EE2350 Syllabus Posted Version 3
Electric Circuits I: Spring 2020

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OFFICE HRS.: (tentative)	Monday, Wednesday	11:30-12:20 PM (between two class periods)
	Tuesday, Thursday	11:30-12:20 PM (between two class periods)
	Friday (if no other meetings)	11:00 AM - 12:00 PM (send e-mail or call before to confirm)

CLASS TIME/PLACE: **Section 1: Monday and Wednesday, 4:30 PM – 5:50 PM (CRN: 23450)**
Physical Science Building 314

Required Textbook and Online System: This course requires the Modified Mastering Engineering (MME) online system ISBN-13: 9780134743844 with e-book version of Nilsson-Ridel (Electric Circuits by Nilsson and Riedel, 11th edition) valid for 24 months! There are alternatives that include a paper copy of the textbook:
See link below for MME purchase options from Pearson directly (also available through the UTEP bookstore)
https://www.pearson.com/store/p/electric-circuits/P100002443676?viewAll=true
MME is a digital platform that replicates the office-hour experience with targeted feedback, study resources, and practical learning experiences. To register, you'll need a Pearson course ID from your instructor, or visit your learning management system. You'll get instant access to the digital content.
Pearson course ID here: **MECABRERA6890077**
Link: https://www.pearsonmylabandmastering.com/northamerica/masteringengineering/

Catalog Description (old version on Goldmine): Introduction to systematic methodologies for the analysis of electric circuits in DC and AC steady state. Use of simulation tools for steady state circuit analysis. Can be taken concurrently with PHYS 2421 and MATH 2326
Catalog Description (Updated version): 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.

Pre-requisites: *EE 1305* Introduction to Electrical Engineering, *MATH 1312* Calculus II each with a grade of *C* or better and department approval.

Co-requisite: *MATH 2326* Differential Equations and *PHYS 2421* Fields and Waves, each with a grade of *C* or better and department approval.

Pre- and Co-requisites by topic: calculus and differential equations; Ohm's law and basic circuit element models from Physics 2421, complex numbers and functions; basic familiarity with engineering software tools.

Specific Outcomes for the Course. By the end of the semester the student will demonstrate the ability 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)

COURSE GRADING

- Two in-class Semester Exams (self-prepared notes allowed) (dates to be announced in Homework Handouts), tentatively
  Exam 1: Last week of February or first week of March
  Exam 2: In mid or late April — **45% (*or 30%)**
- Homeworks including exercises on *Mastering Eng.*, MATLAB Projects and Quizzes. — **25% (*same)**
- Comprehensive Final Exam (self-prepared notes) during Exams week — **30% (*or 45%)**

*** Alternative weighting used only if it gives you a higher grade.**
Grades are not negotiable individually but fair adjustments can be made for the whole class.

DROP DAY: After Exam 1 and before Exam 2 can be extended via faculty drop. Students wanting to drop after Exam 2 can do so by asking the instructor to submit a faculty drop. These are usually routinely approved by Chairs and Deans.

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 via blind copy. Treat e-mail correspondence as a professional exchange of information and always use an accurate "Subject" matter. Never "reply to all" (should I forget to use blind copy) when an e-mail is sent to the whole class. In the future, blackboard may replace or duplicate the use of direct e-mail.

COMPUTER USAGE: Matlab, Multisym, etc. More details later.

TOPICS TO BE COVERED FROM THE TEXTBOOK (the exact order, pages and/or sections and subsections will be listed in homework assignment handouts).

- **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 de- pendent 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 5 The Operational Amplifier** (time permitting): The ideal operational amplifier and its inverting and non-inverting configurations; concept of amplification and active circuits; introduction to two-port networks.
- **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** (time permitting): Balanced three-phase voltages; three-phase voltage sources; analysis of Wye-Wye and Wye-Delta circuits; power calculations in balanced three-phase circuits, etc.

EFFORT, PARTICIPATION, ETIQUETTE and DECORUM:

- Students (domestic or international, no exceptions) that are clearly not doing the homeworks, are failing quizzes, and who fail Exam 1 will be advised to drop the course before Drop Day.
- Come to class and show up on time. Habitual late comers may not be allowed in class without a justification.
- Leaving early is considered disruptive and unprofessional, it should be kept to a minimum. Inform the instructor ahead of time if you must leave early and please sit near the door to minimize disruptions.
- Raise your hand and wait for the go-ahead before answering and asking questions or giving comments.
- Use of laptop/smartphone during class is encouraged for the purposes of accessing the e-book, Mastering Engineering, lecture slides, handouts, solutions, etc. but keep typing noise to a minimum.
- Silence cellular phones during the class period.
- The use of ***cellular phones during exams and quizzes*** is strictly prohibited, turn them off and put them away and out of reach.
- Do not bring ***smelly food*** into the classroom. Eating other things during class should be kept to a minimum and done very quietly.
- Use of the ***restroom during exams and quizzes*** should be done under strict rules and with permission of the proctor/instructor (one student at a time, mobile phones should be surrendered, etc.).
- ***NEW Fairness statement*** (version 3): the key fairness criterion for this course is equal opportunity for all students to receive feedback, help, information, scores, handouts, etc., individual requests cannot be accommodated. Difficulty variation for quizzes and exams is adjusted by curving the scores before entering into the final semester score formula. Typically, this means obtaining a score on a scale of 100% by dividing the raw score by a constant S=approximately the 3rd highest score in the class on that Exam or for the total score for all homeworks+quizzes. Grades are not negotiable individually but fair adjustments can be made for the whole class.

ACADEMIC INTEGRITY

Please review the statements below and UTEP's Web page on Policy on Academic Integrity at:
https://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html