**بسم الله الرحمن الرحيم**

**University: Diyala University**

**College: College of Engineering**

**Department:Electronic Engineering**

**Stage:Second**

**Lecturer name**

**Qualification: Ph.D.**

**Place of work: Electronic Dept.**

**Republic of Iraq**

**The Ministry Of Higher Education**

**& Scientific Research**



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| --- | --- |
| Course Instructor | **Rokan Ali Ahmed** |
| E-mail | **Rokan\_L4@yahoo.com** |
| Title | **Power Electronics** |
| Course Coordinator |  |
| Course Objective | **In this course students will learn a basic competence of the following areas of power electronics to understand and comprehend the scientific theories and their applications related to their field of the study.** |
| Course Description |  **Course Description: Power electronics is the application of electronic circuits to energy conversion. This course discusses introduction to semiconductor device and modeling, design, analysis, and control of, AC/DC rectifiers, DC/AC inverters, DC/DC converters , and AC/AC cycloconverters,. Power electronics applications in motor drives and uninterrupted power supplies** |
| Textbook | 1. **Power Electronics - Circuits, Devices and Applications by M. H. Rashid,**
 |
| Course Assessments | First semester | Second semester | Final Exam |
| **20 %** | **20 %** | **60 %** |
| General Notes | Type here general notes regarding the course |

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**Course Weekly Outline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week | Date | Topics Covered | Lab. Experiment Assignments | Notes |
| 1 | 30/9/ | Survey of power semiconductor devices |  |  |
| 2 | 7/10/ | Power diode, SCR, GTO, LASCR, TRIAC, BJT, MOSFET,IGBT. |  |  |
| 3 | 14/10/ | Power diode, SCR, GTO, LASCR, TRIAC, BJT, MOSFET,IGBT. |  |  |
| 4 | 21/10/ | Power diode, SCR, GTO, LASCR, TRIAC, BJT, MOSFET,IGBT. |  |  |
| 5 | 28/10/ | Turn-on and turn-off characteristics |  |  |
| 6 | 4/11/ | Turn-on and turn-off characteristics |  |  |
| 7 | 11/11/ | switching losses and driver circuits. |  |  |
| 8 | 18/11/ | Protection and cooling |  |  |
| 9 | 25/11/ | All types of rectifiers,  |  |  |
| 10 | 2/12/ | Single phase and three phase converters, |  |  |
| 11 | 9/12/ | Single phase and three phase converters, |  |  |
| 12 | 16/12/ | half and full waves |  |  |
| 13 | 23/12/ | half and full waves |  |  |
| 14 | 30/12/ | Principle of chopper operation and control strategies |  |  |
| 15 | 6/1/ | Step-up and step-down choppers |  |  |
| 16 | 13/1/ | Step-up and step-down choppers |  |  |
| Mid Year Holiday |
| 1 | 17/2/ | Types of chopper circuits |  |  |
| 2 | 24/2/ | Voltage-commutatedchopper and Current-commutated chopper |  |  |
| 3 | 2/3/ | Load-commutated chopper. |  |  |
| 4 | 9/3/ | Single phase and three phase (both 120 mode and 180 mode) inverters |  |  |
| 5 | 16/3/ | Single phase and three phase (both 120 mode and 180 mode) inverters |  |  |
| 6 | 23/3/ | Single phase and three phase (both 120 mode and 180 mode) inverters. |  |  |
| 7 | 30/3/ | Multi-level inverters |  |  |
| 8 | 6/4/ | PWM techniques |  |  |
| 9 | 13/4/ | PWM techniques |  |  |
| 10 | 20/4/ | AC voltage controller |  |  |
| 11 | 27/4/ | AC voltage controller |  |  |
| 12 | 4/5/ | Single phase ac voltage controllers |  |  |
| 13 | 11/5/ | Three phase full wave ac voltage controller. |  |  |
| 14 | 19/5/ | General applications |  |  |
| 15 | 26/5/ | Uninterruptible power supplies. |  |  |
| 16 | 3/6/ | DC motor control, Switched mode power supply (SMPS) |  |  |

**INSTRUCTOR Signature: Dean Signature:**