

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/5
Branch	Electrical and Electronics Engineering			Semester	5 th
Course Code	502	Course Name	Power Electronics and Application		
Course Outcome - 1	Utilize SCR in different power electronic circuit and compare SCR with other power semiconductor devices.			Teach Hrs	Marks
Learning Outcome E0150211	Explain the fundamental of SCR and protection technique for thyristor. (Cognitive domain)			9 Hrs	12 Marks
Contents	Thyristor – SCR: Structure and Operation, Static Characteristics, Type of turn-on methods, Dynamic Switching Characteristics, Two transistor model, Thyristor Protection: Over voltage, over current, dv/dt, di/dt, Gate protection SCR operation: Overview of Series and parallel				
Method of Assessment	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150212	Utilize auxiliary circuit for SCR and Illustrate various type of power semiconductor devices. (Cognitive domain)			7 Hrs	10 Marks
Contents	Firing Circuits for SCR: Main Features of Firing Circuits, Resistance and Resistance-capacitance Firing Circuits and Unijunction Transistor (UJT) Power semiconductor device (Structure, Static Characteristics, Rating, application): LASCR, DIAC, TRIAC, Power BJT, IGBT and MOSFET.				
Method of Assessment	Internal: Mid semester theory examination (Pen paper test)				
Learning Outcome E0150213	Explain commutation techniques used in power electronics circuit. (Cognitive domain)			5 Hrs	8 Marks
Contents	SCR commutation techniques: Class A commutation Class B commutation Class C commutation Class D commutation				
Method of Assessment	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150214	Perform experiment for Static characteristics of power semiconductor devices and for SCR auxiliary Circuits. (Psychomotor domain)			8 Hrs	10 Marks
Contents	<ul style="list-style-type: none"> • Draw static Characteristics of SCR and find Latching and Holding Current • To analyse variation of firing angle of UJT triggering circuit of SCR. • Draw static characteristic of any one of given power semiconductor device- IGBT/MOSFET/TRIAC 				
Method of Assessment	External: Laboratory observation and viva voce.				

+

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 2/5
Branch	Electrical and Electronics Engineering		Semester	5 th	
Course Code	502	Course Name	Power Electronics and Application		
Course Outcome -2	Analyse phase controlled rectifiers for different loads.			Teach Hrs	Marks
Learning Outcome E0150221	Classify phase controlled rectifiers and compare half-wave converter output for various load. (Cognitive domain)			6 Hrs	10 Marks
Contents	Classification of phase controlled rectifiers Single-phase converter: Half-wave converter with R load, (V_{rms} and V_{av}) Half-wave converter with RL and RLE load				
Method of Assessment	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150222	Use various phase controlled rectifiers. (Cognitive domain)			7 Hrs	10 Marks
Contents	Full wave converter with RL load- Mid-point, Bridge type full and semi converter, Effect of freewheeling diode Single-phase Dual Converters: RL load Three phase Half-wave converter with R load Advantages of polyphaser rectification				
Method of Assessment	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150223	Analyse variation of output voltage of single phase controlled rectifier. (Psychomotor domain)			8 Hr	10 Marks
Contents	<ul style="list-style-type: none"> To analyse variation of output voltage of single phase half wave controlled rectifier with R and R-L load. To analyse variation of output voltage of single phase bridge type full wave controlled rectifier with R and R-L load. 				
Method of Assessment	External: Laboratory observation and viva voce.				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 3/5
Branch	Electrical and Electronics Engineering			Semester	5 th
Course Code	502	Course Name	Power Electronics and Application		
Course Outcome – 3	Examine different type of inverter.			Teach Hrs	Marks
Learning Outcome E0150231	Categorize single phase inverter and describe their construction, working and applications of bridge type inverter. (Cognitive domain)			6 Hrs	10 Marks
Contents	Classification of inverter Single phase voltage source inverter: Half bridge inverter and full bridge inverter.				
Method of Assessment	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150232	Select inverter on bases of various techniques. (Cognitive domain)			6 Hrs	10 Marks
Contents	Series inverter and parallel inverter. Pulse width modulated inverter: Single pulse modulation and sinusoidal pulse with modulation. Overview of concept of harmonic.				
Method of Assessment	Internal: Mid semester theory examination (Pen paper test)				
Learning Outcome E0150233	Demonstrate function of inverter. (Psychomotor domain)			8 Hrs	10 Marks
Contents	<ul style="list-style-type: none"> • Demonstrate characteristic of series inverter/parallel inverter. • Simulate Half bridge inverter and full bridge inverter. 				
Method of Assessment	External: Laboratory observation and viva voce.				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 4/5
Branch	Electrical and Electronics Engineering			Semester	5 th
Course Code	502	Course Name	Power Electronics and Application		
Course Outcome – 4	Use power semiconductor devices in chopper, cycloconverter and AC voltage controller circuit.			Teach Hrs	Marks
Learning Outcome E0150241	Select converter for various application and Explain AC voltage controller. (Cognitive domain)			7 Hrs	10 Marks
Contents	Chopper: Classification, Step up, stepdown and 4-quadrant operation of choppers operation Cycloconverter: Classification, single phase step up and stepdown cycloconverter operation (Bridge type and Mid-Point Type) AC voltage controller: Single phase AC voltage controller with R and RL load				
Method of Assessment	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150242	Demonstrate function of various converter. (Psychomotor domain)			8 Hrs	10 Marks
Contents	Demonstrate working of step down chopper / step up chopper. Demonstrate working of single phase step down cycloconverter. Simulate single phase step up cycloconverter. Simulate single phase AC voltage controller with R Load.				
Method of Assessment	Internal: Laboratory observation and viva voce.				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 5/5
Branch	Electrical and Electronics Engineering			Semester	5 th
Course Code	502	Course Name	Power Electronics and Application		
Course Outcome – 5	Examine power electronics devices based circuit for different application.			Teach Hrs	Marks
Learning Outcome E0150251	Illustrate power electronics device and circuit. (Cognitive domain)			6 Hrs	10 Marks
Contents	SMPS, UPS, Static AC circuit breaker, Static DC circuit breaker, AC Static switch and DC Static switch, solid state relays				
<i>Method of Assessment</i>	Internal: Assignment and Quiz				
Learning Outcome E0150252	Utilize power electronic devices based circuit for speed control of electric motors. (Cognitive domain)			6 Hrs	10 Marks
Contents	Speed control of Motors - Advantages of electronic speed control DC drive (block diagram only): single phase and three phase Chopper drive (block diagram only): Speed control, 4-quadrant operation AC drive (block diagram only): Stator voltage control, Stator frequency control and Stator voltage and frequency control.				
<i>Method of Assessment</i>	External: End semester theory examination (Pen paper test).				
Learning Outcome E0150253	Analyze the speed control of motors and examine working of power electronics device and circuit (Psychomotor domain)			8 Hrs	10 Marks
Contents	Demonstrate speed control of single phase induction motor using TRIAC and DIAC. Demonstrate speed control of three phase induction motor/ DC motor. Demonstrate any one of given circuit-UPS, SMPS, Static AC circuit breaker, Static DC circuit breaker, AC Static switch and DC Static switch, solid state relays				
<i>Method of Assessment</i>	Internal: Laboratory observation and viva voce.				

REFERENCE BOOKS:

S.N.	Title & Publication	Author
1.	Power Electronics, Khanna Publishers, ISBN: 9788174092793, 9788174092793	Bimbhra, P. S.
2.	Power Electronics, Publisher: Pearson Education India, ISBN: 9789332584587, 9789332584587	Rashid Muhammad H.
3.	Power Electronics, Publisher: Tata McGraw-Hill Publishing limited, New Delhi ISBN-13: 9780070583894, ISBN-10: 0-07-058389-7	Singh M. D. and Khanchandani, K. B.
4.	Power Electronics, Publisher: Nirali Prakashan, ISBN: 9789389825909	Sen, P.
5.	Power Electronics - A Conceptual Approach, Publisher: Technical Publication Pune, ISBN: 9788184314182, 8184314183	Chitode, J. S.
6.	Power Electronics, Publisher: Prentice-Hall of India Pvt.Ltd, ISBN: 9788120341968, 9788120341968	Jagannathan V.
7.	पॉवर इलेक्ट्रॉनिक्स एंड ड्राइव, Publisher: Neelkanth Publishers Pvt. Ltd., ISBN: 9788184446401, 8184446403	Mohar Singh