هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Physics of Electronics 2**
Course Code:	PHYS 0426
Program:	**PHYSICS**
Department:	**PHYSICS**
College:	**Science**
Institution:	**Majmaah University**
Version:	**1**
Last Revision Date:	**30/12/2024**

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A. General information about the course:

1. Course Identification

1. Credit hours: 3 (3,0,0)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (7)					
4. Course General Description:					
Nowadays, electronics is considered the basis of the modern revolution of industry, communication, control and many other aspects in our life. **Theoretical part:** Digital Electronics: Introduction to digital concepts, Binary and Hexadecimal Systems, Logic Gates, Karnaugh Maps Flip Flops, Shift Registers, Counters, decoders and Memories.					
5. Pre-requirements for this course (if any)**:**					
PHYS 0325					
6. Co-requisites for this course (if any)**:**					
Nill					
7. Course Main Objective(s):					
1. Understand the basic principles and abstractions that are used to analyses and design digital electronic circuits and binary systems.Understand the language of analoge electrical and electronic and how to formulate and solve basic analog electrical and electronic problems. 2. Understand the language of electrical and electronic and how to formulate and solve basic digital electrical and electronic problems. 3. Understand how digital electronic circuits and systems fit into the larger context of science careers, ethics, societal needs, and environmental concerns					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	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**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Knowledge in the fundamentals of digital electronic principles and practices, including analysis, design, evaluation, and management	**K1**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**
1.2	Know basic arithmetic calculations in binary, decimal and hexadecimal;	**K2**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.3	Learn about Logic Gates and Gate Combinations	**K2**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**
2.0	**Skills**			
2.1	Analyses and synthesize combinational logic circuits	**S1**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**
2.2	Demonstrate practical skills in the designing and testing of digital systems	**S2**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**
2.3	Apply Digital Adder – half adder and full Adder and subtractor in project design, evaluation, and analysis.	**S2**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**
3.0	**Values, autonomy, and responsibility**			
3.1	Work collaboratively and constructively and lead diverse teams to perform a wide range of tasks with responsibility and play a major role in joint work planning and evaluation.	**V1**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:** Peer Learning	**Quiz Assignment Mid term exams Final exams**
3.2	Manage tasks and activities related to the discipline and work in a professional manner and with autonomy.	**V2**	**Direct teaching:** Lectures Presenataions discussions **Indirect teaching:**	**Quiz Assignment Mid term exams Final exams**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			Peer Learning	
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Digital Systems	3
2.	Number Systems, Operations, and Codes	3
3.	Logic Gates and Gate Combinations	3
4.	Combinational Logic	6
5.	Functions of Combinational Logic	6
6.	Latches, Flip-Flops, and Timers	6
7.	Shift Registers	6
8.	Counters, decoders, Memory and Storage.	6
9.	Digital Adder –half adder and full Adder and subtractor	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First exam	6th	20%
2.	Second exam	12th	20%
3.	Homework	Every week	10%
4	Quiz	8th	10%
6	Final exam	End of the semester	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	Thomas L. Floyd , Digital Fundamentals: A Systems Approach 1st Edition , 2014.
Supportive References	Thomas L. Floyd, Electronics fundamentals: Circuits, Devices and Applications, 2012
Electronic Materials	

Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, data show, Smart Board, software
Technology equipment (projector, smart board, software)	Computer Lab. and Internet Lab.
Other equipment (depending on the nature of the specialty)	**Library, Wi-Fi internet connections**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students (Indirect)**	**Course Evaluation Survey**
Effectiveness of Students assessment	**Faculty (Direct)**	**Learning Source**
Effectiveness of teaching	Students/ internal committee	Direct (Student evaluation electronically organized by Deanship of registration and admission)/ Verification of students' papers
Effectiveness of students' assessment	Staff members (Peer Reviewer)	Indirect (Frequent meetings and consultation among the teaching staff)
Quality of learning resources	Staff members (Peer Reviewer)	Indirect (Frequent meetings and consultation among the teaching staff)
The extent to which CLOs have been achieved	Staff members (Peer Reviewer)	Direct (Meeting between course coordinators and the tutors)

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	16
DATE	**30/12/2024**