Course Syllabus for

MECH 2340 – Circuits and Applied Electronics

Section	Days	Time	Room	Instructor	TAs
001	MW	10:00-11:15am	SPN 1.121	Ann Majewicz Fey	Orod Kaveh
301 (Lab)	Th	10:00-12:45pm	SPN 1.115	Ann Majewicz Fey	Orod Kaveh
302 (Lab)	Th	1:00-3:45pm	SPN 1.115	Ann Majewicz Fey	Orod Kaveh

Professor Contact Information

Dr. Ann Majewicz Fey
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Teaching Assistant Contact Information

Name: Orod Kaveh
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Office Hours: TBD
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Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-requisite: MECH 1208, PHYS 2326 and MATH 2420
Other Restrictions: None

Course Description

The purpose of this course is to give students a general understanding of basic concepts in electronics geared specifically toward application. Course topics include: circuit components and theory (resistors, capacitors, inductors, component networks), power concepts (AC, DC, single and 3-phase) basic microelectronics (semiconductors, diodes, transistors, op-amps, amplifiers), and digital design (number systems, logic circuits, common ICs). This course includes a laboratory component and team-based final project.

Course Objectives and Topics

Introduce theory, analysis, and application of a variety of electronic components and circuits. The learning objectives/outcomes for this course are as follows:

- Understand the function and application of analog and digital electronic components.
- Analyze electronic circuits involving common analog components, both time-invariant and time-varying systems.
- Use common test equipment to safely and accurately measure voltage, current, and power.

- Design and build electronic circuits to perform tasks common in engineering applications such as amplification, filtering, etc.

Required Textbook and Supplies

Authors: Ulaby, Fawwaz T., Maharbiz, Michel M.
Title & Edition: Circuits, 3rd Edition
ISBN-13: 9781934891223

And additional recommended text is:
Authors: Hambley, Allan R.
Title & Edition: Electrical Engineering: Principles & Applications, 6th Edition
ISBN-13: 9780133116649

It is strongly suggested that you use a personal laptop for this course. The software used in this course includes: Microsoft Office (Word, Excel, Power Point), Matlab and Multisim. These can be purchased from the UTD Technology Store (http://www.utdtechstore.com/). All software is also available in the TI Innovation Lab (SPN 1.115). Notes, supporting material, and other resources will be posted on eLearning.

Important Dates

Labor Day (no classes):	September 4
Last day to withdraw without "W":	September 6
Last day to withdraw with "W":	October 26
Fall Break (no classes):	November 20-26
Last day of classes:	December 6
Finals week:	December 8-14

Course Structure and Schedule

In MECH 2340, you will attend two 75-minute class sessions each week, which will take place in **SPN 1.121** and well as one 3 hour laboratory session which will take place in **SPN 1.115.**

The following is a ***tentative*** schedule of class topics. These dates are subject to change. It is your responsibility to keep up with any changes.

Week	Class	Lab	Topic(s)	Laboratory
1	8-21	8-24	Overview of Course, Electrical Concepts	Electrical Measurement
	8-23		Basic Circuit Components and Analysis	
2	8-28	8-31	Basic Circuit Components and Analysis	Temperature Measurement **+ PROJECT INTRO**
	8-30		Basic Circuit Components and Analysis	
3	9-4	9-7	**NO CLASS LABOR DAY**	Amplifiers
	9-6		Op Amps	
4	9-11	9-14	Op Amps	Amplifiers
	9-13		Op Amps	
5	9-18	9-21	Semiconductors and Diodes	Soldering Lab + Intro to Microprocessors
	9-20		Transistors	

6	9-25	9-28	**PROJECT PROPOSAL PRESENTATIONS**	Transistors and Relays
	9-27		**PROJECT PROPOSAL PRESENTATIONS**	
7	10-2	10-5	Transistors	Digital Lab
	10-4		Motors and Motor Control	
8	10-9	10-12	Digital Number Systems and Logic	**PROJECT WORK TIME**
	10-11		Digital Logic	
9	10-16	10-19	First-order Electrical Systems (RC, RL)	RC, RL Measurement
	10-18		First-order Electrical Systems (RC, RL)	
10	10-23	10-26	Midterm Review	Diodes and Power Supply Circuits
	10-24		**MIDTERM EXAM (in testing center)**	
	10-25		**OPEN LAB FOR PROJECTS**	
11	10-30	11-2	Second-order Electrical Systems (RLC)	**PROJECT CRITICAL DESIGN REVIEW + DEMONSTRATION**
	11-1		Second-order Electrical Systems (RLC)	
12	11-6	11-9	Steady-State Analysis	Signal Processing Lab
	11-8		Steady-State Analysis	
13	11-13	11-16	Laplace and Fourier	**PROJECT WORK TIME**
	11-15		Laplace and Fourier	
14	11-20	11-23	**FALL BREAK NO CLASS**	**NO LAB**
	11-22		**FALL BREAK NO CLASS**	
15	11-27	11-30	AC Power Concepts *(guest lecture, Robert Hart)*	**OPERATIONAL CHECK-OFF**
	11-29		**OPEN LAB FOR PROJECTS**	
16	12-4	12-7	***PROJECT DEMO DAY***	**NO LAB**
	12-6		Final Exam Review Session + **PROJECT CLOSE OUT**	
17		Follow final exam schedule	**Final Exam**	

Grading Policy

[**35%**] **Exams and Quizzes**: There will be a midterm and final exam, composing 66% of the exam grade. Throughout the course, there will be 12 quizzes, either in class, or on eLearning. Grades for the lowest two quizzes will be dropped, and the remaining 10 will be counted as an additional exam. The quizzes will be predominantly conceptual T/F or multiple choice questions based on assigned videos, or short problems for in-class quizzes. Make-up exams will only be allowed for the cases of illness, participation in a university-sponsored event (e.g., athletics), or under unusual circumstances. For all cases, you are required to provide proper documentation.

[**35%**] **Homework and Laboratory Assignments**: There will be weekly written homework, laboratory completion worksheets, or reports. These deliverables will be graded based on completeness, correctness, and legibility. Templates for homework and report submissions will be provided. ***Late assignments will not be accepted under any circumstances and the lowest homework grade will be dropped. All laboratory deliverables are required.***

[**30%**] **Final Project**: The final design project will be graded on (1) a circuit proposal, (2) a critical design review with a demonstration of working subsystems, (3) a demonstration of an operational circuit, (4) participation in the class Demo Day, and (5) a final project report. The class demo day will be on **MONDAY, December 4th, time TBD, in ECSN Foyer,** and will be open to the public, including UTD faculty and students.

You have five business days to appeal any grade after being assigned. After this point, neither grades nor the grading weights will be changed. Your final grade will be rounded to the nearest whole number, based on the following ranges:

	Plus (+)		Minus (-)
A	100 - 97	96 - 93	92 - 90
B	89 - 87	86 - 83	82 - 80
C	79 - 77	76 - 73	72 - 70
D	69 - 67	66 - 63	62 - 60
F		59 and below	

Course & Instructor Policies

Email must be sent from your UTD email account to the UTD email address of the instructor. Emails related to homework submissions should be addressed to both the instructor and TA.

The use of laptop computers, tablets, cell phones, or other electronic devices are ***not*** allowed during lectures or exams, unless required for the activity.

Students may collaborate on homework but must identify which students they worked with on their homework. Homework need to be submitted individually. ***Furthermore, students are not allowed to use any homework solutions obtained from former students, online, or any other source – to do so constitutes academic dishonesty.***

Academic dishonesty will not be tolerated. All suspected cases of academic dishonesty will be sent to the Office of Judicial Affairs (see http://www.utdallas.edu/deanofstudents/managing/). If it is determined that academic dishonesty occurred you will receive a grade of **F** in this course.

For a full list of university policies, please visit http://go.utdallas.edu/syllabus-policies

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE AT THE DISCRETION OF THE INSTRUCTOR.