

Course Name : Electrical and Electronics Engineering Group

Course Code : EE/EP/ET/EJ/EN/EX/IE/IS/IC/DE

Semester : Fourth

Subject Title : Applied Electronics

Subject Code : 9064

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	Pr	PAPER HRS.	TH	TEST	PR	TW	TOTAL
03	--	02	03	80	20	50#	25@	175

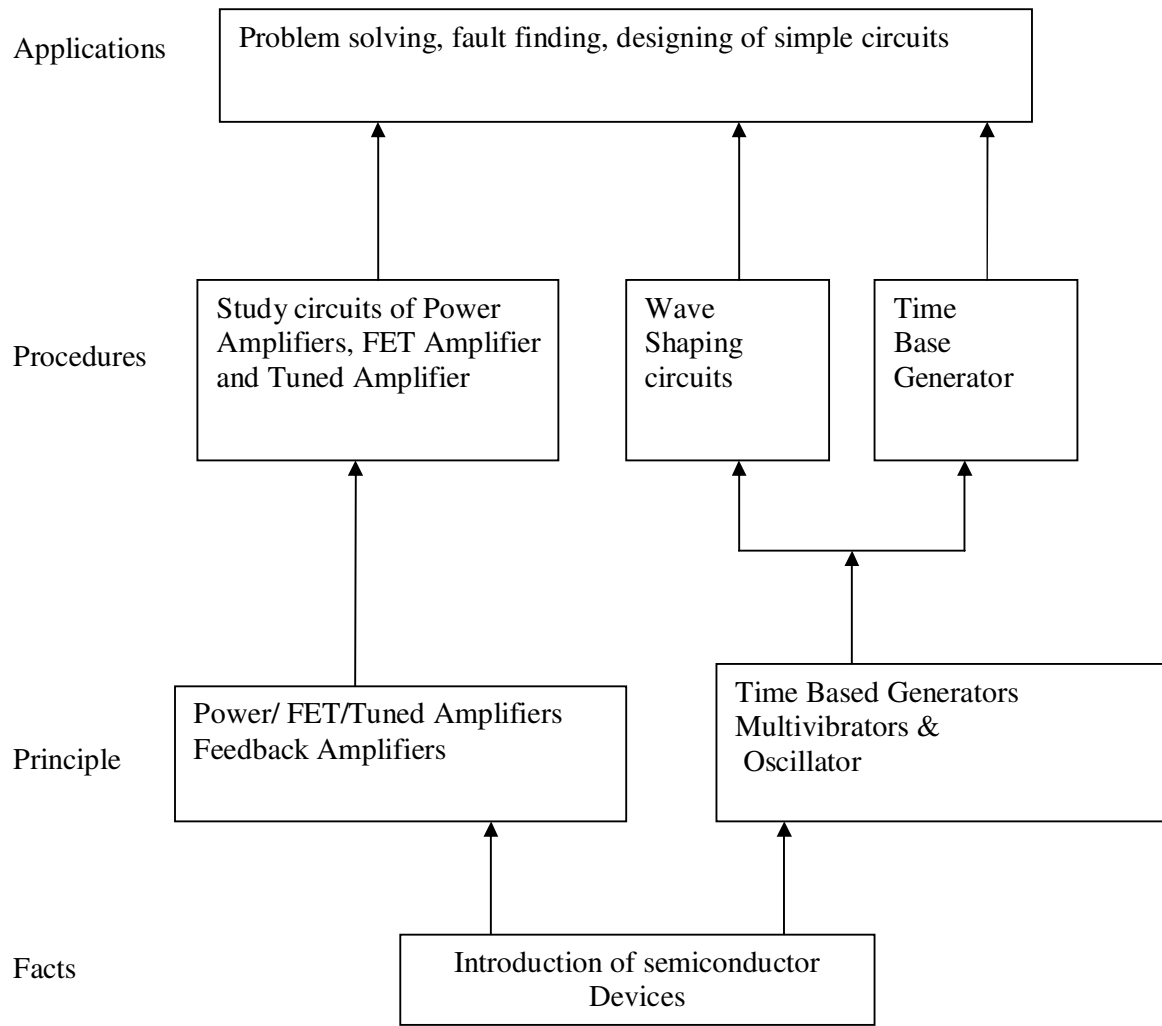
Rationale:

As a core technology subject, it intends to teach operating principle and application of electronic circuits and devices like amplifiers, oscillators, switching circuits, wave shaping circuits. 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.

Objectives:

- 1] Classify various amplifiers & oscillator circuits based on their characteristics.
- 2] Classify different wave shaping circuits & multivibrators.
- 3] Configure regulated power supply using IC's.
- 4] Test and repair various devices.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	<p>AMPLIFIERS</p> <p>1.1) Power Amplifiers</p> <p>1.1.1 Introduction, Classification – Class A, Class B, Class AB & Class C, efficiency of each.</p> <p>1.1.2 Single stage class A power amplifier: Circuit operation, input & output waveforms , graphical Analysis and efficiency of</p> <p>1.1.2.i] Transformer couple resistive load single stage power amplifier</p> <p>1.1.2. ii] Class A push pull amplifier</p> <p>1.1.2.iii] Class B push pull amplifier</p> <p>1.1.2.iv] Class AB push pull amplifier</p> <p>1.1.3 Concept of cross over distortion</p> <p>1.1.4. Advantages of push pull amplifier , collector power dissipation requirement & specifications of power transistor, need of heat sink.</p> <p>1.2 FET Amplifier</p> <p>1.2.1 Biasing of FET: Source Self Bias, Drain to source Bias Application of FET as V V R</p> <p>1.2.2 Common Source Amplifier: Working & Applications</p> <p>1.2.3 Introduction to MOSFET:Types, Construction, Working & Applications</p> <p>1.3 Tuned Amplifiers</p> <p>1.3.1 Introduction & necessity of tuned amplifier. Basic tuned circuits, series & parallel resonance in tuned circuits.</p> <p>1.3.2 Operating principle, circuit working, resonance frequency of single tuned, double tuned amplifiers.</p>	16	24
02	<p>2.1 Feedback Amplifiers & oscillators</p> <p>2.1.1 General theory of feedback: Types of feedback – negative & positive feedback.</p> <p>2.1.2 Types of negative feedback – voltage shunt, voltage series, current shunt & current series.</p> <p>2.1.3 Advantages of negative feedback on voltage gain , bandwidth , input impedance , output impedance, stability , noise , distortion in amplifiers.</p> <p>2.2 Introduction to oscillator , block diagram of sine wave oscillator , requirement of oscillation –</p> <p>2.2.1 Barkhausen criterion , operating principles of RC & LC oscillators</p> <p>2.2.2 RC oscillators – RC phase shift , Wien bridge</p> <p>2.2.3 LC oscillators – Colpitts , Hartley , Crystal oscillators Circuit diagram, equation for frequency of oscillation & frequency stability.</p>	10	18

03	3.1 Wave shaping circuits 3.1.1 Necessity of wave shaping circuits. 3.1.2 Linear circuits – RC integrator & differentiator – input / output waveforms & frequency response. 3.1.3 Non-linear circuits - Clipper , diode series & shunt , positive & negative biased & unbiased & combinational clipper. 3.1.4 Clampers – positive & negative clampers	06	12
04	4.1 Multivibrators 4.2 Transistor as switch. Definition & graphical representation of different time periods . 4.3 Multivibrator classification , circuit working & frequency with specific application . MMV , AMV , BMV & Schmitt trigger	06	12
05	5.1 Time base generator – 5.2 Voltage time base generator, exponential sweep generator UJT Relaxation Oscillator, negative resistance generator. working principle & operation . 5.3 Current time base generator , bootstrap & miller sweep generator , applications in TV & CRO	06	10
06	Trouble shooting & Testing 6.1 Need for trouble shooting , Important steps for testing 6.2 Visible testing – Observing circuits for visible faults like broken component, open contacts etc. 6.3 Active testing – Voltage analysis, Resistance analysis, signal analysis. 6.4 Trouble shootings of multivibrators, phase shift oscillators, transistorised sweep generator, clipping & clamping circuits.	04	04
Total		48	80

Practical:

Intellectual Skills:

- 1 To locate faults in circuits.
2. Interpret the waveforms.

Motor Skill:

1. Ability to Sketch circuit/block diagram.
2. Ability to interpret the circuit.

List of Practicals:

1. To Plot Frequency response of FET amplifier.
2. To Plot Frequency response & bandwidth of negative feedback amplifier.
3. To Study the Colpitt's oscillator.
4. To Study RC Phase shift oscillator.

5. To Study RC integrator and differentiator & draw i/p & o/p waveforms.
6. To Study Clipping and clamping circuits.
7. To Study function of Astable Multivibrator.
8. To Study Monostable Multivibrator.
9. To Study Bistable Multivibrator.
10. To Study UJT relaxation oscillator.

Learning Resources:

Books:

Sr. No	Author	Title	Publication
01	Paul Malvino	Electronic Principles	Tata McGraw-Hill
02	R.S.Sedha	Applied Electronics	S.Chand & Co.
03	Allen Mottershed	Electronics Devices & Circuits	Prantice Hall India LTD.
04	J.Millman and H.Taub	Pulse Digital & Switching Waveforms	Tata McGraw-Hill
05	G.K.Mittal and A.R.Vanvasai	Pulse & Digital Electronics	Khanna Publication