

## Semester Lecture Plan

<b>Name of the college:</b> Government College of Arts, Science & Commerce, Sanquelim-Goa							
<b>Name of Faculty:</b> Aga D. A.				<b>Subject:</b> Physics Major PHY-202 Electronics			
<b>Paper code:</b> PHY-202 Electronics			<b>Program/Course:</b> S.Y. B.Sc.		<b>Division:</b> A		
<b>Academic year:</b> 2024 - 2025			<b>Semester:</b> IV		<b>Total Lectures:</b> 45 lectures Plus Practical		
<b>Course Objectives:</b> Course Objectives: This course aims to provide the students with a foundation in basics of Electronics i.e.1) Detail study of Half, Full and Bridge type Rectifier 2) Bipolar junction transistor characteristics 3)CE and CB mode amplifier characteristics 4) Classes of Amplifier Operation 6) Transistor Biasing 7) Feedback circuits and 7) Linear Ics and OP-AMP							
<b>Course Learning Outcome:</b>							
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	03		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 Introduction- 3rd
				<b>Rectifiers and Regulators Volt-ampere characteristics of</b>			

				Junction diode,			edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
December 24	09/12/2024	14/012/2024	03	<b>Half wave, Full wave and Bridge rectifiers using Junction diodes without and with capacitive filters.</b>	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 24	09/12/2024	14/012/2024	03	PRACTICAL			
					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 characteristics		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).
	16/12/2024	18/12/2024	03	<b>Percentage regulation, Ripple factor and Rectification efficiency. Zener diode characteristics and its use as a simple voltage regulator. Thermistor</b>		White Board and marker	

				<b>characteristics and its use in A.C. voltage regulation.</b>	and its use in A.C. voltage regulation.		
				<b>Transistors</b>  <b>Basic configurations of transistors, Transistor characteristic in CE and CB mode</b>	2) The student will be able to: Describe Basic configurations of transistors, Transistor characteristic in CE and CB mode		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-25	02/01/2025	04/01/2025	03			White Board and marker	
Jan-25	02/01/2025	04/01/2025	03	PRACTICAL			
				<b>Current gains <math>\alpha</math> and <math>\beta</math> and their interrelation, Leakage current in transistors.</b>	2) The student will be able to: Describe Current gains $\alpha$ and $\beta$ and their interrelation, Leakage current in transistors.		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).
Jan-25	06/01/2025	11/01/2025	03			White Board and marker	

							3. Millman and Halkias, Intergrated electronics- TMH (1972).S.CHAND
	13/01/2025	16/01/2025	03	<b>Basic Amplifier Characteristics Current gain, Voltage gain, Power gain, Input resistance, Output resistance, Conversion efficiency</b>	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).
	13/01/2025	16/01/2025	03	<b>PRACTICAL</b>			
	20/01/2025	25/01/2025	03	<b>Classes of amplifier operations, Decibel, Frequency response, Amplifier bandwidth.</b>	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).
	20/01/2025	25/01/2025	03	<b>PRACTICAL</b>			
Jan-Feb 2025	27/01/2025	01/02/2025	03	<b>C-E amplifier: Class A Graphical analysis,</b>	2) The student will be able to: Explain	White Board and marker	1. A.P.Malvino, Electronic Principles –TMH 5th edition

				<b>Effect of adding A.C. load, Input and Output resistance</b>	Graphical analysis, Effect of adding A.C. load, Input and Output resistance		(1996). 2. Allen Mottershed, Electronics Devices and Circuits an Introduction- 3rd edition PHI (1997). 3. Millman and Halkias, Intergrated electronics- TMH (1972).
Jan-Feb 2025	27/01/2025	01/02/2025	03	PRACTICAL			
Feb-25	03/02/2025	08/02/2025	03	<b>Conversion efficiency, Phase relationship between input and output.</b>	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-25	03/02/2025	08/02/2025	03	PRACTICAL			
	10/02/2025	15/02/2025	03	<b>Transistor Biasing :- Bias stability, Stability factor,</b>	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 S.CHAND

	10/02/2025	15/02/2025	03	PRACTICAL			
							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).
	17/02/2025	22/02/2025	03	<b>Different methods of biasing, biasing compensation</b>	2) The student will be able to: Explain about Different methods of biasing, biasing compensation	White Board and marker	
	17/02/2025	22/02/2025	03	PRACTICAL			
Feb-march-25	24/02/2025	01/03/2025	03	<b>Feedback Positive and negative feedback, Voltage and current feedback,,</b>	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).
Feb-march-25	24/02/2025	01/03/2025	03	PRACTICAL			
March-25	03/03/25	08/03/25	03	<b>series and shunt feedback.</b>	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-25	03/03/25	08/03/25	03	PRACTICAL			
				<b>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</b>	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.		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).
	10/03/25	15/03/25	03			White Board and marker	
	10/03/25	15/03/25	03	PRACTICAL			
	17/03/25	22/03/25	03	<b>Linear IC's and</b>	2) The student	White Board	1. A.P.Malvino,

				<b>Operation Amplifiers :- The Differential Amplifier, OP-Amp characteristics, Input and Output impedance, Input bias and offset currents, Input and output offset voltages.</b>	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).
	24/03/25	29/03/25	03	Differential and Common mode gains, CMRR, Slew rate, OP-Amp as inverting , Non Inverting amplifier and Difference amplifier Revision	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).
March-25-April-25	31/03/25	05/04/25	03	Revision	-----		
April-25	07/03/25	11/04/25	03	Revision			

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