

Semester Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa							
Name of Faculty: Aga D. A.				Subject: Physics			
Paper code: PYC- 109 (SOLID STATE DEVICES AND INSTRUMENTATION)				Program/Course: T.Y. B.Sc.		Division: A	
Academic year: 2024 - 2025				Semester: VI		Total Lectures: 60 Theory and Practicals	
Course Objectives: This course aims to provide the students with a foundation in basic designing of Instruments . Thorough knowledge of solid state devices, CRO and Signal generator.							
Course Learning Outcome: The student after undergoing this course will be able to: 1. Describe and explain working of solid state devices. 2.Explain and design various instruments like Ammeter, Voltmeter and Ohmmeter. 3.Describe and Explain various types of transducers. 4. Describe and explain Cathode Ray Oscilloscope and Signal Generator.							
Month	Lectures From: To:		No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
December 24	09/12/2024	14/012/2024	04	Topic 1 Solid State Devices:- Power diodes, Tunnel diodes, Varicap diodes, Schottky Barrier diode,	The student will be able to: 1. Describe and explain working of solid state devices.	White board and marker	1.Allen Mottershed, Electronic Devices and Circuits An Introduction: PHI (1997). 2.Malvino, Electronic

							Principles, TMH (2007). 3.J. Millman and C. Halkias, Electronic Devices and Circuits , Mc Graw Hill (1972).
December 24	09/12/2024	14/012/2024	04	PRACTICAL			
				Topic 1 Semiconductor photoconductive cell, Photovoltaic cell, Photodiode, Light emitting diodes (LED),			1.Allen Mottershed, Electronic Devices and Circuits An Introduction: PHI (1997).
				Topic 1 Liquid Crystal display (LCD), Solar cells and Photocouplers.			2.Malvino, Electronic Principles, TMH (2007). 3.J. Millman and C. Halkias, Electronic Devices and Circuits , Mc Graw Hill (1972).
	16/12/2024	18/12/2024	04		The student will be able to: 1. Describe and explain working of solid state devices.	White board and marker	
Jan-25	02/01/2025	04/01/2025	04	Topic 1 Liquid Crystal display (LCD), Solar cells and Photocouplers.	The student will be able to: 1) Describe and explain LCD, Solar cell and	White board and marker	1.Allen Mottershed, Electronic Devices and

				Topic 2 Industrial devices:- Silicon controlled rectifier (SCR), SCR characteristics, rating,construction and terminal identification, SCR applications, Silicon controlled switch (SCS),	Photocouplers. 2.) Describe and explain working of various Thyristors		Circuits An Introduction: PHI (1997). 2.Malvino, Electronic Principles, TMH (2007). 3J. Millman and C. Halkias, Electronic Devices and Circuits , Mc Graw Hill (1972).
Jan-25	06/01/2025	11/01/2025	04	Topic 2 SCR characteristics, rating,construction and terminal identification, SCR applications, Silicon controlled switch (SCS),	The student will be able to: 1. Describe and explain working of SCR and its Characteristics also SCS	White board and marker	1. Allen Mottershed, Electronic Devices and Circuits An Introduction: PHI (1997). 2. Malvino, Electronic Principles, TMH (2007). 3. J. Millman and C. Halkias, Electronic Devices and Circuits , Mc Graw Hill (1972).
Jan-25	06/01/2025	11/01/2025	04	PRACTICAL			4.
	13/01/2025	16/01/2025	04	Topic 2 Topic 2:- Gate turn off switch (GTO), Light activated SCR (LASCR),	The student will be able to: 1. Describe and explain working of		1.Allen Mottershed, Electronic Devices and Circuits An Introduction: PHI

				Shockley diode	GTO and LASCR		(1997). 2.Malvino, Electronic Principles, TMH (2007). 3.J. Millman and C. Halkias, Electronic Devices and Circuits , Mc Graw Hill (1972).
	13/01/2025	16/01/2025	04	PRACTICAL			
	20/01/2025	25/01/2025	04	Topic 2 Diac, Triac, Typical Diac-Triac Phase control circuit, Unijunction transistor (UJT). Phototransistor	The student will be able to: . Describe and explain working of UJT ,Characteristics and Applications of UJT.		1.Allen Mottershed, Electronic Devices and Circuits An Introduction: PHI (1997). 2.Malvino, Electronic Principles, TMH (2007). J. Millman and C. Halkias, Electronic Devices and Circuits , Mc Graw Hill (1972).
	20/01/2025	25/01/2025	04	PRACTICAL			
Jan-Feb 2025	27/01/2025	01/02/2025	04	Topic 4 : Measuring Instruments - Errors in measurement, Basic PMMC, Analog DC ammeter, Multirange	The student will be able to: Explain and design various instruments like Ammeter, Voltmeter and Ohmmeter	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).

				ammeter, Universal shunt,			
Feb-25	03/02/2025	08/02/2025	04	DC & AC voltmeter, Multirange voltmeter, Extending voltmeter range, Transistor voltmeter, Ohmmeter – Series and shunt type, Multimeter,	The student will be able to: Explain and design various instruments like Ammeter, Voltmeter and Ohmmeter	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).
	03/02/2025	08/02/2025	04	PRACTICAL			
	10/02/2025	15/02/2025	04	Digital voltmeter, Resolution and sensitivity of digital meters, multimeter, frequency meter, Q meter.	The student will be able to: Explain Digital voltmeter and Q meter	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).
	10/02/2025	15/02/2025	04	PRACTICAL			
	17/02/2025	22/02/2025	04	Topic 5 Oscilloscope:- CRT, CRO block diagram (simple CRO), vertical and horizontal deflection system, Vertical amplifier, sweep generator,	The student will be able to: Explain and draw the block diagram of CRT .	White board and marker	1. H. S. Kalsi, Electronic Instrumentation: TMH (2004).

				Delay line. horizontal deflection system, Vertical amplifier, sweep generator, Delay line.			
	17/02/2025	22/02/2025	04	PRACTICAL			2.
Feb- march-25	24/02/2025	01/03/2025	04	Topic-6 Transducers Introduction, Electrical transducer, selecting a transducer, Resistive transducers, Strain gauges, resistance wire gauge,	The student will be able to: Explain Electrical transducers and strain gauges .	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).
	24/02/2025	01/03/2025	04	PRACTICAL			
March- 25	03/03/25	08/03/25	04	types of strain gauges, foil strain gauge, semiconductor strain gauge, Resistance thermometer, Thermistor, Inductor transducer, LVDT	The student will be able to: Explain Electrical transducers and strain gauges .	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).
	03/03/25	08/03/25	04	PRACTICAL			
	10/03/25	15/03/25	04	Capacitive transducer, Piezo	The student will be able to:	White board and marker	H. S. Kalsi, Electronic

				electric transducer and Hall effect transducers.	Explain various transducers and Hall effect.		Instrumentation: TMH (2004).
	10/03/25	15/03/25	04	PRACTICAL			
	17/03/25	22/03/25	04	Topic-7 Signal Generator Standard signal generator, AF sine and square wave generator, Function generator.	The student will be able to: Explain and draw the block diagram of Signal Generator.	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).
	17/03/25	22/03/25	04	PRACTICAL			
	24/03/25	29/03/25	04	Topic-8 Image Capture and display Devices Solid State Image scanners (CCD's), Basic LED TV	The student will be able to: Explain Image capture Scanner and LED TV.	White board and marker	H. S. Kalsi, Electronic Instrumentation: TMH (2004).
March-25-April-25	31/03/25	05/04/25	04	Revision	-----	White board and marker	-----
April-25	07/03/25	11/04/25	03	Revision	-----	White board and marker	-----

*Note: Data filled in the above form is sample data.