GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Power Electronics Engineering

Semester: 3

Subject Code

Subject Name ELECTRONICS DEVICES AND CIRCUITS - II

Sr. No.	Course content
1.	**FEEDBACK IN TRANSISTOR AMPLIFIER AND OSCILLATOR :** 1.1 Introduction to feedback. 1.2 Negative feedback 1.3 Effect and advantages of negative feedback. 1.4 Types of negative feedback in transistor circuits. 1.5 Effect of positive feedback. 1.6 Requirements for oscillation. 1.7 Types of Oscillators: R.C. phase shift oscillator, Wein-bridge oscillator, Harley oscillator, Colpitts oscillator, Crystal oscillator
2.	**TRANSISTOR POWER AMPLIFIER :** 2.1 Class-A operation with transformer coupled load. 2.2 Class-B operation, Push-pull circuit 2.3 Phase inverter, cross over distortion. 2.4 Class AB push-pull operation. 2.5 Class-B efficiency, Complimentary Symmetry push-pull Amplifier
3.	**PULSE CIRCUITS :** 3.1 RC Differentiator: circuit and response to pulse input 3.2 RC Integrator: circuit and response to pulse input 3.3 Definitions: time constant, rise time, fall time, sag 3.4 Multivibrators: Astable, Monostable and Bistable using transistors 3.5 Schmitt Trigger Circuit
4.	**FIELD-EFFECT TRANSISTOR :** 4.1 Field Effect Transistor: Construction, Operation, Characteristics and parameters 4.2 FET amplifiers: Common source, Common drain, Common gate 4.3 MOSFET Depletion type: construction and operation Enhancement type: construction and operation 4.4 Comparison of Bipolar Junction transistor, FET and MOSFET 4.5 IGBT: Construction, characteristics and application
5.	**LINEAR INTEGRATED CIRCUITS :** 5.1 Ideal Operational Amplifier 5.2 Op-Amp IC-741: Basic operation and pins' description 5.3 Applications: inverting amplifier, non-inverting amplifier, summing amplifier, differential amplifier, integrator, differentiator, comparator, V-I converter, instrumentation amplifier, logarithmic amplifier

	5.4	Timer IC-555: Block diagram, basic operation and pin description
	5.5	Applications of IC-555: astable multivibrator and monostable multivibrator
	5.6	Voltage regulator IC-723: Basic operation, pins' description and configurations
	5.7	Frequency generator IC-8038: Basic operation, pins' description and applications

LABORATORY EXPERIENCES:

The sample experiments to be performed include, but are not limited to the following.

1. Build & test differentiating circuit.
2. Build & test integrating circuit
3. Build & test astable Multivibrator.
4. Build & test Bi-stable Multivibrator.
5. Build & test monostable Multivibrator.
6. Build & test schmitt trigger.
7. Build & test colpitt's oscillator.
8. Build & test hartely oscillator.
9. Build & test Wien's bridge oscillator.
10. Obtain the frequency response of negative feedback amplifier
11. Obtain the frequency response of non-inverting OPAMP circuit
12. Obtain the frequency response of inverting OPAMP circuit.
13. Build & test OPAMP as differentiating circuit.
14. Build & test OPAMP as integrating circuit.
15. Build & test OPAMP as summing circuit.
16. Obtain the frequency response of class-B push-pull amp.
17. Obtain the O/P characteristic n-channel JFET.
18. Build & test variable voltage regulator.
19. Build & test OPAMP as instrumentation amplifier.
20. Build & test OPAMP as V-I converter.

Reference Books:

1. Electronic devices & circuits - Robert Boylestad, Louis Nashelsky - Pearson
2. Electronic Devices and Circuits - Allen Motershed - MGH
3. Electronic Principles A.P.Malvino -- TMH
4. Principles of Electronics - V. K. Mehta
5. Integrated Electronics - Millman & Halkias - TMH
6. Op-Amps and Linear Integrated Circuits – Gayakwad - Pearson