

SYLLABUS

Your Course Learning Plan

### COURSE: ELT 101: Basic Electricity: AC/DC

**INSTRUCTOR: Drew Lindsey** 

TIME & DAY/ TIME FRAME: August 18, 2014 to December 6, 2014; class runs from 1:15 PM to 3:00 PM on Mondays and Tuesdays (Mondays: hydrid for non-JTED students)

#### A. Instructor Contact & Communications

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Classroom Location:	CVAG58 Room 164
YC Email Address:	drew.lindsey@yc.edu
Office/Campus Location:	CVAG58
Office/Lab or Online Hours: (if applicable)	TBD
Separate Web Address: (if available)	N/A

#### B. General Course Information, Content, & Learning Outcomes

Course Purpose & Credit Hours:	Course for Electric Utility Technology certificate provides students with a foundation in AC/DC electronics.	
	This course is on a General Education list	
General Education:	<ul> <li>X This course is not on a General Education list</li> <li>** S/U grading is not an option for courses applied to the Arizona General Education Curriculum (AGEC).</li> </ul>	
Course Description:	Basic principles of Alternating Current (AC) and Direct Current (DC) electricity. Examination of the structures and functions of AC and DC circuits including series, parallel and series-parallel circuits. Includes an overview of electric systems and their applications in the utility industry. Three lecture. Two lab.	
Prerequisite/Co-requisite:	None	
1. Basic principles of electricity: the atom, electric current, conductors and insulators, uses in the utility industry         2. Electric circuits: pressure, power, energy, Ohm\222s Law         3. Building DC circuits         4. Electric systems: generating, transmission, sub-station an distribution systems		
Learning Outcomes:	Upon successful completion of this course, the learner will be able to: 1. Identify and explain the basic principles of AC and DC	

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electricity. (1)		
	2. Explain the uses of electricity in the utility industry. (1)	
	3. Identify and describe the structure and function of the various types of electric circuits. (2)	
	4. Outline the basic principles of Ohm\222s Law. (2)	
	5. Identify and use the necessary components to build series	
	circuits. (3)	
	6. Identify and use the necessary components to build parallel	
	circuits. (3)	
	7. Identify and use the necessary components to build series-	
	parallel circuits. (3)	
	8. Describe the structure and function of electric generating stations.	
	9. Explain the functions of electric transmission circuits. (4)	
	10. Identify and describe the functions of electric sub-stations. (4)	
	11. Identify and explain the major components and functions of	
	electric distribution systems. (4) Worksheets	
Assessment Measures	Unit exams	
	Lab experiments Final exam	
	Workshoots: 14 @ 10 points each: 10 points for 70% correct: 0	
	Worksheets: 14 @ 10 points each; 10 points for 70% correct; 0 points for less than 70% correct.	
	<u>Unit exams:</u> 14 @ 50 points possible each; percentage score	
	equals number correct divided by total possible.	
	Lab experiments: 15 @ 20 points each; 10 points for 75% correct;	
	0 points for less than 75% correct.	
	<u>Final exam:</u> 100 points possible: percentage score equals number	
	correct divided by total possible	
	Worksheets: 140 points possible	
	Unit exams: 700 points possible	
Grading (credit) criteria:	Lab experiments: 300 points possible	
Cruaing (creat) criteria.	Final exam: 100 points possible	
	Total points possible: 1,240	
	Grading: $A = 1,116-1,240$ points (90%)	
	B = 992-1,115 points (80%)	
	C = 868-991 points (70%)	
	D = 744-867 points (60%)	
	F = 743 or less	
	I will do my best to respond to email, voice mail within 24 hours during the week. I	
	will return graded assignments within 7 <u>days after the scheduled due date</u> . If you	
	have questions regarding an assignment, contact me <u>prior to the due date</u> so your	
	question can be answered in a timely manner.) ISCET online learning course ESA-1 and ESA-2	
C. Textbooks, software, supplies,	Safety glasses Scientific calculator	
equipment and/or tools		

# Student Resources (as applicable)

Campus Resources:	Campus Resources available through Student Services ( <u>http://www.yc.edu/v4content/student-services/default.htm).</u>
myYC Portal:	<ul> <li>All Yavapai College students will be required to use the <i>myYC</i> Portal to register, add, or drop classes online at <u>http://my.yc.edu/</u>. First-time students will create a log-on username and password. The <i>myYC</i> Portal includes: <ul> <li>Links to your College email</li> <li>Your degree audit system – <i>DegreeWorks</i> – to track your progress</li> <li>Registration information - also your schedule</li> <li>View transcripts, update information, and more!</li> </ul> </li> <li>For assistance with the Portal, go to <u>http://portalinfo.yc.edu/support.asp</u></li> </ul>
Student Email Accounts:	Yavapai College requires enrolled students to have an e-mail address to which official College communications can be sent called 'Scholar', accessed by clicking on the email icon in your <i>myYC</i> portal.
	Students are expected to check their Yavapai College Scholar account for college- related information and for class information and announcements, as directed by the instructor. For assistance, go to <u>http://www.yc.edu/content/myyc/emailinfo.htm</u>
	Students may elect to forward their e-mail to an address different from their official Yavapai College account (see instructions on website), but assume full responsibility for reading e-mail at the forwarded location.
Library Services:	Library services are available at the Prescott and Verde Valley Campuses. Both are members of a countywide library network, which provides access to a wide range of information and resources at libraries throughout Yavapai County. Both libraries also include public computer access.
Learning Centers & Tutoring:	Learning Centers are available on both the Prescott and Verde Valley Campuses. These centers provide a variety of learning support for students including tutoring, adaptive computer and learning equipment for students with disabilities, and a networked general computer lab for registered students. Please call for details: Prescott - 776-2085, or Verde Valley – 634-6562. Web link: http://www.yc.edu/v4content/learning-center/
Online resources and services:	Online writing tutoring for any academic subject is available at <a href="http://www.yc.edu/v4content/learning-center/">http://www.yc.edu/v4content/learning-center/</a>
Open Computer Labs:	Most campuses have open computer lab hours for currently-enrolled students. Please check your campus site for availability and schedules.

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	Monday, September 1st – Labor day (no class)
Uslidaus & Clasuraa	Tuesday, November 11, 2013 – Veteran's Day (no class)
Holidays & Closures:	Fall break for high schools (October 6-10) no classes
	Wednesday through Friday, November 26 <sup>th</sup> – 28 <sup>th</sup> – Thangsgiving Break
Important Dates:	Instruction Begins – August 18, 2014
<u>important Dates</u> .	Last Day to Add/Drop Regular class –August 24, 2104
	Last Day for 100% refund – August 24, 2014
	Last Day of Student-initiated Withdrawals (no refunds) – October 13, 2014 Last Day of classes – December 6, 2014
Institutional Policies ar	nd Instructor Procedures
Attendance:	
Attendance:	Students are expected to attend and participate in all class meetings, laboratories, and field trips. A student who expects to be absent due to
	another school-sponsored activity or compelling personal reason must make
	prior arrangements with the instructor. All course work must be made up as
	directed by the instructor. A student who does not adhere to instructor and
	College attendance requirements may be dropped from the course as defined in the Yavapai College General Catalog.
	A student-initiated drop date is established by the College. For Fall semester
Course Withdrawal:	2013, this date is <b>Monday, October 13th, 2014.</b> <u>Students are responsible to</u>
	drop a class through the Self-Service option on the <i>myYC</i> Portal. If you have not
	withdrawn from a class by the student-initiated drop date, you will receive the letter grade earned in the course at the end of the semester. An instructor may
	withdraw students from class after the student-initiated date. If a student does
	not follow official procedures for withdrawing from a course, failing grades may
	be posted on your student permanent record.
Satisfactory (S)	An "S" grade is defined as equivalent to a grade of "C" or better on the
Unsatisfactory (U) Grades	conventional grading scale of A-F. A course completed with an "S" grade
	indicates appropriate subject area knowledge to satisfy the prerequisite requirement of a related higher-level course.
	Specified courses are graded only S/U. Students who prefer the S/U grading
	option must notify the class instructor. Conditions of
	Satisfactory/Unsatisfactory (S/U) grading:
	• Since some college and universities limit the number of credits completed with S/U grading that will transfer, or restrict the way that such credits may
	be applied to degree requirements, it is recommended that students
	preparing to transfer select the S/U grading option only for elective courses.
	• A maximum of twelve (12) hours of "S" credit from 100- and 200-level
	<ul> <li>courses may be applied toward Yavapai College graduation requirements.</li> <li>S/U grading is not an option for courses applied to the Arizona General</li> </ul>
	Education Curriculum (AGEC).
	• S/U grades are not computed in the student's Yavapai College grade point
	average.

Academic Integrity:	Honesty in academic work is a central element of the learning environment. It will be assumed that you will present your own work. The presentation of another individual's work as one's own or the act of seeking unfair academic advantage through cheating, plagiarism or other dishonest means are violations of the College's Student Code of Conduct. Definitions of plagiarism, cheating, and violation of copyright and penalties for violation are available in the Yavapai College Student Code of Conduct (http://www.yc.edu/v4content/student-services/code-conduct.htm)
Student Code of Conduct:	Respect for the rights of others and for the College and its property are fundamental expectations for every student. The "Code of Conduct" outlines behavioral expectations, and explains the process for responding to allegations of student misconduct.
	Students are expected to respond and write in a professional and appropriate manner when activities are assigned to create scenarios, discuss opinions, present on a selected subject, or post to the web discussion board. Inappropriate language or objectionable material will not be tolerated and could result in disciplinary measures and/or a failing grade for the class.
	Web link for the Student Code of Conduct – http://www.yc.edu/v4content/student-services/code-conduct.htm
Internet Downloading:	Yavapai College technological equipment and resources must be used in accordance with the Copyright Guidelines. Use of Yavapai College equipment and resources to illegally copy, download, access, print or store copyrighted material or download pornographic material is strictly prohibited. For example, file swapping of copyrighted material such as music or movies is strictly prohibited. Users found to violate this policy will have their privileges to use Yavapai College technological equipment and resources revoked.
Disability Resources:	Yavapai College is committed to providing educational support services to students with documented disabilities. Accommodations for a student must be arranged by the student through the Disability Resources Coordinator (Prescott Campus: 928-776-2079 or Verde Valley Campus: 928-634-6563).

Cell Phone, Pages & Texting:	Yavapai College is committed to providing a quality learning environment. All cell phones and pagers must be placed in a non-audible mode while in classrooms, computer labs, the library, the learning center, and testing areas. Cell phones and pagers need to be used outside these facilities. <b>Cell phones</b> <u>must be turned off in the lab</u> . <b>Please turn them off and take them</b> with you to prevent theft. <u>Do not</u> leave them on your desk.
Tobacco Use:	Yavapai College is committed to limiting exposure to the harmful effects of primary and secondary smoke to campus students, visitors, and employees. If you use the facilities at Yavapai College, we comply with ASRS 36-301.01, Smoke Free AZ. Smoking is prohibited indoors and 25 feet from all doors, windows and vents.
	At CTEC the smoking area is designated outside the exterior door nearest the student lounge. NO other areas are permitted for smoking.
	In order to reduce the harmful effects of tobacco use and maintain a healthful working and learning environment, the district prohibits the use of tobacco except in specific areas. Tobacco use on college property is defined as lighted pipes, cigars, cigarettes, and the use of snuff and smokeless tobacco in any form.
Drug & Alcohol Free Environment:	Yavapai College's policy is to provide an environment free of drugs and alcohol. The use of illegal drugs and abuse of alcohol pose significant threats to health and can be detrimental to the physical, psychological, and social well-being of the user and the entire Yavapai College community, and is prohibited.
Additional Instructor Information & Procedures:	LATE WORK: Assigned work (worksheets, labs, review questions and exams) will be accepted after the due date defined in the calendar only if prior notice is given of an absence to the instructor in advance of the class meeting (via e-mail or phone). In other words, if you miss class and don't let me know about it in advance you will not be allowed to make up any work that you missed. Note: All assignments including labs and worksheets are due the next
	<u>class meeting.</u>
Online System & Assignment Requirements	All course materials are available 24/7 at the course shell in Blackboard.

## **COURSE CALENDAR**

Date	Activity	Assessment
8/18/2014	Unit 1: Introduction         • Syllabus         • Electric Utility Technology Certificate         • Lab/safety guidelines         NOTE: All labs and worksheets are due the next         class after they are assigned.	Worksheet 1: Lab/safety guidelines (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
8/19/2014		Pre-test (not a part of your grade)
8/25/2014	<ul> <li>Unit 2: Atomic Theory</li> <li>Atomic particles</li> <li>Laws of attraction/repulsion</li> <li>Directed drift</li> </ul>	Unit 1 Exam (50 points possible) <u>Worksheet 2: Atomic Theory</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
8/26/2014		Lab 2-1: Introduction to lab trainers (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
9/1/2014	<ul> <li>Unit 3: Voltage and current</li> <li>Voltage and current defined</li> <li>Relationship between voltage and current</li> <li>Voltage and current units</li> </ul>	Unit 2 Exam (50 points possible) <u>Worksheet 3: Voltage and current</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
9/2/2014		Lab 3-1: Using a DMM (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
9/8/2014	<ul> <li>Unit 4: Electrical measurements</li> <li>Type of meters</li> <li>How to safely measure V, I and R with a DMM</li> </ul>	Unit 3 Exam (50 points possible) <u>Worksheet 4: Electrical</u> <u>measurements</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
9/9/2014		Lab 4-1: Measuring voltage and current (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
9/15/2014	<ul> <li>Unit 5: Resistance and power</li> <li>Resistance and power units</li> <li>Relationship of R and P</li> <li>Resistor color code and measurements</li> </ul>	Unit 4 Exam (50 points possible) <u>Worksheet 5: Resistance and power</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).

9/16/2014		Lab 5-1: Measuring resistance (20 points possible: 10 for 70% correct, 0 for less than 70% correct). Lab 5-2: The potentiometer (20 points possible: 10 for 70% correct, 0 for less than 70% correct).
9/22/2014	<ul> <li>Unit 6: Ohm's Law</li> <li>Relationship of V, I and R</li> <li>Ohm's Law calculations</li> </ul>	Unit 5 Exam (50 points possible) <u>Worksheet 6: Ohm's Law</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
9/23/2014		Lab 6-1: Ohm's Law (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
9/29/2014	Unit 7: Series DC circuits <ul> <li>Concept</li> <li>Calculations</li> <li>Troubleshooting</li> </ul>	Unit 6 Exam (50 points possible) <u>Worksheet 7: Series circuits</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
9/30/2014		Lab 7-1: Series DC circuits (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
10/6/2014	FALL BREAK – NO CLASS!	
10/7/2014	FALL BREAK – NO CLASS!	
10/13/2014	Unit 8: Parallel DC circuits <ul> <li>Concept</li> <li>Calculations</li> <li>Troubleshooting</li> </ul>	Unit 7 Exam (50 points possible)Worksheet 8: Parallel circuits (10points possible: 10 for 70% correct,0 for less than 70% correct).
10/14/2014		Lab 8-1: Parallel DC circuits (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
10/20/2014	Unit 9: Series-parallel DC circuits <ul> <li>Concept</li> <li>Calculations</li> <li>Troubleshooting</li> </ul>	Unit 8 Exam (50 points possible) <u>Worksheet 9: Series-parallel circuits</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
10/21/2014		Lab 9-1: Series-parallel DC circuits (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
10/27/2014	<ul> <li>Unit 10: Electromagnetism</li> <li>Magnetism and electromagnetism</li> <li>Electromagnetic devices</li> <li>DC and AC motors</li> </ul>	Unit 9 Exam (50 points possible)Worksheet 10: Electromagnetism(10 points possible: 10 for 70%correct, 0 for less than 70% correct).

10/28/2014		Lab 10-1: Safety pin motor (20 points possible: 20 for 70% correct, 0 for less than 70% correct). Lab 10-2: Relays (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
11/3/2014	<ul> <li>Unit 11: Alternating current</li> <li>How alternating current is generated</li> <li>AC transmission</li> </ul>	Unit 10 Exam (50 points possible) <u>Worksheet 11: Alternating current</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
11/4/2014		Lab 11-1: Measuring AC voltage and frequency (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
11/10/2014	Unit 12: Transformers	Unit 11 Exam (50 points possible)
	<ul><li>Transformer theory</li><li>Types of transformers</li><li>Turns ratio</li></ul>	Worksheet 12: Transformers (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
11/11/2014	Veteran's Day – NO CLASS!	
11/17/2014	<ul> <li>Unit 13: Inductance and inductive circuits</li> <li>Inductance</li> <li>Inductance in series/parallel</li> <li>Inductive reactance</li> </ul>	Unit 12 Exam (50 points possible) <u>Worksheet 13: Inductive circuits</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
11/18/2014		Lab 12-1: Transformers (20 points possible: 20 for 70% correct, 0 for less than 70% correct). Lab 13-1: Inductive circuits (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
11/24/2014	<ul> <li>Unit 14: Capacitance and capacitive circuits</li> <li>Capacitance</li> <li>Capacitance in series and parallel</li> <li>Capacitive reactance</li> </ul>	Unit 13 Exam (50 points possible) <u>Worksheet 14: Capacitive circuits</u> (10 points possible: 10 for 70% correct, 0 for less than 70% correct).
11/25/2014		Lab 14-1: Capacitive circuits (20 points possible: 20 for 70% correct, 0 for less than 70% correct).
12/1/2014	Final exam prep	Unit 14 Exam (50 points possible)
12/2/2014		Final Exam (150 points possible)

\*\*\* end of ELT 101: Basic Electricity: AC/DC syllabus \*\*\*