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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.
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| **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.
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| **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 %
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| **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). |