LESSON PLAN

Subject :- TH:1 Fundamentals of Power Electronics **(Code) TH-1 EEPC202** **Name of faculty:-** Er Harekrushna Sahu

Semester :-4th **Class allotted 4p/w** **Branch :- Electrical Engineering**

Discipline	Semester:-4TH	From date:-23/12/25 To date:18/4/26	45P/45H
Subject:FPE	No. of days/ per week 4p/w:	Theory –Topics/Lesson	
DATE	**PERIOD**	**TOPIC COVERED**	**REMARKS**
23/12/25 to 15/1/26		**Unit No. I : Power Electronic Devices** 1.1 Power electronic devices 1.2 Power transistor 1.2.1 construction and working principle 1.2.2 V-I characteristics and uses 1.3 IGBT 1.3.1 Construction and working principle 1.3.2 V-I characteristics and uses 1.4 Concept of single electron transistor (SET) 1.5 Aspects of Nano- technology(concept only)	
16/1/26 to 07/02/26		**Unit No. II: Thyristor Family Devices** 2.1 SCR 2.1.1 Construction of SCR 2.1.2 Two transistor analogy of SCR 2.1.3 Types, working and characteristics 2.1.4 SCR mounting and cooling 2.2 Types of Thyristors: SCR, LASCR, SCS, GTO, UJT, PUT, DIAC and TRIAC 2.3 Thyristor family devices 2.3.1 Symbol and construction 2.3.2 Operating principle 2.3.3 V-I characteristics 2.4 Protection circuits	

		2.4.1 Over-voltage 2.4.2 Over-current 2.4.3 Snubber 2.4.4 Crowbar	
09/02/26 to27/02/26		**Unit No. III: Turn-on and Turn-off Methods of Thyristor** 3.1 SCR Turn-On methods 3.1.1 High Voltage thermal triggering, 3.1.2 Illumination triggering 3.1.3 dv/dt triggering 3.1.4 Gate triggering 3.2 Gate trigger circuits 3.2.1 Resistance and Resistance-Capacitance circuits 3.3 SCR triggering using UJT 3.4 PUT: Relaxation Oscillator and Synchronized UJT circuit 3.5 Pulse transformer and opto-coupler based triggering. 3.6 SCR Turn-Off methods: 3.6.1 Class A- Series resonant commutation circuit 3.6.2 Class B-Shunt Resonant commutation circuit 3.6.3 Class C-Complimentary Symmetry commutation circuit 3.6.4 Class D-Auxiliary commutation 3.6.5 Class E-External pulse commutation 3.6.6 Class F-Line or natural commutation	
28/02/26 to 21/03/26		**Unit No. IV: Phase Controlled Rectifiers** 4.1 Phase control: firing angle, conduction angle. 4.2 Single phase half controlled, full controlled and midpoint controlled rectifier with R, RL load 4.2.1 Circuit diagram, working, input- output waveforms, equations for DC output and effect of freewheeling diode 4.3 Different configurations of bridge controlled rectifiers: Full bridge, half bridge with common anode, common cathode, SCRs in one arm and diodes in another arm	

23/03/26 to 18/4/26		**Unit No. V: Industrial Control Circuits** 5.1 Applications: Burglar's alarm system, Battery charger using SCR, Emergency light system, Temperature controller using SCR and; Illumination control/ fan speed control TRIAC 5.2 SMPS 5.3 UPS: Offline and Online 5.4 SCR based AC and DC circuit breakers.	

Signature of HOD **Signature of Faculty**