

Government Polytechnic, Mandi Adampur

Name of Faculty: Sh. Ravinder Kumar

Discipline: Electronics

Semester: 5

Subject: Power Electronics

Lesson Plan Duration: 18 Weeks

Week	Theory		Practical	
	Lecture Day	Topic	Practical Day	Topic
Week 1	Day 1	Unit 1: Introduction to thyristors and other Power Electronics Devices	day 1	To plot V-I characteristic of an SCR.
	Day 2	a) Construction, Working principle of SCR		
	Day 3	two transistor analogy of SCR, V-I characteristics of SCR.		
Week 2	Day 4	b) SCR specifications and ratings.	day 2	File Check
	Day 5	c) Different methods of SCR triggering.		
	Day 6	d) Different commutation circuits for SCR.		
Week 3	Day 7	e) Series and parallel operation of SCR.	day 3	To plot V-I characteristics of TRIAC.
	Day 8	f) Construction and working principle of DIAC, TRIAC and their V-I characteristics.		
	Day 9	g) Construction, working principle of UJT, V-I characteristics of UJT. UJT as relaxation oscillator.		
Week 4	Day 10	(GTO), Programmable Uni-junction Transistor (PUT), MOSFET.	day 4	File Check
	Day 11	i) Basic idea about the selection of Heat sink for thyristors.		
	Day 12	j) Applications such as light intensity control, speed control of universal motors, fan regulator, battery charger.		
Week5	Day 13	Test Unit 1	day 5	To plot V-I characteristics of UJT.
	Day 14	Unit 2: Controlled Rectifiers		
	Day 15	a) Single phase half wave controlled rectifier with load (R, R-L)		
Week 6	Day 16	a) Single phase half wave controlled rectifier with load (R, R-L)	day 6	File Check
	Day 17	b) Single phase half controlled full wave rectifier with load (R, R-L)		
	Day 18	c) Fully controlled full wave bridge rectifier.		
Week 7	Day 19	d) Single phase full wave centre tap rectifier.	day 7	To plot V-I characteristics of DIAC.
	Day 20	Test Unit 2		

	Day 21	Unit 3: Inverters, Choppers, Dual Converters and Cyclo converters.		
Week 8	Day 22	a) Principle of operation of basic inverter circuits	day 8	File Check
	Day 23	concepts of duty cycle		
	Day 24	series and parallel Inverters and their applications.		
	Day 25	b) Choppers: Introduction	day 9	Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
	Day 26	types of choppers (Class A, Class B, Class C and Class D).		
	Day 27	Step up and step down choppers.		
Week 10	Day 28	c) Dual Converters and cyclo converters: Introduction	day 10	File Check
	Day 29	types and basic working principle of dual converters and cyclo converters and their applications.		
	Day 30	types and basic working principle of dual converters and cyclo converters and their applications.		
Week 11	Day 31	Test Unit 3	day 11	Observation of wave shape of voltage at relevant point of single-phase half wave controlled rectifier and effect of change of firing angle.
	Day 32	Unit 4: Thyristorised Control of Electric drives		
	Day 33	a) DC drive control i) Half wave drives		
Week 12	Day 34	ii) Full wave drives	day 12	File Check
	Day 35	Full wave drives		
	Day 36	iii) Chopper drives (Speed control of DC motor using choppers)		
Week 13	Day 37	Chopper drives (Speed control of DC motor using choppers)	day 13	Observation of wave shapes of voltage at relevant point of single phase full wave controlled rectifier and effect of change of firing angle.
	Day 38	Revision and problem discussion		
	Day 39	b) AC drive control i) Phase control		
Week 14	Day 40	ii) Constant V/F operation	day 14	File Check
	Day 41	Constant V/F operation		
	Day 42	iii) Cycloconverter/Inverter drives.		
Week 15	Day 43	Cycloconverter/Inverter drives.	day 15	Observation of wave shapes and
	Day 44	Revision and problem discussion		

	Day 45	Test Unit 4		measurement of voltage at relevant points in TRIAC based AC phase control circuit for Varying lamp
Week 16	Day 46	Unit 5: Un interrupted Power Supply (UPS)	day 16	File Check
	Day 47	a) UPS: Block Diagram		
	Day 48	specifications of on-line UPS		
Week 17	Day 49	off line and Smart UPS	day 17	system and routine maintenance of batteries.
	Day 50	off line and Smart UPS		
	Day 51	b) Concept of high voltage DC transmission		
Week 18	Day 52	Concept of high voltage DC transmission	day 18	File Check
	Day 53	Revision and problem discussion		
	Day 54	Test Unit 5		