DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN ELECTRONICS AND COMMUNICATION ENGINEERING

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

LINEAR INTEGRATED CIRCUITS

CURRICULAM DEVELOPMENT CENTRE

M-SCHEME

(Implemented from the Academic year 2015 - 2016 onwards)

Course Name: Electronics and Communication Engineering

Subject code : 34044

Semester : IV Semester

Subject title : LINEAR INTEGRATED CIRCUITS

TEACHING AND SCHEME OF EXAMINATION:

Number of Weeks/ Semester : 15 weeks

Subject	Instruction		Examination			
			Marks			Duration
Linear integrated circuits	Hrs/ week	Hrs/ semester	INTERNAL ASSESMENT	BOARD EXAM	TOTAL	
	4	60	25	75	100	3Hrs

TOPICS AND ALLOCATION:

Unit	TOPICS	Hrs
I	Introduction to operational amplifiers	10
II	Opamp applications	10
III	PLL & Waveform generators	11
IV	D/A and A/D Converters	10
V	Special Function ICS	9
	Revision – Test	10
	TOTAL	60

RATIONAL IC technology needs the fundamentals of Integrated Circuits for students regarding the application and special function ICs.

OBJECTIVES:

- To understand the basics of operational amplifier.
- To study the op-amp applications.
- To understand PLL & waveform generators.
- To study D/A and A/D converters and special function ICs.

34044 LINEAR INTEGRATED CIRCUITS

DETAILED SYLLABUS

UNIT	NAME OF THE TOPIC	HOURS
1	**UNIT 1: INTRODUCTION TO OPERATIONAL AMPLIFIERS** Integrated circuit - Classification of IC - Advantages of IC over discrete components –Types of IC Packages - Operational amplifier IC 741 – Schematic symbol for opamp – pin diagram of IC 741 –Block diagram of an opamp – Characteristics of an Ideal opamp - Simple Equivalent circuit of an opamp – virtual ground – opamp parameters – CMRR –Slewrate Basic linear circuits- Inverting Amplifier, Non Inverting amplifier – Differential Amplifier – sign changer – scale changer.	10
2	**UNIT 2: OPAMP APPLICATIONS** Summing amplifier- Multiplier – Divider – Voltage follower – comparator – zero crossing detector - Integrator – Differentiator – Voltage to current converter – current to voltage converter – Instrumentation amplifier Waveform generators – square wave, triangular wave, sine wave, saw tooth wave generators. (Qualitative treatment only)	10
3	**UNIT 3: PLL & APPLICATIONS (Qualitative treatment only)** PLL – Basic principles of PLL – Basic Block schematic of PLL – Lock range – capture range - -Basic components of PLL – Phase detector, LPF –VCO Monolithic VCO 566- Pin diagram –Basic Block diagram of VCO 566. Monolithic PLL 565-Pin diagram - Functional Block diagram of PLL IC 565,Applications of PLL – frequency translation – frequency multiplication	11

4	**UNIT 4: D/A AND A/D CONVERTERS** **D/A CONVERTERS** Digital to analog converter – Basics of D/A conversion –weighted Resistor D/A Converter – R-2R Ladder D/A Converter – Specifications of DAC-Accuracy, Resolution, Monotonocity, Settling time. **A/D CONVERTERS** Analog to digital converter – Basics of A/D conversion – sampling – Sample and hold circuit – quantization – Types of A/D converter – Block diagram of Flash, Successive approximation, Ramp, Dual Slope ADC – Specifications of ADC – Accuracy, Resolution, conversion time – Functional Block diagram of IC ADC 0808	10
5	**UNIT 5: SPECIAL FUNCTION ICs: (qualitative treatment only)** IC 555 Timer – pin diagram of IC 555 – Functional Block diagram of IC555 – Applications – Astable multi vibrator – mono stable multi vibrator – Schmitt trigger . IC voltage regulators – linear fixed voltage regulator – Positive voltage regulator using IC 78xx, negative voltage regulator using IC 79xx General purpose regulator using LM 723-Pin diagram of LM723- Low voltage and High voltage regulator using LM 723.	09
Revision-Test		10

Text Books:

1. Linear Integrated circuits – D.Roychoudhury&Shail.B. Jain – New age International

Publishers – II Edition – 2004.

2. “Integrated circuits” – K.R. Botkar – KhannaPulbisher’s – 1996

REFERENCE BOOKS:

1.Introduction to system design using IC “-B.S. Sonde – Wiley Eastern Limited

– II Edition– 1992

2. “Operational Amplifiers and Linear Integrated circuits”- Ramakant .A Gayakwad –

Prentice Hall – 2000.

3. Digital Integrated Electronics –Taub&Schlling – Mcgraw Hill – 1997

4. Operational amplifiers and Linear Integrated circuits by Robert F.Coughlin and

Frederick F.Driscoll –PHI –publications –sixth Edition-2009.

5. Linear Integrated Circuits by Salivahanan&V.S.Kanchana Baskaran-TMH-2008