Electric Circuits 1, Sect. 001
EE 2350 – Fall 2016
Syllabus, Version 3.0 Aug. 30, 2016

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1 General Information

- **Course ID:** Electric Circuits 1, EE 2350-001, CRN-**16058**
- **Time and Place:** Tuesday and Thursday, 4:30 PM – 5:50 PM in CCSB **1.0202**
- **Required Textbook and Online System:** Electric Circuits 1 EE 2350 has two required resources: (1) the textbook Electric Circuits by Nilsson and Riedel, 10th edition (printed or electronic format); and (2) the MasteringEngineering for Electric Circuits, an online tutorial and homework system, see ID and link below: Course ID **MECABRERA02199**
  http://www.pearsonmylabandmastering.com/northamerica/masteringengineering
- **Prerequisites:** EE 1305, MATH 1312, MATH 2326 and PHYS 2421, each with a grade of *C* or better and department approval. MATH 2326 and PHYS 2421 may be taken concurrently with EE 2350.
- **Instructors Office:** Engineering Annex Building room Eng. Annex A 306
- **Office Hours:** Monday – Friday 11:00 – 12:00 noon. Friday may be canceled if there are conflicting meetings (e-mail or call me first)
- **Teaching Assistant:**
  Name: Ms. Pyra Darshni Office Hours (tentatively) : 11:00 AM – 1:00 PM daily
  Office: Engineering E315A Tel. (915)747-6598
  Lab. to receive students for Office Hours: Engineering E333
- **Use of Softwares** (Matlab, Multisym, etc.): TBD

2 Catalog Description

Theory of electric circuits including circuit variables (voltage, current, power and energy) and elements (sources, resistors, capacitors and inductors), Ohm's law, Kirchhoff's laws, Thévenin and Norton equivalents, node-voltage and mesh-current methods, sinusoidal steady- state analysis and power calculations, and balanced three-phase circuits.

Prerequisites: EE 1305 Introduction to Electrical Engineering, PHYS 2421 Fields and Waves, MATH 1312 Calculus II, and MATH 2326 Differential Equations, each with a grade of *C* or better and department approval. MATH 2326 and PHYS 2421 may be taken con- currently with EE 2350.

3 Student Outcomes

The focus in EE 2350 is the study of electric circuits in the steady-state. The course has the following student outcomes:

Students completing EE 2350 will be able to:

- Understand the terminology used in conjunction with electric circuits and the terminal characteristics of ideal circuit elements. (I)
- Mathematically model electric systems using ideal resistive, inductive, and capacitive elements. (I)
- Apply phasors and impedance transformations to the analysis of electric circuits fed by a sinusoidal input in steady state. (C)
- Apply various systematic methods (node, mesh, terminal equivalency, and circuit theorems) to electric circuit analysis in steady state. (C)
- Apply various circuit analysis techniques to study circuits that include ideal transformer and operational amplifiers. (C)
- Apply various circuit analysis techniques to study energy and power in dc and ac circuits. (C)
- Apply software tools to the analysis of electric circuits in steady state. (C)

4 Contents in the Textbook

- **Chapter 1** Circuit Variables
  International System of Units (SI); overview of circuit analysis; voltage and current; ideal basic circuit element; power and energy.
- **Chapter 2** Circuit Elements
  Voltage and current sources; electrical resistance (Ohm's law); construction of a circuit model; Kirchhoff's laws; analysis of a circuit containing dependent sources.
- **Chapter 3** Simple Resistive Circuits
  Resistors in series; resistors in parallel; voltage-divider and current divider circuits; voltage division and current division; measuring voltage and current; measuring resistance (Wheatstone bridge); delta-to-wye equivalent circuits.

- **Chapter 4** Techniques of Circuit Analysis
  Terms for describing circuits; node-voltage method; node-voltage method and dependent sources; node-voltage method special cases; mesh-current method; mesh-current method and dependent sources; mesh-current method special cases; node-voltage method versus the mesh-current method; source transformations; Thévenin and Norton equivalents; deriving a Thévenin equivalent; maximum power transfer; superposition.
- **Chapter 6** Inductance, Capacitance, and Mutual Inductance
  Inductor; capacitor; equivalent inductance; equivalent capacitance; mutual inductance.
- **Chapter 9** Sinusoidal Steady-State Analysis
  Sinusoidal source; sinusoidal response; phasor; passive circuit elements in the frequency domain; Kirchhoff's laws; series, parallel and delta-to-wye; Thévenin and Norton; node-voltage method; mesh-current method; transformer; ideal transformer; phasor diagrams.
- **Chapter 10** Sinusoidal Steady-State Power Calculations
  Instantaneous power; average and reactive power; root-mean-square (rms); complex power; power calculations; maximum power transfer.
- **Chapter 11** Balanced Three-Phase Circuits
  Balanced three-phase voltages; three-phase voltage sources; analysis of Wye-Wye and Wye-Delta circuits; power calculations in balanced three-phase circuits, etc.
- **Chapter 5** The Operational Amplifier
  The ideal operational amplifier and its inverting and non-inverting configurations; concept of amplification and active circuits; introduction to two-port networks.

COURSE GRADING

• In-class Semester Exams (2-3 in-class exams)	**50%**
• Homeworks, Software Projects, Quizzes	**20%**
• Comprehensive Final Exam, during Final Exams week	**30%**
TOTAL	**100%**

KEY DATES:

Exam 1 almost certain date:	September 27 (Tuesday)
Exam 2 almost certain date:	October 25 (Tuesday)
Exam 3 almost certain date:	November 22 (Tuesday)
Final Exam 3 actual date:	Tuesday, Dec 6th 4:00 pm - 6:45 pm

USE OF E-MAIL: Each student is required to read their officially registered UTEP e-mail account often enough to monitor ongoing information related to this course. All assignments will be sent via e-mail. Treat e-mail correspondence as a professional exchange of

information. Use an accurate "Subject" and never "reply to all" when an e-mail is sent to the whole class.

EFFORT, PARTICIPATION and ETIQUETTE:

- Students that are clearly not doing the homeworks, are failing quizzes and who fail Exam 1 will be dropped from the course by the instructor unless there are extenuating circumstances (let's discuss it).
- Show up on time. Habitual late comers may not be allowed in class without a pre-approved justification.
- Leaving early is considered disruptive due to the limitations of our classroom (no doors in the back). Inform the instructor ahead of time if you must leave early and sit near the door to minimize disruptions.
- Ask questions, your fellow students will also benefit.
- Bring your book to class and/or your laptop, however, keep typing noise to a minimum.
- Turn down the sound on cell phones, beepers, i-pods, etc. during the class period.
- Do not introduce smelly food to the classroom, the Pavlov effect is real!

ACADEMIC INTEGRITY

Please review the statements below and UTEP's Web page on Policy on Academic Integrity at:
http://sa.utep.edu/osccr/academic-integrity/

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another person's as ones' own. And, collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Dean of Students Office for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.
Academic dishonesty is an assault upon the basic integrity and meaning of a University. Cheating, plagiarism, and collusion in dishonest activities are serious acts which erode the University's educational and research roles and cheapen the learning experience not only for the perpetrators, but also for the entire community. It is expected that UTEP students will understand and subscribe to the ideal of academic integrity and that they will be willing to bear individual responsibility for their work. Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be referred to the Dean of Students Office for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.