GUJARAT TECHNOLOGICAL UNIVERSITY

M.E – Instrumentation and Control Engineering

(Applied Instrumentation)

Semester: II

Subject Name: **ADVANCE INSTRUMENTATION**

Sr. No.	Course content
1.	**Circuits with Resistive Feedback** I/V and V/I converters, Current amplifiers, Difference Amplifiers, Instrumentation Amplifiers, Instrumentation Applications, Transducer Bridge Amplifiers
2.	**Active Filters** The transfer function, First order active filters, Audio filter applications, Standard second order response, KRC filters, Multiple feedback filters, State variable and Biquad filters, Sensitivity, Filter approximations, Cascade design, Generalized Impedence converters, Direct design, The switched capacitor, Switched capacitor filter, Universal SC filters
3.	**Static OpAmp Limitations:** Simplified Op Amp circuit design, Input Bias and offset current, Low input Bias-current Op Amp, Input offset voltage, Low input Bias-voltage Op Amps, Input offset error compensation, Maximum ratings
4.	**Dynamic Op Amp Limitations:** Open lop response, closed loop response, Input and output Impedances, Transient Response, Effect of finite GBP on Integrator circuits, Effect of finite GBP on filters, current-feedback amplifiers
5.	**Noise:** Noise properties, Noise dynamics, Source of Noise, Op Amp Noise, Noise in photodiode amplifiers, Low-noise Op Amps
6.	**Stability:** The stability problem, Stability in constant GBP OP Amp circuits, Internal Frequency compensation, External Frequency compensation, Stability in CFA circuits, Composite amplifiers

Reference Books:

1. Franco S., Operational Amplifiers and Analog Integrated Circuits, McGraw Hill International Edition, 1988
2. Analog Circuit Design, John Marcus, PH