EE-309: Circuit Theory-II, Section 1

COURSE SYLLABUS: FALL 2025 (8/24/2025)

INSTRUCTOR INFORMATION

Instructor:	Dr. Sharif, Sheikh
Office Location:	AG/ET #219
Office Hours:	Tuesday and Thursday, 10:30-11:30 AM, or by appointment
Office Phone:	903-886-5960
Office Fax:	903-886-5960
University Email Address:	Sharif.Sheikh@etamu.edu
Preferred Form of Communication:	Email
Communication Response Time:	within 24 hours (weekdays)

COURSE INFORMATION

Class Meeting Schedule:	From 8/25/2025 to 12/13/2025. See course outline
Class and Lab Meeting Dates:	Monday and Wednesday, 12:30 – 1:45 PM
Classroom:	AG/ET #214
Course Format:	This 3-credit course meets for 2.5 hours/week on campus
Textbook Required:	Electric Circuits, 11th ed., by James W. Nilsson and Susan Riedel, Pearson, 2018, ISBN 9780134746968.
Optional References	Fundamentals of Electric Circuits, 6th Edition, by Charles K. Alexander and Matthew N. Sadiku, McGraw-Hill, 2016
Software Required	MS Office, LTspice (free) ….
Optional Texts and/or Materials	Multisim software (available on school computers)

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 the 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

Prerequisites: EE 220 with a minimum grade of C.

Student Learning Outcomes of EE-309:

- 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 the s-domain equivalent for RLC circuits and solve them 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, 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 LTSpice, MATLAB, Python, etc. to simulate and analyze circuits

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COURSE REQUIREMENTS

Minimal Technical Skills Needed

Working knowledge and basic skills in using Microsoft Office products Word, Excel, and PowerPoint.
Working knowledge and understanding of electrical circuits fundamentals covered in EE220.

Instructional Methods

The instructional methods will include lectures (modules), class discussions, course projects, assignments, problem-solving exercises, and simulations using software. Instructions will be based on the course textbook and lecture handouts. Course materials, announcements, and lecture notes will be posted on the course website (D2L).

Tips for Success in the Course

Students must attend classes, participate in classwork and discussions, and complete the required course assessments that support the anticipated learning objectives. Students are expected to regularly log in to the course website (D2L) to download course material, submit their coursework as instructed, and follow up on new announcements. This course covers more advanced content that requires at least 6 hours of extensive study per week.

Assignment solutions:

Assignment solutions must be submitted by the specified due date mentioned on the D2L platform. Each homework assignment requires a separate solution report. Unless prior arrangements are made with the instructor, no late submission of assignment solutions will be permitted. Some homework assignments may require the submission of simulation files created using software. Any file that is flagged as infected with malware or viruses will not receive a grade.

Exams and Quizzes

The exams (midterm and final) will be closed-book & closed-notes. Relevant scientific formulas will be provided in the supplementary sheet. The student will need to bring a scientific calculator for the exam. The use of a personal phone (or any other smart device) is strictly prohibited during exams. A makeup exam may be offered, but an official permit for absence that fulfills University procedures should be available on time.

Make-up Assessments:

Make-up assessments (Assignments, lab reports, 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 Integrity:

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. If you are unsure whether something constitutes academic dishonesty, consult the instructor before submission. Refer to the TAMUC Academic Integrity section (included on page 8) for additional details.

Attendance

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. For more information about the ETAMU attendance policy, please view the Attendance Webpage and the Class Attendance Policy

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

GRADING

Final Grade

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

Assessments

The following assessments will be used in this course to evaluate individual progress:

Assessment	Weight
Attendance	15%
Assignments	15%
Class Quizzes	15%
Midterm Exam	20%
Final Exam	20%
Project	15%

COURSE OUTLINE

The instructor reserves the right to adjust the schedule to serve the needs of the class, and any changes will be communicated promptly.

Weeks	Lecture Topics
1: 25th & 27th Aug.	Review of Circuit Analysis Techniques, Mutual Inductance
2: 3rd & 8th Sep.	Natural Response of RL/RC, and RLC circuits, Sinusoidal Steady-State Analysis, Circuit analysis (KVL, KCL…) in the phasor frequency domain, Phasor diagrams
3: 10th & 15th Sep.	
4: 17th & 22nd Sep.	Sinusoidal Steady-state Power calculations. Calculating Real, reactive, power factor, and Complex powers. Sinusoidal Steady State circuits. Balanced Three-Phase Systems
5: 24th & 29th Sep.	
6: 1st & 6th Oct.	
7: 8th & 13th Oct.	Introduction to Laplace Transform. Use the Laplace Transform to Predict a Circuit Response, Electric Circuit Analysis in the s-domain, Transfer Functions….
8: 15th & 20th Oct.	
9: 22nd & 27th Oct.	
10: 29th & 3rd Nov.	Frequency-Selective Circuits, Transfer functions of Passive Filters, Bode plots. Brief Introduction to Active Filters.
11: 5th & 10th Nov.	
12: 12th & 17th Nov.	Introduction to Fourier series and Fourier transform. Fourier series representation of a periodic signal. Finding the Sinusoidal Steady-state response of electric circuits using the Fourier Transform. Introduction to a two-port network
13: 19th & 24th Nov.	
14: 26th & 1st Dec.	
15: 3rd Dec.	Review

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: D2l's Brightspace). Below are the 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

Zoom Video Conferencing Tool
https://inside.tamuc.edu/campuslife/CampusServices/CITESupportCenter/Zoom_Account.aspx?source=universalmenu

Communication and Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: https://community.brightspace.com/support/s/contactsupport

STUDENT RESPONSIBILITIES FOR THE COURSE

CWID and Password

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@etamu.edu during the office hours.

Technology-Related Issues

Personal computer and internet connection problems do not excuse the requirement to complete all coursework in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, an ETAMU campus open computer lab, etc.

TECHNOLOGY REQUIREMENTS AND SUPPORT

Minimal Technical Skills Needed

Students will need a reliable computer and internet access for this course. Students must be able to effectively use myLeo email, myLeo Online D2L (Brightspace), and Microsoft Office.

Learning Management System (LMS) – D2L's Britespace

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 the technical requirements:

- View the Learning Management System Requirements Webpage.
- Learn more on the LMS Browser Support Webpage.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found on the Brightspace Support Webpage.

COMMUNICATION AND SUPPORT

Interaction with Instructor Statement

If you have any questions or are having difficulties with the course material, please contact your instructor. Correspondence will always be through university email (your "myLeo" mail) and announcements in myLeo online (D2L). You will not RECEIVE email through D2L, so be sure to check your ETAMU email for communication. Students are encouraged to check their university email daily.

Include the Following in Emails with the Instructor:

- Course name and subject in the subject line
- Salutation (Good afternoon, Dr. Jackson)
- Proper email etiquette (no "text" emails – use proper grammar and punctuation)
- Student name and CWID after the body of the email

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced.

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail online in the Student Guidebook.
Students should also consult the Rules of Netiquette Webpage for more information regarding how to interact with students in an online forum.

ETAMU Attendance

For more information about the attendance policy, please view the Attendance Webpage and the Class Attendance Policy

Academic Integrity

Students at East Texas A&M University are expected to maintain high standards of integrity and honesty in all their scholastic work. For more details and the definition of academic dishonesty, see the following procedures:

Undergraduate Academic Dishonesty University Procedure 13.99.99.R0.03

Undergraduate Student Academic Dishonesty Form

Graduate Student Academic Dishonesty University Procedure 13.99.99.R0.10

Graduate Student Academic Dishonesty Form

Use of Artificial Intelligence

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, Chatbots, or other software that have the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided, the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: **Office of Student Disability Resources and Services**

East Texas A&M University

Velma K. Waters Library Rm 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@etamu.edu

Website: Office of Student Disability Services

Nondiscrimination Notice

East Texas A&M University will comply in the classroom and in online courses with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information, or veteran status. Further, an environment free from discrimination based on sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and have a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and ETAMU Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all East Texas A&M University campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

East Texas A&M Supports Students' Mental Health – Counseling Services

The Counseling Center at East Texas A&M University, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connections to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Mental Health and Well-Being

The university aims to provide students with essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to TELUS Health, a service available 24/7/365 via chat, phone, or webinar. Scan the QR code to download the app and explore the resources available to you for guidance and support whenever you need it.

As an Institutional Member of the National Association of Schools of Music, East Texas State A&M University supports the Association's commitment to student health and wellness. The following web address provides links to information for resources related to physical and mental well-being, as well as assists in offering preventative measures that students can take to avoid serious and/or chronic conditions: Musician Health and Safety - East Texas A&M University

Department and Accrediting Agency Statements:

School of Music Mission Statement:
The School of Music at East Texas A&M University promotes excellence in music through the rigorous study of music history, literature, theory, composition, pedagogy, and the preparation of music performance in applied study and ensembles to meet the highest standards of aesthetic expression.