COURSE DESCRIPTIONS

Faculty	**Engineering**				
Department	**Department of Renewable Energy Engineering**			**NQF level**	7
Course Title	Electric Circuits 1 Laboratory	**Code**	703452	**Prerequisite**	Electric Circuits 1
Credit Hours	1 credit	**Theory**	30 min	**Practical**	150 min
Course Leader	Dr. Jamal Alsadi	**email**	j.alsadi@jadara.edu.jo		
Lecturers	Dr. Amer Al-Canaan	**emails**	a.alcanaan@jadara.edu.jo		
Lecture time	13:30 -16:00 Mon, Wed	**Classroom**	-	**Attendance**	
Semester	Summer 2021/2022	**Production**	2019	**Updated**	2021

Short Description

The student learns the basic principles of connecting and testing DC resistive and capacitive circuits. Students learn also the use of power supplies, multi-meters, circuit simulators as well as, electric measuring devices and components.

Course Objectives

- To be able to discuss potential difference and current in a circuit in terms of electric field, work per unit charge and motion of charges
- To understand that current is constant throughout a simple closed circuit
- To be able to demonstrate Kirchhoff's Second Law in a simple closed circuit
- To be able to connect current and voltage probes properly
- To be able to demonstrate Ohm's Law for linear resistors to understand that not all resistors are linear resistors
- To be able to determine the resistivity of a piece of metal experimentally

Learning Outcomes

A. Knowledge - Theoretical Understanding

Upon successful completion of this course, student should:

a.1 Explain basic electrical concepts, including electric charge, current, electrical potential, electrical power, Norton and Thevinin equivalent circuits and energy; Identify the advantages of electric network topology: nodes, branches, and loops to solve circuit problems, (K1)

B. Knowledge - Practical Application

a.2 Conduct experiments and **measure** resistance, equivalent resistance, voltage and current. (K2)

C. Skills - Generic Problem Solving and Analytical Skills
b.1 Compute voltage, current, power and **analyse** electric circuits using Kirchof's current and voltage laws.
D. Skills - Communication, ICT, and Numeracy
b.3 Perform group work and **write** technical report to analyse, describe basic DC/AC circuits.
E. Competence: Autonomy, Responsibility, and Context
Teaching and Learning Methods
Standard Lecture Online Lecture Inside lab. experiments Multi-media Content Tutorials Simulation using Tina and LTSPice circuit simulators
Assessment Methods
Class Participation and Assignments
Reports (10 report.)
Quizzes {(3-5) quizzes of (10-15) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer}
Midterm Exam
Final Exam

Course Contents					
Week	**Hours**	**CLOs**	**Topics**	**Teaching & Learning Methods**	**Assessment Methods**
1	5	a1, a2	Introduction to Tina and LTSpice electric circuit simulators Fundamental of electric circuits, DC power supply, DC meters, switches	Experimental learning Discussions and analysis	
2	5	a1, a2, b1, b3	1. Ohm's Law, Resistors, Fundamental of electric circuits, DC power supply, DC meters, switches 2. Resistors, Potentiometers, Series and Parallel DC Circuits	Experimental learning	Reports # 1 & 2
3	5	a1, a2, b1, b3	3. Potentiometers, Series and Parallel DC Circuits 4. Wheatstone Bridge	Discussions and analysis	**Quiz #1** Reports # 3 & 4
4	5	a1, a2, b1, b3	5. Δ-Y Connection	Experimental learning	Report # 5 **Midterm exam**

5	5	a1, a2, b1, b3	6. Superposition 7. Thevenin's and Norton's Theorems	Discussions and analysis	**Quiz #2** Reports # 6 & 7
6	5	a1, a2, b1, b3	8. Maximum Power transfer and Source Transformation 9. RC, RL and RLC transient circuits with DC sources	Experimental learning	Reports # 8 & 9
7	5	a1, a2, b1, b3	10. Oscilloscope: Voltage, Current and Time measurements.	Experimental learning	Reports # 10
8	5	a1, a2, b1, b3	Revision **Final Exam**	Discussions and analysis	**Final exam**

Infrastructure	
Textbook	Laboratory notes and manual
References	Engineering Circuit Analysis, W.H.Hayat, Kemerly and Durbin, 6th Edition.
Electronic materials	Experiment procedures, simulator manuals
Other	**Tables, manuals**

Course Assessment Plan						
Assessment Method		**Grade**	**CLOs**			
			a.1	**a.2**	**b.1**	**b.3**
First (Midterm)		**20%**	10	5	5	
Second (if applicable)						
Final Exam		**40%**	20	10	10	
Coursework		**40%**				
Coursework assessment methods	Assignments					
	Case study					
	Discussion and interaction					
	Group work activities					
	Lab tests and assignments/attends		5	5	10	10
	Presentations					
	Quizzes				10	
Total		**100%**	35	20	35	10

Plagiarism

Plagiarism is claiming that someone else's work is your own. The department has a strict policy regarding plagiarism and, if plagiarism is indeed discovered, this policy will be applied. Note that punishments apply also to anyone assisting another to commit plagiarism (for example by knowingly allowing someone to copy your code).

Plagiarism is different from group work in which a number of individuals share ideas on how to carry out the coursework. You are strongly encouraged to work in small groups, and you will certainly not be penalized for doing so. This means that you may work together on the program. What is important is that you have a full understanding of all aspects of the completed program. In order to allow proper assessment that this is indeed the case, you must adhere strictly to the course work requirements as outlined above and detailed in the coursework problem description. These requirements are in place to encourage individual understanding, facilitate individual assessment, and deter plagiarism.