



Course Specification

— (Bachelor)

Course Title: Electronic Devices

Course Code: CEN1304

Program: Bachelor in Computer Engineering

Department: Computer Engineering

College: Faculty of Computers and Information Technology

Institution: University of Tabuk

Version: 1.0

Last Revision Date: 27 July 2022



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A. General information about the course:

1. Course Identification

1. Credit hours: (4)

2. Course type

- A. University College Department Track Others
- B. Required Elective

3. Level/year at which this course is offered: (6/3)

4. Course general Description:

The course is intended to provide an understanding of the basics of semiconductor materials (Diodes, BJTs, FETs, and etc.) and their properties and their applications in electronic systems. Use different types of the lab equipment and tools such as scopes, multi-meter, power supplies, function generators, crimping, soldering irons, etc. And design and testing of different types of electronic device circuits.

5. Pre-requirements for this course (if any):

Electrical Circuits CEN 1301

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

1. Understand the basics of semiconductor materials and their properties.
2. To recognize the different types of diodes and their applications in electronic systems as well as their modes and regions of operation.
3. Analyze the diode circuits using graphical and iterative methods.
4. Understand the construction of BJT and FET transistors.
5. Identify the configurations, operation modes and Q-points of BJT and FET.
6. Be able to use different types of the lab equipment and tools such as scopes, multi-meter, power supplies, function generators, crimping, soldering irons, and etc.
7. Conduct and investigate the Voltage current characteristics a normal diode and Zener diode.
8. Design and testing of: series and parallel diode circuits (clipping, clamping, voltage regulation circuits, rectifiers, light emitting diodes, etc.), seven segment display common anode and common cathode configurations, and the biasing characteristics of BJT transistor circuits.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		



No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		75

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define the fundamental of semiconductor material properties, majority and minority carries.	K4	Lectures, Lab sessions	Class Works, Assignments, Exams, Lab works.
1.2	Familiarize with the forward and reverse modes of the diodes, diodes circuits and their implementation in electronic systems	K2,K5	Lectures, Lab sessions	Exams, Lab works.
1.3	Recognize the basic construction, characteristics, and behavior of BJT and FET transistors.	K2,K3	Lectures, Lab sessions	Class Works, Assignments, Exams, Lab works.
2.0	Skills			



Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Analyze and Explain the diode circuits using graphical and iterative methods.	S2, S3	Lectures, Lab sessions	Class Works, Assignments, Exams, Lab works.
2.2	Differentiate between the BJT circuits of various configurations.	S2,S3	Lectures, Lab sessions	Exams, Lab works.
2.3	Recognize the FET mode of operations and the circuits configurations	S2, S4	Lectures, Lab sessions	Class Works, Assignments, Exams, Lab works.
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate the effectiveness of Teamwork	V1,V2	Lectures, Lab sessions	Exams, Lab works.
3.2	Interpret and criticize the methods of conducting the Lab experiments	V1,V2	Lectures, Lab sessions	Class Works, Assignments, Exams, Lab works.

C. Course Content

No	List of Topics	Contact Hours
1.	<ul style="list-style-type: none"> Introduction to semiconductor materials Lab: introduction on how to use the lab equipment, measuring instruments and tools 	5
2.	<ul style="list-style-type: none"> Introduction to Semiconductor Diodes Lab: Design of the forward and reverse bias circuits of the diode 	5
3.	<ul style="list-style-type: none"> VI characteristics of the Diode and the diode Equation Lab: Design of the forward and reverse bias circuits of the diode and to study the VI characteristics of the Diode and the diode Equation 	5
4.	<ul style="list-style-type: none"> Light emitting diodes and their applications Lab: Design of series and parallel LED circuits 	5
5.	<ul style="list-style-type: none"> Seven segment display, types and applications Lab: Design of Seven segment display (CA, CC) to display the letters and numerals 	5
6.	<ul style="list-style-type: none"> Photodiodes and their applications Lab: design of photodiode circuit 	5
7.	<ul style="list-style-type: none"> Rectifiers (Half wave, full wave and bridge rectifiers) Lab: Design of half wave, full wave and power supply circuits 	5
8.	<ul style="list-style-type: none"> Zener Diode and voltage regulation circuits Lab: design of Zener diode circuits 	5



9.	<ul style="list-style-type: none"> Clipping Circuits, Clamping circuits and their applications Lab: design of clipping and clamping circuits 	5
10.	<ul style="list-style-type: none"> Voltage Multipliers (voltage doubler, tripler, etc. Lab: design of voltage doubler and tripler circuits 	5
11.	<ul style="list-style-type: none"> Diodes Circuits Lab: design of diodes circuits 	5
12.	<ul style="list-style-type: none"> Serial and Parallel connection of the diodes Lab: design of series and parallel circuits of the diodes 	5
13.	<ul style="list-style-type: none"> BJT transistor configuration and modes of operation Lab: design of BJT common emitter, common base and common collector circuits to study the transistor load line and Q-point 	5
14.	<ul style="list-style-type: none"> BJT Transistor Biasing Circuits Lab: design of BJT CE Bias, CB bias and CC bias 	5
15.	<ul style="list-style-type: none"> FET Transistor configuration, operation modes and biasing Lab: design of FET common source, Common gate and common drain circuit to study the transistor load line and Q-point 	5
Total		75

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments, Quizzes, Lab works, Class Works	1-15	30%
2.	First Midterm Exam	7 - 9	15%
3.	Second Midterm Exam	11-13	15%
4.	Final Semester Exam	14-17	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	1. Floyd, Electronic Devices (Conventional Current Version), 10/E, Pearson Higher Education, 2018, ISBN-10: 9781292222998, ISBN-13: 9781292223018.
1. Supportive References	2. S. Salivahanan and N. Suresh Kumar, Electronic Devices and circuits, 4/E, McGraw-Hill, 2017, ISBN 0074633864, ISBN-10: 9789339219505, ISBN-13: 978-9339219505. 3. LAB Manual.



Electronic Materials	<ol style="list-style-type: none"> 1. www.wowebook.com 2. Faculty member's sites 3. SDL
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, laboratory
Technology equipment (projector, smart board, software)	White board, Data show projector
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Teaching	Faculty, Program Leaders, and Advisory Board	Both Direct and Indirect
	Students	Indirect
Effectiveness of Students Assessment	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Both Direct and Indirect
Quality of Learning Resources	Faculty, Students, and Advisory Board	Indirect
The Extent to which CLOs have been Achieved	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Direct (as in section B) and Indirect/Surveys
	Students	Indirect
Other	-	-

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

