COURSE TITLE: Manufacturing Processes and Materials

COURSE NUMBER: ETI 1420

COURSE DESCRIPTION (with prerequisites):
This course provides an overview of the manufacturing processes utilized in advanced manufacturing facilities as well as the materials most likely to be encountered. Students will be exposed to manufacturing machines, automated systems, operating systems, and maintenance. Manpower, skill sets, tools, procurement, production timing, productivity, raw materials, schematics, and engineering documentation will be discussed. This course is one of six courses required for national MSSC-CPT certification. 3 semester credit hours.

NAME(S) OF INSTRUCTORS:
TBA, Teacher Education Building “O”, Room 107, Office hours as posted.

EFFECTIVE ACADEMIC YEAR:
2018-2019

REQUIRED TEXTBOOKS AND INSTRUCTIONAL MATERIALS:

Amatrol eBook, 5085-1C Advanced Manufacturing Program Summary, Volume 1, Copyright 2013 Amatrol, Inc.

GRADING POLICY:
The standing of a student in each course is expressed by one of the following letters and corresponding grading system:
A – 90 – 100
B – 80 – 89
C – 70 – 79
D – 60 – 69
F – 59 or less
The Chipola Catalog provides policies and procedures regarding the grading system. A student’s Grade Point Average is derived from the grading system/quality point scale.

ATTENDANCE AND WITHDRAWAL POLICIES:
Chipola College expects regular attendance of all students, and all instructors record attendance daily. Students who are absent from classes for any reason other than official college activities must satisfy the instructor concerned that the absence was due to illness or other clearly unavoidable reasons. Otherwise, the student may suffer grade
loss at the discretion of the instructor. Chipola policy allows each instructor to specify in the Instructor First Day Handout whether or not an absence is excusable and what affect the absence or tardy may have on the grade.

A student is allowed to repeat a course a maximum of three (3) times. On the third attempt a student (1) must bear the full cost of instruction (unless waived by Student Services), (2) cannot withdraw, and (3) must receive a grade.

MAKE-UP POLICY:
Chipola allows each instructor to specify in the Instructor First Day Handout the makeup policy.

ACADEMIC HONOR CODE POLICY:
Students are expected to uphold the Academic Honor Code. Chipola College’s Honor Code is based on the premise that each student has the responsibility to (1) uphold the highest standards of academic honesty in his/her own work; (2) refuse to tolerate academic dishonesty in the college community; and (3) foster a high sense of honor and social responsibility on the part of students. Further information regarding the Academic Honor Code may be found in the Chipola Catalog, Student Governance section.

STUDENTS WITH DISABILITIES POLICY:
Chipola College is committed to making all programs and facilities accessible to anyone with a disability. Chipola's goal is for students to obtain maximum benefit from their educational experience and to effectively transition into the college environment. Students with disabilities are requested to voluntarily contact the Office of Students with Disabilities to complete the intake process and determine their eligibility for reasonable accommodations.

NOTICE OF EQUAL ACCESS/EQUAL OPPORTUNITY AND NONDISCRIMINATION:
Chipola College does not discriminate against any persons, employees, students, applicants or others affiliated with the college with regard to race, color, religion, ethnicity, national origin, age, veteran’s status, disability, gender, genetic information, marital status, pregnancy or any other protected class under applicable federal and state laws, in any college program, activity or employment.

Wendy Pippen, Associate Vice President of Human Resources, Equity Officer and Title IX Coordinator, 3094 Indian Circle, Marianna, FL 32446, Building A, Room 183C, 850-718-2269, pippenw@chipola.edu.

LIBRARY AND ON-LINE REFERENCE MATERIALS:
The library is a comprehensive learning resource center providing information in print, electronic, and multimedia format to support the educational objectives of the College. On-line catalogs, e-books and electronic databases can be accessed by using the LINCCWeb icon on the Chipola Library website at www.chipola.edu/library. If you have questions about database usage consult the “How to Use the Chipola Databases” on the Library website or call the Library at 850/718-2274 during regular hours. Library
hours are posted each semester at the building entrance and on the Library website. See your Instructor First Day Handout for individual instructor recommendations and resources.

TECHNOLOGY RESOURCES:
The college’s learning management system is Canvas. Classes become available on Canvas on the first day of the semester. It is the student’s responsibility to log onto the Canvas system the first day of class to establish the first day of attendance and to check announcements. All official class communication must be through Canvas. For further information, contact your instructor or the Director of eLearning. The Canvas support hotline is available online in live chat and on the phone, toll-free, at 855-308-2812 for any issues in accessing or utilizing Canvas. The Technology Center, located in the library, is equipped with computer workstations. Lab hours are posted each semester at the building entrance and on the Library website.

FREE TUTORING RESOURCES:
The Academic Center for Excellence (ACE) Lab, located in Building L, offers free tutoring from 8 a.m. to 5 p.m. and is equipped with computer workstations. ACE lab hours are posted each semester at the room entrance and on the website. Additionally, Chipola College has contracted Smarthinking, a Pearson Company, for online tutoring services, accessible especially from 5 p.m. to 8 a.m. and weekends. Smarthinking can be accessed through Canvas.

ELECTRONIC DEVICE USAGE STATEMENT:
Classrooms should be free of all unnecessary distractions from the task of learning. Therefore, as a general rule, students should silence and avoid use of all electronic devices (laptops, phones, tablets, etc.) not being used for coursework. Consult first-day handouts for any specific policies related to the use of electronic devices in the classroom, as they may vary depending upon the nature of the course or the guidelines of the instructor. Faculty reserve the right to regulate the use of electronic devices and their accessories in class.

DISCIPLINE SPECIFIC COMPETENCIES / LEARNING OUTCOMES:
This course examines the major engineering materials used in industry, metallic and non-metallic, in terms of their properties, forming processes used, and their engineering applications.

LINKING COURSE-LEVEL STUDENT LEARNING OUTCOMES WITH DISCIPLINE-SPECIFIC COMPETENCIES, ASSESSMENT METHODS, AND ARTIFACTS

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<tr>
<th>COURSE-LEVEL STUDENT LEARNING OUTCOMES FOR ETI 1420</th>
<th>DISCIPLINE-SPECIFIC GENERAL EDUCATION COMPETENCIES</th>
<th>ASSESSMENT METHODS FOR COURSE LEVEL STUDENT LEARNING OUTCOMES</th>
<th>LEARNING ARTIFACTS FOR AA PROGRAM ASSESSMENT</th>
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Upon the successful completion of this course, students will be able to:

1. Understand the various functions of manufacturing and their complex interrelationships
2. Participate in the production process
3. Read and interpret manufacturing instruments
4. Demonstrate knowledge of the criteria for tool design, maintenance, procurement, and handling.
5. Understand how raw materials are moved, handled, and used in a manufacturing environment.
6. Demonstrate an understanding of the importance and impact of routine maintenance of machines and equipment on operations.
7. Participate in the supply chain process
8. Recognize and work with most materials utilized in manufacturing
9. Exhibit an overall knowledge of the production process

**Assessment Codes**

| 1. Demonstrate an understanding of industrial processes and material properties. |
| 2. Demonstrate ability to generate and interpret computer-aided drawings (CAD). |
| 3. Demonstrate a fundamental understanding of electronics and electricity. |
| 4. Demonstrate an understanding of industrial safety, health, and environmental requirements. |
| 5. Demonstrate proficiency in the use of quality assurance methods and quality control concepts. |
| 6. Demonstrate proficiency in using tools, instruments, and testing devices. |
| 7. Demonstrate math skills appropriate for employees in an engineering work environment. |
| 8. Demonstrate basic troubleshooting skills appropriate for employees in an engineering work environment. |

Assessment methods used are:

Q, T, SD,
MEANS OF ACCOMPLISHING STUDENT LEARNING OUTCOMES:
Assignments will consist of homework problems and reading from the textbook, eLearning materials from Amatrol, hands-on labs performed in class, lab reports, and other assignments at the instructor’s discretion.

ASSIGNMENT AND/OR COURSE OUTLINE

Course Content:
Introduction and Overview of Manufacturing
Nature, Mechanical, and Physical Properties of Materials
Dimensions, Surfaces, and Measurements
Metals, Ceramics, Polymers, and Composite Materials
Fundamentals of Metal Forming
Theory of Metal Machining, Operations, and Tools
Rapid Prototyping and Additive Manufacturing
Processing of Integrated Circuits, Electronics Assembly, and Packaging
Automation Technologies for Manufacturing Systems
Integrated Manufacturing Systems
Process Planning and Production Control
Quality Control and Inspection

Assignments
ETI 1420 Manufacturing Processes & Materials
Assignments will consist of homework problems and reading from the textbook, eLearning materials from Amatrol, hands-on labs performed in class, lab reports, and other assignments at the instructor’s discretion.

A primary focus of this course is the development of the State Curriculum Framework Skills:

- Demonstrate an understanding of industrial processes, predictive maintenance programs, and material properties.
- Generate and interpret computer-aided drawings.
- Demonstrate a fundamental understanding of electronics and electricity, AC and DC Motor and Drive concepts and terminology.
- Demonstrate an understanding of industrial safety, health, and environmental requirements.
- Demonstrate proficiently in the use of quality assurance methods and quality control concepts inclusive of predictive and preventative maintenance theory;
program effectiveness, efficiencies and savings; Lean Operating Systems; Six Sigma; and DMAIC to create variation-free, value-added processes.

- Demonstrate proficiency in using tools, instruments and testing devices.
- Effectively communicate verbally and in writing within a variety of business environments.
- Demonstrate an understanding of modern business practices and strategies and the implications of globalization and the impact of international trade on manufacturing in a competitive environment.

**EXAMINATIONS:**
Assessments are determined by measuring the ability of each student to retain the learning outcomes and objectives of the course.

1. Attending classes
2. Completing book and computer assignments along with laboratory work.
3. Quizzes and tests

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework &amp; Lab Assignments</td>
<td>45%</td>
</tr>
<tr>
<td>Quizzes &amp; Chapter Tests</td>
<td>25%</td>
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<tr>
<td>Notebook, Attendance, etc.</td>
<td>10%</td>
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<tr>
<td>Comprehensive Final Exam</td>
<td>20%</td>
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**CERTIFICATION ALIGNMENT:**
This course is designed to help those interested in testing for the Manufacturing Skill Standards Council Certified Production Technician (MSSC-CPT) Maintenance Awareness exam. When you pass the Maintenance Awareness exam, you receive a certificate (not a certification) that serves as a base for your pursuit of the CPT Certification. To earn your certification, you must submit and pass the Safety, Quality Practices & Measurement, and Manufacturing Processes exams. Individuals must pass all four CPTAE required assessments within two years in order to achieve the full-CPTAE certification. The MSSC-CPT Certification is valid for 5 years.

See your Instructor First Day Handout for individual instructor assignment schedule.