



Jordan University of Science and Technology
Faculty of Engineering
Biomedical Engineering Department

BME314 Medical Electronics II

Second Semester 2022-2023

Course Catalog

3 Credit Hours. 3 Credit hours (3 h lectures). Operational amplifiers and medical applications, oscillator types and applications, switching modes of transistor, TTL logic family, MOSFET logic circuits, logic transistors, regenerative logic circuits, digital to analog and analog to digital converters, medical applications of regenerative circuits and data converters.

Text Book

Title	Electronic Circuit Analysis and Design
Author(s)	Donald A Neamen
Edition	4th Edition
Short Name	Ref#1
Other Information	...

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref# 2	Electronic Circuits, Discrete and integrated	D. L. Schilling and C. Belove. McGraw-Hill.	1st Edition	...

Instructor

Name	Prof. Nedal Al-Ababneh
Office Location	E1L2
Office Hours	Sun : 09:30 - 10:30 Sun : 11:30 - 12:30 Mon : 10:00 - 11:00 Tue : 09:30 - 10:30 Tue : 11:30 - 12:30 Wed : 13:00 - 14:00

Email	nedalk@just.edu.jo
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Class Schedule & Room

Section 1:
 Lecture Time: Sun, Tue : 10:30 - 11:30
 Room: M2010

Prerequisites

Line Number	Course Name	Prerequisite Type
283130	BME313 Medical Electronics 1	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Operational Amplifiers: Theory of operation, inverting amplifier, summing amplifier, non-inverting amplifier, current to voltage converter, difference amplifier, instrumentation amplifier, integrator, differentiator, and oscillators.	
Week 2	Op-amp Based Oscillators : Conditions of oscillation, Wien bridge oscillator.	
Week 3	Transistor-Transistor Logic (TTL) Family : BJT Inverter Voltage transfer characteristic, logic levels, noise margin, fan-out, transient response, switching speed, and basic TTL inverter, basic TTL NAND gate.	
Weeks 4, 5	MOSFET Logic Circuits: NMOSFET inverter, complementary NMOSFET (CMOS) Inverter, MOSFET logic gates, interfacing CMOS and TTL logic gates	
Week 6	Regenerative Logic Circuits : Bistable multivibrator Monostable multivibrator Astable multivibrator.	
Weeks 7, 8	Analog-Digital Data Converters : Digital-to-Analog (D/A) converters Analog-to-Digital (A/D) converters.	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Explain the concept and applications of operational amplifiers. [1SLO1, 1SLO2, 1SLO3, 1SLO4]	20%	
Study the design of analog systems using operational amplifiers. [1SLO1, 1SLO2, 1SLO3, 1SLO4]	20%	
Understand the operating principle, design and applications of TTL and MOSFET logic gates circuits. [1SLO1, 1SLO2, 1SLO3, 1SLO4]	20%	
Understand the types, parameters and operation of multivibrators. [1SLO4]	20%	
Understand the use and operation of A/D and D/A converters. [1SLO1, 1SLO2, 1SLO3, 1SLO4]	20%	

Relationship to Program Student Outcomes (Out of 100%)																			
A	B	C	D	E	F	G	H	I	J	K	L	M	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7
													20	20	20	40			

Evaluation	
Assessment Tool	Weight
Midterm	50%
final	50%

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