Course Syllabus
MFG 110  01
Modern Manufacturing Techniques I
Fall 2016

Faculty: Mr. Stephen Jenkins
Telephone: 443-523-6257
410-677-5144
Email:
Office Hours: By Appointment
Class Time  Lecture: Monday: 5:00 – 6:15  p.m. Parkside High School
Lab: Monday: 6:15 -  8:15  p.m. Parkside High School

Course Description:
Modern Manufacturing Techniques 1 (2 credits)

This course provides students with experience in the use of precision measurement, modern manufacturing techniques and processes, and manufacturing nomenclature, as well as the maintenance of manufacturing equipment. Risk management, Occupational Safety and Health Administration (OSHA) regulations are stressed. American National Standards Institute (ANSI) and American Society of Mechanical Engineers (ASME) standards and statistical process control are introduced. Also covered are the techniques for tool layout and the use of hand tools and bench work, metal-cutting technology, metal-cutting saws, drilling machines, and computerized numerical control (CNC) mill and lathe machines. Speeds, feeds, depth of cuts and the production of parts from blueprints are integrated throughout the course.

Textbook:
Lecture: Walker, John, Machining Fundamentals, Goodheart-Wilcox, 8th ed.
Laboratory: Walker, John, Machining Fundamentals, Goodheart-Wilcox, 8th ed.

COURSE OBJECTIVES, ASSESSMENT GOALS AND ASSESSMENT STRATEGIES

1. Identify safety hazards and use common shop safety equipment with concern for environmental impact.
   A. Participate in a safety lecture and shop safety tour
   B. Successfully review safe practices and complete a teacher made safety test
Assessment Strategy: Exam questions, quizzes and homework. *GEO 2
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Fall 2016

2. Identify and use basic hand tools for semi precision machining  
   A. Successfully complete a lab on the use of hand tools  
   B. Complete a teacher made quiz on the correct use of hand tools  
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

3. Make basic semi-precision dimensional measurements  
   A. Participate in a demonstration showing correct semi precision measurement techniques  
   B. Using a micrometer and mechanics steel scale measure parts to within .005” accuracy  
   C. Complete a teacher made quiz on semi precision dimensional measure  
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

4. Read and correctly interpret semi precision engineering drawings to apply Lean Manufacturing Techniques to operations and processes  
   A. Construct simple products using ANSI standard blueprints.  
   B. Participate in blueprint reading exercises and complete a teacher made quiz on blueprint reading.  
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

5. Perform tool bit grinding and setting for semi precision machining.  
   A. After participation in an assigned reading the student will successfully complete lab research activity to produce a lathe tool bit  
   B. By class 4 the student will successfully produce and resurface throughout the course a lathe tool bit useful to operate a lathe for semi precision metal turning  
Assessment Strategy: Toolbit grinding project review and grade. * GEO 2

6. Perform basic semi-precision layouts.  
   A. The student will complete a reading assignment and successfully attend a lecture showing the completion of semi precision layout techniques  
   B. Given a lecture and reading assignment the student will successfully perform a semi precision layout  
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

7. Prepare materials for machining by selecting speeds, feeds, tooling and other methods  
   A. Given a reading assignment and lecture the student will perform feed and speed calculations  
   B. Given a reading assignment and lecture the student will select tooling as indicated in the assignment and required by the instructor  
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

8. Perform technical manual skills on sawing machines and drilling machines
A. Given a reading assignment and lecture the student the student will pass a teacher made quiz on semi precision sawing and drilling.
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

9. Study and report on Environmentally sensitive clean manufacturing to perform operations on lathes and milling machines using acceptable practices
A. Given a reading assignment and lecture the student will operate industrial quality machine tools to semi precision tolerances (.005”)
B. Given a machine tool, measurement instruments and a blueprint the student will produce parts assigned for course completion within semi precision blueprint specifications
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

10. Identify and use vocabulary needed to address environmental issues of waste disposal and energy efficiency in machine shop operations.
A. The student will maintain a vocabulary list through out the course culminating in 20 words with definitions approved by the instructor.
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2

11. Describe the basic principles of computer numerically controlled machine tools in the use of the basic principles of LEAN Manufacturing and the 5S approach
A. The student will memorize and explain 10 G words
B. The student will memorize and explain 5 M words
C. The student will explain the concept of numerical control programming
Assessment Strategy: Exam questions, quizzes and homework. * GEO 2
*Note: Assessment Strategy There is a required Graded internet assignment. Satisfies GEO 2

Course Requirements

Grading and Exams: Grades will be determined on the basis of tests, weekly laboratory work, project assignments, quizzes, Electronic Library project, and the comprehensive final exam. This course will include a comprehensive final exam. The grading percentages are as follows:

Machining projects 30%
Exam(s) + Quizzes 30%
Assignments/Homework 20%
Electronic Library Assignment 10% Paper as assigned
Final Exam 10% December 9th at PHS at 5:00 p.m

Conversion of numeric average to Final (Letter) Grade:
A 90 – 100
B 80 – >90
C 70 – >80
D 60 – >70
F Below a 60
Electronic Writing and Research Assignment
Students are required to complete an electronic assignment.

TOPIC FOR PAPER. Research the topic “additive manufacturing”. Traditional manufacturing has consisted of “subtractive manufacturing.” Explain (as many as you can) the differences and what impact do these differences have on:

1. Costs of “start-up” to produce a product including the costs of startup equipment.
2. Costs to produce small quantities of manufactured items.
3. Compare the advantages and disadvantages of the traditional method vs the new additive manufacturing method.

Find some articles on this topic and evaluate those articles to explain in a 2 page paper, single spaced. This is a technology course, so your paper should have (near) perfect grammar and content. You may work on your paper in class.

Rubric for grading Electronic Writing Assignment. (GEO 2)

Cover Page
Covers necessary information
Title, name course info, date

Report - show your mastery of the material for this course
Spelling
Thesis statement
Body of report
Intro paragraph-main idea
Accurate
Readability/content
Length
Works cited with proper citations
APA format as defined on Wor-Wies’ website.
Summary required

Works Cited
Minimum # of references

GEO Relevance to GEO 2
Discuss and show the use of higher level Cad skill

Explained relevance to course
Demonstrate your ability to think beyond the limits of this course by writing information that ties this course to your career goal.

Explained relevance to program & self-skills needed to succeed
Tentative Schedule

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<th>Week</th>
<th>Chapters</th>
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*Subject to change

**Blackboard Disclaimer:**
Blackboard is being used as the primary tool for this course. To access course content in Blackboard you need to have access to a computer with an Internet connection. Computers are available on campus in FOH 217, HH 100, GH 304 and FOH 305.
Please follow these directions to access course syllabi and any other materials posted.

Login Information:
1. From the Wor-Wic home page, point to “Quick Links” (top –right) and then click “Blackboard Login.”
2. Enter your Wor-Wic user ID and password (same as your Wor-Wic email user ID and password).

**Academic Honesty Policy:**
Students are required to maintain a high level of academic performance. All work submitted to the instructor will be regarded as the work of the student taking the course. Cheating and plagiarism are defined in Wor-Wic’s Student Conduct Policy found in the College Catalog. Infractions of this policy will result in disciplinary action including failure of the assignment, test, or the course.

**Emergency Information Statement**
In the event of severe inclement weather or other emergency, information about the closing of the college will be communicated via e2Campus and the College's website. Faculty will communicate with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via Blackboard. Students will be responsible for completing all assignments in accordance with class policies.

**Services for Students with Disabilities**
Wor-Wic provides reasonable accommodations for students with disabilities, in compliance with the Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973. If you are in need of accommodations, please contact the counseling office at (410) 334-2899. For more information, see Wor-Wic's Services for Students with Disabilities web page.