**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 | 125 | CNC LATHE OPERATION AND PROGRAMMING | 1.1  *Lecture/Demonstration*  2. .4 *Lab/Studio*  3.l *Credit Hours* |

**Course Description**

Prerequisite: MFT 123 with a grade of C or better.

Covers the principles and operation of CNC (Computer Numerical Control) machine tools with an emphasis on the set up and operation of lathes. Includes safety, turning, grooving, drilling, boring, threading, cutting tools, and introduction to CNC programming on common industry controls including Haas, Fanuc and Siemens. Students may earn NIMS Levell CNC Lathe Programming Set Up and Operator credential.

**Topical Outline**

1. Safety Review
2. Basic Machining and Supplemental Review

Ill. CNC Programming, Commands, Formats, Input, Proofing, Editing

1. Applied Trigonometry
2. Taper Calculations and Inspection
3. Machine Control Units (MCU) Manual Data Input (MDI)
4. Set Up and CNC Lathe Operation
5. Calculation Speeds and Feeds
6. Linear and Circular Interpretation
7. Absolute and Incremental Programming
8. Tool Nose Radius Offset
9. Introduction to Can Cycles
10. Grooving
11. Single Point Threading
12. Program Planning
13. Trouble Shooting
14. Machinability, Chip Formation

**Method of Presentation**

1. Lecture
2. Laboratory
3. Other: Demonstrations

**Student Outcomes (The student should)**

1. correctly apply machine shop safety practices.
2. set up and operate CNC lathe to perform straight and taper turning, radius turning, facing, center drilling, boring, and cutoff processes.
3. read, de-bug, and edit CNC lathe word address programs to produce assigned work.
4. enter manual data input (MDI) CNC word address lathe programs to produce work within the tolerances on engineering drawings.
5. solve shop math problems that include speeds and feeds, trigonometry, tapers, threads, engineering drawing interpretation and calculations relating to machine tools.
6. be able to program various projects

**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

1. *Course content learning outcomes*

\_x\_ouizzes

\_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 Skills Standard Level I.

**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

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