Jordan University of Science and Technology

Faculty of Institute Of Nanotechnology

Nanotechnology And Engineering Department

NANO701 Semiconductor Devices

First Semester 2021-2022

Course Catalog
3 Credit Hours. This course introduces an introduction to quantum mechanics, principles and physics of semiconductor devices, de Broglie principle, wave functions, Schrodinger equation, semiconductor crystals, atomic bonds, Doping, atomic energy levels, E-K diagrams, P-N junctions, semiconductor conductors, Schottky Diode, and Ohmic Contacts.

Text Book	
Title	Principles of Semiconductor Devices 2nd edition
Author(s)	Sima Dimitrijev
Edition	2nd Edition
Short Name	Textbook
Other Information	

Instructor	
Name	**Dr. YAHIA MAKABLEH**
Office Location	-
Office Hours	Sun : 11:00 - 13:00 Mon : 09:00 - 11:00 Tue : 10:30 - 12:30 Wed : 08:30 - 10:00
Email	yfmakableh@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Wed : 11:30 - 14:30 Room: U

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction crystals	
Week 2	Energy bands part I	
Week 3	Energy bands part II	
Week 4	E-K diagrams	
Week 5	Fermi Dirac distribution neutrality equation	
Week 6	Drift Current Part I	
Week 7	Drift Current Part II	
Week 8	Diffusion Current Part I	
Week 9	Diffusion Current Part II	
Week 10	Generation and Recombination Part I	
Week 11	PN junction part I	
Week 12	PN junction part II	
Week 13	PN junction part III	
Week 14	Schottky Diode and Ohmic Contacts	
Week 15	Schottky Diode and Ohmic Contacts Part II	
Week 16	Revision	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Anility to solve numerical equations related to Schrodinger equation, semiconductor crystals, atomic bonds, Doping, atomic energy levels, E-K diagrams	30%	
Analysis and explain Drift and Diffusion current behavior	25%	
Differentiate between different types of current carrier generation and recombination	15%	
Solve and analyze PN junction problems	30%	

Evaluation	
Assessment Tool	**Weight**
Midterm	30%
Semester work	20%
Final	50%

Policy	
Homework Policy:	Homeworks will be distributed on weekly bases.
Attendance Policy	Attendance is required as announced (on campus or online).

Date Printed: 2021-12-09