

MEMS 0031 – Electric Circuits
Spring of 2024

Classroom: 3-101 Office: 4-219
Office Hours: R 1~4 pm Email: jin.xu@scupi.cn

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Catalog Description:

This 3-credit course is an introduction to linear circuit networks including constitutive equations for circuit elements, Ohm's and Kirchhoff's laws, mesh and node equations.

Prerequisites: PHYS 0175 Physics for Science and Engineering 2

Course Outcomes:

- Understand the terminology used in conjunction with electric circuits and the terminal characteristics of ideal circuit elements;
- Mathematically model electric systems using ideal resistive, inductive, and capacitive elements;
- Apply phasors and impedance transformations to the analysis of electric circuits fed by a sinusoidal input in steady state;
- Apply various systematic methods (node, mesh, terminal equivalency, and circuit theorems) to electric circuit analysis in steady state and study power;
- Apply various circuit analysis techniques to study circuits that include ideal transformer and operational amplifiers;
- Use MATLAB to assist in the analysis of electric circuits in steady state.

Required Textbook:

James A. Svoboda and Richard C. Dorf, *Introduction to Electric Circuits*, SI Version Global Edition.

Course Policies:

Regular class attendance is expected. If a student routinely misses class or is tardy to class, grade reduction will occur. Moreover, three unexcused absences will result in 70 as the best possible grade for this course. Each student is responsible for all the material presented in class and in the reading assignments. Exams will emphasize treatment of material covered in lectures. In general, no late assignments will be accepted, nor makeup exams given. Exceptions will be made for a valid excuse consistent with University Policy. If you cannot attend an exam or meet a due date, you must contact the instructor *prior to* the exam or due date. (Failure to do so will result in a zero on that exam/assignment.) Arrangements will be made for students on a case-by-case basis.

Integrity and Academic Expectations:

“Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation in oral or written form. Such violations will be dealt with severely, in accordance with University policy. Plagiarism means representing someone else's idea or writing as if it were your own. If you use someone else's ideas or writing, be sure the source is clearly designated.”

Grading Policy:

Exams 1 & 2 = 25% each, Final = 25%, Homework and Quiz = 15%, and Project = 10%. Please go to Grade Center on BB for up-to-date grades. Grades will not be curved, and the official SCU grading scale will be used when determining your final letter grade (based on the numerical grade).

90~100 = A	80~85 = B+	70~73 = C+	60~63 = D
85~ 90 = A-	76~80 = B	66~70 = C	< 60 = F

Syllabus Jin Xu

73~76 = B- 63~66 = C-

Tentative Course Schedule:

Week	Topics
1	Course Overview & Circuit Variables
2	Circuit Elements
3	Resistive Circuits
4	Circuit Theorems
5	Circuit Theorems
6	Exam #1
7	Amplifier
8	Energy Storage Elements
9	RL Circuits
10	RC Circuits
11	RLC Circuits
12	Exam #2
13	RLC Circuits
14	Sinusoidal Analysis
15	Sinusoidal Analysis
16	Exam Review
17	Final Exam