

ETR 141-123L

Electronics I – Electronic Applications

COURSE OUTLINE

Prerequisites:

ETR 113 or ELE 133. ETR 141 is the lecture portion of the course while ETR 123 is the lab portion.

Course Description:

1. ETR 141, Electronics I (3 CR). Prerequisite: ETR 113. Co-requisite: ETR 123. Introduces electronic devices as applied to basic electronic circuits and systems. Topics include basic electronic device theory and direct applications to analog electronic circuits. Lecture 3 hours per week.
2. ETR 123, Electronics Applications I (1 CR). Co-requisite: ETR 141. Provides laboratory and shop experience as applied to basic electronic devices, circuits and systems with emphasis on practical measurements. This is the laboratory for ETR 141 and is scheduled directly following the 141 class. Assignments will involve construction and demonstration of the circuits discussed in class. Laboratory 3 hours per week.

The major objective of this course is to provide entry level knowledge and skills for a wide range of occupations in electricity and electronics. Our purpose is to assist in the education and preparation of technicians who can effectively diagnose, repair, verify, and install electronic circuits and systems. We will provide a solid and practical foundation in analog electronic concepts, device theory, and modern digital solutions for those who may need or want to go on to more advanced study

Semester Credits: 4 **Lecture Hours:** 8:05 – 9:15 a.m. **Lab/Recitation Hours:** 9:30 – 10:30 a.m.

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



ETR 141-123L

Electronics I – Electronic Applications

Course Outcomes

At the completion of this course, the student should be able to:

1. Re-confirm knowledge of series, parallel, and series-parallel DC and AC circuits
2. Identify and analyze the operation of power supply circuits and components.
3. Analyze circuits using bipolar transistors, field-effect transistors, and integrated circuits.
4. Discuss amplifier applications including their use in audio, video, and RF receiving systems.
5. Explain and analyze the operation of circuits using negative feedback.
6. Discuss the basic oscillator principles and identify common types of oscillators.
7. Construct electronic circuits in the lab and use the voltmeter and oscilloscope to analyze and verify operation.
8. Demonstrate proficiency and teamwork skills in the laboratory

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



ETR 141-123L

Electronics I – Electronic Applications

Required Materials:

Each class session you are required to bring paper, pencil, and a scientific calculator. Please become completely familiar with your calculator functions prior to the beginning of our course – **know your calculator!**

Textbook:

Text: Schuler, Charles A., Electronics Principles and Applications, Eighth Edition. Glencoe/McGraw-Hill Book Company, 2008. ISBN 978-0-07-310694-6

The following supplementary materials are available:

1. ETCAI software applications will be provided on Blackboard for Lab and Homework assignments
2. National Instruments Multi-SIM software will be available in class for circuit construction and analysis
3. A link to download PSpice Schematics software will be provided on Blackboard for Lab and Homework assignments

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



ETR 141-123L

Electronics I – Electronic Applications

Topical Description:

<u>Class</u>	<u>Topic</u>	<u>Text Reference</u>
Week 1	1) Introduction, Course policies and administrative 2) Safety 3) What you should know 4) Chapter 1-2 Overview 5) DC/AC Equivalent Circuits 6) Lab: DC/AC Equivalent Circuits 7) Diodes, types and characteristics—Read chapter and answer questions	Chap. 1-3
Week 2	Power Supplies - rectifier types and filtering	4-1–4-5
Week 3	Voltage multipliers and voltage regulation	4-6–4-10
Week 4	Continuation of Chapters 1-4, Test #1 – Chapters 1-3 and 4(partial)	– – –
Week 5	Bipolar junction transistors - device characteristics and testing Other Transistor Types, Transistor Switches.	5-1–5-5 5-6–5-7
Week 6	Amplifier gain/measurements, Common Emitter Amplifier characteristics and analysis. Other configurations, Simulation and modeling..	6-1–6-5
Week 7	Continuation of Chapters 5-6, Test #2 - Chapters 5-6	– – –
Week 8	Multistage amplifier analysis, coupling methods, FET Amplifiers and negative feedback	7-1–7-5
Week 9	VWCC Spring Break (March 3-10) — No Classes	– – –
Week 10	Power amplifier circuits -- push-pull, Complementary-Symmetry, and class C RF amplifiers.	Chap. 8
Week 11	Operational amplifier, differential amplifiers, inverting and non-inverting amplifiers.	9-1–9-4
Week 12	Operational Amplifier frequency response and applications	9-5–9-7
Week 13	Troubleshooting, Test #3 - Chapters 7-10	Chap. 10
3/29 – 4/5	HS Spring Break—Classes continue at VWCC	– – –
Week 14	Oscillator Circuits.	Chap. 11
Week 15	Electronic Communications/Radio Receivers Electronic Control Devices and Regulated Power Supplies	Chap. 12 Chap. 14-15
Week 16	Comprehensive Final Exam	– – –



ETR 141-123L

Electronics I – Electronic Applications

Notes to Instructors

(List information about optional topics, departmental exams, etc.)

- 1.
- 2.
- 3.
- 4.

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273

