

GOVERNMENT POLYTECHNIC, PUNE
(An Autonomous Institute of Govt. of Maharashtra)

Programme	:	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme Code	:	01/02/03/04/05/06/07/08/21/22/23/24/26/16/17
Name of Course	:	Applied Electronics
Course Code	:	ET383

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	04	64

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	3 Hrs.	2 Hrs.	--	--
Marks	20	80	50	--	--

Course Rationale:

As a core technology subject, it intends to teach operating principle and application of electronic circuits and devices like amplifiers, oscillators, Feedback amplifiers, Time base generators,. The subject knowledge is required in Industrial electronics, Instrumentation and Communication system. Understanding of the subject will provide skill to the students for trouble shooting & testing of some of circuits & devices.

Course Objectives:

After studying this course, the student will be able to

•	Classify different types of BJT and their configuration
•	Understand the need for biasing.
•	Understand working of FET and MOSFET based on application, concept of biasing
•	Compare different power amplifiers,
•	Select the FET tuned amplifier for appropriate application
•	Compare and classify feedback amplifiers ,oscillators, Time base generator

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
SECTION-I			
1.	Transistors		
	1.1 Introduction <ul style="list-style-type: none"> • Types of transistors, Transistor packaging & terminal identification, symbols • Operation of PNP & NPN transistors • Configuration (CB, CC & CE), input -output characteristics, • Relation between α, β, γ, Comparison between CB, CC & CE, • Transistor as switch 	14	16
	1.2 BJT Biasing <ul style="list-style-type: none"> • Need for biasing, • Concept of DC load lines, • Operating point (Q), stabilization, thermal runaway, • Types of biasing <ol style="list-style-type: none"> i. Fixed biasing circuits. ii. Base biased with emitter feedback. iii. Voltage divider 		
2.	Field Effect Transistors (FET):		
	2.1 FET <ul style="list-style-type: none"> • Construction of JFET, (n-channel & p-channel) • Working, principle & characteristics (Drain characteristics & Transfer characteristics) 	08	08
	2.2 FET biasing <ul style="list-style-type: none"> • Self bias • Source bias • Voltage divider bias • Applications of FET 		
	2.3 MOSFET: <ul style="list-style-type: none"> • Introduction, types, construction • Working & Applications. 		
3.	Power Amplifiers		
	3.1 Introduction <ul style="list-style-type: none"> • Small signal Amplifier concept • Comparison between small signal amplifier and power amplifier • Classification: class A, class B, class AB & class C. with respect to operating point on load line, efficiency, 	12	16
	3.2 Single stage class A Amplifier <ul style="list-style-type: none"> • Operation, input output 		

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	<ul style="list-style-type: none"> Single stage class A operating point on load line, efficiency, 		
	3.3 Class B push-pull amplifier, <ul style="list-style-type: none"> Operation, input output Advantages & disadvantages, applications of power amplifier. 		
SECTION-II			
4.	Tuned Amplifier		
	4.1 Introduction <ul style="list-style-type: none"> Introduction & necessity of tuned amplifier Basic tuned circuit Circuit diagram & operating principle of single & double tuned Amplifiers Stager tuned Amplifier 	05	08
5.	Feedback Amplifiers and Oscillators:		
	5.1 Concept of Feedback series & current shunt. <ul style="list-style-type: none"> Types of feedback: negative and positive feedback Types of feedback connections, voltage shunt, voltage series, current series & current shunt. 	10	12
	5.2 Introduction to Oscillators: <ul style="list-style-type: none"> Need and condition for oscillators (Barkhausen's criteria) Type of oscillator: LC Oscillators-Hartley Oscillator, Colpitts Oscillators, RC phase shift oscillator and crystal oscillator-Concept, working and applications 		
6.	Multivibrators		
	6.1 Multivibrators. <ul style="list-style-type: none"> Classification AMV circuit working ,waveforms & frequency BMV circuit working ,waveforms & frequency MMV circuit working ,waveforms & frequency Applications. Schmitt trigger 	05	08
7	Time Base Generators:		
	7.1 Unijunction Transistor (UJT): <ul style="list-style-type: none"> Construction, Working principle & characteristics 		
	7.2 Types of Time Base Generators: <ul style="list-style-type: none"> Free running time base generator, working principle of UJT as time base generators, (Relaxation oscillator). Circuit diagram and working of <ol style="list-style-type: none"> Voltage time base generator, Current time base generator, Bootstrap time base generator, Miller's sweep generator & its applications. 	10	12
	Total	64	80

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List of Practical/Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment
1	Input output characteristics of common base configuration.
2	Input output characteristics of common emitter configuration.
3	Switching characteristics of BJT.
4	V-I characteristics of UJT.
5	Frequency response of single stage common emitter amplifier, determine gain and BW.
6	Frequency response of two stage RC coupled amplifier using BJT.
7	Frequency response of single tuned amplifier of BJT & determine tuned frequency and BW.
8	Plot Frequency response of FET amplifier
9	Study of Class A, Class B, Class C, power amplifier
10	Study function of Astable Multivibrators
11	Study function of Monostable Multivibrator
12	Study function of Bistable Multivibrator
13	Study function of Schmitt's Trigger circuit
14	Study function of UJT relaxation oscillator
15	Study of Miller sweep generator.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Transistors	Classroom Teaching and laboratory work
2.	FET	Classroom Teaching and laboratory work
3.	Power Amplifiers	Classroom Teaching and laboratory work
4.	Tuned Amplifier	Classroom Teaching and laboratory work
5.	Feedback Amplifiers and Oscillators	Classroom Teaching and laboratory work
6.	Multivibrators	Classroom Teaching and laboratory work
7.	Time Base Generators	Classroom Teaching and laboratory work

Text Books:

Sr. No	Author	Title	Publication
1.	R.S.Sedha	Applied Electronics	S.Chand & Co.

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Reference Books:

Sr. No	Author	Title	Publication
1.	P.Ramesh Babu	Electronics Device and Circuit	Scitech
2	Allen Mottershed	Electronics Devices & Circuits	Prantice Hall India LTD.
5	Robert L.Boylestead Louis Neshelsky	Electronics Circuit and Circuit Theory	Pearson

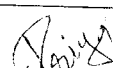


Learning Resources:

1. Reference Books, 2. Data Manual

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Transistors	04	08	04	16
2.	FET	04	--	04	08
3.	Power Amplifiers	04	08	04	16
4.	Tuned Amplifier	--	04	04	08
5.	Feedback Amplifiers and Oscillators	04	04	04	12
6.	Multivibrators	--	08	-	08
7.	Time Base Generators	04	04	04	12
Total		20	36	24	80

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