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

**GENERAL COURSE OUTLINE**

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| Course Prefix | Course Number | Course Title | *Contact Hours* |
| MFT | 120 | MACHINING PROCESSES II | 1. j\_ *Lecture/Demonstration* 2. 4 *Lab/Studio* 3. 3 *Credit Hours* |

**Course Description**

Prerequisite: MFT 105 and (MTH 097, MTH 101, MTH 103 or higher) with grades of Cor better.

Covers advanced machine shop theory with emphasis on safe practices and applications. Includes lathes, grinders (I.D., O.D. and surface), milling machines and tool grinders. Studies production machining, feed and speed applications and quality control techniques applied to precision machining. Introduces gage blocks, height gages, magnetic sine plate and modern indexable tooling. Students may earn NIMS credentials Mill 2, Lath 2, and Grinding 1.

#### Topical Outline

1. Safety in Shop Practice
2. Review Feed and Speed Calculations
   1. RPM B.IPM

Ill. Review Measuring Tools

A. Measurement Systems

B. Precision Measurement

1. Metal Composition
2. Heat Treatment
3. Milling and Grinding Operations
   1. Workholding and Toolholding
4. Grinding Wheels
5. Wheel Dressing
6. Bluepring Reading
7. Metal Cutting Theory
   1. Horsepower
8. Depth of Cut
9. Volume Metal Removal
10. Dimensional Metrology
    1. Planning Inspection Procedures
11. Use of Gauges
12. Practical Use of Inspection Tools
13. Production Planning
    1. Process Planning

B. Tooling and Workholding Selection

1. Process Theory
   1. Turning
2. Grading
3. Milling
4. Drilling and Tapping
5. Tooling Maintenance
6. Laboratory Projects

#### Method of Presentation

1. Other: Lecture with use of overhead projector and video where applicable; Laboratory demonstrations of inspection and manufacturing equipment; Student demonstrations of equipment as required.

#### Student Outcomes (The student should)

1. demonstrate the ability to safely and accurately operate shop equipment.
2. plan and produce a finished product from engineering prints.
3. plan and use inspection techniques which reflect accepted industrial practice.
4. efficiently use available equipment for manufacture.
5. demonstrate knowledge of machine shop theory.
6. correctly use hand tools, measuring tools, saws, drilling machines, milling, grinding and lath machines.
7. set up and operate manual grinding machines to perform wheel dressing, parallel,

perpendicular and angle surface grinding.

1. set up and operate manual milling machines to perform tramming and aligning of workholding devices, hole making, squaring, slotting and pocket milling.

#### Method of Evaluation

* 1. *Typical classroom assessment techniques*

\_Projects

\_Class participation

\_Objective tests

\_Studio/Lab performance

\_Final exam

\_Portfolios

\_Essays/Term papers

\_Oral examination

\_Research report

B. *Course content learning outcomes*

\_Quizzes

\_Group participation

\_Case study assignments

\_Homework

\_Midterm Exam

\_lLExams

1. *Additional assessment information (optional).*

Assigned projects.

Technical paper and technical notes.

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

#### Textbook

Correctly use hand tools, measuring tools, saws, drilling machines, milling, grinding and lath machines.

* 1. *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

Language on the syllabi course materials developed by INAM funds:

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