

# BOSTON UNIVERSITY COLLEGE OF ENGINEERING

## Syllabus: EK307 – Electric Circuits – Spring 2025

### Lecture:

Section	A3
Instructor	Selim Ünlü (selim@bu.edu)
Time	Tu/Th 3:30 – 5:15
Classroom	PHO 211
Office Hours	In person (PHO826) TBD / Zoom on TBD
Office Location	PHO 826 (Office Hours in-person in PHO826 or on ZOOM @ <a href="https://bostonu.zoom.us/my/selimunlu">https://bostonu.zoom.us/my/selimunlu</a> )

### Course Description:

Introduction to electric circuit analysis and design; voltage, current, and power, circuit laws and theorems; element I-V curves, linear and nonlinear circuit concepts; operational amplifier circuits; transient response of capacitor and inductor circuits, sinusoidal-steady-state response, frequency response, transfer functions; Includes design-oriented laboratory. (4 credits)

**Coreq:** CAS PY 212

**Textbook: (strongly recommended but not required)** Alexander and Sadiku, *Fundamentals of Electric Circuits*, 7<sup>th</sup> Edition, McGraw Hill, ISBN 9781307555080

### Alternate textbook reference:

Thomas/Rosa/Toussaint, *The Analysis and Design of Linear Circuits*, 8<sup>th</sup> ed., 2016, ISBN978-1-119-23538-5.

### Course Methodology:

EK307 involves the use of a coordinated set of lectures, labs, homework, and exams to provide students with an introduction to electric circuit analysis and design. Laboratory sessions will be conducted using the kits that has been sent to students. Labs are coordinated by Vladimir Kleptsyn [vklep@bu.edu](mailto:vklep@bu.edu). Students are required to register for a laboratory section as well as a discussion section. The course will contain two mid-terms and a final exam.

### Course announcement and communications:

Primary method for course announcement and information disseminations will be through blackboard and piazza sites. All lectures will be in person. We will have office hours in person and by zoom.

### Homeworks:

HWs are assigned on BlackBoard. Due dates will be posted as a reference. There is no submission or credit.

### Class Participation/Quizzes:

On a weekly basis, a quiz with ~3 questions will be assigned. Some questions will be attempted/reviewed during class and quizzes will be submitted online (Gradescope) by due date (typically Fridays – with potential extension to the weekends).

<b>Grading:</b>	Final Exam	30%
	Mid-term 1	15%
	Mid-term 2	20%
	Labs	20%
	Homework	(intended to provide more practice – no credit)
	Quizzes	10%
	Class Participation	5% (office hours, lectures)

## Community of Learning: Class and University Policies

1. Missed Exam – Absence from an exam can be excused only for reasons, as stipulated by Boston University academic policies<sup>†</sup>, such as illness, death in a family, religious reasons, or unavoidable travel. In each case, permission of the instructor in advance is required, as well as a written authorization by a physician (in the case of illness) or other appropriate authorized signature. The student will be required to take a makeup exam. **FINAL EXAM is scheduled on May 9 at 9AM**
2. HWs are assigned on BlackBoard. Due dates will be posted as a reference. There is no submission or credit. Solutions will be posted after the due date. Please attempt the questions prior to reviewing the solutions.
3. You are encouraged to attend office hours and study groups. However, you are required to answer the HWs / Quiz questions by yourself. <sup>‡</sup>
4. Attendance – Attendance (either in-person or online) in lectures is considered essential but not mandatory. Class participation will constitute 5 % of overall grade. We affirm our commitment to [\*Policy on Religious Observance\*](#).<sup>§</sup>
5. Late Quiz – Late quiz will not be accepted since we intend to make the solutions available soon after the deadline.
6. **Inclusion:** I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.
7. **Accommodations for Students with Documented Disabilities:** If you are a student with a disability or believe you might have a disability that requires accommodations, requests for accommodations must be made in a timely fashion to Disability & Access Services, 25 Buick St, Suite 300, Boston, MA 02215; 617-353-3658 (Voice/TTY). Students seeking academic accommodations must submit appropriate medical documentation and comply with the established policies and procedures <http://www.bu.edu/disability/accommodations/>
8. Laboratories will be managed Kleptsyn, Vladimir [vklep@bu.edu](mailto:vklep@bu.edu). We will communicate more information on Labs.

---

<sup>†</sup> <http://www.bu.edu/academics/policies/>

<sup>‡</sup> <https://www.bu.edu/academics/policies/academic-conduct-code/>

<sup>§</sup> <https://www.bu.edu/academics/policies/absence-for-religious-reasons/>

**Schedule<sup>††</sup> of Lectures and Exams:**

Alexander and Sadiku

<u>Dates</u>	<u>Topic Description</u>	<u>Text Material</u>
1/21	READING ASSIGNMENT: Introduction, basic concepts, and notation. Units, Voltage, Current, Power, Energy. Review Chapter 1	Chapter 1
1/23	Circuit Elements, Ohm's Law. Resistors in parallel and series.	2.1 – 2.2, 2.5 – 2.6
1/28	Kirchhoff's Laws. KVL and KCL. Dependent sources.	2.3-2.4, 1.6
1/30	Methods of Analysis: Node Voltage, Equivalencies	3.1 – 3.6
2/4	Circuit Theorems: Linearity, superposition, equivalency	4.1 – 4.3
2/6	Source transformations, Thevenin and Norton Equivalents	4.4 – 4.7
2/11	Maximum Power Transfer and Review of Chapter 4	4.8
2/12	Review before exam	
2/20	<b>Mid-Term Exam I (up to end of Chapter 4)</b>	
2/25	Op-amp circuits and analysis	5.1 – 5.8
2/25	<b>Last Day to Drop Standard Courses (without a "W" grade)</b>	
2/27	Capacitors and Inductors	6.1 – 6.5
3/4	First-order Circuits: Source-free RC and RL circuits	7.1 – 7.3
3/6	Step Response of RL and RC circuits	7.4 – 7.6
3/18	First-order Op-amp circuits and Applications	7.7 and 7.9
3/20	Second-order Circuits: Source-free RLC circuits	8.1 – 8.4
3/25	Second-order Circuits – review before exam	8.5 – 8.7
3/27	Review before exam	
4/1	Mid-Term Exam II (up to end of Chapter 8)	
4/3	Complex numbers, sinusoids/phasors	9.1 – 9.3
4/4	<b>Last Day to Drop Standard Courses (with a "W" grade)</b>	
4/8	Phasor relationships for circuit elements, impedance and admittance	9.3 – 9.9
4/10	Phasors and Sinusoidal Steady-State Analysis	9.5 – 10.4
4/15	Thevenin/Norton and Examples of phasor analysis	10.5 – 10.7
4/17	AC Power Analysis: instantaneous vs average power, RMS	11.1 – 11.4
4/22	Frequency Response – passive filters	14.1 – 14.3
4/24	Frequency Response – Bode Plot	14.7
4/29	Frequency Response – filters	14.4
5/1	Frequency Response – review	14.4
TBD	REVIEW before final	
TBD	Final Exam (all the course material during the semester)	

<sup>††</sup> This schedule is for Section A2. The specifics may be subject to change.

**Graduate Teaching Fellows:**

GTF		Howard Dao	
E-mail (@bu.edu)			

**Teaching Assistants:**

UTA			
E-mail (@bu.edu)			