

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

**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.