

FLORIDA COMMUNITY COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: PMT 2261

COURSE TITLE: CAD /CAM I

PREREQUISITE(S): PMT 2254

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 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: 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 <u>PER TOPIC</u>
I. Creation of 2-dimensional and 3-dimensional wire frame drawings.	10
II. Creation of simple 2-D tool paths including contour, pocket, and holes.	10
III. Editing of existing drawings for CAM processing.	10
IV. Instruction on set-up and operation of EMCO CNC machining center.	10
V. Machining strategy and process planning for milling operations.	10
VI. Creation of 3-D surfaces/solids for design and machining.	10

PROGRAM TITLE: Engineering Technology

COURSE TITLE: CAD /CAM 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.
- 14.26 Demonstrate acceptable procedures to set up a CNC Machining center.

LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

NUMBER(S): TITLES(S):

- 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.

15.0 DEMONSTRATE PROFICIENCY IN COMPUTER-AIDED DRAFTING/COMPUTER-AIDED MANUFACTURING (CAD/CAM) SOFTWARE - The student will be able to:

- 15.01 Create CAD/CAM geometry for tool path processing.
- 15.02 Demonstrate procedures to import/export CAD/CAM files.
- 15.03 Demonstrate contouring using CAM tool path commands.
- 15.04 Apply pocketing using CAM tool path commands.
- 15.05 Demonstrate drill cycles using CAM tool path commands.
- 15.06 Demonstrate thread cycles using CAM tool path commands.
- 15.07 Demonstrate engraving using CAM tool path commands.
- 15.08 Construct lettering using CAM tool path commands.
- 15.09 Demonstrate nesting using CAM tool path commands.
- 15.10 Describe procedures for CAM post-processing.
- 15.11 Apply tool path verification for a CAM program.
- 15.12 Apply job set-up procedures for a CAM program.
- 15.13 Demonstrate ability to save, copy, delete, and rename computer files with Windows-based programs.
- 15.14 Create a CNC machining working portfolio.
- 15.15 Demonstrate the use of back plotting in a cam program.



**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.

Section 1	
COURSE PREFIX AND NUMBER: <u>PMT 2261</u>	SEMESTER CREDIT HOURS: <u>3</u>
COURSE TITLE: <u>CAD/CAM I</u>	

Section 2
TYPE OF COURSE: (Click on the box to check all that apply)

AA Elective AS Required Professional Course College Prep
 AS Professional Elective AAS Required Professional Course Technical Certificate
 Other _____
 General Education: (For General Education courses, you must also complete Section 3 and Section 7)

Section 3 (If applicable)
INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

Communications Social & Behavioral Sciences Mathematics
 Natural Sciences Humanities

Section 4
INTELLECTUAL COMPETENCIES:

Reading Speaking Critical Analysis Quantitative Skills Scientific Method of Inquiry
 Writing Listening Information Literacy Ethical Judgment Working Collaboratively

Section 5 LEARNING OUTCOMES		METHOD OF ASSESSMENT
1	Creation of 2-dimensional and 3-dimensional wire frame drawings.	Hands-on test, quizzes, or written test
2	Creation of simple 2-D tool paths including contour, pocket, and holes.	Hands-on test, quizzes, or written test
3	Editing of existing drawings for CAM processing.	Hands-on test, quizzes, or written test
4	Instruction on set-up and operation of EMCO CNC machining center.	Hands-on exercises, written quizzes or tests.
5	Machining strategy and process planning for milling operations.	Hands-on test, quizzes, or written test
6	Creation of 3-D surfaces/solids for design and machining.	Hands-on tests, written quizzes, and tests

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