

ENGR 065 Circuit Theory

Introduction

Dr. Huifang Dou
Lecturer, School of Engineering
hdou@ucmerced.edu

Introduction

Instructor:

Huifang Dou

Email: hdou@ucmerced.edu

Teaching Assistants:

Mahmoud Abido

Email: mabido@ucmerced.edu

Cristian Manzo

Email: cmanzo4@ucmerced.edu

Seyed Mehrad Mortazavi

Email: smortazavi3@ucmerced.edu

Donglei Yang

Email: dyang36@ucmerced.edu

Introduction

This course has

- ▶ 26 lectures including 2 reviews (describe in detailed in the syllabus)
- ▶ 9 labs (form teams, and submit lab reports online) and 1 project
- ▶ 12 assignments (Complete on papers with your name, assignment number. The size of papers is letter size of 8.5 by 11 inches. The papers can have strips, grids, or are just blank. Upload to Assignments/CatCourses before due dates)
- ▶ 4 pop quizzes (5 multiple-choice questions, 5 minutes, randomly given in class. Complete with Quizzes/CatCourses. No make ups for any reasons)

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- ▶ 2 quizzes (10 multiple-choice questions plus 1 bonus question, 30 minutes, give at the end of class, will announce on CatCourses, use Quizzes feature in Catcourses)
- ▶ 1 midterm exam (Free response questions, on Oct 16th, 75 minutes, in class, upload to Quizzes/CatCourses)
- ▶ Final exam (Free responses, on Dec. 16th, upload to Quizzes/CatCourses)

Introduction

The lectures will cover:

- ▶ *Three laws:*
 - Ohm's law
 - Kirchhoff's current law (KCL)
 - Kirchhoff's voltage law (KVL)
- ▶ *Four quantities:*
 - current,
 - voltage
 - power
 - energy

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- ▶ *Five basic ideal circuit elements:*

1. Resistors,
2. Capacitors,
3. Inductors,
4. Current sources, and
5. Voltage sources

- ▶ *Six circuit analysis techniques*

1. Series and parallel combinations or simplifications
2. Kirchhoff's current and voltage laws, and Ohm's law
3. The node-voltage and mesh-current method
4. The source transformation
5. The Thévenin and Norton equivalents
6. The superposition (linear circuits)

Introduction

- ▶ *One mathematical tool:*
 - Laplace transform

All above topics will be applied into

- ▶ DC and AC circuits
- ▶ Transient and steady-state responses of circuits (for circuits having inductors and capacitors)