

SEMESTER <i>Seventh</i>	DEPARTMENT <i>Power Engineering</i>	COURSE TITLE <i>Power Systems Utilization</i>
COURSE CODE <i>EP707</i>	HOURS: 3 UNITS: 3	COURSE SPECIFICATIONS <i>Theoretical Content</i>
1. Describe the Types, Sketch the Characteristics of Mechanical Loads and Breaks. <ul style="list-style-type: none"> ➤ Describe the operation, advantages and disadvantages of mechanical loads. ➤ Identify the torque/speed characteristics of each type. 		
2. Specify the Requirements for Selection of Motor Drives. <ul style="list-style-type: none"> ➤ Define electric drives and its applications. ➤ Define the stability of drive operation. ➤ Identify how drives are chosen and the options for an adjustable speed drive. 		
3. Describe the Utilization of Electromechanical and Static Converter DC Motor Controls. <ul style="list-style-type: none"> ➤ Define and sketch the Ward-Leonard method to control the speed of DC motor. ➤ Describe the field control of DC motors. ➤ Describe with schematics the control of DC motor using DC choppers (speed control and braking). ➤ Describe with schematics and state the feature of control of DC motor using three phase dual converter for 4-Quadrant operation. 		
4. Describe the Utilization of Electromechanical and Static Converter AC Motor Controls. <ul style="list-style-type: none"> ➤ Describe with illustrative diagrams and state the main features of the speed control of three phase induction motors by AC voltage control, invertors, slip power recovery and PWM invertors. 		
5. Define the Utilization of Standby Power Supplies. <ul style="list-style-type: none"> ➤ Describe standby power supply with power-generating plants (operating conditions, installation site, surge loading, switch gear and control gear. ➤ Define the principle of uninterrupted power supply with standby rotary UPS plant. 		

- Define the principle and function of uninterrupted power supply with static UPS systems.

References:

1. *Electric Motors and Drives*, Austin Hughes, Newnes 1990.
2. *Power Electronics and Motor Control*, W. Shephard, L.N. Hulley and D. Liang, Cambridge Univ. Press 1995.
3. *Power Electronics: Circuits, Devices and Applications*, M. H. Rashid, Printics-Hall 1994.