

SEMESTER <i>Sixth</i>	DEPARTMENT <i>Control Engineering</i>	COURSE TITLE <i>Power Electronics</i>
COURSE CODE <i>EP610</i>	HOURS: 3 UNITS: 3	COURSE SPECIFICATIONS <i>Theoretical Content</i>
<p>1. Understand the Power Electronic Devices, Its Firing and Protection Techniques.</p> <ul style="list-style-type: none"> ➤ Explain PN junction, power diode and draw its characteristics. Define their applications. ➤ Define power transistors (BJT, MOSFET, IGBT, etc...). ➤ Explain operation and protection of power transistors. ➤ Explain thyristor (SCR, triac, GTO, etc). Draw firing and protection circuits for thyristors. 		
<p>2. Determine the Average Value of the Output Voltage and Current. Examine the Effect of the Inductive Load on the Rectification Process.</p> <ul style="list-style-type: none"> ➤ Explain controlled rectifier circuits, Define single phase rectifier with resistive and inductive loads. ➤ Determine effect of inductive load on single and three phase rectifier circuits, three phase rectifier with resistive load. ➤ Determine and conclude applications. 		
<p>3. Understand the Theory of Operation of Different Types of Chopper Circuits.</p> <ul style="list-style-type: none"> ➤ Describe operation principles of choppers. ➤ Define and draw types of chopper circuits. ➤ Determine and conclude applications. 		
<p>4. Understand the AC Voltage Controller.</p> <ul style="list-style-type: none"> ➤ Explain operation principles of phase control circuits. ➤ Define single-phase controller with resistive and inductive loads. ➤ Determine and conclude applications. 		

5. Understands the Theory of Operation of Inverters with the Control of Voltage and Frequency.

- Explain principles of operation of inverters, Single phase inverters, Three phase inverters.
- Determine and concludes applications.

References:

1. *Power electronics for technology*, Printice Hal. By Ashfag Ahmed.
2. *Introduction to power electronics*, Arnold and Oxford university press inc. ,Newyork.
Denis Fewson.
3. *Power control electronics*, Printice Hall Inc.,1983. By Boyd Larson.
4. *Power electronics*, Printice Hall Inc, 1993. By Mohammed H. Rashid.Collin, Robert. E.