

## FLORIDA COMMUNITY COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: PMT 2254

COURSE TITLE: CNC Programming II

PREREQUISITE(S): PMT 2250

COREQUISITE(S): None

CREDIT HOURS: 3

CONTACT HOURS/WEEK: 4

CONTACT HOUR BREAKDOWN:

    Lecture/Discussion: 1

    Laboratory: 3

    Other \_\_\_\_\_:

FACULTY WORKLOAD POINTS: 3.01

STANDARDIZED CLASS SIZE  
ALLOCATION: 24

## CATALOG COURSE DESCRIPTION:

This course expands on the CNC Programming I course, providing further study in computer-aided numerical control programming of CNC Lathes. It concentrates on the lathe series of machines and includes set-up, centering, turning, facing, filing, polishing, burning, thread cutting and other processes common to the lathe series.

SUGGESTED TEXT(S): Machine Tool Practices, ISBN: 0-13-033447-2, by Kibbe and Neely.

IMPLEMENTATION DATE: Fall Term, 2009 (20101)

REVIEW OR MODIFICATION DATE:

## COURSE TOPICS

CONTACT HOURS  
PER TOPIC

I. Safety checklist and CNC Lathes setup.	5
II. Planning for programming CNC Lathes.	10
III. Programming from print and sample parts for the Lathe	15
IV. Tooling for CNC Lathes.	5
V. Edit/troubleshoot programming and process errors.	10
VI. Process, programming, and operation for CNC Lathe.	15

PROGRAM TITLE: Engineering Technology Specialization Tract:

COURSE TITLE: CNC Programming I I

CIP NUMBER: 1615.061300 AS

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

12.0 DEMONSTRATE PROFICIENCY IN THE PRINCIPLES, CONCEPTS AND APPLICATIONS IN METAL FABRICATION METHODS - The student will be able to:

12.01 Understand professionalism in the manufacturing environment.

12.02 Understand, use and work with precision numbers.

12.03 Interpret mechanical drawings.

12.04 Demonstrate the use of geometric dimensioning and tolerancing.

12.05 Understand materials, and machining processes.

12.06 Demonstrate safe use of hand and power tools.

12.07 Identify the use and process in part layout.

12.08 Demonstrate a working knowledge of metal forming equipment.

12.09 Demonstrate the use of precision steel rulers.

12.10 Demonstrate the use of oxy - fuel cutting.

12.11 Demonstrate acceptable methods in tungsten inert gas welding.

12.12 Demonstrate acceptable methods in gas metal arc welding.

12.17 Demonstrate acceptable methods to use a dial indicator.

12.18 Explain the use of a height gauge to measure stock.

12.19 Identify aircraft sheet metal tools.

12.20 Demonstrate acceptable methods hand cutting and forming sheet metal.

12.21 Demonstrate the use of layout sheet metal tools.

12.22 Demonstrate acceptable methods using micro-counter sinks.

12.23 Demonstrate acceptable methods of Riveting solid rivets.

12.24 Identify and demonstrate operation of the pneumatic rivet gun.

12.25 Demonstrate the use of a rivet gauge set.

12.26 Demonstrate acceptable methods using a back rivet set.

12.27 Demonstrate acceptable methods using bucking bars.

12.28 Demonstrate the use of rivet squeezers and dimpling.

12.29 Demonstrate acceptable methods in using a blind riveting.

12.30 Identify the axes on a CNC mill.

LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

NUMBER(S):            TITLES(S):

- 12.31 Demonstrate hand jog features on a CNC mill & CNC lathe.
- 12.32 Demonstrate acceptable methods to use an ironworker.
- 12.33 Demonstrate acceptable methods using a break & shear.
- 12.34 Demonstrate the use of dial calipers.

14.0 DEMONSTRATE PROFICIENCY IN THE SET-UP AND OPERATION OF MANUAL AND CNC MACHINING CENTERS - The student will be able to:

- 14.01 Set up and maintain a manual lathe and mill.
- 14.02 Demonstrate acceptable processes using a manual lathe and mill.
- 14.03 Demonstrate acceptable control of machining processes.
- 14.04 Identify and define the physics of machine cutting metals.
- 14.05 Demonstrate the characteristics of machining cutting tools.
- 14.06 Define and identify parameters of cutting tool life.
- 14.07 Demonstrate efficient parameters in production processes.
- 14.08 Demonstrate the process to drill and layout holes to a specific size.
- 14.09 Identify baseline machining layout.
- 14.10 Identify manual machining procedures used in CNC programming.
- 14.11 Identify grinding machining practices and processes.
- 14.12 Identify thread types and tooling used in machining.
- 14.13 Identify metal alloys and their properties in machining.
- 14.14 Demonstrate job planning procedures in machining.
- 14.15 Demonstrate procedures to calculate cutting tool speeds and feeds.
- 14.16 Demonstrate methods for accessing machine RPM.
- 14.17 Identify coordinate and primary machining axes.
- 14.18 Define and describe Absolute and incremental coordinates.
- 14.19 Identify the five CNC drive components.
- 14.20 Demonstrate rapid travel and interpolation.
- 14.21 Identify coordinate and primary machining axes.
- 14.22 Identify and define industrial machining and turning centers.
- 14.23 Identify processes for program creation and data management.
- 14.24 Demonstrate acceptable procedures in starting CNC machines.
- 14.25 Demonstrate the CNC machine controls for set up and operation.

LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

NUMBER(S):            TITLES(S):

- 14.26 Demonstrate acceptable procedures to set up a CNC Machining center.
- 14.27 Demonstrate acceptable procedures to run programs using a CNC machining center.
- 14.28 Demonstrate acceptable procedures to generate a CNC program.
- 14.29 Demonstrate acceptable procedures in CNC job planning.
- 14.30 Identify cutting tools collets and holding fixtures.
- 14.31 Identify CNC tooling and applications.
- 14.32 Define CNC programming code words and conventions.
- 14.33 Define and demonstrate CNC program fixed cycles.



**Florida Community College  
At Jacksonville**

**Course Learning Outcomes & Assessment  
For All College Credit Courses**

*NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.*

<b>Section 1</b>	
<b>COURSE PREFIX AND NUMBER:</b> <u>PMT 2254</u>	<b>SEMESTER CREDIT HOURS:</b> <u>3</u>
<b>COURSE TITLE:</b> <u>CNC Programming II</u>	
<b>Section 2</b>	
<b>TYPE OF COURSE: (Click on the box to check all that apply)</b>	
<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course
<input type="checkbox"/> AS Professional Elective	<input checked="" type="checkbox"/> AAS Required Professional Course
<input type="checkbox"/> Other _____	<input type="checkbox"/> College Prep
<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)	<input type="checkbox"/> Technical Certificate

**Section 3 (If applicable)**

**INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:**

<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	

**Section 4**

**INTELLECTUAL COMPETENCIES:**

<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively

<b>Section 5</b>		
<b>LEARNING OUTCOMES</b>		<b>METHOD OF ASSESSMENT</b>
1	Safety checklist and CNC Lathes setup.	Hands-on test, quizzes, or written test
2	Planning for programming CNC Lathes	Hands-on test, quizzes, or written test
3	Programming from print and sample parts for the Lathe.	Hands-on exercises, written quizzes or tests.
4	Tooling for CNC Lathes.	Hands-on test, quizzes, or written test
5	Edit/troubleshoot programming and process errors.	Hands-on tests, written quizzes, and tests
6	Process, programming, and operation of Lathes.	Hands-on tests, written quizzes, and tests

**Section 6** Name of Person Completing This Form: Darrell J. High Date: 05/07/07