EE459-2: Application of Power Electronics

Course code and name	EE459-2: Application of Power Electronics
Credits units	2 Credit units
Contact hours	4 Contact hours: 1 lecture, 1 tutorial and 2 practical
Instructor name	
Textbook	Ned Mohan, Tore m. Undeland, and William P. Robbins, Power Electronics Converters, Applications, and Design, second edition, John Wiley & sons INC.
Other supplemental materials	-
	Specific course information
a. Course description	This course will give the students a sufficient study and analysis about the using of power electronics in residential and industrial applications lighting control, dc power supplies and speed control of dc & ac motor using different topology of power electronics circuit.
b. Prerequisite	EE456-3 and EE353-3
c. Required / Elective	Elective
	Course Learning Outcomes

CLO of the Lecture Activities:

CLO1: Explain the important role of power electronics in power system, applications of power electronics in utility system. Residential, Commercial, and the operation of three phase voltage source inverter, solid state circuit breaker and different dc to dc chopper.

CLO2: Determine the parameters of three phase drive system controlling dc motor.

CLO3: Evaluate the design premieres of power electronic circuits such Step down (Buck), Step up (Boost) and Step down/ step up (Buck/Boost) Converters.

CLO4: Calculate the performance of a speed control system of a dc motor using solid state control rectifier Single phase bridge rectifier and dc chopper.

CLO of the Laboratory Activities:

CLO1: Verify theory and to improve knowledge learned in class.

CLO2: Formulate and solve problems related to theory.

CLO3: Design and safety conducts an experimental procedure.

CLO4: Independently perform accurate quantitative measurements, interpret experimental results, perform calculations on these results and draw a reasonable, accurate conclusion.

CLO5: Communicate critical analysis of scientific information through written reports.

CLO6: Be integrated inside a group of work and respect the team working.

Brief list of topics to be covered

- Introduction to Power Electronics
- Applications of Power Electronics in Power System
- Characteristics of Power semiconductor Switches
- Single Phase Bridge Rectifier Circuit with R & R-L Load
- Three Phase Bridge Rectifier Circuits with R & R-L Load
- Application of Uncontrolled Rectifier
- Single-Phase Controlled Rectifier with R & R-L Load
- Single-Phase Bridge Controlled Rectifiers
- Three-Phase Controlled Rectifiers with R & R-L Load
- Application of Controlled Rectifiers
- Single Phase and Three Phase AC Voltage Controller
- Step Up and Step Down DC To DC Converters
- Single Phase and Three Phase DC To AC

Mapping Course Learning Outcomes to Student Outcomes

	Lecture Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							

CLO3							
CLO4							
	Laboratory Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							
CLO3							
CLO4							
CLO5							
CLO6							