

Course Syllabus

A. COURSE INFORMATION AND TEACHING STAFF

1. Course	Name	ELECTRICAL CIRCUITS I						
	Code	230112120						
	Activity	Lecture						
	Credit hours	3						
	Semester	Fall 2024/2025						
	Pre-requisite	No Pre-Requisite						
2. Teaching staff, time and location	Section	Building	Room	Day	Time	Instructor	Office hours	
	1	ENG	308	N T Th	08:30-09:20	Dr.Osama Adam Mahmood Omari osama.omari@aaup.edu	NTTh 10:30 - 11:20 MW 10:00 - 11:15	

B. COURSE POLICIES

1. Commitment and Attendance	<p>Attendance is required; and university regulations in this regard are strictly applied. It is important to note the following:</p> <ol style="list-style-type: none"> The student is expected to follow all announcements issued by the university, faculty, department as well as the course instructor through the official channels. It is the student's full responsibility to get aware of these announcements and to react accordingly. The student has to communicate electronically with the course instructor, whenever needed, through the official channels exclusively which are limited to the AAUP email and Moodle messages only. The student is expected to attend all classes* and to arrive at classroom on time. If the instructor is late for class, the student must wait for at least 10 minutes before leaving the classroom. Absence by more than 25% of classes leads to an automatic withdrawal from the course (the grade W is assigned). The use of mobile phones or any other smart electronic devices is strictly prohibited during classes. <p>*a class refers to a lab session in case of labs.</p>
	<p>The student must perform all course assessment activities, i.e. assignments, quizzes, exams etc. It is important to note the following:</p> <ol style="list-style-type: none"> Absence from an exam or a quiz other than the final exam leads to a zero mark in that exam or quiz. An exception allowing a makeup is made for a student submitting a legitimate excuse that is accepted by the instructor in a timely manner. Absence from the final exam leads to an FA grade that eventually turns to an F grade. An exception allowing a makeup exam is made if the student submits an official excuse that is accepted by the Academic Affairs in compliance with the university regulations. Late policy is applied if the student fails to submit his/her assignments and/or projects in due time.
2. Performance of assessment activities	

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3. Academic Integrity

The student is expected to be honest during the performance of assessment activities. While not limited to the list below, the following actions are examples of cheating:

1. Copying from other students.
2. Using materials that are not authorized by the proctor during quizzes or exams.
3. Collaborating with other students during quizzes or exams.
4. Stealing or buying the content of exams, quizzes, and assignments.
5. Stealing ideas and work of others and presenting them as that of the student (known in academia as plagiarism).
6. Using mobile phones or any other smart electronic devices during quizzes or exams.

4. Grading

A	4.00
A-	3.67
B+	3.33
B	3.00
B-	2.67
C+	2.33
C	2.00
C-	1.67
D+	1.33
D	1.00
F	0.35

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5. Learning and teaching methods	Lectures	Class sessions involve lectures, video shows, case studies, discussions, debates, and power-point presentations on topics and current issues related to the course contents.
	Readings	This must be a key responsibility to each student. Students should read the relevant parts of the textbook and other materials before class. They should be prepared to raise questions and to get engaged in arguments on related topics in the class schedule.
	In class learning activities	Students are encouraged to learn actively individually and cooperatively in groups. Students are expected to engage with the material, participate in the class, and collaborate with each other. Students will be asked to analyze an argument, demonstrate role play, discuss case studies, make presentations, or apply a concept to a real-world situation.
	Outside class learning activities	The course instructor assigns projects and home assignments to students individually or in groups.
	Feedback	The instructor provides the students with feedbacks on their performance throughout the course, which can help them to realize their weaknesses and work harder to improve their performance.
	Online learning	Online learning platforms are utilized to provide students with additional resources as well as a continuous access to the course material beyond the classroom.

C. COURSE DETAILS

1. Course description & purpose	Electrical components: resistors, capacitors, inductors, voltage and current sources. Ohm's law, Kirchhoff's voltage and current laws. DC circuit analysis: Nodal voltage, mesh current, superposition, source transformation, Thevenin's, Norton's equivalents. Resistive circuits and the equivalent resistance, Y , and Y_{eq} . RL, RC, and RLC circuit analysis.
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2. CSLOs		Upon the completion of the course, students will be able to achieve the following learning outcomes:
	CSLO1	Explain the concepts and parameters associated with: voltage, current, power, energy, resistance, capacitance and inductance.
	CSLO2	Apply Kirchhoff's laws, linearity, superposition, and Thevenin's theorem in the design and analysis of circuits and choose the most appropriate analyzing technique for the particular circuit to be analyzed.
	CSLO3	Compare between resistive, inductive, capacitive, and hybrid circuits from analysis point of view and solve transient problems in switching circuits.

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4. CSLOs assessment	Outcomes	CSLO 1	CSLO 2	CSLO 3
	1 - Mid. Term	✓	✓	
	2 - Quiz	✓	✓	✓
	3 - Final Exam	✓	✓	✓

5. Assessments	Assessment tool	Weight %	CSLOs	Due week
	Mid. Term	30%	1,2	
	Quiz	20%	1,2,3	
	Final Exam	50%	1,2,3	
	Total	100%		

6. Course schedule	Week	Topics	Study material	Assignment	CSLOs
	1	BASIC COMPONENTS AND ELECTRIC CIRCUITS • Units and scales • Charge, current, voltage, and power	Chapter 2		1
	2	VOLTAGE AND CURRENT LAWS • Nodes, Paths, Loops, and Branches • Kirchhoff's Current Law • Kirchhoff's Voltage Law	Chapter 3		1
	3	VOLTAGE AND CURRENT LAWS • Series and Parallel Connected Source • Resistor in Series and Parallel	Chapter 3		1
	4	BASIC NODAL AND MESH ANALYSIS • Nodal Analysis • Super Node	Chapter 4		1,2

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6. Course schedule	Week	Topics	Study material	Assignment	CSLOs
	5	BASIC NODAL AND MESH ANALYSIS • Mesh Analysis • The Super Mesh	Chapter 4		1,2
	6	USEFUL CIRCUIT ANALYSIS TECHNIQUES • Linearity and Superposition	Chapter 5		1,2
	7	USEFUL CIRCUIT ANALYSIS TECHNIQUES • Thevenin and Norton Equivalent Circuit	Chapter 5		1,2
	8	Midterm Exam USEFUL CIRCUIT ANALYSIS TECHNIQUES • Maximum Power Transfer • Delta-Wye Conversion	Chapters 1 - 5		1,2
	9	CAPACITORS AND INDUCTORS • The Capacitors • The Inductors	Chapter 7		1,2,3
	10	CAPACITORS AND INDUCTORS • Inductance and Capacitance Combinations • Consequences of Linearity	Chapter 7		1,2,3
	11	BASIC RL AND RC CIRCUITS • The Source-Free RL Circuit • Properties of the Exponential Response	Chapter 8		1,2,3
	12	BASIC RL AND RC CIRCUITS • The Unit-Step Function	Chapter 8		1,2,3
	13	BASIC RL AND RC CIRCUITS • Natural and Forced Response	Chapter 8		1,2,3
	14	THE RLC CIRCUIT • The Source-Free Parallel Circuit • The Overdamped Parallel RLC	Chapter 9		1,2,3
	15	THE RLC CIRCUIT • Critical Damping • The Underdamped Parallel RLC Circuit • The Source-Free Series RLC	Chapter 9		1,2,3
	16	Final Exam	Chapters 1 - 5 and 7 - 9		1,2,3



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D. COURSE MATERIAL

1. Textbook	"Engineering Circuit Analysis", 8th Edition, William H. Hayt, Jr., McGraw-hill Higher Education
2. Reference material	1- "Circuit Analysis Theory and Practice", Rubbins & Miller. 2- "Introductory Circuit Analysis", Robert L. Boylestad.
3. Internet resources	https://portal.aaup.edu/ https://moodle.aaup.edu/ www.allaboutcircuits.com/