Syllabus:
Advanced Manual Machining

Subject Code: 172302
Course Number: GM9006
CIP Code: 48.0501
SOC Code: 51-4041

C-TEC of Licking County
150 Price Road
Newark, Ohio 43055
Instructor: Bob Bronkar

Instructor Contact:
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Class Meeting Times:
- Monday – Thursday 5:00 p.m.- 10:00 p.m.

Class Location:
- Classroom 7002

Minimum Hours:
- 185 Hours

Course Prerequisites:
- WorkKeys pretesting, copy of High School Diploma or GED
- Blueprint Reading GM9003 OR test out
- Basic Manual Machining GM9005 OR test out

Required and Recommended Texts and Resources:

Websites for Gathering Information and Research:

Course Description:
The 185 hour Advanced Manual Machining Program provides students with knowledge and skills covering precision machining and complex setups. The student receives advanced precision training in machining skills using lathes, vertical milling machines, surface grinders and other various shop equipment. Students develop advanced skill in working with a variety of metals and various types of cutting tools. Use of precise measuring tools and making accurate setups is taught. Lab projects become increasingly complex and require tighter tolerance as the course progresses. Instruction includes set up and running of machines as well as math and finishing techniques. Successful completion of the course prepares students for entry level positions in general machine shops.
Course Objectives/Outcomes/Sequence:
The course objectives include:

- Preparing students for post-program success, both in the work force and in their educational pursuits.
- Preparing students to process information using higher order thinking skills and to engage in sound decision-making.
- Providing a rich learning environment utilizing research-based methods of instruction, and current resources and materials.
- Maintaining high expectations for all students regardless of educational needs and providing support necessary for achievement.
- Providing a challenging, worthwhile curriculum based on current industry/academic expectations. Specifically and upon successful completion of the program/course for Advanced Manual Machining the students will be able to demonstrate proficiency with:

Section 1, Unit 1- Introduction to Machining
- Machining history
- The role of machining in society

Section 1, Unit 2- Careers in Machining
- Modern machining careers
- Related careers
- Describe the purpose of cutting fluids, and define the types used

Section 1, Unit 3- Workplace Skills
- Personal skills
- Technical skills
- Job seeking

Section 2, Unit 2- Measurement Systems and Machine Tool Math Overview
- Understand English and metric(SI) measurement systems and perform conversions
- Fractions and decimals
- Basic Algebra

Lab work:
- Workbook page 257 project- Jack Screws
- Workbook page 267 project- Compound Clamp
Section 2, Unit 2 - Measurement Systems and Machine Tool Math Overview
- Identify and use properties of basic geometry
- Understanding of angular relationships

Lab Work:
- Workbook page 199 project - Bench Block
- Workbook page 217 project - 1-2-3 Blocks

Quiz 1 - Sections 2 Basic Math, Algebra, and Geometry

Textbook Units Section 2
- Section 2, Unit 2 - Measurement Systems and Machine Tool Math Overview
- Pythagorean theorem
- Cartesian coordinate system

Labwork:
- Workbook page 183 project - Micrometer Stand

NIMS Certification
- NIMS - National Institute for Metalworking Skills
- All students must choose at least 3 from the following Machining Level 1 Credentials:
  - Measurement, Materials, & Safety
  - Job Planning, Benchwork & Layout
  - Manual Milling Skills 1
  - Turning Operations: Turning Between Centers
  - Turning Operations: turning Chucking Skills
  - Grinding Skills 1
  - Drill Press Skills 1

Quiz 2 - Math - Trigonometry
Labwork
- Finish projects
- NIMS Hands-on Tests

NIMS Certifications
- Continued from week 4
Textbook Section 2
- Section 2, Unit 7 - Heat Treatment of Metals
- Discuss common heat treatment processes
- Define different types of equipment used
- Identify and discuss hardness testers and methods used

Lab work:
- Workbook page 243 project - Small Brass Hammer
- Heat treat steel samples and test hardness
- Flame harden tool steel sample

Textbook Section 2
- Section 2, Unit 3 - Semi-Precision Measurement
- Accuracy and precision, discuss difference
- Angular measurement
- Review of semi-precision measurement tools
- Section 2, Unit 4 - Precision Measurement
- What is precision measurement?
- Common precision measurement tools and techniques
- CMM’s and Farro Gages

Lab Work:
- Complete all projects needed for grade
- Start vise project

Grading:
Evaluation of student performance is based upon pupil performance objectives relating to course competencies study. The number of competencies mastered and the degree of mastery is translated into appropriate grades consistent with the C-TEC Board of Education policy on grading guidelines, practices, and procedures.

In the process of evaluation, instructors obtain several grades for each student within the time frame of the program/course. These grades may include, but are not limited to, performance on tests, quizzes, homework, assignments, special research projects, classroom participation, lab competency mastery and/or improvement and the demonstration of positive employability traits.
**Journal Summary:** A journal summary should begin with an introductory paragraph that introduces the main topic of the article and summarizes its content. Following the introduction, several paragraphs should be written detailing insights, implications, and how the information might be applied in your career. In addition, the summary should include your thoughts and opinions concerning the content of the article. Summaries should be approximately 1 1/2 to 2 pages in length.

**Grading Scale**
90-100% - A  
80-89% - B  
70-79% - C<70 = unacceptable  
60-69% - D  
59% or below – F

**Credentialing:**
NIMS Credential Machining 1

**Course Policies:**

- **Disruptive Behavior** – Disruptive behavior of any type is NOT permitted and may result in dismissal from the program. Sleeping during class, tardiness to class, excessive talking during class and disrespectful behavior are examples of disruptive behavior.

- **Plagiarism** – Submitting plagiarized work for an academic requirement is considered academic misconduct. Plagiarism is the representation of another’s work or ideas as one’s own; it includes the unacknowledged word-for-word use and/or paraphrasing of another person’s work, and/or inappropriate unacknowledged use of another person’s ideas.

- **Diversity** - It is the responsibility of the instructor and the students to foster and maintain a harmonious, non-threatening and non-discriminating environment in the classroom. Therefore, all individuals are to be respected as equal and contributing partners of our society.

- **Attendance:** Must maintain at least 90% rate of attendance. You are required to attend all classes. However, you may miss up to 2 classes and still pass the course. Any other absences must be approved by the program supervisor.