BLINN COLLEGE Master Course Syllabus Review Summary

MCHN 2003 Fundamental of Computer Numerical Controlled (CNC) Machine Controls

Instructor: Brisco Humes

Technical

Purpose Statement:

Fundamentals of CNC Controls is an introductory course that will assist the student in understanding the relationship between computers and machines in industry and the impact CNC machines have made on every person on the planet. Instruction on machine terminology, theory, part layout and bench work is included. Emphasis will be placed on shop safety, housekeeping and preventative maintenance.

Review One	Review Two

Course Description:

Students will be able to create basic CNC programs that include all necessary codes to safely and efficiently produce multiple parts accurately. Emphasis will be placed on good housekeeping, proper safety procedures and preventative maintenance.

Review One	Review Two

Expanded Description:

1. Safety.
    A. Student will be expected to identify and use properly all Personal Protective Equipment (PPE) required by OSHA or other governing entities and routinely used in commercial machine shops.
    B. Students will be able to identify and take corrective action when they observe an unsafe condition or practice.
    C. Students will maintain a clean and safe work environment at all times, and will follow accepted safety procedures at all times.
2. Print reading and machine shop mathematics.
    A. Students will be able to identify various drawing elements and describe the purpose for each element.
    B. Students will be able to interpret a 2 dimensional drawing and visualize and / or create a finished machined part from the drawing by utilizing standard process planning methods.
    C. Students will be able to use dimensional information given on a print and convert between inch and metric or between fractional and decimal.
    D. Students will be able to use dimensional information given on a print and be able to calculate additional information necessary to complete the finished part to print specifications. Example: Determine X and Y coordinates when given a statement such as “5 holes equally spaced on a 3 inch bolt circle”.
3. Analyze the Bill of Materials (BOM) on a drawing or create one if necessary and procure the appropriate items.
4. Identify different materials used in manufacturing.
    A. Students will be able to evaluate specific properties of materials to determine if is ferrous or non-ferrous, or metal or non-metal and use the information to determine proper feeds and speeds.
    B. Students will be able to select a suitable material for specific applications based on their knowledge of different characteristics for each material.
5. Identify and use appropriate measuring tools in the correct manner, based on size and material of the part and tolerance to be held.
6. Identify the major parts of each machine tool and correctly use proper CNC codes to control the actions of each corresponding part.
7. Operate different machine tools safely and accurately.
8. Use hand tools safely and effectively.
9. Use correct procedure to layout rough material on the bench to prepare for machining.

Review One	Review Two

Credit Hours: 0
Lecture: 0
Lab: 0
Clinical: 0
Practicum: 0
Experiential Education: 0

Review One	Review Two

Prerequisite(s): Completed MCHN 1034/1054

Review One	Review Two

Course Requirements:

Review One	Review Two

Grading Scale:

Letter Grade Points
A =90-100%
B =80-89%
C =70-79%
D =60-69%
F =59% and below

Review One	Review Two

Grading System:
Students should complete all performance tasks on time at REQUIRED MASTERY LEVEL. Tasks, projects, and various assignments will be scored based on time; accuracy; neatness; completeness; procedure; skill; detail; motivation and attitude; safety practices; clean up; care of manuals, logbooks, and references; and other grading criteria. No task shall be rated until assignment is complete. Complete shall include condition and cleanliness of equipment; clean-up of work areas; tool condition and return; all projects, supplies and materials being stored properly.

Review One	Review Two

Assessment:

FUNDAMENTALS OF CNC CONTROLS COMPETENCY PROFILE

STUDENT:

COURSE: **MCHN 2003**

4	**Skilled:**	**Can work independently with no supervision.**
3	**Moderately Skilled:**	**Can perform assignment completely with limited supervision.**
2	**Marginally Skilled:**	**Requires frequent instruction and close supervision.**
1	**No Exposure:**	**No experience or knowledge in this area.**

RATING SCALE:

4	3	2	1	COMPETENCY
				Student wears appropriate PPE at all times
				Student demonstrates a desire to always work in a safe manner without prompting
				Student follows established safety procedures
				Student prepares lathe, chucks part, assembles tooling in timely manner
				Student determines correct feeds and speeds and includes in programs accordingly
				Student performs lathe operation and finishes operation in a safe and acceptable manner
				Student prepares milling machine, clamps part, assembles tooling in timely manner
				Student determines correct feeds and speeds and includes in programs accordingly
				Student performs milling operation and finishes operation in a safe and acceptable manner
				Student prepares drilling machine, clamps part, assembles tooling in timely manner
				Student determines correct feeds and speeds and adjusts drilling machine accordingly
				Student performs drilling operation and finishes operation in a safe and acceptable manner
				Student prepares finished part for inspection and uses the appropriate measuring device to compare the finished part to engineering drawing
				Student uses engineering drawing and appropriate layout tools to prepare a rough part for machining
				Student demonstrates safe practice by periodically cleaning the work area and thoroughly cleans the work area and machine at the end of the class period.

Review One	Review Two

Semester Instructional Schedule:

Course Outline:
I. Introduction to Safety in the Machine Trades
II. Tour of Machine Shop
III. Basic Measuring Tools
IV. Basic Machine Shop Mathematics
V. Basic Machine Shop Print Reading
VI. Tool Sharpening
VII. Lathe Safety and Operation
VIII. Milling Machine Safety and Operation
IX. Drilling Machine Safety and Operation
X. Band Saw Safety and Operation
XI. Job Planning
XII. Part Layout
XIII. Additional Assignments at the Instructors Discretion

Review One	Review Two

Materials:

Review One	Review Two