Wharton County Junior College

Administrative - Master Syllabus
COVER SHEET

***Purpose**: It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.*

Course Title - D.C Circuits
Course Prefix and Number - CETT 1403
Department – Electronics Eng. Tech. **Division -** Technology and Business
Course Type: (check one)
☐ Academic General Education Course (from ACGM – but not in WCJC Core)
☐ Academic WCJC Core Course
☒ WECM course (This course is a Special Topics or Unique Needs Course: Y☐ or N☒)

Semester Credit Hours # : Lecture hours# : Lab/other hours # **4:3:3**

Equated Pay hours for course – 4.5

List Lab/ Other Hours
Lab Hours 3
Clinical Hours
Practicum Hours
Other (list)

Course Catalog Description - A study of the fundamentals of direct current including Ohm's law, Kirchoff's laws, and circuit analysis techniques. Emphasis on circuit analysis of resistive networks and DC measurements. Voltage, current, resistance, Ohm's Law, Kirchoff's Voltage and Current Laws, Thevenin, Norton, Superposition, and Maximum Power transfer theorems. Laboratory use of components, meters, power supplies, and oscilloscope.

Prerequisites/Co requisites - Credit or concurrent enrollment in both CETT1425 and MATH 1314.

Prepared by David Kucera ***Date*** 06/20/12

Reviewed by department head David Kucera ***Date*** 06/20/12

Accuracy verified by Division Chair David Kucera ***Date*** 08/03/12

Approved by Dean of Vocational Instruction or Vice President of Instruction Lac ***Date*** 11-9-12

I. Topical Outline – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non-lecture instruction):

The following performance will be expected of any student completing this course with a passing grade. There is no absolute time limit on the performance of these objectives, unless noted, but the grade received by the student will depend, in part, on the relative speed and precision of the student's performance in these tasks. Where subjective evaluations are indicated, the instructor will make these judgments based on his or her knowledge of the skills required to place a graduate with the expectation of successful on-job performance.

The student will be expected to perform the following tasks in written examination or laboratory demonstration:

- Clearly define work, force, energy, charge, voltage, current
- Write and use the basic formulae relating work, force, distance, charge, voltage, and time
- Correctly convert between all commonly used SI prefixed multipliers
- Demonstrate the ability to use a calculator to solve problems involving scientific and engineering units and metric prefixes
- Determine/read correct meter scale for measurement of voltage, resistance, and current.
- Draw a basic circuit and correctly label the components of the circuit
- Draw the correct symbols for resistors, batteries, capacitors, inductors, connected and non-connected conductors.
- Correctly convert between color-codes and resistor values
- Distinguish between linear and non-linear resistances when give a series of paired voltage-current measurements
- Write and demonstrate correct use of Ohm's Law
- Define resistance in terms of voltage and current
- Calculate resistance when given conductance
- Calculate conductance when given resistance
- Calculate the equivalent resistance of series-connected resistors
- Calculate the current, voltage, and power for each resistor in a series circuit given the voltage source and the value of each resistor
- Demonstrate understanding of Kirchoff's Voltage Law by solving problems requiring use in a series circuit

- Indicate understanding of the relativity of voltage measurements by calculating voltages in a series circuit when the reference point is moved
- Determine of the effect of the size of a resistance on the voltage drop across the resistance in a series circuit
- Calculate the equivalent resistance of parallel-connected resistors
- Calculate the voltage, current, and power for each resistor in a parallel circuit given the voltage source and the value of each resistor
- Calculate the voltage, current, and power for each resistor in a parallel circuit given a current source and the conductance of each resistor
- Write a description of the effect of the size of a resistor on the current through the resistor in a parallel circuit
- Discuss meter loading as a function of the input resistance of a meter
- Given no more than 12 resistors in a series-parallel circuit with no delta or wye connections, and given the source voltage or current, solve for the voltage across and the current through each resistor
- Write and correctly solve the voltage divider formula for three resistors in series

II. Course Learning Outcomes

Course Learning Outcome	Method of Assessment
Apply safety techniques while working on and troubleshooting various circuits and components; Interpret color codes and other descriptors used in electronics Identify various sources of electricity in DC circuits Interpret characteristics of voltage, current, resistance, and power in DC circuits; Measure voltage, current, and resistance in DC circuits using measuring devices; Analyze DC circuits using applicable mathematical formulas such as Ohm's Law, Kirchhoff's Law, and the power formula; Troubleshoot	Assessed in Capstone Experience: CETT 2370 Final Project course

III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.

An appropriate electronics text covering DC Circuits. Example-Principles of Electronic Circuits by Floyd 9th edition.

Calculator – scientific with Sine, Cosine, Tangent capabilities..

IV. Suggested Course Maximum – 30 Lecture 15 Laboratory

V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.

Lecture facilities for 30 students. Laboratory facilities for 18 students must include 9 bench positions each with a digital meter, logic probe, 20 MHz oscilloscope and probes, breadboarding facility with power supply and signal generator, and a stock of basic AC circuit components.

VI. Course Requirements/Grading System – Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course

Evaluation of Performance:

Course grades will be determined by the percentage of course objectives for which the student can demonstrate mastery and by attendance as stated in the Departmental Policy sheet provided to the student. Mastery of course objectives will be determined by written examinations, an attendance grade as described in the Departmental Policy handout, a daily work grade which will include graded homework, graded laboratory work, and a comprehensive final exam.

Approximate Grade Evaluation Summary:

Major tests 60%
Attendance.....10%
Lab reports, homework, and quizzes. 15%
Comprehensive Final examination 15%

VII. Curriculum Checklist

☐ - **Academic General Education Course** (from ACGM – but not in WCJC Core)
No additional documentation needed

☐ - **Academic WCJC Core Course**
Attach the Core Curriculum Checklist, including the following:

- Basic Intellectual Competencies
- Perspectives
- Exemplary Educational Objectives

☒ - **WECM Courses**
If needed, revise the Program SCANS Matrix & Competencies Checklist.