



**I. COURSE DESCRIPTION:**

This is a course in electronics which includes topics such as series, parallel and combination DC circuits, diodes, LEDs, NPN and PNP bipolar transistors used as a switch, logic gates and flip-flops

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Describe TTL and CMOS logic gate technology.
2. Describe the operation of basic logic gates including NOT, AND, OR, NAND, NOR and EXCLUSIVE-OR gates.
3. Identify the schematic symbols both North American and European for basic logic gates.
4. Demonstrate the use of basic logic gates to create digital logic circuits.
5. State the Boolean equations for simple logic gates.
6. Design and test combinational logic circuits using basic logic gates.
7. State the truth table and demonstrate the use of an R,S and D type flip-flop.
8. Demonstrate the use of a logic probe to troubleshoot a digital system.
9. Demonstrate the proper procedure for soldering and de-soldering.
10. State the standard resistor colour code.
11. Connect resistors in series, parallel and combination circuits, complete with voltmeter and ammeter connections.
12. Describe the properties of N and P type semiconductor materials.
13. Describe the and demonstrate operation of the bipolar diode.
14. State current and voltage requirements for silicon diodes, germanium and light emitting diodes (LEDs).

15. Demonstrate requirements for silicon diodes, germanium diodes and LEDs to be forward and reverse biased.
16. Explain the important diode characteristics used when selecting replacement diodes.
17. Describe the operation and biasing requirements of NPN and PNP transistors.
18. Identify the schematic symbols for NPN and PNP bipolar transistors.
19. Describe and demonstrate how a transistor can be use as a switch.
20. Describe the operation of an opto-coupler.
21. State and demonstrate common applications for an opto-coupler.

### **III. TOPICS:**

1. Semiconductors
2. Power Rating
3. Junction Diodes
4. Light-Emitting Diodes (LEDs)
5. The Transistor
6. The Transistor Switch
7. Digital Logic
8. The Bounceless Switch

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Electronics for Electricians  
Stephen L. Herman

**V. EVALUATION PROCESS/GRADING SYSTEM:****The grading weight for the course is:**

Theory 50%  
Lab 50%

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

**VI. SPECIAL NOTES:**Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 703 so that support services can be arranged for you.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.