



Course Specification

— (Bachelor)

Course Title: **Medical Electronics**

Course Code: **MPHY6431**

Program: **Medical Physics**

Department: **Physics**

College: **Science**

Institution: **University of Bisha**

Version: **1**

Last Revision Date: 5 September 2023

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A. General information about the course:

1. Course Identification

1. Credit hours:	3 (2 Lectures + 1 Laboratory)				
2. Course type					
A.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>	Track <input type="checkbox"/>	Others <input type="checkbox"/>
B.	Required <input type="checkbox"/>	Elective <input type="checkbox"/>			
3. Level/year at which this course is offered:	7 th Level / 4 rd year				
4. Course general Description					
This course introduces the characteristics and medical applications of semiconductor devices, diodes, transistors circuits. Bias analysis of the electronic circuits and their medical applications.					
5. Pre-requirements for this course (if any):					
NA					
6. Co- requirements for this course (if any):					
NA					
7. Course Main Objective(s)					
Recognize the fundamental of electronic devices and circuits.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	4	100%
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	60





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			
1.1	Describe diode and transistor bias.	K2	Lecturing	Quizzes Homework Midterm exam Final exam
2.0	Skills			
2.1	Solve problems in electronics.	S1	Solve problems. Self-learning	Quizzes Homework Midterm exam Final exam
2.2	analyze experimental data.	S2	Practices lab	Reports Practical exam
2.3	Communicate positively with others.	S4	Presentation Work group	Reports Presentation
3.0	Values, autonomy, and responsibility			
3.1	Exhibit self-learning skills independently.	V2	Self-learning	Reports Presentation
3.2	Ability to work in team effectively.	V3	Work group	Reports Presentation

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Electronics. 1.The Atom. 2. Materials Used in Electronics. 3. Current in Semiconductors. 4. N-Type and P-Type Semiconductors Experiment #1.	6
2.	The PN Junction and Diodes 1.The PN Junction. 2.Diode Operation. Experiment #2.	6
3.	The PN Junction and Diodes 3. Voltage-Current (V-I) Characteristics of a Diode. 4. Diode Models	6





	Experiment #3.	
4.	Diodes applications 1.Half-Wave and Full-Wave Rectifiers. 2.Power Supply Filters and Regulators. Experiment #4.	6
5.	Diodes applications. 1.Ripple Factor of output voltage signal of rectifier's circuit . 2.Voltage Multipliers. Experiment #5.	6
6.	Special purpose diodes. 1. The Zener Diode 2. Zener Diode Applications Experiment #6.	6
7.	Special purpose diodes. 3. Optical Diodes 4 Other Types of Diodes Experiment #7.	6
8.	Bipolar junction transistor BJT application. 1.The BJT as an Amplifier. 2.The BJT as a Switch. 3.The Phototransistor Experiment #8.	6
9.	Transistor bias circuits. BJT 1. The DC Operating Point 2. Voltage-Divider Bias Experiment #9.	6
10.	Medical Electronic devices. Physiological Instrumentation Experiment #10.	6
Total		60

Table: The matrix of consistency between the content and the learning outcomes of the course.

	Course Learning Outcomes					
	1.1	2.1	2.2	2.3	3.1	3.2
Topic 1	√	√	√	√	√	√
Topic 2	√	√	√	√	√	√
Topic 3	√	√	√	√	√	√
Topic 4	√	√	√	√	√	√
Topic 5	√	√	√	√	√	√
Topic 6	√	√	√	√	√	√
Topic 7	√	√	√	√	√	√
Topic 8	√	√	√	√	√	√
Topic 9	√	√	√	√	√	√
Topic 10	√	√	√	√	√	√





D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework, quizzes, reports, and presentation.	1: 10	5 %
2.	Achievement file (Practical experience reports).	1: 10	5 %
3.	First term exam	7: 8	10 %
4.	Second term exam	12:13	10 %
5.	Practical exam	15	20 %
6.	Final exam	End of Semester	50 %

*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	ELECTRONIC DEVICES, 10th Edition, Floyd. Thomas L. Pearson Education, Limited, (2018).
Supportive References	-ELECTRONIC DEVICES AND CIRCUIT THEORY, 11th Edition, Boylestad, Robert L. Prentice hall, (2013).
Electronic Materials	- Blackboard. - PowerPoint presentations. - Digital library of University of Bisha https://ub.deepknowledge.io/Bisha
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<p>Laboratory equipment</p> <ol style="list-style-type: none"> Forward & Reverse Bias Characteristics of PN Junction Diode and LED- Diode. Zener diode characteristics. Half Wave Rectifier. Full Wave Rectifier. Input & Output Characteristics of BJT Switching Characteristics of BJT-Transistor. Frequency Response of CE Amplifier circuit. Voltage multiplier. Logic gats circuits (and, or, not).





Items	Resources
	10. Input & Output Characteristics of FET – Transistor Configuration and parameter calculations.
Technology equipment (projector, smart board, software)	Projector or smart board
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students.	Indirect (Questionnaire).
Effectiveness of students assessment	Students, Staff members, Program Leader.	Indirect (Questionnaire).
	Peer Reviewer.	Direct (Review exam)
Quality of learning resources	Students, Staff members, Program Leaders.	Indirect (Questionnaire).
The extent to which CLOs have been achieved	Students, Staff members, Program Leader.	Indirect (Questionnaire).
	Course coordinator.	Direct (Course Learning Outcomes Assessment).

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	College of Science Council
REFERENCE NO.	١
DATE	5 September 2023

