



Course Syllabus

**According to JORDAN National Qualification Framework
(JNQF)**

Course Name: Electrical Circuits (1)

Course Number: 04022130

General Course Information:

Course title	Electrical Circuits (1)
Course number	04022130
Credit hours	3h. theory
Education type	[Face-to-Face]
Prerequisites/corequisites	General Physics (2); (11021202)
Academic Program	Communications & Electronics Engineering.
Program code	REE, CEE
Faculty	Engineering
Department	Communications & Electronics Engineering.
Level of course	2 nd year
Academic year /semester	
Awarded qualification	B.Sc.
Other departments involved in teaching the course	Renewable Energy Engineering Department.
Language of instruction	English
Date of production/revision	

Course Coordinator:

Coordinator's name	Dr, Zakaria Al-Omari
Office No	4203
Office Phone extension number	2488
Office Hours	Su. 13:00-14:00
Email	Zakaria.alomari@iu.edu.jo

Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

Course Description (English/Arabic):

English	Basic Components of Electrical Circuits: Units and Scales, Current, Voltage, Power, Voltage and Current Sources, Ohm's Law; Voltage and Current Laws: KVL, KCL; Techniques of Circuit Analysis; Circuit Theorems: Linearity and Superposition, Source Transformations, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer; Energy Storage Elements: Capacitor, Inductor, Basic RL and RC Circuits; Introduction to AC Circuits.
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Textbook: Author(s), Title, Publisher, Edition, Year, Book website.

Hayt, W. H., Kimmerly, J. E., and Durbin, S. M., "Engineering Circuit Analysis 8th Edition", McGraw Hill, 2012
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References: Author(s), Title, Publisher, Edition, Year, Book website.

Required book (s), assigned reading and audio-visuals:

1. Alexander, C. K. and M. N. Sadiku, Fundamentals of Electric Circuits, McGraw Hill, 2005.
2. Thomas, R. E. and A. J. Rosa, The Analysis and Design of Linear Circuits, Wiley, 2006.
3. Nilsson, J. W. and S. Riedel, Electric Circuits, Prentice-Hall, 2004.

Internet links

<https://elearn.iu.edu.jo/>

Course Educational Objectives (CEOs):

1.	To recognize current as the rate at which charge flows past a point, identify the units for electric current, and perform simple computations regarding electric current.
2.	Understanding of resistive and energy storage elements, independent and controlled sources.
3.	Utilize basic analysis laws (Kirchhoff's current law, KCL, Kirchhoff's voltage law, KVL, and Ohm's law) to derive useful relationships for series and parallel combinations of passive and active components.
4.	Utilize voltage and current division techniques to simplify circuit analysis.
5.	Design simple electrical circuits, with DC sources, that satisfy specific functional requirements.
6.	Analyze dc(direct current) and ac (alternating current) and dc (direct current) circuits containing resistors, inductors, capacitors, to determine current, voltage, power, and energy values.

Intended Learning Outcomes (ILO's):

	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill, and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
A	Knowledge and Understanding:				
A1	Knowing the essential components of an electric circuit and understanding their functions.	1, 2	1	1	K
A2	Understanding different techniques to analyze an electric circuit	1, 2, 3	1, 2	1	K
A3	Understanding different electric circuit theorems	1, 2, 3	1, 2	1	K
A4	Understand the characteristics of capacitor and inductor	4, 5	1, 2	1	K
B	Intellectual skills:				
B1	Explain the operation and performance of different types of circuits.	1, 2, 3, 6	1, 2	2	S
C	Subject-specific skills:				
C1	Explanation of how a capacitor and an inductor stores energy.	1, 2, 3, 6	1, 2	3	S
D	Transferable skills:				

***Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**** Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.**

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program. A graduate of the () program will demonstrate:		Descriptors**		
		K	S	C
1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	✓		
2.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.		✓	
3.	An ability to communicate effectively with a range of audiences.		✓	
4.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.		✓	
5.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.		✓	
6.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.		✓	
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.		✓	

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule (please choose the type of teaching)

✓ Face to Face

☐ **Hybrid (2 Lectures Face – To - Face +1 Lecture Asynchronous)**

☐ **Hybrid (1 Lectures Face – To - Face +1 Lecture Asynchronous)**

☐ **Online (2 Lectures Synchronous +1 lecture Asynchronous)**

Week	First Lecture (.....)	Second Lecture (.....)	Third Lecture (.....)	Ach. ILOs	Ach. PLOs	Descriptors**
1	Introduction	Introduction	Introduction	A1	1	K
2	Circuit Variables	Circuit Variables	Circuit Variables	A1	1	K
3	Circuit Elements	Circuit Elements	Circuit Elements	B1	1, 2	K
4	Simple Resistive Circuits	Simple Resistive Circuits	Simple Resistive Circuits	B1	1, 2	K, S
5	Simple Resistive Circuits	Simple Resistive Circuits	Simple Resistive Circuits	B1	1, 2	K, S

6	Techniques of Circuit Analysis	Techniques of Circuit Analysis	Techniques of Circuit Analysis	A1, 2, 3, 4, B1	1, 2	K, S
7	Techniques of Circuit Analysis	Techniques of Circuit Analysis	Techniques of Circuit Analysis	A1, 2, 3, 4, B1	1, 2	K, S
8	Circuit theorems	Circuit theorems	Circuit theorems	A1, 2, 3, 4, B1	1, 2	K, S
9	Revision	Revision	Mid - Term			
10	Capacitance	Capacitance	Capacitance	A1, 2, 3, 4, B1	1, 2	K, S
11	Inductance	Inductance	Inductance	A1, 2, 3, 4, B1	1, 2	K, S
12	Introduction to AC circuit	Introduction to AC circuit	Introduction to AC circuit	A1, 2, 3, 4, B1	1, 2	K, S
13	Techniques of Circuit Analysis	Techniques of Circuit Analysis	Techniques of Circuit Analysis	A1, 2, 3, 4, B1	1, 2	K, S
14	Introduction to 3-phase circuits	Introduction to 3-phase circuits	Introduction to 3-phase circuits	A1, 2, 3, 4, B1	1, 2	K, S
15	Revision	Revision				

* K: Knowledge, S: Skills, C: Competency

Teaching Methods and Assignments:

The development of ILOs is promoted through the following teaching and learning methods:

- Interactive videos
- Practice Labs
- Discussion Forums
- Quizzes
- Other Interactive online activities
- Reports

Course Policies:

A- Attendance policies:

The maximum allowed absences are 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignments on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehavior:

Cheating, plagiarism, misbehavior will result in zero grades and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) ____%
- Midterm ____%
- Final Exam ____%

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the IU E-Learning Platform at: <https://elearn.iu.edu.jo/>
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools implemented in the course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others:.....

Responsible Persons and their Signatures:

Course Coordinator	Dr. Zakaria Al-Omari	Completed Date	
		Signature	
Received by (Department Head)	Dr. Zakaria Al-Omari	Received Date	
		Signature	