   2. Machines
   3. Superfinishing
8. General Maintenance
   1. General Housekeeping and Maintenance
   2. Preventive Maintenance
      1. Lubrication and Cutting Fluids
9. Process Planning
   1. Theory
   2. Applications
10. Introduction to Vertical Milling Machine
    1. Identify components and function of components of vertical milling machine.

#### Method of Presentation

1. Lecture
2. Laboratory
3. Other: Video presentations and PowerPoint presentations

#### Student Outcomes (The student should)

1. demonstrate the ability to operate in a safe environment and recognize the safety issues of machine operation.
2. demonstrate the ability to operate an engine lathe by producing a product assigned by the instructor and requiring basic turning operations.
3. demonstrate the ability to operate a vertical milling machine by setting up and producing a

given project.

1. demonstrate the ability to operate a drill press by performing the operations of drilling, counterboring, tapping, etc.
2. demonstrate the ability to operate band saw and cutoff saws in support of assigned projects.
3. demonstrate the ability to operate a surface grinder.
4. demonstrate the ability to operate layout and inspection tools by producing and checking typical industrial products.
5. demonstrate a general understanding of machine shop theory and practice.
6. plan the sequence of operations to produce a part.
7. assess quality as described by the component detail through use of various hand instruments.
8. set up and operate engine lathes to perform straight and taper turning, face, center drill,

drilling and threading.

#### Method of Evaluation

* 1. *Typical classroom assessment techniques*

\_lLProjects

\_Class participation

\_Objective tests

\_Studio/Lab performance

\_Final exam

\_Portfolios

\_Essays/Term papers

\_Oral examination

\_Research report

### Course content learning outcomes

\_Quizzes

\_Group participation

\_Case study assignments

\_Homework

\_Midterm Exam

\_lLExams

### Additional assessment information (optional).

* 1. Instructor will assess minimum acceptable levels of shop skill and accuracy against the National Institute for Metalworking Skills Standard Level 1.

#### Textbook

* 1. Technical paper and technical notes

### Required

o Hoffman, Peter J., Hopewell, Eric S., Janes, Brian, Sharp, Jr., Kent M.. Precision Machining Technology. 1st Edition. Delmar, Cengage Learning, 2012 ISBN: 9781435447677

o *Supplementary materials*

***None***

o *Software*

***None***

Prepared by: Kurt Billsten Fall 2014

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