COURSE TITLE: Introduction to Electronics

COURSE NUMBER: EET 1084C

COURSE DESCRIPTION (with prerequisites):
This course provides the foundation for electronic circuits and measurements. Students will study principles of electricity, magnetism, and basic laws of electronics. Course topics will include fundamentals of DC circuits, AC circuits, semiconductors, and digital circuits. The course will integrate the conceptual measurements with the various electronic measuring instruments and their usage in weekly laboratory exercises. This course is one of six courses required for national MSSC-CPT certification. 3 semester credit hours. (5 contact hours.)

NAME(S) OF INSTRUCTORS:
Aubri Hanson, Teacher Education Building “O”, Room 107, Telephone (850) 718-2321, College extension 2321, Office hours as posted, hansona@chipola.edu

EFFECTIVE ACADEMIC YEAR:
2016-2017

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
try, 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.

Karan Davis, Associate Vice President of Human Resources, Equity Officer and Title IX
Coordinator, 3094 Indian Circle, Marianna, FL 32446, Building A, Room 183A, 850-
718-2205, davisk@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 provides an introduction to the basic fundamentals, terminology, and applications used in the electronics industry. The topic coverage will include circuit theory principles, electronic components, transistor usage, amplifiers, power supplies, digital logic techniques, and electronic instruments. Topics include: fundamentals of electricity, current, voltage, resistance, Ohm’s law, electrical measurements, power, DC circuits, magnetism, inductance, capacitance, AC circuits, transformers, semiconductors, integrated circuits, optoelectronic devices, power supplies, amplifiers, oscillators, binary number system, basic logic gates and simplification, printed circuit board fabrication and repair, electronic troubleshooting techniques, etc.

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

<table>
<thead>
<tr>
<th>COURSE-LEVEL STUDENT LEARNING OUTCOMES FOR EET 1084C</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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<tbody>
<tr>
<td>Upon the successful completion of this course, students will be able to:</td>
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<td>Assessment methods used are:</td>
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<tr>
<td>1. Understand electricity and electronics</td>
<td>Demonstrate an understanding of industrial processes and material properties.</td>
<td>Q, T, CF, SD, SP, H, Sk Check</td>
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<td>2. Work with electronic components, circuits and devices</td>
<td>Demonstrate ability to generate and interpret computer-aided drawings (CAD).</td>
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<td>3. Understand AC and DC electric circuit theory</td>
<td>Demonstrate a fundamental understanding of electronics and electricity.</td>
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<td>4. Analyze circuits and utilize circuit models to solve electrical problems</td>
<td>Demonstrate an understanding of industrial safety, health, and environmental requirements.</td>
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<td>5. Apply circuit techniques to semiconductors and discrete components</td>
<td>Demonstrate proficiency in the use of quality assurance methods and quality control concepts.</td>
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<td>6. Utilize measuring instruments and electronic workstations</td>
<td>Demonstrate proficiency in using tools, instruments, and testing devices.</td>
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<td>7. Use computer simulation techniques to analyze electronic circuits</td>
<td>Demonstrate math skills appropriate for employees in an engineering work environment.</td>
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<td></td>
<td>Demonstrate basic troubleshooting skills appropriate for employees in an engineering work environment.</td>
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**Assessment Codes**

| T = Tests | RPT = Report/Presentation | Proj. = Projects |
| Pre/Post = Pre- and Post-Tests | SP = Skills Performance | Exp. = Experiments |
| OT = Objective Tests | SD = Skills Demonstration | Cap. Proj. = Capstone Project |
| UT = Unit Tests | W = Writing Assignments | Cap. Course = Capstone Course |
| Q = Quizzes | E = Essays | Prac. = Practicum |
| F = Final Examination | DE = Documented Essays | Intern. = Internship |
| CF = Cumulative Final | RP = Research papers | H = Homework |
| EX = Departmental Exam | J = Jury | PS = Problem Solving |
| SE = Nat’l or State Standardized Exam | R = Recital | DB = Discussion Board |
| BO = Behavioral Observation | Clin. = Clinicals | CS = Case Study |
| | | CP = Case Plan |
| | | Port. = Portfolio |
| | | Obs. = Teacher Observation |
| | | Sk. Check = Skills Check-off |
| | | Curriculum Frameworks |
| | | JP = Judged |
| | | Performance/Exhibition |
MEANS OF ACCOMPLISHING STUDENT LEARNING OUTCOMES:
1. Learning modules for course theory delivered online.
2. In-class lecture and discussion.
3. Hands-on competency-based labs.
4. Assessments.

ASSIGNMENT AND/OR COURSE OUTLINE
Course Content:
- Electricity
- Current, voltage and resistance
- Ohm’s law
- Electrical measurements and power
- Parallel and series circuits
- Magnetism
- AC and DC circuits
- Inductance, capacitance, and transformers
- Resonance, filters, transistors, diodes, FETs, and thyrisors
- Semiconductors and amplifiers
- Op amps and power supplies
- Analog and digital electronics
- Binary number system, basic logic gates, and simplification
- Analyzing circuits
- Use of circuit models to solve electrical problems
- Basic troubleshooting techniques
- Computer simulation techniques to analyze electronic circuits
- Wire connection and soldering

Assignments
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 a fundamental understanding of electronics and electricity, grounding techniques, and AC/DC theory.
- Solve circuit problems using unit conversion and scientific notation.
• Solve problems involving electric charge, current, potential difference, energy, Ohm’s law, work, and power.

• Solve problems involving series, parallel, and combination resistances.

• Solve problems involving magnetic circuits, inductance, capacitance, reactance, and impedance in circuits.

• Solve AC problems involving peak value, instantaneous value, average value, and RMS value of a sine wave.

• Prepare and complete concise, neat, and accurate lab reports.

**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. Writing lab reports and keeping a course notebook.
4. Quizzes, tests, and comprehensive final exam including practical exam.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Lab Assignments &amp; Reports</td>
<td>25%</td>
</tr>
<tr>
<td>Quizzes &amp; Chapter Tests</td>
<td>25%</td>
</tr>
<tr>
<td>Notebook, Attendance, etc.</td>
<td>10%</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>20%</td>
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</table>

**CERTIFICATION ALIGNMENT:**
This course is designed to help those interested in testing for the Manufacturing Skill Standards Council Certified Production Technician (MSSC-CPT) Quality and Measurement exam. When you pass the Quality and Measurement exam, you receive a college credit 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, Maintenance Awareness, 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.