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| **Date:** | Examination No.: | Version: 2022-2023 | Start: |
| **Module Name - Code** | Power Electronics -  21301 | | |
| **Module Language:** | English | | |
| **Responsible:** | Ali Abdulqadir Rasool | | |
| **Lecture (s):** | Basheer Abdulrahman & Velar Hikmat | | |
| **College:** | College of Engineering – Salahaddin University-Erbil | | |
| **Duration:** | 15 week – 1 semester | | |
| **Course outcomes:** | After successful completing of the course, the students will:  Understand and learn fundamentals of power electronics, the theory and methods for analysis and design of power electronics circuits.  Acquire basic understanding of various power converter modules used to build power electronics systems.  Acquire the ability to select and design suitable power converter modules/system in order to meet requirements of industrial applications.   * Have the ability for understanding advanced topics of power Electronics and Electric Drives. | | |
| **Course Content:** | * **Introduction** to Power Electronics. * **Thyristor:** Types, construction, characteristics, equivalent circuit, protection, firing and commutation circuits. * **Controlled Rectifiers**: Single phase and three phase types (half and full controlled) in case of resistive and inductive load, effect of freewheeling diode, Fourier series of source current. * **DC to DC Converter (DC chopper):** Step down, control modes, resistive and inductive load, Buck and Boost types converters. * **AC to AC converter** **(AC Regulator):** Integral Cycle, Phase voltage control and cycloconverter. * **DC to AC converter (Inverter):** Full bridge single phase inverter feeding resistive and inductive load, harmonic analysis of output voltage, there phase 180 ° inverter. | | |
| **Literature:** | Power Electronics, Circuits and Applications by: Muhammad H. Rashid.  Power Electronics by: Mohan  Power Electronics by: Cyril W. Lander.  Electrical Machines, Drives and Power Systems by: Theodore Wildi. | | |
| **Type of Teaching:** | 3 hrs. in lectures + 2 hours (Practical) | | |
| **Pre-requisites:** | None | | |
| **Preparation Modules:** |  | | |
| **Frequency:** | Autumn Semester | | |
| **Requirements for credit points:** | For the award of credit points, it is necessary to pass the module exam. It contains:  Three examination during the academic semester, Assignments and Final examination.  **Student's attendance is required in all classes**. | | |
| **Credit point:** | 5 | | |
| **Grade Distribution:** | The following grade system is used for the evaluation of the module exam:  The module exam is based on the summation of two categories of evaluations:  **First: (50%)** of the mark is based on the academic semester effort which includes   * - Normal theoretical exam 20 % * - Quizzes on theoretical part 10 % * - Assignments on theoretical part 5 % * - Normal exam, reports and quizzes on practical part 15 %.   **Second: (50%)** of the mark is based on final examination that is comprehensive for the whole of the study materials reviewed during the academic semester which includes:   * - Final theoretical exam 40 % * - Final practical exam 10 % | | |
| **Work load:** | The workload is 135 hrs. It is the result of 45 hrs. attendance and 90 hrs. self-studies (Assignments, preparation for exam and applications). | | |