Spring 2011

ESE 304
Electronic Instrumentation and Operational Amplifiers

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INTRODUCTION

Design of electronic instrumentation: structure of basic sensors and measurement systems, transducers, analysis and characteristics of operational amplifiers, analog signal conditioning with operational amplifiers, sampling, multiplexing, A/D and D/A conversion; digital signal conditioning, data input and displays, and automated measurement systems. Application of measurement systems to pollution of industrial monitoring is considered.

COURSE CONTENT and SYLLABUS:

1 Technology of Electrical Measurements
1.1 Electrical Sensors
1.2 Errors
2 Operational Amplifier Fundamentals
2.1 Circuits with Resistive Feedback
2.2 Static Op Amp Limitations
2.3 Dynamic Op Amp Limitations
2.4 Noise
2.5 Stability
3 Application of Operational Amplifier
3.1 Active Filters
3.2 Nonlinear Circuits
3.3 Signal Generators
3.4 Voltage References and Regulators
3.5 D-A and A-D Converters
3.6 Nonlinear Amplifiers and Phase-Locked Loops

During the semester students will have 10 single problem's home works, 3 Midterms and a Final examination.
Prerequisite: ESE 372

Textbook:
S. Franco, Design with Operational Amplifiers and Analog IC, McGraw-Hill, Third Edition, 2002

Class Time:	Tu. and Th. 12:50 PM to 2:10PM
Location:	PHYSICS, room P113
Office Hours:	Mo. 1:00 PM - 3:00 PM and We. 1:00 PM - 3:00 PM Room 133 (Suffolk Hall)