**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 | 123 | INTRODUCTION TO CNC MACHINING | 1. .3.*Lecture/Demonstration*2. *2. Lab/Studio*3. .3. *Credit Hours* |

**Course Description**

Prerequisite: Prior or concurrent enrollment in MFT 120 with a grade of Cor better.

Introduces setup and operation of CNC machining and turning centers. Teaches CNC machine tool controls through laboratory experiences and the manufacture of

pre-programmed parts including part holding techniques, alignment, process planning, tooling for CNC machine tools, and inspection of machined products. Students may earn NIMS Level 1 CNC Operator credential.

**Topical Outline**

1. CNC Safety
2. Transition from Coventional to CNC Mill and Lathe Ill. Work Holding and Tool Holding
3. The Cartesian Coordinate System
4. Setup and Operation of Vertical Machining Centers
5. Setup and Operation of Turning Centers
6. Speeds and Feeds of Cutter and Part Properties
7. Tool and Work Offsets
8. Preparatory Codes
9. Miscellaneous Codes
10. Simple CNC Programming
11. Machine Control Unit: Function, Display, Alpha Numeric, Axis Motion, Override, Cursor Page, and Mode Buttons

**Method of Presentation**

1. Lecture
2. Class Discussion
3. Other: Demonstration, Hands-on laboratory practice, Problem solving

**Student Outcomes (The student should)**

1. correctly apply machine shop safety practices.
2. setup and operate vertical machining centers.
3. setup and operate turning centers.
4. set machine parameters for machine tool operations at multiple work locations.
5. analyze part measurements and derive necessary changes at the machine toll registers to produce parts within specified tolerances.
6. set tool and work offsets.
7. understand the basic principles of CNC lathe and mill.
8. program a simple lathe and mill part

**Method of Evaluation**

* 1. *Typical classroom assessment techniques*

\_Projects

\_Class participation

\_Objective tests

 x\_studio/Lab performance

\_Final exam

\_Portfolios

\_Essays/Term papers

\_Oral examination

\_Research report

B. *Course content learning outcomes*

 x\_Quizzes

\_Group participation

\_Case study assignments

\_Homework

\_Midterm Exam

 x\_Exams

1. *Additional assessment information (optional).*

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

**Textbook**

* 1. *Required*

o Smid, Peter. CNC Programming Handbook. 3rd Edition. Industrial Press, 2008 ISBN: 9780831133474

o *Supplementary materials*

***None***

o *Software*

***None***

Prepared by: Kurt Billsten Fall 2014

CID: 4258

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