GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Embedded Systems (Branch Code - 54)

Year – I (Semester – I) (W.E.F. July 2013)

Subject: Electronic System Design (715403)

Sr. No.	Course Content	Hours
1	**Passive components:** Understanding and interpreting data sheets and specifications of various passive and active components, non-ideal behavior of passive components.	4
2	**Op amps:** DC performance of op amps: Bias, offset and drift, AC Performance of operational amplifiers: band width, slew rate and noise, Properties of a high quality instrumentation amplifier, Design issues affecting dc accuracy & error budget analysis in instrumentation amplifier applications, Isolation amplifier basics and Active filers: design of low pass, high pass and band pass filters.	7
3	**ADCs and DACs:** Characteristics and performance parameters of ADC & DAC, interfacing to microcontrollers, selecting proper ADC and DAC.	6
4	**Power supplies:** Characteristics, design of full wave bridge regulated power supply. Circuit layout and grounding in mixed signal system.	5
5	**Practical Logic Circuit Design Issues and Techniques:** Understanding and interpreting data sheets, specifications of various CMOS & BiCMOS family Logic devices, Electrical behaviour (steady state & dynamic) of CMOS& BiCMOS family logic devices, Benefits and issues on migration of 5-volt and 3.3 volt logic to lower voltage supplies. CMOS/TTL Interfacing Basic design considerations for live insertion. JTAG/IEEE 1149.1 design considerations, Design for testability, estimating digital system reliability, Digital circuit layout and grounding, PCB design guidelines for reduced EMI.	7
6	**Electromagnetic Compatibility:** Designing for EMC, EMC regulations, typical noise path, methods of noise coupling and methods of reducing interference in electronic systems.	5
7	**Grounding of Electronic Systems:** Safety grounds, signal grounds, single-point ground systems, multipoint-point ground systems, hybrid grounds, functional ground layout, practical low frequency grounding, hardware grounds, grounding of cable shields ground loops, shield grounding at high frequencies Power line filtering, power supply decoupling, decoupling filters, high frequency filtering and system bandwidth.	6
8	**Protection Against Electrostatic Discharges (ESD):** Static generation, human body model, static discharge, ESD protection in equipment design, software and ESD protection, ESD versus EMC.	6
9	**Packaging & Enclosures of Electronic System:** Effect of environmental factors on electronic system, nature of environment and safety measure, Packaging's influence and its factors.	6

Text Books:

1. Electronic Instrument Design, First edition; Author: Kim R.Fowler; Publisher: Oxford University Press.
2. Noise Reduction Techniques in Electronic Systems, Second edition, Author: Henry Wott, Publisher: John Wiley & Sons.
3. Digital Design Principles& Practices, Third edition, Author: John F. Wakerly; Publisher: Prentice Hall International, Inc.
4. Operational Amplifiers and linear integrated circuits, Third edition, Author: Robert F. Coughlin; Publisher: Prentice Hall International, Inc
5. Intuitive Analog circuit design, Second Edition, Author: Marc T Thompson; Published by Elsevier

Reference Books:

1. The Art of Electronics, Second Edition, Author: Paul Horowitz, Winfield Hill, Cambridge University Press