EE8451 LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

DETAILED SYLLABUS

OBJECTIVES:

To impart knowledge on the following topics

• Signal analysis using Op-amp based circuits.

• Applications of Op-amp.

• Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator

Circuits.

• IC fabrication procedure.

UNIT I IC FABRICATION

IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching, diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance, resistance, FETs and PV Cell.

UNIT II CHARACTERISTICS OF OPAMP

Ideal OP-AMP characteristics, DC characteristics, AC characteristics, differential amplifier; frequency response of OP-AMP; Basic applications of op-amp – Inverting and Non-inverting Amplifiers, summer, differentiator and integrator-V/I & I/V converters.

UNIT III APPLICATIONS OF OPAMP

Instrumentation amplifier and its applications for transducer Bridge, Log and Antilog Amplifiers- Analog multiplier & Divider, first and second order active filters, comparators, multivibrators, waveform generators, clippers, clampers, peak detector, S/H circuit, D/A converter (R- 2R ladder and weighted resistor types), A/D converters using opamps.

UNIT IV SPECIAL ICs

Functional block, characteristics of 555 Timer and its PWM application - IC-566 voltage-controlled oscillator IC; 565-phase locked loop IC, AD633 Analog multiplier ICs.

UNIT V APPLICATION ICs

AD623 Instrumentation Amplifier and its application as load cell weight measurement – IC voltage regulators –LM78XX, LM79XX; Fixed voltage regulators its application as Linear power supply - LM317, 723 Variability voltage regulators, switching regulator- SMPS – ICL 8038 function generator IC.

TEXT BOOKS:

1. David A. Bell, 'Op-amp & Linear ICs', Oxford, 2013.

2. D. Roy Choudhary, Sheil B. Jani, 'Linear Integrated Circuits', II edition, New Age, 2003.

3. Ramakant A. Gayakward, 'Op-amps and Linear Integrated Circuits', IV edition, Pearson Education, 2003 / PHI. 2000.