**بسم الله الرحمن الرحيم**

**University: Diyala University**

**College: College of Engineering**

**Department: Electronic Engineering**

**Stage: first**

**Lecturer name:**

**ADNAN MOHAMMED TAHA**

**Qualification: MSc Degree.**

**Place of work: Electronic Dept.**

**Republic of Iraq**

**The Ministry Of Higher Education**

**& Scientific Research**



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| --- | --- | --- | --- |
| Course Instructor | **ADNAN MOHAMMED TAHA** | | |
| E-mail | **adnanalmamory@gmail.com** | | |
| Title | **Electronic Physics** | | |
| Course Coordinator | **ADNAN MOHAMMED TAHA** | | |
| Course Objective | **The aim of this subject is to make the students ready to understand and comprehend the scientific theories and their applications related to their field of the study.** | | |
| Course Description | **Aims the subject of Physics electronic student learning during the school year idea for atomic structure and energy levels catapult his metal in addition to semiconductor LED's are solid state types and their applications in the field of communication and understand the electronic circuits and the most important electronic elements involved in the designs of these circuits and the development of the mind of the student and his design work in the transmission of information and establishing circuits Electric different and therefore the end that we expect from the teaching of this article is to entrench principles and theory that are considered in the establishment of any circuit electronic understanding.** | | |
| Textbook | 1. Electronic circuits & devices by Millman | | |
| Course Assessments | First semester | Second semester | Final Exam |
| **20 %** | **20 %** | **60 %** |
| General Notes |  | | |

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**Course Weekly Outline**

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| --- | --- | --- | --- | --- |
| Week | Date | Topics Covered | Lab. Experiment Assignments | Notes |
| 1 | **27/9/** | **Energy Levels and Atomic Structure** |  |  |
| 2 | **4/10/** | The atom, model, wave nature of light |  |  |
| 3 | **11/10/** | dual nature of matter, wave function |  |  |
| 4 | **18/10/** | energy – band theory of metals, insulators and semiconductors |  |  |
| 5 | **24/10/** | crystal structure, ionic, covalent and metallic bonding, energy hand of crystals. |  |  |
| 6 | **1/11/** | Internal structure of materials cell, packing miller indices |  |  |
| 7 | **8/11/** | crystal planes and direction , brags law and x- ray diffraction , electronic ballistics |  |  |
| 8 | **15/11/** | Mobility and conductivity |  |  |
| 9 | **22/11/** | energy distribution of electrons |  |  |
| 10 | **29/11/** | Fermi level, work function |  |  |
| 11 | **6/12/** | Semiconductor materials (SI, GE and compound semiconductors) |  |  |
| 12 | **12/12/** | extrinsic semiconductors |  |  |
| 13 | **20/12/** | Fermi – level in semi conductor diffusion and carrier life time |  |  |
| 14 | **27/12/** | hall effect . |  |  |
| 15 | **3/1/** | P-N junction in equilibrium, current–voltage characteristics |  |  |
| 16 | **10/1/** | charge–control description of a diode transition and diffusion capacitances |  |  |
| Spring Break | | | | |
| 1 | **21/2/** | diode switching times |  |  |
| 2 | **28/2/** | diode models |  |  |
| 3 | **6/3/** | small- signal model and load line concept |  |  |
| 4 | **13/3/** | introduction to heterojuncions and double heterojunctions . |  |  |
| 5 | **20/3/** | Rectifiers |  |  |
| 6 | **27/3/** | zener diodes voltage regulators |  |  |
| 7 | **3/4/** | clipping circuits |  |  |
| 8 | **10/4/** | clamping circuits |  |  |
| 9 | **17/4/** | wave form generation |  |  |
| 10 | **24/4/** | Varactor diode |  |  |
| 11 | **1/5/** | tunnel diode |  |  |
| 12 | **8/5/** | photodiode |  |  |
| 13 | **15/5/** | photovoltaic (solar)cell |  |  |
| 14 | **22/5/** | light emitting diode |  |  |
| 15 | **29/5/** | principle and operation of semiconductor laser |  |  |
| 16 | **2/6/** | metal electronic palasilics semiconductor diode. |  |  |

**INSTRUCTOR Signature: Dean Signature:**