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Course Code	2EI405
Course Title	Linear Integrated Circuits

Course Learning Outcome:
At the end of the course, students will be able to -
1. utilize different signal conditioning ICs for various applications.
2. analyze the signal conditioning IC based circuits
3. design various signal conditioning circuits.

Syllabus	Teaching Hours

UNIT 1: Opamp applications and special purpose Opamps   15
Summing, scaling and averaging amplifier, Voltage follower, Integrator, Differentiator, Differential amplifier, Logarithmic Amplifier, Exponential amplifier, Instrumentation amplifier, Voltage to current converter, Current to voltage converter, Comparator, Zero crossing detector, Schmitt trigger, Precision rectifier, Half and full wave rectifier, Active filters, Oscillators , Instrumentation amplifiers .

UNIT 2: Timers :   5
Astable and monostable operation, applications of 555 timers : Missing Pulse detector, PWM generation, Ramp Generation.

UNIT 3: Power Supply Design: 4
Introduction, Performance parameters, Filtering, Function of a bleeder resistor in filter circuit, Voltage multipliers, Regulated power supply, SMPS, Comparison of linear power supply and SMPS, Switch mode converters.

UNIT 4 : Isolation Amplifier :   5

Isolation amplifiers, basic need of isolation, commercially available monolithic isolation amplifier AD284J, applications of the isolation amplifier.

UNIT 5: Motor Driver ICs: 4

Basic H-Bridge motor driver, motor driver ICs, motor current sense techniques, driver ICs for brushless motors and servo motors.

UNIT 6: Converters : A/D Converters : Delta Sigma Converters, Frequency to voltage and voltage to frequency converters, Applications of converters.   5

UNIT 7: Miscellaneous ICs: 7

Instrumentation Amplifiers, Temperature sensor ICs, thermocouple signal conditioning ICs, pressure sensors and MEMS based ICs , Display Drivers.

Self Study:
The self study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self study contents.

References:
1.   Michel Jacob, Application and Design with Analog Integrated Circuits, PHI Publication.
2.   Botkar K R, Integrated Circuits, Khanna Publication.
3.   Walter G. Jung, Op-Amp Applications Handbook, Elsevier Publication.
4.   John Webster, The Measurement, Instrumentation and Sensors Handbook, CRC Press.
5.   Datasheets of the related Integrated Circuits.
6.   Robert Boylestead, Electronic Devices and Circuit Theory , PHI Publication.