EAST TEXAS A&M
College of Science and Engineering

Circuit Theory II

Fall 2026

Course Number: E309 (Mon., Tues., Wed., Thurs. sections 01E, 02E) Instructor Name: Dr. Ike Agbor

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Email: Ike.Agbor@etamu.edu Classroom #: AG/ET #211

Office hours: Tuesday and Thursday 10:30-11:30 AM Lecture Schedule: Monday to Thursday

COURSE DESCRIPTION:

This course is the second of two courses that address DC and AC circuit analysis. The topics include AC circuit analysis techniques, AC power concepts, polyphaser circuits, magnetically coupled circuits, application of Laplace transform in circuit analysis, bode plots, passive filters, and two-port networks. The course has an associated Laboratory experiments set, which will require the use of simulation software and hardware equipment.

COURSE PREREQUISITES/COREQUISITES:

EE 220 with a minimum grade of C.

REFERENCE BOOK(S):

Electric Circuits, 11th ed., by James W. Nilsson and Susan Riedel, ISBN 9780134746968

RECOMMENDED LEARNING MATERIALS:

https://www.analog.com/en/resources/design-tools-and-calculators/ltspice-simulator.html ; https://everycircuit.com/app ; https://www.tinkercad.com/ ; https://dcaclab.com/

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

- Understand Laplace transform, including basic transform rules, derivation of basic transform pairs, inverse transform from s-domain to time-domain using partial fraction expansion.
- Be able to draw s-domain equivalent for RLC circuits and solve using KVL and KCL in the s-domain and transform back to the time domain.
- Know how to draw the s-domain and phasor frequency domain equivalent for sinusoidal steady state analysis of RLC circuits and solve using KVL and KCL in the phasor frequency domain.

- Know how to analyze magnetically coupled circuits with self and mutual inductance using Laplace.
- Define and calculate RLC circuit transfer functions, and calculate poles & zeros, and understand their significance.
- Understand low pass, high pass, bandpass, and band reject filter concepts.
- Be able to use the Fourier transform to analyze RLC filter circuits and be able to plot the response in MATLAB as a function of frequency (i.e., Bode plot, whether log or linear frequency scale).
- Define and calculate instantaneous, average, and reactive power; calculate the power factor for a given load; calculate RMS power.
- Be able to calculate values in decibels (dB).
- Be familiar with two port network analysis.
- Be familiar with balanced three phase circuits.
- Be able to use software tools such as MATLAB, Python, LTSpice, etc. to simulate and analyze circuits.

LAB SAFETY TRAINING:

Student laboratory safety training is delivered through the LMS system (D2L) in coordination with Banner for automatic assignment, tracking, communication, and completion records for all students enrolled in designated labs and/or corequisite courses**. All students in this course must complete the required safety** training **before the first lab session**. Once completed, the training remains valid for the rest of the academic year (through the following August) and must be retaken in subsequent years. This is a mandatory University policy with no exceptions. Failure to complete the training will result in exclusion from all lab activities, including those that contribute to your grade. For additional information, please contact the Office of Environmental Health and Safety at EHS@etamu.edu

GRADING POLICY:

Midterm-Exam + Final Exam	(15+20)%
Quizzes	15%
Assignments/HW/Class-Exercises	20%
Attendance and Participation	10%
Project	20%
Total	**100%**

Final grades in this course will be based on the following scale:

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

Note: This grading policy may be updated as the course progresses.

INSTRUCTIONAL METHODOLOGIES:

Instructional Methods: This course will utilize a combination of lectures, discussions, assignments, problem-solving activities, exercises, course projects, and software-based simulations. Course materials,

announcements, and lecture notes will be posted on the Brightspace (D2L) learning management system.

Coursework Submissions: Unless otherwise specified in the instructions, all submissions (homework, quizzes, etc.) must be completed individually. While you may discuss problems with classmates or collaborate on designated group lab activities, final submissions should reflect your own work.

Late Submissions: Work is due by the posted deadline in Brightspace or as announced in class. Late work will incur the following penalties: 1 day late: 10% deduction; 2 days late: 20% deduction; 3 or more days late: No credit.

Participation and Assistance: Active participation is encouraged. Please ask questions in class, via email, or during office hours. If posted office hours do not work for you, you may request an appointment. You are also welcome to stop by my office at any time; if I am available, I will assist you.

Exams and Quizzes: Exams will be closed book and closed notes unless otherwise specified. You can bring a scientific calculator. The use of cell phones, smartwatches/glasses, or earbuds during exams is strictly prohibited. A makeup exam may be considered only with an official excuse meeting University guideline.

Make-up Assessments: Make-up assessments (labs, quizzes, exams) are generally not offered without valid, documented justification. When approved, make-up work should be completed within one week of the missed assessment, if possible. Early communication is essential, and approval is not guaranteed.

Academic Honesty: The first incident of academic misconduct will result in a zero for the assessment; further violations may lead to a failing grade in the course. All incidents will be reported to the department chair. Academic dishonesty includes but is not limited to: Cheating or prohibited collaboration; Plagiarism or falsifying information/citations; Tampering with equipment, software, or other students' work; Posting course materials online without permission….. If you are unsure whether something constitutes academic dishonesty, consult the instructor before submission.

Use of Artificial Intelligence (AI) Tools

Any use of AI-based tools (e.g., ChatGPT, other chatbots, code generators) must be clearly documented in your submission. Undocumented AI use will be treated as plagiarism and subject to academic dishonesty penalties.

ATTENDANCE POLICY AND DRESS CODE

Attendance will be taken at the beginning of the class. Make-up for a missed In-class assignment may be given only if you contact the instructor before the end of the class and there is a valid reason for the absence.

No. of unexcused absences	< 4	= 4	= 5	= 6	= 7	> 7 and <10
Grade penalty	0%	5%	10%	20%	30%	50%

ADD/DROP:

Students are responsible for checking the academic calendar to verify add/drop deadlines. Course adds and drops are processed online. Courses dropped within the official add/drop period will be removed from the student's record. If a student registers for a course but later withdraws from or fails its prerequisite, the student must drop that course. In some cases, the Registrar may drop the student, but it is ultimately the **student's responsibility to ensure all prerequisites are met** and to withdraw from any course for which they no longer qualify. Students should meet with their academic advisor or department chair to revise their schedule and discuss how the withdrawal or failure of a prerequisite may affect their degree progress.

ACADEMIC SUPPORT:

Please visit: https://www.etamu.edu/trio-programs/student-support-services/

TECHNOLOGY REQUIREMENTS (LMS):

All course sections offered by East Texas A&M University have a corresponding course shell in the 'myLeo' Online Learning Management System (LMS). Below are technical requirements:

LMS Requirements:

https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

ACCESS to LMS AND NAVIGATION:

Students will need a Campus-Wide ID (CWID) and password to access the course. If you do not know your CWID or have forgotten your password, please contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu

Note: Issues with personal computers or internet connections will not be accepted as an excuse for failing to complete coursework on time and to the required standard.

TECHNICAL SUPPORT:

Students experiencing technical issues with any part of the Brightspace LMS should contact Brightspace Technical Support at 1-877-325-7778. Additional support options are available here: https://community.brightspace.com/support/s/contactsupport

ETAMU POLICIES FOR STUDENT CONDUCT, ACADEMIC INTEGRITY

The Code of Student Conduct can be found in the Student Guidebook: http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

For additional information about the ETAMU attendance policy, please visit:

•http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx
•http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

ETAMU definition of academic dishonesty:
•http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf
•http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

ETAMU ADA STATEMENTS (students with disabilities)

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Velma K. Waters Library Rm 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

ETAMU CONCEALED CARRY STATEMENTS

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

SYLLABUS OUTLINE:

Weeks	Lecture Topics
1	Review of Circuit Analysis Techniques
2	RLC circuits and Frequency response, Sinusoidal Steady-State Analysis
3	AC Power in Sinusoidal Steady State
4	
5	
6	Balanced Three-Phase Systems
7	
8	Laplace Transform Applications in Circuit Analysis
9	
10	Frequency-Selective Circuits
11	
12	Active Filter Design
13	
14	Fourier Analysis and Signal Spectra
15	

Note: (1) The instructor may modify, add, or delete any topics anytime during the course. The instructor reserves the right to modify the syllabus during the semester at any time.

(2) Template for Assignments will be separately provided.