هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Electric Circuit Lab
Course Code:	EE1223
Program:	Electrical Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Imam Mohammad Ibn Saud Islamic University
Version:	V5
Last Revision Date:	01-01-2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (5th level, 3rd year)					
4. Course general Description:					
In this lab course the student will get hands-on experience to design, construct and analyze different Electrical circuits. Student will learn Ohm's law, Kirchhoff current & voltage laws, Resistors in Series & Parallel, Star to Delta circuit analysis, Thevenin's & Norton's theorem, Superposition theorem & Maximum power transfer theorem Verification, RC circuit transient analysis & AC sinusoidal analysis. During this course the student will learn hand on experience on simulation software "PSpice", Bread board, oscilloscope & Functional generators.					
5. Pre-requirements for this course (if any)**:**					
EE 1222, GE 1101					
6. Co-requisites for this course (if any)**:**					
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7. Course Main Objective(s):					
• Construct Electrical circuits using Hardware bread board & simulation software. • Construct and test different circuits to perform analysis & verify different theorems. • Learn usage of various electrical hardware instruments and equipment related to Electrical engineering. • Able to simulate basic circuits on software, performing a pre-analysis before implementing on hardware.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning	-	-
3	Hybrid • Traditional classroom • E-learning	-	-
4	Distance learning	-	-

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	-
2.	**Laboratory/Studio**	30
3.	**Field**	-
4.	**Tutorial**	-
5.	**Others (specify)**	-
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
K1	Solve Basic Electric circuit problems by using linear algebra and simple calculus.	1.2	Applying During Experiment Writing in report	Report Writing
K1	Solve practical problem logically using correct theoretical concepts.	1.6	Reading Manual Performing Experiments	Quizzes in class Midterm exam Final exam
2.0	**Skills**			
S1	Use various engineering tools to design, analyze, build, and test electric circuits.	2.3	Performing during Experiment. Writing in report	Final practical Exam Mid Practical Exam
S2	Simulate electric circuits using various IDE environments	6.6	Reading Manual Performing Experiments	Midterm exam Final exam
S2	Use engineering Judgment to draw conclusion	6.7	Report writing	Report Evaluation
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
V1	Use of Graphs, Tables and Diagrams	3.3	Group discussions during class Performing Experiments	Quizzes in class Midterm exam Final exam

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to PSpice for Circuit Analysis	2
2	Introduction to Bread board and Resistor color codes	2
3	Verification of Kirchoff's Current Law (KCL)	2
4	Verification of Kirchoff's Voltage Law (KVL)	2
5	Series and Parallel Circuits	2
6	Delta-Wye (Y-Δ) and Bridge Circuit Analysis	2
7	Verification of Superposition Theorem	2
8	Verification of Thevenin's Theorem	2
9	Verification of Norton's Theorem and Source Transformation	2
10	Verification of Maximum Power Transfer Theorem	2
11	The Oscilloscope and Function Generator	2
12	Transient Analysis of First Order RC Circuit	2
13	The Sinusoidal AC Response of R, L, and C Circuits	2
14	Transient Analysis of First Order RL Circuit	2
15	RLC Series and Parallel Resonance (AC Analysis)	2
16	Mid and Final Exam	4
Total		**34**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm 1	7^{th} week	20%
2.	Reports	Every week	20%
3.	Pre-Lab Quiz	Weekly	10%
4.	Quiz	10^{th} Week	10%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
5.	Final Exam	Final Exam week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Lab manual Given by University
Supportive References	Engineering Circuit Analysis, W. H. Hayt, Jr., J. E. Kemmerly, and S.M. Durbin,
Electronic Materials	Computer animations supplied by the instructor.
Other Learning Materials	Using Softwares is Encouraged for Simulation Purpose other than that of Lab.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	SR 145 in Lab Room with 10-15 Students per Section
Technology equipment (projector, smart board, software)	Lab Equipment, Computers, Internet connection, Blackboard LMS software, data-show, and white board.
Other equipment (depending on the nature of the specialty)	Provided in the lab.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students assessment	Students	Indirect
Quality of learning resources	Relevant Focus Group	Indirect
The extent to which CLOs have been achieved	Dept. Quality Committee	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	

REFERENCE NO.	
DATE	