

Engineering Technology –ECET Option

Course Number and name: ET 190 Applied Circuits and ET 191 Applied Circuits Laboratory

Credits & Contact Hours: ET 190 is 3cr. Each week has three lectures of 50 min. each. Total semester contact hours are approximately 45 hr.
ET 191 – the accompanying laboratory section is 1cr. (3p) and meets for 2hr and 40 min each week in one lab session per week

Instructor's name: Thomas Jenkins

Textbook title, author, and year: Principles of Electric Circuits, 9th ed., Floyd, Prentice Hall, 2009;

Specific Course Information:

- a) **Course Catalog Description** – Application of Ohm's law, Kirchoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced.
- b) **Co- or Prerequisite:** Math 190 (Co), ET 191 Lab(Co)
- c) This course is required for both the ECET and MET degrees. Can be taken as a technical elective or physics substitute for CET and IET degrees

Course Goals & Objectives:

To provide the student with basic knowledge and skills relating to principles of AC/DC circuits.

Related ABET Objectives and Outcomes: The department of Engineering Technology and Survey Engineering ECET option has an objective of having its graduates possess the following skills and knowledge.

1. An appropriate mastery of the knowledge, techniques, skills and the modern tools of their disciplines including:
 - **Digital circuit analysis and design techniques**, architecture and applications of microcomputer systems, and the building, testing, operation and maintenance of electronic and computer systems.
 - The use of **Boolean mathematics in support of** the analysis, design, and application of electronic systems.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology;

Course topics and lecture hours devoted to each topic:

TOPICS	HRS.
• Engineering Terminology, methodology, symbology, and notation	3
• Voltage, Current, and Resistance	3
• Series/Parallel Resistive Circuits	3
• Energy and Power	2
• Voltage dividers, current dividers, KVL, KCL	4

• Voltage and current sources	2
• Circuit Theorems, Thevenin's Theorems, Max. Pwr. xfer	5
• Mathematics of matrices and simultaneous equations	3
• Branch, Mesh, Nodal circuit analysis techniques	4
• Capacitors and Inductors in DC and AC	3
• RLC circuit analysis techniques	4
• Transformers	3
• Tests and Quizzes, Review, Problem Solving and Examples	8

Laboratory Projects: There is approximately 14 laboratory sessions per semester. Laboratory exercises are done in conjunction with the text readings and the lecture materials. The laboratories are designed to apply the theory of the analysis with the application of the circuit. Students must take a problem specification, design a digital circuit, construct the circuit, and verify the design by testing with test and measurement equipment. A *formal* lab write-up is required by each group. **Equipment utilized by the students include (but is not limited to):** Digital Multimeters, Oscilloscopes, logic probes, Cadet designer boards (with built-in switches, LED's, function generators), Function generators and power supplies, and various resistors, capacitors, inductors, transformers, wire, et.al.

Example of topics for laboratories might include those topics covered in the ET 190 lecture section

Lab1:

Course Introduction – Safety and Equipment familiarization

Lab procedures and write-up formats

Resistors and the Ohmmeter Measurements

Review the safety lectures via the syllabus links.

Lab 2: Basic Voltage and Current Measurements

Lab 3: Series and Parallel Circuits

Lab 4: Soldering Application Lab

Lab 5: Series/Parallel Circuits

Lab 6: Thevenin's Theorem

Lab 7: Mesh and Node Analysis

Lab 8: Superposition

Lab 9: The Oscilloscope and AC signals

Lab 10: Capacitors in DC

Lab 11: RC and RL impedances

Lab 12: Frequency Response of an RC, RL, RLC Circuits

Lab 13: Phase Measurement with the Oscilloscope

Lab 14: Transformers

Prepared by: Thomas Jenkins

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