

McLennan
C O M M U N I T Y
C O L L E G E

WACO, TEXAS

COURSE SYLLABUS

AND

INSTRUCTOR PLAN

ELECTRICAL CIRCUITS I

ENGR 2305 – SECTION 01

PROF. PAULINA Z. SIDWELL

NOTE: This is a 16-week course.

NOTE: This is a HYFLEX course.

COVID 19 Notice:

McLennan Community College is committed to providing you with every resource you need to reach your academic goals including your safety. We will continue to monitor the evolving situation with COVID 19 and adjust our safety guidelines to make sure we offer a safe environment for you and our faculty. Please make sure to consult your faculty and the MCC website at <https://www.mclennan.edu/crisis-management/coronavirus-updates/index.html> on any changes to these guidelines.

ELECTRICAL CIRCUITS I

ENGR 2305 SECTION 01

Course Description:

Principles of electrical circuits and systems. Basic circuit elements (resistance, inductance, mutual inductance, capacitance, independent and dependent controlled voltage, and current sources). Topology of electrical networks; Kirchhoff's laws; node and mesh analysis; DC circuit analysis; operational amplifiers; transient and sinusoidal steady-state analysis; AC circuit analysis; first- and second-order circuits; Bode plots; and use of computer simulation software to solve circuit problems. Semester hours 3 (3 lec)

Prerequisites and/or Corequisites:

Co-requisite: ENGR 2105—Electrical Circuits Laboratory, MATH 2320—Differential Equations. Prerequisite: C or better in PHYS 2426—Principles of Physics II

Instructor Information:

Instructor Name: Paulina Z. Sidwell

MCC E-mail: psidwell@mclennan.edu

Office Phone Number: (254) 299 8544

Office Location: SB144

Office/Teacher Conference Hours: Mon/Wed 11:00 to 1 pm (on campus); Tues/Thurs 11:00 am to 1:00 pm (online only via Zoom, Meeting ID 4242506102); Fridays by appointment only.

Make appointments here: <https://calendly.com/psidwell>

This is a HYFLEX course. There are three options for you to engage with this class's lectures:

- **Face-to-face:** We meet on Mondays and Wednesdays from 9:35 am to 11:00 am in room SB131
- **Zoom, during class time:** Here is the Zoom ID we will be using each time
<https://mclennan.zoom.us/j/4242506102>
- **Online, asynchronously:** You can watch pre-recorded lectures. In order to receive attendance, you must take notes while watching the lecture, and submit the notes by the beginning of the next class period.

Required Text & Materials:

Required:

- *Fundamentals of Electric Circuits, 7th edition with Connect access* by C. K. Alexander and M. N. O. Sadiku; McGraw Hill – Inclusive Access
- TI-89 graphing calculator, or similar

MCC Bookstore Website: <http://www.mclennan.edu/bookstore/>

Additional requirements:

Students must have a reliable computer and internet connection. Students must be able to demonstrate basic computer literacy skills such as keyboarding, sending and receiving email, and using a web browser.

MCC Engineering uses Slack for communication. All major course announcements will be posted in Slack – failure to check Slack will result in you missing important information. Also, anything we hear about jobs, scholarships, speakers, etc., will also be posted to Slack in the #general channel.

Slack can be used on both a desktop computer and as an app. For more information about Slack in general, visit <https://slack.com/>. You will be invited to our class channel via your MCC student account. Detailed guidelines for Slack are on Brightspace and on Slack itself.

Methods of Teaching and Learning:

Students will learn through lectures, reading, and through work on homework, quizzes, and exams. Additional methods may be used as opportunities present themselves.

Course Objectives and/or Competencies:

Upon successful completion of this course, the student will be able to demonstrate the following learning outcomes:

1. Define basic electrical concepts, including electrical potential, electrical current, and electrical power. (*Chapter 1*)
2. Discuss concepts of electrical network topology, including nodes, branches, and loops. (*Chapters 2 and 3*)
3. State the characteristics of ideal independent and controlled voltage and current sources. (*Chapter 1*)
4. Define the relationship of voltage and current in resistors, capacitors, inductors, and mutual inductors. (*Chapters 2, 6, and 13*)
5. Use Kirchhoff's laws in the analysis of electrical circuits. (*Chapters 2 and 9*)
6. Articulate the concepts of Thévenin and Norton equivalent circuits, and apply the concepts to circuit analysis. (*Chapters 4 and 10*)
7. Analyze first and second order AC and DC circuits for steady-state and transient response. (*Chapters 7, 8, 15, and 16*)
8. Analyze simple operational amplifier circuits using an ideal operational amplifier model. (*Chapters 5 and 10*)

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9. Apply basic transformer models, including voltage and current relationships to turns ratio, circuit components, and reflected impedance calculations in engineering problems.
(Chapter 13)

Course Outline or Schedule:

You are responsible for everything listed below. In the event that I am not able to be physically present in class, I may provide video or assign other activities so we do not get behind. Other graded material (tests, homework, etc.) will continue to be due as indicated in the syllabus, unless I let the class know otherwise. Any changes to this schedule will be announced in class, on Slack, on Brightspace, or through email.

Module	Class Date	Topic	Chapter	HW due
0	9-Jan	Day 0: Introduction	-	
1	11-Jan	Day 1: Basic Concepts	1.1 - 1.6	Orientation Quiz Tech Check Quiz
	16-Jan	<i>MLK Day (no class)</i>		
2	18-Jan	Day 2: Ohm's Law and Kirchhoff Laws	2.1 - 2.4	HW 1
	23-Jan	Day 3: Voltage and Current Division, Delta-Wye Transformations	2.5 - 2.7	
3	25-Jan	Day 4: Nodal Analysis	3.1 - 3.3	HW 2
	30-Jan	Day 5: Mesh Analysis	3.4 - 3.5	
4	1-Feb	Day 6: Superposition, Source Transformation	4.1 - 4.4	HW 3
	6-Feb	Day 7: Thevenin and Norton's Theorems, Max Power Transfer	4.5 - 4.6, 4.8	
T1	8-Feb	Day 8: Test 1 Review		Test 1 Review* (*due 9:35) HW 4
	Test 1 (Ch 1 - 4) due Friday, Feb 10th at 11:59 pm			
5	13-Feb	Day 9: Operational Amplifiers: Ideal, Inverting	5.1 - 5.4	
	15-Feb	Day 10: Operational Amplifiers: Non-Inverting, Summing, Difference	5.5 - 5.8	
6	20-Feb	Day 11: Intro to Capacitors	6.1 - 6.3	HW 5
	22-Feb	Day 12: Intro to Inductors	6.4 - 6.5	
7	27-Feb	Day 13: First Order Circuits	7.1 - 7.3	HW 6
	1-Mar	Day 14: Singularity Functions, Step Response in First Order Circuits	7.4 - 7.6	
Spring Break (Mar 6 - 10)				
8	13-Mar	Day 15: Second Order Circuits	8.1 - 8.2	HW 7
	15-Mar	Day 16: Source-Free Series and Parallel RLC Circuit	8.3 - 8.4	
9	20-Mar	Day 17: Step Response in Second Order Circuits	8.5 - 8.6	HW 8
	22-Mar	Day 18: General S.O. Circuits	8.7	

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T2	27-Mar	Day 19: Test 2 Review		Test 2 Review* (*due 9:35) HW 9
	Test 2 (Ch 5 - 8) due Tuesday, March 28th at 11:59 pm			
10	29-Mar	Day 20: Sinusoids and Phasors	9.1 - 9.3	
	3-Apr	Day 21: Impedance and Admittance	9.4 - 9.5, 9.7	
11	5-Apr	Day 22: Sinusoidal Steady-State Analysis	10.1 - 10.4	HW 10
	10-Apr	Day 23: Sinusoidal Steady-State Analysis pt 2	10.5 - 10.7	
12	12-Apr	Day 24: Magnetically Coupled Circuits	13.1 - 13.2	HW 11
	17-Apr	Day 25: Transformers	13.4 - 13.5	
13	19-Apr	Day 26: Applications of the Laplace Transform	16.1 - 16.3	HW 12
	24-Apr	Day 27: Transfer Functions and State Variables	16.4 - 16.5	
T3	26-Apr	Day 28: Test 3 Review		Test 3 Review* (*due 9:35) HW 13
	Test 3 (Ch 9, 10, 13, 16) due Friday, April 28th at 11:59 pm			
	Final Exam (Comprehensive) due Tuesday, May 2nd at 11:59 pm			

Course Grading Information:

Grade Distribution	
Homework	35%
Practice Tests	10%
Tests	55%
Total	100%

A: 90%+ B: 80% – 89% C: 70% – 79% D: 60% – 69% F: 0% – 59%

Test Reviews: Three Test Reviews will be due according to the course calendar. These are meant to help students prepare for each upcoming test. They are open notes, closed book. The Test Reviews are timed and must be completed individually and using Respondus Monitor. Students will have two attempts to score as high as they can.

Homework. Homework assignments are due by 11:59 pm on the day marked on the course calendar. All homework assignments will be done through the Connect homework suite.

Tests: Four tests will be given during the semester (three partial tests and a comprehensive Final). Tests must be taken by the deadline marked on the course calendar, using Respondus Monitor. Tests will be 100 minutes long (the Final will be 120 minutes long). You will be

allowed your calculator and a 3 by 5-inch index card. You will need to submit your scratch work as soon as the test is done in order to receive credit. The lowest test grade will be dropped.

Academic Dishonesty. Any student that is found guilty of academic dishonesty such as cheating, plagiarism, or collusion on any problem on an assignment, quiz, or test will receive a grade of zero on the entire assignment, quiz, or test. For repeated violations (including multiple violations on the same assignment, quiz, or test) and/or egregious violations, a guilty student can be assigned a failing grade in this course and can be recommended for suspension from the McLennan Community College District.

Academic Resources. The Engineering & Physics Club has regularly scheduled Homework Nights to assist students who need help with their engineering coursework. Free tutoring will be provided. Zoom and in-person options will be available. Please check Slack for time, location and/or Zoom link.

Late Work, Attendance, and Make Up Work Policies:

MCC allows for "excused" absences caused by (1) authorized participation in official College functions, (2) personal illness, (3) an illness or a death in the immediate family, or (4) the observance of a religious holy day. It is your responsibility to let me know the reason for an absence the day you return to campus and provide sufficient documentation (doctor's note, email from coach, etc.).

Since this course is Hyflex, you have three options for daily attendance:

- **In Person.** Come to class, as you would for any other class.
- **Zoom.** Log into Zoom using the link provided on Brightspace. It is highly recommended that students keep their camera on. The professor might ask direct question for the Zoom participants. Those who have their cameras off and don't participate may be counted as absent.
- **Online, on your own time.** Watch the assigned lecture videos and take notes while you do so. Email me a pdf of all your notes before the next class period, and I will count you as "present."

Per MCC policy, you may be dropped from the class if you are absent for 25% of the class prior to the drop date. Whether you are in class or not, you are expected to meet all deadlines. No late homework is accepted without documentation. If you are dropped before the official drop date (*for Spring 2023, the date is March 23*), you will receive a grade of W. If the 25% absences are reached after the official drop date, the instructor may assign a W, if the student is passing and requests to be withdrawn. However, if a student who is not passing reaches the 25% point

after the official drop date, the student will receive grade they earn. In extenuating circumstances, the instructor may assign a W to a student who is not passing.

If you wish to drop this class, you must email me from your MCC student account before 5 pm on the last day for student-initiated drops, with the request "Please drop me from COURSE ID and SECTION NUMBER."

Student Behavioral Expectations or Conduct Policy:

Students are expected to maintain classroom decorum that includes respect for other students and the instructor, prompt and regular attendance, and an attitude that seeks to take full advantage of this educational opportunity.

*** [Click Here for the MCC Academic Integrity Statement](#)**

(www.mclennan.edu/academic-integrity)

The link above will provide you with information about academic integrity, dishonesty, and cheating.

*** [Click Here for the MCC Attendance/Absences Policy](#)**

(<https://www.mclennan.edu/highlander-guide/policies.html>)

Click on the link above for the college policies on attendance and absences. Your instructor may have guidelines specific to this course.

** You will need to access each link separately through your Web browser (for example: Mozilla Firefox, Chrome, Microsoft Edge or Safari) to print each link's information.*

Updated 11/04/2022

McLennan
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COLLEGE

ACADEMIC RESOURCES/POLICIES

Accommodations/ADA Statement:

Any student who is a qualified individual with a disability may request reasonable accommodations to assist with providing equal access to educational opportunities. Students should contact the Accommodations Coordinator as soon as possible to provide documentation and make necessary arrangements. Once that process is completed, appropriate verification will be provided to the student and instructor. Please note that instructors are not required to provide classroom accommodations to students until appropriate verification has been provided by the Accommodations Coordinator. For additional information, please visit www.mclennan.edu/disability.

Students with questions or who require assistance with disabilities involving physical, classroom, or testing accommodations should contact:

disabilities@mclennan.edu 254-299-
8122
Room 319, Student Services Center

Title IX:

We care about your safety, and value an environment where students and instructors can successfully teach and learn together. If you or someone you know experiences unwelcomed behavior, we are here to help. Individuals who would like to report an incident of sexual misconduct are encouraged to immediately contact the acting Title IX Coordinator at titleix@mclennan.edu or by calling, Dr. Claudette Jackson, (Diversity, Equity & Inclusion/Title IX) at (254) 299-8465. MCC employees are mandatory reporters and must report incidents immediately to the Title IX Coordinator. Individuals may also contact the MCC Police Department at (254) 299-8911 or the MCC Student Counseling Center at (254) 299-8210. The MCC Student Counseling Center is a confidential resource for students. Any student or employee may report sexual harassment anonymously by visiting <http://www.lighthouse-services.com/mclennan/>.

Go to McLennan's Title IX webpage at www.mclennan.edu/titleix/. It contains more information about definitions, reporting, confidentiality, resources, and what to do if you or someone you know is a victim of sexual misconduct, gender-based violence or the

crimes of rape, acquaintance rape, sexual assault, sexual harassment, stalking, dating violence, or domestic violence.

Student Support/Resources:

MCC provides a variety of services to support student success in the classroom and in your academic pursuits to include counseling, tutors, technology help desk, advising, financial aid, etc. A listing of these and the many other services available to our students is available at <http://www.mclennan.edu/campus-resource-guide/>

Academic Support and Tutoring is here to help students with all their course-related needs. Specializing in one-on-one tutoring, developing study skills, and effectively writing essays. Academic Support and Tutoring can be found in the Library and main floor of the Learning Commons. This service is available to students in person or through Zoom from 7:30 am - 6:00 pm Monday through Thursday and 7:30 am - 5:00 pm on Friday. You can contact the Academic Support and Tutoring team via Zoom (<https://mclennan.zoom.us/j/2542998500>) or email (ast@mclennan.edu) during the above mentioned times.

College personnel recognize that food, housing, and transportation are essential for student success. If you are having trouble securing these resources or want to explore strategies for balancing life and school, we encourage you to contact either MCC CREW – Campus Resources Education Web by calling (254) 299-8561 or by emailing crew@mclennan.edu or a Success Coach by calling (254) 299-8226 or emailing SuccessCoach@mclennan.edu. Both are located in the Completion Center located on the second floor of the Student Services Center (SSC) which is open Monday-Friday from 8 a.m.-5 p.m.

Paulanne's Pantry (MCC's food pantry) provides free food by appointment to students, faculty and staff. To schedule an appointment, go to https://mclennan.co1.qualtrics.com/jfe/form/SV_07byXd7eB8iTqJg. Both the Completion Center and Paulanne's Pantry are located on the second floor of the Student Services Center (SSC).

MCC Foundation Emergency Grant Fund:

Unanticipated expenses, such as car repairs, medical bills, housing, or job loss can affect us all. Should an unexpected expense arise, the MCC Foundation has an emergency grant fund that may be able to assist you. Please go to <https://www.mclennan.edu/foundation/scholarships-and-resources/emergencygrant.html> to find out more about the emergency grant. The application can be found at https://www.mclennan.edu/foundation/docs/Emergency_Grant_Application.pdf.

MCC Academic Integrity Statement:

Go to www.mclennan.edu/academic-integrity for information about academic integrity, dishonesty, and cheating.

Minimum System Requirements to Utilize MCC's D2L|Brightspace:

Go to <https://www.mclennan.edu/center-for-teaching-and-learning/Faculty-andStaffCommons/requirements.html> for information on the minimum system requirements needed to reliably access your courses in MCC's D2L|Brightspace learning management system.

Minimum Technical Skills:

Students should have basic computer skills, knowledge of word processing software, and a basic understanding of how to use search engines and common web browsers.

Backup Plan for Technology:

In the event MCC's technology systems are down, you will be notified via your MCC student email address. Please note that all assignments and activities will be due on the date specified in the Instructor Plan, unless otherwise noted by the instructor.

Email Policy:

McLennan Community College would like to remind you of the policy (<http://www.mclennan.edu/employees/policy-manual/docs/E-XXXI-B.pdf>) regarding college email. All students, faculty, and staff are encouraged to use their McLennan email addresses when conducting college business.

A student's McLennan email address is the preferred email address that college employees should use for official college information or business. Students are expected to read and, if needed, respond in a timely manner to college emails. For more information about your student email account, go to www.mclennan.edu/studentemail.

Instructional Uses of Email:

Faculty members can determine classroom use of email or electronic communications. Faculty should expect and encourage students to check the college email on a regular basis. Faculty should inform students in the course syllabus if another communication method is to be used and of any special or unusual expectations for electronic communications.

If a faculty member prefers not to communicate by email with their students, it should be reflected in the course syllabus and information should be provided for the preferred form of communication.

Email on Mobile Devices:

The College recommends that you set up your mobile device to receive McLennan emails. If you need assistance with set-up, you may email Helpdesk@mclennan.edu for help.

You can find help on the McLennan website about connecting your McLennan email account to your mobile device:

- [Email Setup for iPhones and iPads](#)
- [Email Setup for Androids](#)

Forwarding Emails:

You may forward emails that come to your McLennan address to alternate email addresses; however, the College will not be held responsible for emails forwarded to an alternate address that may be lost or placed in junk or spam filters.

For more helpful information about technology at MCC, go to [MCC's Tech Support Cheat Sheet](#) or email helpdesk@mclennan.edu.

Disclaimer:

The resources and policies listed above are merely for informational purposes and are subject to change without notice or obligation. The College reserves the right to change policies and other requirements in compliance with State and Federal laws. The provisions of this document do not constitute a contract.