FALL 2023 SYLLABUS: ENGR 2910 - CIRCUIT ANALYSIS I
(3 CREDIT HOURS)

GENERAL INFORMATION

Instructor: Brian Rashap	Section: 101; CRN 88913
Office: Fuse Makerspace	Class Times: MW 17:30-18:45, MS 214
Phone: 505 850-6352 (mobile)	Email: brashap@cnm.edu
Office Hours:	Wednesday: 16:30-17:30 SRC 203 (Main)

COURSE DESCRIPTION
This course introduces the following concepts: Basic elements and sources, energy and power, Ohm's law and Kirchhoff's laws, resistive networks, node and loop analysis, sinusoidal sources and complex representations and three phase circuits.

Prerequisite: CSCI 1151 or CSCI 1152 or CSCI 1153.
Pre- or corequisite: PHYS 1320 and MATH 2410.

TEXTS/MATERIALS
Textbook: Electric Circuits, 11th edition, by James W. Nilsson & Susan Riedel

- Always bring a scientific calculator to class.

STUDENT LEARNING OUTCOMES (see Appendix for more detailed learning outcomes)
By the end of the course, the student should be able to:
- Understand the function of basic electronic components (resistors, capacitors, inductors, and op amps) and to calculate currents flowing through and voltages across these components.
- Solve for currents and voltages in DC linear circuits.
- Solve for currents and voltages in linear circuits excited by time-varying waveforms
- Solve for time varying responses in R-L-C networks
- Employ phasor notation and solve for currents and voltages in linear circuits using phasor concepts

COURSE REQUIREMENTS
- Students who are registered for a face-to-face in-person course are expected to attend all class meetings.
- While on campus, students must comply with all current CNM COVID safe practices (see below).
- In the event the class is moved to an online format, we will maintain regular online class times via Zoom, as in "Real Time Online". You will still be expected to attend remote classes as if you were in-person. Links will be provided if and when necessary.

- **Attendance**: Attendance is strongly correlated with class success.
    - According to CNM regulations, students enrolled for credit or audit are expected to attend all class sessions.
    - Attendance is taken every class throughout term.
    - Students arriving more 15 minutes late are considered absent for that class.
    - Students who miss the equivalent of 15% of contact time may be dropped from the course by the instructor. But it is ultimately the student's responsibility to withdraw from the course.

- o Absences from class do not relieve students from responsibility for missed assignments, material covered in class, or exams.
- o Any unavoidable absences must be brought to the attention of the instructor at the earliest opportunity. Only valid, documented excuses will be accepted should a student miss class.
- o Summary lecture pdf notes will be made available at CNM Learn (class Blackboard site). o You will be expected to read the provided notes and the textbook prior to class to prepare yourself for collaborative, problem-solving sessions.
- o Communication will only occur using the student's CNM email address and/or through the class website at CNM Brightspace. Check your CNM email regularly.
- o Students should know their CNM login information to access email and Brightspace.

- **In Class: Please be respectful to your classmates.**
  - o Do not disrupt the learning environment for others.
  - o If you must leave the classroom for a short period of time do so in a courteous manner that does not affect your classmates.
  - o Disruptive behavior may be subject to institutional disciplinary actions. o Cellphone policy: do not make or receive phone calls or text message during class. o We will be engaging in collaborative work for many of our class meetings. o *Complete all recommended readings and arrive to class prepared and ready to contribute.*
  - o Please bring a suitable notebook and writing materials to every class.

- **Homework**: All homework is to be completed and submitted to the instructor during regular class time.
  - o 10 homeworks will be posted during term on an approximately weekly basis. Homework questions will be based on textbook examples and end-of-chapter problems.
  - o To ensure maximum points on your homeworks, please follow the protocol outlined here:
    - • Complete each problem on a separate page/sheet of paper using pencil to correct for mistakes. (More than one problem per page is permitted if the questions/answers are short.)
    - • Show all your working for each problem, starting with a written reasoning behind your solution, algebraic steps, equations to be used to solve the problem, your calculation method, and final answer.
      - o Your final answer should be clearly written on a separate line and double underlined or circled.
      - o Points will be deducted if your final answer does not include units.
      - o Points will be deducted if your work is not legible.

- **Midterm Exam: Proctored Midterm exams will be conducted in-class during regular class times during term.**
  - o 2 Midterm exams will be conducted during the Spring term.
  - o Approximate dates for Midterms are listed in the tentative schedule at the end of this syllabus.
  - o Midterm exams will consist of a combination of multiple-choice questions, and long answer, worked-problems in the style of textbook problems.
  - o There are no dropped midterm exams
- **Presentation**: All students will give an in-class presentation, lasting approximately 10 minutes in length. Presentation days will occur late in the term. The topic for presentation must be discussed with the instructor and should pertain to the class.

- **Cumulative Final Exam:** Our final exam will be on **Wednesday, 6th December 2023 from 17:30 to 18:45 in classroom MS 415.**
  - o You must attend the final exam. This is the last day of class.
  - o All students must receive a grade greater than or equal to 50% on the final exam in order to pass this course.
  - o If you do not attend the final exam you will receive a grade F for the class.
  - o The final is comprehensive/cumulative and will contain topics covered throughout the term.
  - o The style of the final exam will be similar to that of the Midterms, with a combination of multiple-choice and worked-problems.

- **THERE ARE NO MAKE UP EXAMS**

COURSE GRADING

The grades will be assigned based on the standard scale:

A = 90 – 100%   B = 80 – 89.9%   C = 70 – 79.9%   D = 60 – 69.9%   F = 0 – 59.9%

Grades will be calculated according to the following scheme:

Presentation (1 x 10%)	10%
Homework (10 x 2%)	20%
Midterm Exams (2 x 20%)	40%
Final Exam (1 x 30%)	30%*
Total	100%**

  * The final exam is comprehensive and all students must receive a grade greater than or equal to 50% on the final exam in order to pass this course.

  ** In the event CNM closes on the day of the final exam, final grades for students will be calculated based on all work assessed up to that point in the course.

REGISTRATION DEADLINES

Tuition payment deadline: 22:00 on Friday, 25th August, 2023
Last day to drop without W (and last day for refund): Monday, 11th September, 2023
Last day to drop with W (and last day to change grading option): Friday, 3rd November, 2023

Faculty Feedback: The Faculty feedback system allows your instructor to securely provide feedback on your performance in this course. If your instructor uses it, you may be contacted by a CNM Academic/Achievement Coach to follow up on the feedback.

Academic Honesty: Academic dishonesty will not be tolerated. As a CNM student you agree to adhere to the CNM Dishonesty Policy, please see the following link for details.
https://www.cnm.edu/depts/dean-of-students/documents/ACADEMIC_DISHONESTY_POLICY_0328-08.pdf

Special Needs Accommodations: Qualified students with special learning needs are encouraged to work with the Disability Resource Center, and notify the instructor at the beginning of the class about any specific assistance that may be required to support the student's learning. It is the instructor's intent to assist qualified students with special learning needs by making course modifications that will ensure a successful learning experience for the student.

Students are asked to contact the **CNM Disability Resource Center** (DRC) program office in order for support staff to assist the instructor with course modifications. The DRC webpage may be reached from the main CNM web page. DRC contact information is: Phone (505) 224-3259 or 1-888-453-1304; TTY Line 224-3262; Fax 224-3261. When students are assigned to a support counselor, individual email contact information is also provided.

PaperCut: PaperCut is an element of the sustainability effort at CNM. Its purpose is to reduce paper usage. Each student has an online account with an allotment of 150 free printer pages per term. If this allotment runs out, additional pages may be purchased by the student. For more information, go to the PaperCut website: http://cnm.edu/papercut.

Commit to graduate! Graduating with an associate's degree or certificate will make you more employable and will increase your earning potential for a lifetime. Getting your degree or certificate is your reward for the hard work and dedication you put into your studies at CNM. Set your graduation date today! Learn more at http://cnm.edu/graduation.

Smoke-free campus: In an effort to respect all students, CNM has created smoke-free zones as well as designated smoking areas at all CNM locations. The use of tobacco products, including the use of chewing tobacco and e-cigarettes is limited to the designated smoking areas and banned from all other areas. View CNM's policy on smoking at http://www.cnm.edu/about/smoke-free-campus. View a map of the designated smoking areas at http://www.cnm.edu/about/smoke-free-campus/designated-smoking-areas.

Classroom Disruption: Due to the intensity of the information in the lecture and laboratory classes, classroom disruptions will not be tolerated. In CNM classrooms and laboratories, all cellular telephones and pagers must be turned off or switched to silent or vibrator mode. Electronic entertainment devices are to be turned off and headphones removed. Students being disruptive will be asked to leave the class.

COVID-19 Policy (Spring 2023)

It is our highest priority to keep you and those around you safe. We want you to be aware of the following guidelines that we urge all CNM community members to follow. Please read these guidelines and follow all helpful signage on campus.

- **COVID-19 Symptom Checking:** As of December 19, 2022, the requirement to complete and submit a Daily Health Self-Assessment before coming to a CNM location will no longer be required if you do not have COVID or COVID symptoms. Only individuals who test positive for COVID or experience symptoms of COVID will be required to complete the Daily Health Self-Assessment.
- **Wellness:** Now more than ever it is important that you only come to campus when you are feeling well. If you have a fever, cough, stomach symptoms, or headaches (list not inclusive) then please stay home. If this happens, you will need to fill out a Daily Health Self-Assessment through myCNM and then notify your instructor of your illness and, if possible, that instructor will work with you to ensure you stay current with your coursework.
- **Face Masks:** Though CNM recommends face masks, we do not require face masks to be worn indoors or outdoors at CNM locations.
- **Vaccines**: All students, faculty, and staff will continue to need to be fully vaccinated or receive an approved exemption to be on CNM campuses. You're considered fully vaccinated if you've received the initial primary series of the Pfizer, Moderna, or Johnson & Johnson vaccines. To request an exemption, go to: https://rtc.cnm.edu/login
- **Seating Chart:** Your instructor will create a seating chart to better track potential COVID exposures. Please maintain your chosen seat for the entire term.
- **Non-compliance**: Any requirements not followed by the student may result in dismissal from class, referral to the Dean of Students, and/or other disciplinary action.

APPENDIX: DETAILED LEARNING OUTCOMES

- unit conversions, energy, and power
- identify basic circuit elements, use Ohm's law, and apply Kirchoff's Laws to simple circuits
- analysis of simple resistive circuits: circuit reduction for resistors in series and parallel, and applying voltage and current division
- description of the Wheatstone Bridge and construction of equivalent circuits using Deltato-Wye transformations
- use of the node-voltage and mesh-current techniques of circuit analysis
- equivalent circuits construction through source Transformations and applications of Thevenin's and Norton's theorems, and the concept of superposition
- description of operational amplifiers: the ideal op amp model, inverting-amp, noninverting amp, difference amp, and summing amp
- definition of inductance and capacitance, combinations of capacitors/inductors in series and mutual inductance
- circuits containing resistors and inductors or capacitors, response of first order RL & RC circuits: natural response, step response, and the integrating amplifier
- natural and step responses of parallel and series RLC circuits and integrating amplifiers
- introduction to phasors, circuit elements and analysis in the frequency domain, and phasor diagrams
- power calculations for sinusoidal voltage and current sources

FALL 2023: ENGR 2910 – Circuit Analysis I Schedule

WEEK	DATE	CHAPTER & TOPIC
1	08/28 08/30	Introduction Ch. 1 – Circuit Variables
2	09/04 09/06	**No classes – Labor Day** Ch. 2 – Circuit Elements
3	09/11 09/13	Ch. 2 (continued) Ch. 3 – Simple Resistive Circuits
4	09/18 09/20	Ch. 3 (continued)
5	09/25 09/27	Ch. 4 – Techniques of Circuit Analysis
6	10/02 10/04	Ch. 4 (continued)
7	10/09 10/11	Ch. 4 (continued)
8	10/16 10/18	**Problem Review Session** **Midterm 1**
9	10/23 10/25	Ch. 5 – OP Amps* Ch. 6 – Inductance, Capacitance and Mutual Inductance
10	10/30 11/01	Ch. 7 – Responses of First Order RL and RC Circuits
11	11/06 11/08	Ch. 7 (continued) **Midterm 2**
12	11/13 11/15	Ch. 8 - Natural and Step Responses of RLC Circuits*
13	11/20 11/22	**Student Presentations** Ch. 9 – Sinusoidal Steady State Analysis*
14	11/27 11/29	Ch. 9 (continued) Ch. 10 – Sinusoidal Steady State Power Calculations*
15	12/04 12/06	Ch. 10 (continued) **CUMULATIVE FINAL EXAM**

*Selected topics to be covered as time permits