GOVERNMENT CO-ED POLYTECHNIC, RAIPUR
DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

Session:-
Semester:- **5th**
Session start date as per University Calendar:-
Course Name:- **Power Electronics**
Course Code:-
Name of Subject teacher:-

Unit -1 Power Electronic Devices

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
1.1 Silicon ControlledRectifier (SCR): Construction, Principle of operation, Characteristic Curve, Two Transistor Analogy, Switching Characteristics and Triggering Methods	2	**1.1** Test the Performance of a given SCR and Plot the VI characteristics. **1.2** Test the performance of a given MOSFET and plot the output Characteristics.	2	
1.2 Rating and Protection: Over Voltage, Over Current, Snubber circuit	1			
1.3 Series and parallel Operation of SCRs: String Efficiency	2	**1.3** Test the performance of a given IGBT and plot the output Characteristics. **1.4** Test the performance of TRIAC for the given AC Load Control. **1.5** Design the R and RC Triggering Circuit for Triggering SCR.	2	
1.4 DIAC, TRIAC: Construction, Operation, Characteristic Curves and Applications	1			
1.5 Power BJT, MOSFET, IGBT: Construction, Operation, Characteristic Curves and Applications	2			

Number of periods planned (CI + LI) : 12
Number of periods actually taken :

Unit – 2 Commutation Technique And DC-DC Converter

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
2.1 Need for commutation in SCR	1	**2.1** Test the performance of a buck converter at different duty cycle for a given resistive load. **2.2** Test the performance of a buck converter at different duty cycle for a given resistive inductive load. **2.3** Test the performance of a boost converter at different duty cycle for a given resistive load. **2.4** Test the performance of a forced commutation circuit (A, B, C, D and E)	2	
2.2 Principle of Natural and Forced Commutations (class A, class B, class D and class E)	4			
2.3 Working principle of Buck, Boost and Buck-Boost Converter	3			
2.4 Simple numerical on Converters: duty ratio calculation, output voltage, current, input and output power, efficiency calculation for a buck converter, boost converter	2			

Number of periods planned (CI + LI) : 12
Number of periods actually taken :

Unit – 3 Phase Controlled Rectifier

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
3.1 Single Phase Half Wave Controlled Rectifier with R, RL and RLE load. .	2	**3.1** Build and test a triggering circuit for a single phase full wave controlled rectifier using SCR. **3.2& 3.3** Test the performance of a half wave controlled rectifier comprising of SCR for R and RL load.	2	
3.2 Single phase full wave controlled rectifier (M-2 &B-2 connection) with R, RL and RLE load.	4			
3.3 Effect of free-wheel diode in single phase full converter.	1	**3.4** Test and Analyze the performance of a half wave controlled rectifier comprising of SCR for RL load with free Wheeling Diode . **3.5** Test the performance of a Full wave controlled rectifier comprising of SCR for RL load and Calculate The Ripple Factor.	2	
3.4 Effect of source inductance on Converter performance.	1			
3.5 Three-phase half wave-controlled rectifier with R and RL load	2			

Number of periods planned (CI + LI) : 14
Number of periods actually taken :

Unit – 4 Inverter & Cycloconverter

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
4.1 Inverter: Working principle, types-Voltage Source Inverter, Current Source Inverter.	1	**4.1 & 4.2** Test the performance of a single-phase half bridge and full bridge VSI feeding R & RL load.	2	
4.2 PWM Inverters: single phase Half bridge and full bridge with R and RL load.	3			
4.3 PWM techniques: single pulse, multi-pulse and SPWM (Uni-polar and bipolar switching)	1	**4.3 &4.4** Measure the input to output frequency of a single phase to single phase step up & step down cyclo-converter.	2	
4.4 Concept of three phase VSI	3			
4.5 & 4.6 Cyclo-converter	2			

Number of periods planned (CI + LI) : 14
Number of periods actually taken :

Unit – 5 AC Voltage Controller, UPS And SMPS

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
5.1 Single phase AC voltage controller: Working principle and its applications	4	**5.1** Measure the output load voltage of a single phase AC voltage controller using On-off control.	1	
5.2 Significance of UPS, Block diagram of UPS, function of each block, types: ON-line& Off-line UPS.	4	**5.2** Measure the output load voltage of a single phase AC voltage controller using phase angle control for a resistive load.	1	
5.3 SMPS: Block diagram, principle of operation, advantages and disadvantages and applications of SMPS.	4	**5.3** Measure the output load voltage of a single phase AC voltage controller using phase angle control for a resistive inductive load.	2	

Number of periods planned (CI + LI) : 16
Number of periods actually taken :

Number of Total periods planned : 68
Number of Total periods actually taken :

Subject Teacher :

HOD
(Department of Electrical Engineering)