El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	**Advanced Technology Industrial Manufacturing**
COURSE RUBRIC AND NUMBER	**CETT 1302**
COURSE TITLE	**Electricity Principles**
COURSE CREDIT HOURS	**3 2 : 2** **Credits Lec Lab**

I. Catalog Description

Principles of electricity including proper use of test equipment, A/C and D/C circuits, and component theory and operations. **(2:2).**

II. Course Objectives

Upon satisfactory completion of this course, the student will be able to:

A. Safety
1. Perform safety and environmental assessments.
2. Utilize effective, safety-enhancing workplace practices.
3. Explain electrical principles such as electrical shock hazard, ground faults, grounding, and bonding.
4. Demonstrate electrical safety principles in the workplace, including lock-out/tag-out.
5. Identify types of personal protective equipment for various work environments and identify hazardous locations.
6. Apply common-sense rules for working safely.

B. Getting Started
1. Identify common components and symbols used in electricity.
2. Examine test equipment, including digital multimeter, clamp-on ammeter, megohmmeter, and oscilloscope.
3. Explain the importance of engineering notation when taking electrical measurements.

C. Basic Electrical Concepts and Components
1. Explain atom theory and its relationship with electricity.
2. Describe the electrical properties of electricity such as current, voltage, and resistance.
3. Examine types of materials used as conductors, insulators, and semiconductors.
4. Identify resistors and show how to interpret the resistor color code.
5. Identify different DC power sources such as batteries, and explain conventional and electron flow.

D. Ohm's Law and Power
1. Calculate electrical values using Ohm's law in basic resistive electrical circuits.
2. Explain how to calculate electrical power and efficiency.

3. Demonstrate how to use the multimeter to measure current, voltage, and resistance.

E. Series and Parallel Circuits
1. Examine the electrical properties of series circuits and explain Kirchoff's Voltage Law (KVL).
2. Perform Ohm's law in series circuits and use the multimeter to demonstrate results.
3. Identify the electrical properties of parallel circuits and explain Kirchoff's Current Law (KCL).
4. Perform Ohm's law in parallel circuits and use the multimeter to demonstrate results.
5. Examine series-parallel circuits using Ohm's law.

F. Magnetism
1. Explain the characteristics of magnetism and electromagnetism.
2. Examine electromagnetic relays: an application of electromagnetic principles.
3. Demonstrate the operation of electromagnetic relays including the memory function.

G. Inductance and Capacitance.
1. Identify the different types of inductors and capacitors.
2. Study inductance and capacitance in DC circuits.
3. Demonstrate series and parallel inductors, and perform calculations.
4. Interpret series and parallel capacitors, and perform calculations.

H. Alternating Current
1. Study alternating current (AC): Overview and time measurements.
2. Explain waveform magnitude.
3. Identify sine waves: Phase and instantaneous values.
4. Examine rectangular waves.

I. Inductive and Capacitive Circuits
1. Study series and parallel RL circuits, and identify inductive reactance (X_L).
2. Study series and parallel RC circuits, and identify capacitive reactance (X_C).
3. Examine series and parallel LC and RLC circuits.

J. Three-Phase Power
1. Describe inductive Wye (Y) and Delta (Δ) circuits.
2. Identify Wye-Delta and Delta-Wye circuits.
3. Estimate power and power factor.

K. Introduction to Transformers.
1. Explain transformer voltage, current, and power.
2. Identify transformer winding configurations.
3. Examine three-phase power transformer configurations.

III. THECB Learning Outcomes (WECM)

Upon successful completion of this course, students will:

1. Identify basic principles of electricity (A/C and D/C), voltage, current, and circuitry.
2. Apply Ohm's law to electrical calculations.
3. Use test equipment to measure continuity, voltage, and current values.
4. Use electrical safety principles.

IV. Evaluation

Students must demonstrate the knowledge and skills stated in the objectives in order to complete the course. Exams, quizzes, and lab assignments will be determined by the instructor.

The final grade report will be based on the percentage of the total points earned.

90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

Students should be able to compute their grade average anytime during the course. Missed assignments and make-up tests will be given at the discretion of the instructor.

V. Disability Statement (Americans with Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

VI. 6-Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit, and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.

VII. Title IX and Sex Discrimination

Title 9 (20 U.S.C. 1681 & 34 C.F.R. Part 106) states the following "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any educational program or activity receiving Federal financial assistance." The Violence Against Women Act (VAWA) prohibits stalking, date violence, sexual violence, and domestic violence for all students, employees and visitors (male and female). If you have any concerns related to discrimination, harassment, or assault (of any type) you can contact the Assistant to the Vice President for Student and Enrollment Services at 915-831-2655. Employees can call the Manager of Employee Relations at 915-831-6458. Reports of sexual assault/violence may also be reported to EPCC Police at 915-831-2200.