Semester Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa		
Name of Faculty: Aga D. A. & Suvarna Patil	**Subject:** Physics Major PHY-202 Electronics	
Paper code:PHY-202 Electronics	**Program/Course: S.Y. B.Sc.**	**Division: A**
Academic year: 2025 - 2026	**Semester: IV**	**Total Lectures: 45 lectures Plus Practical**

Course Objectives:Course Objectives: This course provides a foundation for understanding and working with electronic components and circuits related to rectifiers, regulators, transistors, amplifiers, biasing, feedback, and linear integrated circuits. The outcomes can be adapted based on the specific focus and depth of the course.

Course Learning Outcome: 1.Understand the working principles of rectifiers and their applications.
2.Develop a solid understanding of transistor operation and characteristics.
3.Define and explain key amplifier parameters such as gain, bandwidth, and input/output impedance also Understand the characteristics and operation of Class A amplifiers and its stability and explain the concept of feedback in electronic circuits.
4.Understand the characteristics and applications of operational amplifiers (Op-Amps).

Month	Lectures From:	To:	No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
December 25	01/12/2024	06/012/2025	03	**Rectifiers and Regulators Volt-ampere characteristics of**	2) The student will be able to: 1. Describe Volt-ampere characteristics of Junction diode,	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an

				Junction diode,			Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
December 25	08/12/2025	13/012/2025	03	**Half wave, Full wave and Bridge rectifiers using Junction diodes without and with capacitive filters.**	2) The student will be able to: 1)Describe and explain Half wave, Full wave and Bridge rectifiers using Junction diodes without and with capacitive filters..	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
December 25	08/12/2025	13/012/2025	02	PRACTICAL			
	15/12/2025	20/12/2025	03	**Percentage regulation, Ripple factor and Rectification efficiency. Zener diode characteristics and its use as a simple voltage regulator.**	2) The student will be able to: Describe Percentage regulation, Ripple factor and Rectification efficiency. Zener diode characteristics and its use as a simple voltage regulator. Thermistor	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH

				Thermistor characteristics and its use in A.C. voltage regulation.	characteristics and its use in A.C. voltage regulation.		(1972).
Jan-26	02/01/2026	10/01/2026	03	**Transistors** **Basic configurations of transistors, Transistor characteristic in CE and CB mode**	2) The student will be able to: Describe Basic configurations of transistors, Transistor characteristic in CE and CB mode	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
Jan-26	02/01/2026	10/01/2026	02	PRACTICAL			
Jan-26	12/01/2026	17/01/2026	03	**Current gains α and β and their interrelation, Leakage current in transistors.**	2) The student will be able to: Describe Current gains α and β and their interrelation, Leakage current in transistors.	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).Devices and Circuits an Introduction- 3rd

							edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).S.CHAND
Jan-26	12/01/2026	17/01/2026	02	**Practical**			
	19/01/2026	24/01/2026	03	**Basic Amplifier Characteristics Current gain, Voltage gain, Power gain, Input resistance, Output resistance, Conversion efficiency**	2) The student will be able to: Describe Current gain, Voltage gain, Power gain, Input resistance, Output resistance, Conversion efficiency	White Board and marker	A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
	19/01/2026	24/01/2026	02	**PRACTICAL**			
	27/01/2026	31/01/2026	03	**Classes of amplifier operations, Decibel, Frequency response, Amplifier bandwidth.**	2) The student will be able to: Explain Classes of amplifier operations, Decibel, Frequency response, Amplifier bandwidth.	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
	27/01/2026	31/01/2026	02	PRACTICAL			
Feb 2026	02/02/2026	07/02/2026	03	**C-E amplifier**:	2) The student	White Board	1. A.P.Malvino,

				Class A Graphical analysis, Effect of adding A.C. load, Input and Output resistance	will be able to: Explain Graphical analysis, Effect of adding A.C. load, Input and Output resistance	and marker	Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
Feb 2026	02/02/2026	07/02/2026	02	PRACTICAL			
Feb-26	09/02/2026	14/02/2026	03	**Conversion efficiency, Phase relationship between input and output.**	2) The student will be able to Explain, Conversion efficiency, Phase relationship between input and output..	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
Feb-26	16/02/2026	21/02/2026	02	PRACTICAL			
	23/02/2026	28/02/2026	03	**Transistor Biasing :- Bias stability, Stability factor,**	2) The student will be able to: Explain Bias stability, Stability factor,	White Board and marker	1) 1. Arthur Beiser, Concepts of Modern Physics, 5th Edition, McGraw Hill (1985). 2) Modern Physics By B. L. Theraja

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	23/02/2026	28/02/2026	02	PRACTICAL			
March-26	02/03/2026	07/03/2026	03	**Different methods of biasing, biasing compensation**	2) The student will be able to: Explain about Different methods of biasing, biasing compensation	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
	02/03/2026	07/03/2026	02	PRACTICAL			
March-26	09/03/2026	14/03/2026	03	**Feedback Positive and negative feedback, Voltage and current feedback,,**	2) The student will be able to: Explain Positive and negative feedback, Voltage and current feedback,	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
March-26	09/03/2026	14/03/2026	02	PRACTICAL			
March-26	16/03/26	23/03/26	03	**series and shunt feedback.**	2) The student will be able to: Explain series and shunt feedback.	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen

							Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
March-26	16/03/26	21/03/26	02	PRACTICAL			
	16/03/26	21/03/26	03	**Effect on negative feedback on gain, frequency response, input and output resistance and distortion. Positive feedback, Barkhausen criterion for oscillations, Phase shift oscillator, Wein bridge oscillator, LC tank circuit, Hartley oscillator and Colpitts oscillator. Topic-2Particle Accelerators Linear accelerator**	2) The student will be able to Describe Effect on negative feedback on gain, frequency response, input and output resistance and distortion. Positive feedback, Barkhausen criterion for oscillations, Phase shift oscillator, Wein bridge oscillator, LC tank circuit, Hartley oscillator and Colpitts oscillator.	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
	16/03/26	21/03/26	03	PRACTICAL			
	23/03/26	28/03/26	03	**Linear IC's and**	2) The student	White Board	1. A.P.Malvino,

				Operation Amplifiers :- The Differential Amplifier, OP-Amp characteristics, Input and Output impedance, Input bias and offset currents, Input and output offset voltages. Differential and Common mode gains, CMRR, Slew rate, OP-Amp as inverting ,	will be able to Describe The Differential Amplifier, OP-Amp characteristics, Input and Output impedance, Input bias and offset currents, Input and output offset voltages.	and marker	Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
	23/03/26	28/03/26	02	**Practical**			
	30/03/26	31/03/26	03	Non Inverting amplifier summing amplifier Difference amplifier, Wein bridge and Phase shift oscillator using Op-Amp.	The student will be able to Describe Differential and Common mode gains, CMRR, Slew rate, OP-Amp as inverting , Non Inverting amplifier and Difference amplifier	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition (1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
	30/03/26	31/03/26	02	Practical			

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