

PPH437: MICROELECTRONICS

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Course Objectives: To build up the concept integrated circuits and its application in the electronics and communications.

Operational Amplifiers. Basic information of Op-Amp Ideal Operational Amplifier, Feedback in operational amplifiers: Inverting and noninverting amplifiers. DC and AC characteristics of Op-Amp. Slew Rate and CMRR of Op-Amp.

Operational Amplifier Applications: Adder, subtractor and differential amplifier; Current to voltage and voltage to current converter, Sample and hold circuit, Log and antilog amplifiers, multiplier and divider, Differentiator and integrator. Comparator and Waveform generator: Comparator, Schmitt trigger, Square wave generator, Monostablemultivibrator, Triangular and Sine wave generator.

Timer: Monostable and astable operation of 555 timer. Applications of monostable mode: Missing pulse detector, Linear ramp generator, frequency divider and pulse width modulation.

Phase Locked Loops: Basic principles of 565 PLL, Phase detector /comparator, Voltage controlled oscillator, Low Pass filter, Applications of Phase locked loop: Frequency multiplication and division, frequency translation.

D/A and A/D converters: Basic digital to analog conversion techniques, Analog to digital converters.

Course Learning Outcomes (CLO):

Students will have understanding of:

1. operational amplifiers and its applications.
2. knowledge of comparator and wave form generator.
3. construction, working and applications of 555 timer & 565 phase locked loop integrated circuits. Moreover, they will also acquire the knowledge of digital to analog and analog to digital techniques.

Recommended Books:

1. Millman, J. and Halkias, C.C., *Integrated Electronics, Tata McGraw Hills*
2. Gaikwad, Ramakant, *Opamps and Linear Integrated Circuits, Prentice-Hall of India.*
3. Choudhury, D. Roy and Jain, S, *Linear Integrated Circuits, New Age Publishers, India.*