



Course Syllabus

Course #: EET-1050 Course Name: Electricity I

Division: Engineering and Industrial Technologies

Class Days: Class Time:
Location: Classroom: Laboratory:
Credit Hours: 3 Contact Hours: 4 Lab Hours: 2 Lecture Hours: 2

Instructor: Office Location:
Phone: Email Address:

Office Hours: TBD

Division Office/Location: Engineering Building Division Fax: 419-334-2300

Full-time Contact Person: Jayne Bowersox Phone(s): (419) 559-2410

Course Description: This is an introductory electricity course for Industrial Electricity, Electronics, Integrated Manufacturing/Robotics majors, and skilled trades personnel. A study of DC and AC electricity concepts, with a practical approach to applications in an industrial environment. The course will cover basic electrical theory, terminology, applications, troubleshooting and safety aspects of electrical circuits and components. This class will be structured with both lab and lecture.

Prerequisite(s): None

Corequisite(s): None

Entry Level Skills and Knowledge:

Basic math skills including scientific notation and simple algebra

Required Texts, Supplies and Equipment:

TEXT: ELECTRICITY AND ELECTRONICS FUNDAMENTALS FOR INDUSTRIAL MAINTENANCE by Thomas Kissell

Scientific calculator with engineering notation

Jumper leads with insulated alligator clips

Grading:

- Test 1
Test 2
Test 3
Lab Test 1
Lab Test 2
Quiz Average
Final

Grading:

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

Learning Outcomes:

Upon completion of the course, the student should be able to:

- Be familiar with safety and fundamental concepts of electricity.
- Know how to correctly use the resistor color code.
- Be familiar with the principles of induction and magnetism.
- Know how to determine inductive reactance.
- Be familiar with capacitance and capacitive reactance.

- Use ampacity tables to determine wire size in accordance with NEC.
- Connect components in a series circuit.
- Connect components in a parallel circuit.
- Use a VOM meter to measure voltage resistance and current.
- Explain why an oscilloscope is used to measure both AC voltage and frequency.
- Make single phase transformer connections and explain the theory of operation.
- Perform basic voltages current and resistance calculations using OHM'S Law.
- Recognize basic electrical symbols as standardized by IEEE and ANSI
- Explain the basic theory of operation of a programmable logic controller. (PLC)
- Explain how inputs and outputs are interfaced to PLCs.
- Apply basic troubleshooting concepts and practices.
- Become familiar with the following digital logic functions: AND, OR, NOT, NAND, NOR, XOR, and Timers
- Apply both digital and relay logic in the basic programming of a PLC.

Assessment of Student Learning:

Assessment Project and Measurement in course (if any):

Plan of Work:

<u>Week</u>	<u>READING</u>	<u>ACTIVITY</u>
1	1-10	Safety and Fundamental Concepts of Electricity
	23-26	Fundamentals of Electricity
2	33-42	Voltmeters, Ammeters, Ohmmeters.
	43-45	Principles of Series Switches
	61-63	Principles of Parallel Switches
3	46-51	Resistance and Resistors
	166-167	Conductors, AWG and Ampacities
4,5	51-59	Ohm's Law and Series Circuits
		Kirchhoff's Voltage Law and Voltage Dividers
6		WRITTEN TEST 1 AND LAB TEST 1
7,8	63-67	Parallel Circuits and Kirchhoff's Current Law
9		WRITTEN TEST 2 AND LAB TEST
10,11	68-72	Series-Parallel Circuits and Loading Effect

12		WRITTEN TEST 3	
	73-83	Principles of Induction and Magnetic	
13	85-95	AC Fundamentals	
	101-108	Transformer Fundamentals	
	119-130	Relays and Solenoids	
14	231-250	Introduction to Programmable Logic Controllers	See below table
	254-259	Allen-Bradley PLC input and output instructions	
15	250-252	Allen-Bradley PLC timer instructions	
	252-253	Allen-Bradley PLC counter instructions	
		Troubleshoot PLC using : LEDS, status lights, and cursors	
		Design problem to accomplish a give task	
16		FINAL EXAM	

PLC Lab Exercises

Allen Bradley MicroLogix 1000

Lab 5	One input and one output Pg. 25
Lab 6/7	Multiple inputs and Outputs Pg. 33/39
Lab 8	ON delay type timers Pg. 45
Lab 9	Off delay type timers Pg. 52
Lab 8	Retentive type timers Pg. 45
Lab 10	Counters Pg. 59
OPTIONAL LABS	
*Lab Auto resetting timers	
*Lab Sequencers	

Week	Lab #	Lab topic
1		
2	1	Using A Meter
3	2	Series and Parallel Switches
		Cont.
4	3	Resistor Color Code and Potentiometers
4	4	Series Circuits and Ohms law
5	4a	Advanced Series Circuits and Ohms law
6		WRITTEN TEST 1 AND LAB TEST 1
7,8	5 & 5a	Parallel circuits
9		WRITTEN TEST 2 AND LAB TEST 2
10,11	6	Series-Parallel Circuits
12		Written Test 3
13	8	Operation of the Oscilloscope and A.C. Fund.
13	10	Single Phase Transformers
13	9	Relays and Solenoids
14	11	PLC Lab 5,6
14	12	PLC Lab 7,8
165	13	PLC Lab 9,10

Course Requirements:

Complete all assignments as required

Policies

Course Withdrawing: If for any reason you need to withdraw from this course, be certain that you do so according to College procedure. It is your responsibility to know and follow this procedure. If you simply stop coming to class, without officially withdrawing from the course, your grade is an automatic “F.” Please follow official College procedure for withdrawing from this or any course.

College Academic Policies are located in the College Catalog. A copy of the current catalog may be picked up in any of the division offices or admissions. The list of college policies is also available online at <https://www.terra.edu/register/Collegecat/policies.asp>.

Support Services: The College offers a number of support services to assist in your success in this course and all courses. Among these services are the Writing & Math Center in B105, the Office of Learning Support Services, which coordinates the campus disability services and tutoring programs, the computer labs, and the computers in the atriums.

Any student who feels he/she may need an accommodation based on the documentation of a disability should contact the Office of Learning Support Services privately to discuss his/her specific issues. Please contact the OLSS at (419) 334-8400 X 208 or visit 100 Roy Klay Hall (Building A) to coordinate reasonable accommodations.

If you have a documented disability and are receiving academic accommodations through the Office of Learning Support Services, please schedule a meeting with your instructor in a timely manner so that we may discuss how these services will be arranged.

Tutoring services are available to students beginning the second week of every quarter. Students requesting tutoring services should obtain a tutor request form from the OLSS in 100 Roy Klay Hall (Building A) or online at the Terra website. Please note that instructor verification and acceptance of the Student Learner Agreement is necessary for all tutoring requests. All requests should be submitted to 100 Roy Klay Hall (Building A).