ELECTRONIC MODULES FOR INDUSTRIAL APPLICATIONS USING OP-AMPS

ELECTRICAL ENGINEERING

PROF. HARDIK J PANDYA
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TYPE OF COURSE : New | Elective | UG/PG
INTENDED AUDIENCE : Engineering Students, Faculty from Engineering Colleges
PRE-REQUISITES : Basic Electronics

COURSE DURATION : 8 weeks (25 Feb'19- 19 Apr'19)
EXAM DATE : 28 April 2019

COURSE OUTLINE :

This course is a system design-oriented course aimed to provide exposure on industrial applications of op-amp and its importance in the real world. In this course, different applications/case-studies (including biomedical and industrial application) are considered and will be discussing in detail about the fundamentals of the system, its operation and its importance. Since analog circuits play a crucial role in the implementation of an electronic system, this course emphasis on complete system design with initial discussion on circuit design. As part of this course student can build analog systems using analog ICs and study their macro models.

ABOUT INSTRUCTOR :

Dr. Hardik J. Pandya is an Assistant Professor in the Department of Electronic Systems Engineering, Division of Electrical Sciences, IISc Bangalore where he is developing Advanced Microsystems and Biomedical Devices Facility for Clinical Research and Biomedical and Electronic (10-6-10-9) Engineering Systems Laboratory to carry out cutting-edge research on novel devices to solve unmet problems in biology and medicine. He is recipient of prestigious Early Career Research Award from Science and Engineering Research Board, Government of India as well as a start-up grant of 228 Lacs from IISc. He has taught Design for Analog Circuits, Analog Integrated Circuits, VLSI technology, and Semiconductor Devices to undergraduate and graduate students from Electronic Engineering, Instrumentation Engineering, and Applied Physics.

COURSE PLAN :

Week 01 : Understanding the Datasheet of Op-Amps
Week 02 : To design and build a speed control of a DC motor using op-amp
Week 03 : To design and build an op-amp based ECG signal acquisition and BPM measurement
Week 04 : Fundamentals of EEG and design a signal conditioning circuit to acquire EEG signal
Week 05 : Fundamentals of pulse oximeter and implementation of pulse oximeter using op-amp
Week 06 : Design and develop a signal conditioning circuit for operating heater voltage of a MQ 7 gas sensor
Week 07 : Electronic module for printing press machines
Week 08 : Electronic module for heating PT 100 and operating as a hot-wire anemometer to find the velocity of the air, Electronic module for delineating signal from background noise