

Ministry of Higher Education and Scientific Research

Republic of Iraq

University: University Of Basrah

College: Science

Department : Physics



Year : 2021-2022

Semester : First

SYLLABUS: < physics of semiconductor >

>INSTRUCTOR: Asst.. Prof. Saeed jabbar Abbas Mohammed	Phone: -
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COURSE OVERVIEW

Find the characterization of intrinsic and extrinsic semiconductors, like concentration of electrons and holes, conductivity, mobility. Transport properties and generation recombination phenomena in bulk semiconductors are covered also. Study of the effect of adding (or doping) impurities on the previously properties of the semiconductors

GOALS AND OBJECTIVES

To teach properties, models, and concepts associated with semiconductor materials. Provides detailed insight into the internal workings of basic semiconductor materials such as carrier's concentration, transport phenomena, ambipolar transport.

TEXTBOOK AND READINGS

- [1] semiconductor physics and devices-basic principles, by Donald A. Neamen
- [2]
- [3]

COURSE ASSESSMENTS

The course grade (**100** points) will be based on the following elements:

	Points
Exams	80
Reading Checks	0
Participation	5
Attendance	5
Assignments	10

COURSE DESCRIPTION AND ASSIGNMENT SCHEDULE

This **NO.** -credit hour course is 15 weeks long. You should invest **NO.** hours every week in this course.

WK	DATE	TOPIC	READING	ASSIGNMENT
1		1.1 charge carriers in semiconductors 1.2 Equilibrium Distribution of Electrons and Holes		
2		1.4 The intrinsic carrier concentration 1.5 The intrinsic Fermi-Level position 1.6 Dopant Atoms and Energy levels		
3		1.7 Ionization Energy 1.8 The extrinsic semiconductor 1.9 The n_0p_0 Product		
4		Degenerate and Nondegenerate semiconductors 1.11 Equilibrium Electron and hole concentrations 1.12 Position of Fermi Energy Level		
5		Month exam I		
6		2.1 Carrier Drift 2.2 Mobility Effects		
7		2.3 Conductivity 2.4 Carrier Diffusion		
8		2.5 Total current density 2.6 The Hall Effect		

9		Month exam 2		
10				
11				
12		3.1 carrier Generation and Recombination Mathematical analysis of Excess Carriers		
13		Ambipolar Transport		
14		Haynes- Shockley Experiment		
15		3.5 Quasi-Fermi Energy Levels 3.6 Surface Effects		
15	<i>Mid Exam</i>			

Is it possible to develop the curriculum <within the teaching authority 20%> to include vocabulary that serves sustainability	
1- Yes, it is possible (point an appropriate aspect)	<p>1- Fighting poverty 2- No hunger 3- Developing life-long learning and education 4- Green chemistry 5- Sustainable development 6- Water purification 7- Water recycling for agriculture 8- Creativity and production -9- Sustainable energy (wind Sun and organic energy) -10- Environmental development- 11- pollution measurement -12- child care program-13- public health development program-14- measuring the efficiency of health institutions-15- gender equality-16- non-extremism- 17- drug efficiency 18- Food efficiency for infants, children, adults and the elderly -19- Efficiency of the overall environment -20- Waste recycling-21- Heavy water disposal mechanisms-22- Literacy program- 23- Mechanisms for preserving biodiversity-24- Mechanisms for spreading peace and justice in society- 25- Developing life in the seas and oceans-26- Studying the level of university education and the mechanisms for its development-27- Mechanisms for developing the local industry in Iraq-28- Mechanisms for developing infrastructure in Iraq-29-Reducing racial discrimination in all its forms-30-The basics of sustainable cities- 31- Mechanisms to reduce consumption and increase production- 32- Mechanisms to provide job opportunities for all-33- Study aspects of developing green areas-34- Study climatic phenomena in the country-35- Mechanisms for obtaining good health and well-being.</p>
2- Suggest aspect that serves sustainability	