ECEN 3714 Network Analysis (Spring 2022)

Instructor: Daqing (Daching) Piao , PhD, Professor **Office**: 218 **General Academic Building**

Office hours: Regular office hours are scheduled each week to meet with any student who needs assistance with this course or who needs professional, career, curriculum, or technical advice. All students are encouraged to make the most use of the office hours. The office hours are: Tuesday and Thursday**, 4:00pm—5:30pm**
In the event that you cannot meet during a scheduled office hour, the instructor is also available by appointment. Please contact the instructor by e-mail (daqing.piao@okstate.edu) or by phone (405-744-5250). You may also contact the ECE front desk by phone (405-744-5151) or by e-mail (eceinfo@okstate.edu) if you need assistance with making an appointment. (Lab TA, Md Zobaer Islam, office hours: TBD, zobaer.islam@okstate.edu)

Time & Location:	**Lecture**	**All sections**	**M,**	**W, F**	**8:30---9:20am, CLB 112**
	Lab	Section 20696,	W		3:30---5:20pm, CEAT Endeavor Lab 325
		Section 20690		R	3:30—5:20pm, CEAT Endeavor Lab 325
		Section 20697,		F	1:30---3:20pm, CEAT Endeavor Lab 325

Textbook: Electric Circuits, 11th Edition, James Nilsson & Susan Riedel, ISBN-13: 978-0-13-474696-8, (the same textbook used for ECEN2714). Required

Prerequisites: ECEN 2011, ENSC 2613, MATH 2233

Catalog Description:

Advanced mathematical analysis techniques used in circuit analysis including Laplace transforms, Fourier transforms, and Fourier series. Circuit frequency response, Bode plots, and filters, including passive, active, low-pass, high-pass, and band-pass filters. Theory of linear circuits; two-port circuit models and parameters.

Specific goals for the course:

The objective of the course is to introduce some advanced methods of circuit analysis. After the completion of this course, a student is expected to be able to:

1. Analyze 1st and 2nd order circuits using node and mesh methods
2. Derive Laplace Transform of time functions, by definition or tables as required
3. Derive the inverse Laplace Transform of frequency domain functions
4. Analyze circuits using Laplace Transform
5. Derive transfer function of a circuit
6. Perform convolution of two time functions
7. Analyze the frequency response of a circuit using transfer function
8. Sketch Bode diagrams given a transfer function
9. Design passive and active filters
10. Build and debug a frequency-selective circuit in the lab
11. Find Fourier series of simple periodical signal

Course topics (not necessarily in the order shown):

1. Time response of first and second order circuits
2. Laplace Transform and properties
3. Inverse Laplace Transform and partial fractional expansion
4. Transfer function
5. Circuit analysis using Laplace transform and transfer function
6. Impulse response and convolution
7. Bode diagrams
8. Frequency-selectivity of circuits
9. Passive and active filter
10. Fourier Series
11. Two-port circuit model

Grading policy: (four components as shown)

		Weighting toward the final grade
Laboratory	~11 regular labs, 1 final project	30%
Homework	Up to 12 assignments	10%
Milestone-Test	3 tests (date announced). 50% of the lowest score among the three, 100% of the highest and the medium scores among the three, will be counted toward the final letter grade. Each test will be comprehensive for the materials covered up to the immediate last lecture.	25%
Quiz	5 (pop quiz)	10%
Final exam	University general exam date. Comprehensive	25%

Grade Scale: A: at or above 90.0%; B: at or above 80.0% and lower than 90.0%
C: at or above 70.0% and lower than 80.0% D: at or above 60.0% and lower than 70.0%
F: lower than 60.0%

Homework:

Homework assignment will be posted to Canvas, and submission is on-line. Keys to homework assignments will be posted approximately 1week after the posting of the assignment. No late submission.

Quiz: Quizzes will be administrated without prior announcement. A total of 5 quizzes will be administered. Each quiz will take approximately 5 minutes and may be administered by the end of a lecture without advanced announcement. No makeup quiz is allowed.

All quizzes will be closed book, notes, and electronics of any kind. Each quiz will be counted equally to the final grade. The quizzes account for 10% of the final grade. The graded quiz will NOT be returned to the class. Graded quizzes are available for review during the regular office hours.

Milestone-Test:

Milestone-tests will be administered to evaluate and consolidate the knowledge important to the next step of learning. The test will be comprehensive up to the materials covered by the immediate previous lecture. No calculator is allowed in any of the tests. Some tests may be open to notes.

A total of 3 milestone tests will be given, at the pre-scheduled dates. The dates are subject to change. Change of the test date, if happens, will be announced no later than the last lecture prior to the test. Among the test scores earned, 50% of the one that is the lowest and 100% of the one that is the highest, and 100% of the medium score will be counted toward 25% of the final grade. A first "0" test score, whether it is due to missing the test or other reasons including sanctioned for violating academic integrity, will count as the one lowest. If a second "0" test score occurs, this second "zero" score will be counted as one of the two test scores with regular weight toward the test-portion of the final grade.

The graded tests will NOT be returned to the class. Graded tests are available for review during the regular office hours.

There is no early test or examination under any circumstances. No make-up tests will be given

Final Examination:

The final exam is comprehensive, covering all course materials. Calculators are not allowed in tests and exam without prior permission by the instructor. No calculator is allowed in the tests. Cheat sheets of two pages maximum in hard-copy are allowed.

Students missing the Final Examination with a VALID reason who notify the instructor of the reasons for their absence by noon of the day that is one day before the scheduled final examination in the course will receive a grade of "I" (incomplete) for the course and be expected to take a make-up final examination at a time arranged with the instructor (not later than the end of the first week of classes of the following semester). Students who are absent from the final examination and who do not notify the instructor of the VALID reason for their absence by noon of the day that is one day before the examination will have their final grade computed with a score of zero being recorded for the final examination. Students who are absent from the final examination and who do not have a VALID reason for their absence will have their final grade computed with a score of zero being recorded for the final examination.

In this course, there is no early test or examination under any circumstances. VALID reasons for missing a scheduled test or examination include illness sufficient to require medical care justified by physician's advanced notes, participation in a University assigned activity which requires you to be away from campus on the day of the test or examination, and similar reasons beyond your control for which proper verification and justification must be provided. Vacation plans, oversleeping, illness not sufficient to require medical attention, social activities (including fraternity, sorority, and residence hall activities), family obligations, etc., are not sufficient reasons for missing a scheduled test or examination. Under the condition that missing a scheduled test or examination is justified by the instructor, plans for making up the missed test or examination must be discussed with and approved by the instructor case-by-case.

Cell-phone and other personal electronic devices:

It is a requirement that cell-phones and other personal electronic devices not relevant to classroom learning are turned OFF. Using electronics are limited for taking notes or other tasks (such as class evaluation) specifically announced during the class. Repeated disruption and distraction of the lecturing due to activities irrelevant to classroom learning and discussion may result in excusing or dispelling from the classroom and penalties on the grade.

Special Accommodations for Students

According to the ADA, each student with a disability is responsible for notifying the University of his/her disability and requesting accommodations. If you think you have a qualified disability and need classroom (laboratory room) accommodations, contact the office of Student Disability Services (SU315). Please advise the instructor of your disability as soon as possible (no later than the first Friday), to ensure timely implementation of appropriate accommodations. Faculty has an obligation to respond when they receive official notice of a disability from SDS but are under no obligation to provide retroactive accommodations. To receive services, you must submit appropriate documentation and complete in intake process during which the existence of a qualified disability is verified and reasonable accommodations are identified. Call 744-7116 v/t for more information.

ACADEMIC INTEGRITY POLICY

Oklahoma State University is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge. You are referred to the Office of Academic Affairs, 101 Whitehurst, 405-744-5627, http://academicintegrity.okstate.edu/ for the details of OSU's academic integrity policy and additional information.

Caution: Unless otherwise authorized to collaborate on an assignment, all assignments are to be prepared and completed individually. Authorized collaborations, if there is any, will be specified in the class. The submitted written works based on authorized collaboration, however, shall be prepared individually.

Keeping the Grades and the Graded Materials:

It is your responsibility to keep all graded materials returned to you, until course grades are final.

Attendance:

Regular class attendance is required.

The lectures include both written and verbal discussions/developments that are all important to your mastering of course materials. The reading assignments may contain material that will not be covered explicitly in the lecture. If you skip classes you will find tests and exams more difficult. Quizzes will be administered unannounced.

Drop and Add:

The instructor will follow the University, College and Departmental guidelines for drops and adds.

You are referred to the Syllabus Attachment for other university-wide general information.