هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Electronic Devices and Applications Lab
Course Code:	EE 1322
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: (6th level, 3rd year)					
4. Course general Description:					
This lab course is intended to introduces the Bipolar Junction Transistor (BJT) and Operational Amplifier characteristics, Frequency Response of Single and Double stage BJT amplifier, Different Configurations of op-amps, Applications of Op-amps such as inverting & non-inverting Comparators, Characteristics and Frequency response of inverting & non-inverting amplifiers, integrators , differentiators, Active Low Pass Filters and their Frequency Responses, Active High Pass Filters and their Frequency Responses, Schmitt Triggers, Oscillators.					
5. Pre-requirements for this course (if any)**:**					
EE 1321					
6. Co-requisites for this course (if any)**:**					
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7. Course Main Objective(s):					
1. Providing students with the fundamentals of a Electronic devices such as diode, Zener diode, BJT, etc., 2. Providing students with the necessary skills to operate oscilloscope, AFG, Multimeters, DC supply etc., 3. Providing students with the knowledge of designing a Half wave rectifier, a FWR, Clippers, Clampers etc., 4. Providing students with the basic skills to analyze a clipping and clamping circuit. 5. Providing students with the basic skills to analyze a HWR, FWR with Filters circuit. 6. Providing students with the basic skills to Design a general DC supply. 7. Providing Students with necessary assistance to carry out their project.					

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**			
K2	Recognize and recall special symbols and characteristics used for the devices such as Diodes, Zener diode, BJT, MOSFETs, and op-amps.	7.2	Studying datasheets	Lab performance, report, exams
2.0	**Skills**			
S2	Design and analyze basic applications of diodes, Zener diode, BJT, MOSFETs, and op-amps.	6.4	Reading Manual Performing experiments	Lab performance, report, exams
S2	Design and demonstrate op-amp based oscillators	6.5	Reading Manual	Lab performance, report, exams
S2	Practice the use of oscilloscope, function generator, DC Supply, digital multimeter, etc.,	6.2	Reading Manual Performing experiments	Lab performance, report, exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
S2	Prepare lab report for the performed experiments	6.3	Report writing	Report Evaluation
3.0	**Values, autonomy, and responsibility**			
V1	Prepare lab report for the performed experiments	3.2	Report writing	Report Evaluation

C. Course Content

No	List of Topics	Contact Hours
1.	VI Characteristics of A pn-Junction Diode	2
2.	VI Characteristics of a Zener Diode	2
3.	Half Wave Rectifier With & Without Filter	2
4.	Full Wave Rectifier With & Without Filter	2
5.	Common Base Configuration Input-Output Characteristics	2
6.	Emitter Follower	2
7.	Op-amp Comparators	2
8.	Inverting and Non-inverting Amplifiers (DC & AC)	2
9.	Integrator and Differentiators	2
10.	Low Pass Filter	2
11.	High Pass Filter	2
12.	Schmitt Trigger	2
13.	BJT Amplifier	2
14.	BJT Multistage Amplifier	2
15.	RC Phase Shift Oscillator	2
16.	Exams and project	4
Total		**34**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes (average of 2 quizzes)	5th& 8th week	10%
2.	Midterm 1	12th week	20%
3.	Report	Every week	30%
4.	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	1- T. L. Floyd, Electronic Devices: Electron Flow Version, 9th Ed., Prentice Hall (Pearson Education Inc.), 2012. 2- R. C. Jaeger and T. N. Blalock, Microelectronic Circuit Design, 4th Ed., Mc Graw Hill, 2011. 3- A. S. Sedra and K. C. Smith, Microelectronic Circuits, 5th Ed., Oxford University, 2004. 4- R. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, 7th Ed., Prentice Hall. 5- M. Tooley, Electronic Circuits: Fundamentals and Applications, 3rd Ed., Elsevier Ltd., 2006. 6- R.A.Gayakawd, OPAMP & Linear Integrated Circuit, Pearson Education., 2010.
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	