ENGE 240: Basic Circuit Theory
Lecture 0: Administrative Matters

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Outline

- Course Structure
- Textbooks
- Grading
- Homework
- Exams

Course Structure

- Spring 2026: January 26 – May 8
- Time and Class Location:

  Tuesday and Thursday 9:30 am - 10:45 am

  Location: EACM 1078

- Class Participation and Reading

  Both class participation and doing the readings are important

- Lecture Notes

Admin Matters

- Office: Room 3007, E.A.S.C. Building
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- Office hours:

  TBA.

Course Description

- This course introduces the fundamental principles of electric circuits

- Basic circuit elements, resistors, capacitors, inductors, independent and dependent sources, and operational amplifier; Kirchhoff's laws; nodal and mesh analysis; superposition; Thevenin and Norton theorems; DC and AC steady state analysis; Transient analysis for first and second order circuits; phasors.

- Prerequisite:

  MATH 211

- Co-requisite:

  MATH 241 and ENGE 241

Textbooks

- Richard C. Dorf and James A. Svoboda, “Introduction to Electric Circuits”, 8th/ 9th Edition, John Wiley, 2010/13.

- Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits 3rd Edition, McGraw Hill 2007.

- Additional material will be provided if necessary.

Course Schedule

Week 1	Course Overview; Electric Circuits and current; relationship between charge and current; systems of units, relationship between charge and voltage, Power and energy; circuit analysis and design; Design example	Ch. 1
Week 2	Engineering and Linear Models, Active and Passive Circuit Elements, Resistors, Independent Sources, Voltmeters and Ammeters, Dependent Sources, Transducers and Switches	Ch. 2
Week 3	Dependent Sources, Transducers and Switches, Kirchoff's Laws, Series Resistors and Voltage Division	Ch. 2/3
Week 4	Series Voltage Sources and Parallel Current Sources, Circuit Analysis, Analyzing Resistive Circuits	Ch. 3
Week 5	Circuit Analysis, Analyzing Resistive Circuits	Ch. 3
Week 6	Node Voltage Analysis of Circuits with Current Sources, Node Voltage Analysis of Circuits with Current and Voltage Sources, Node Voltage Analysis with Dependent Sources	Ch. 4
Week 7	Mid-term Exam Mesh current analysis with independent, dependent, voltage, and current sources, including a comparison of the node voltage and mesh current methods	Ch. 4
Week 8	Spring Break	

Please note that the schedule maybe updated based on the progress of the class.

Course Schedule (Cont'd)

Week 9	Source Transformation, Superposition, Thevenin's Theorem	Ch. 5
Week 10	Thevenin's Theorem, Norton's Equivalent Circuit, Maximum Power Transfer, Operational Amplifier, Ideal Op Amp	Ch. 5/6
Week 11	Nodal Analysis of Circuits containing Ideal Op-Amps, design using Op-Amps, Op-amp circuits, and Linear Algebraic Equations, Characteristics of practical Op-Amps, analysis of Op-Amp circuits	Ch. 6
Week 12	Capacitors, Energy Storage in Capacitors, Series and Parallel Capacitors, Inductors, Energy Storage in an Inductor, Series and Parallel Inductors, Initial Conditions of switched circuits, Op-Amp Circuits and linear Differential Equations, plot Capacitor or Inductor Voltage or Current	Ch. 7
Week 13	Op-Amp Circuits and Linear Differential Equations, plot Capacitor or Inductor Voltage or Current First-order circuits, The response of a first-order circuit to a constant input, Sequential switching, Stability of first-order circuits	Ch. 7/8
Week 14	The unit step function, The response to a first-order circuit to a non-constant source, Differential Operations, Design example, DE for circuits with two energy storage elements, Solution to 2nd order DE, Parallel RLC circuits and damping	Ch. 8/9
Week 15	Forced response and complete response of RLC circuits, Sinusoidal sources, Steady state response of an RL circuit. Complex forcing functions	Ch. 9/10
Week 16	Final Exam	

Please note that the schedule maybe updated based on the progress of the class.

Exams and Grading

- Homework assignments (14 Homework and four quizzes)

- Mid-term and Final exams
  The mid-term exam and the final exam are scheduled according to the university schedule (closed book, closed notes)

- Grading:

Participation	10%
Homework	10%
Quiz	20%
Project	10%
Mid-Term Exam	20%
Final Exam	30%

Grading

- **Tentative Grading Scale**

Grades will be based on the following numerical guidelines:

Average Range	Grade
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

Important Reminder

- Class participation is important
- Please send me an email before the class if you will be absent
- Homework due： No Late submission
- Project due： No Late submission
- Grade