Course Syllabus

1	**Course title**	Digital Electronics	
2	**Course number**	0302330	
3	**Credit hours**	3	
	Contact hours (theory, practical)	Theory 3	
4	**Prerequisites/corequisites**	Electronics 0302231	
5	**Program title**	BSs	
6	**Program code**	0302	
7	**Awarding institution**	The University of Jordan	
8	**School**	Science	
9	**Department**	Physics	
10	**Course level**	3rd year level	
11	**Year of study and semester(s)**		
12	**Other department(s) involved in teaching the course**	-	
13	**Main teaching language**	English	
14	**Delivery method**	☒Face to face learning　☐Blended　　☐Fully online	
15	**Online platforms(s)**	☐Moodle　☒Microsoft Teams ☐Skype　　☐Zoom ☐Others…………	
16	**Issuing/Revision Date**	25-7-2024	

17 Course Coordinator:

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18 Other instructors:

19 Course Description:

This course provides an in-depth exploration of foundational physics concepts and principles, Number systems and codes; digital electronic signals and switches; basic logic gates; Boolean algebra and reduction techniques; exclusive-OR and Exclusive-NOR gates; arithmetic operations and circuits; code converters; multiplexers and de-multiplexers; flipflops and registers; practical considerations for digital design; counter circuits; shift registers; multi-vibrators and 555 timer; interfacing to the analog world; microprocessor fundamentals.

20 Course aims and outcomes:

A- Aims:

After successfully completing this course, the student will be able to:

1- Students need understand the basic differences between analogue and digital signals.

2- Students will be able understand the basic treatment of digital signals and the basics digital signals manipulation (Analogue -to-digital converters, digital-to-analogue converters, multiplexers, and de-multiplexers)

3- Students will study the different number systems (decimal, binary, octal decimal, and hexadecimal) and their applications in digital electronics.

4- The students are expected to understand digital logic, logic gates, and Boolean Algebra.

5- The students will learn how to use logic simplification and combinational logic and functions of combinational logic.

6- Students are expected to understand the different applications of digital logic in flip-flops, adders, counters, timers, and shift registrars.

B- Students Learning Outcomes (SLOs):

For purposes of mapping the course SLOs to the physics program SLOs, at the successful completion of the physics program, graduates are expected to be able to:

SLO (1) Master professionally a broad set of knowledge concerning the fundamentals in the basic areas of physics: Quantum Mechanics, Classical Mechanics, Electrostatics and Magnetism, Thermal Physics, Optics, Theory of Special Relativity, Mathematical Physics, Electronics.

SLO (2) Apply knowledge of mathematics and fundamental concepts in the basic areas of physics to identify and solve physics related problems.

SLO (3) Utilize computers and available software in both data collections and data analysis.

SLO (4) Utilize standard laboratory equipment, modern instrumentation, and classical techniques to design and conduct experiments as well as to analyze and interpret data.

SLO (5) Develop a recognition of the need and ability to engage in life-long learning.

SLO (6) Demonstrate ability to use techniques, skills, and modern scientific tools necessary for professional practice.

SLO (7) Communicate clearly and effectively in both written and oral forms.

SLO (8) Apply proficiently team-work skills and employ team-based learning strategies.

SLO (9) Apply professional and ethical responsibility to society.

Upon successful completion of this course, students will be able to:

Program SLOs / Course SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)	SLO (9)
1. Students need understand the basic differences between analogue and digital signals.	✓	✓							
2. Students will be able understand the basic treatment of digital signals and the basics digital signals manipulation (Analogue - to-digital converters, digital-to-analogue converters, multiplexers, and de-multiplexers)	✓	✓							
3. Students will study the different number systems (decimal, binary, octal decimal, and hexadecimal) and their applications in digital electronics.	✓	✓							
4. The students are expected to understand digital logic, logic gates, and Boolean Algebra.	✓	✓							
5. The students will learn how to use logic simplification and combinational logic and functions of combinational logic.	✓	✓							
6. Students are expected to understand the different applications of digital logic in flip-flops, adders, counters, timers, and shift registrars.	✓	✓							

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21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	**CH1: Introductory Concepts**	1	F to F	teams		Exams, In class exams and H.W sets	
	1.2							
	1.3							
2	2.1	**CH2: Number Systems, Operations, and Codes**	2	F to F	teams		Exams, In class exams and H.W sets	
	2.2							
	2.3							
3	3.1							
	3.2							
	3.3							
4	4.1	**CH3: Logic Gates**	3	F to F	teams		Exams, In class exams and H.W sets	
	4.2							
	4.3							
5	5.1	**Boolean Algebra, and Logic Simplification**	4	F to F	teams		Exams, In class exams and H.W sets	
	5.2							
	5.3							
6	6.1							
	6.2							
	6.3							
7	7.1	**Ch5: Combinational Logic Analysis**	5	F to F	teams		Exams, In class exams	

	7.2						and H.W sets	
	7.3							
8	8.1	**CH6: Functions of Combinational Logic**	5	F to F	teams		Exams, In class exams and H.W sets	
	8.2			F to F	teams			
	8.3							
9	9.1							
	9.2							
	9.3							
10	10.1	**CH7: Latches, Flip-Flops, and Timers**	6				Exams, In class exams and H.W sets	
	10.2			F to F	teams			
	10.3							
11	11.1							
	11.2							
	11.3							
12	12.1	**CH8: Counters**	6	F to F	teams		Exams, In class exams and H.W sets	
	12.2							
	12.3							
13	13.1							
	13.2							
	13.3							
14	14.1	**CH9: Shift Registers**	6	F to F	teams		Exams, In class exams and H.W sets	
	14.2							
	14.3							
15	15.1							
	15.2							

	15.3						

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Midterm Exam	30	CH 1,2,3,4	1,2,3	6 weeks	Face to Face
In class exams and homework sets	30	CH 1,2,3,4,5,6,7,8,9	1,2,3,4,5,6	16 weeks	Face to Face Elearning
Final Exam	40	All	1,2,3,4,5,6	Last week	Face to Face

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

Internet , computer.

24 Course Policies:

A- Attendance policies: Regular attendance at all learning activities is expected, and unsatisfactory attendance maylead to disciplinary action according to the University of Jordan regulations.

B- Absences from exams and submitting assignments on time: Students may be permitted to make up an exammissed due to illness or other legitimate absence. A doctor's certification before allowing a student to make up an exam due to illness is required.

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior: The University Of Jordan policy will be implemented

E- Grading policy: according to the table above.

F- Available university services that support achievement in the course:

25 References:

A- Required book(s), assigned reading and audio-visuals:

   Digital Fundamentals, by Thomas L. Floyed, 10th or any later edition

B- Recommended books, materials, and media:

1) **Digital Electronics, Principles, Devices and Applications,** by A. K. Miani.
2) **Basic Digital Electronics,** by A. J. Evans.
3) **Introduction to Digital System,** by J. Crisp.

26 Additional information:

Extra credit for extra work

Name of Course Coordinator: Bashar LahlouhSignature: ---------------------- Date: ------------------
Head of Curriculum Committee/Department: ------------------------- Signature: ----------------------------------
Head of Department: -- Signature: ---------------------------
Head of Curriculum Committee/Faculty: -------------------------------------- Signature: -------------------------
Dean: --- Signature: ---