Course Title : Electronics Lab-III

Course Number : ELC3190
Credits : 02
Course Category : DC
Pre-requisite(s) : ELC2120
Contact Hours (L-T-P) : 0-1-2
Type of Course : Laboratory
Course Assessment : Course Work (60%)
: End Semester Exam (40%)

Course Objectives

To assist the students in achieving a better understanding of the operation of microelectronic circuits, and to provide a first experience in analysis, design, and test of the circuits using the OrCAD Tool

Course Outcomes (COs)

After completing this course, the students will be able to:

1. Write SPICE programs for circuit simulation and analysis using OrCAD tool
2. Compare and analyse theoretical and simulated results
3. Verify the develop circuit designs met the given specifications and their feasibility on ICs
4. Draw conclusions from analysis and include in the technical lab report

Lab Exercises

Passive and Active Filters
• Simulate passive filter circuit response
• Analyse and simulate the frequency response of KHN biquad filter

Diodes and Application
• Simulate and interpret diode I-V curve
• Analyse diode-based clipper, clamper and precision rectifier

MOS Transistors and MOS Applications
• Simulate dc transfer characteristics of MOS differential amplifier and carry out .TF analysis
• Simulate CMOS logic circuits verify the logic function, and measure the propagation delay

BJT and BJT Amplifiers
• Investigate BJT I-V characteristics and determine its key parameters
• Analyse class B push-pull amplifier circuit. Also determine its %THD at the output

Opamp and Oscillator
• Analyze and simulate opamp based oscillator circuit for a given frequency
• Analyse the given circuit and simulate the noise performance at the output
Mini Projects

At the end of this project, the students will be able to do the following:

• Circuit design using active devices
• Making and justifying design choices based on requirements
• Simulate design using the OrCAD Spice. Record results and verify design specifications are met

Note Specific lab exercise under each topic may vary from those state above.

Books


Web Resources

https://www.orcad.com/resources/library/orcad-pspice-designer-ad
https://www.youtube.com/watch?v=qhkVgKYoo04
http://bwrcs.eecs.berkeley.edu/Classes/IcBook/SPICE/

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Total = 12
Electronic engineering (also called electronics and communications engineering) is an electrical engineering discipline which utilizes nonlinear and active electrical components (such as semiconductor devices, especially transistors and diodes) to design electronic circuits, devices, integrated circuits and their systems. The discipline typically also designs passive electrical components, usually based on printed circuit boards. Studying our electronic & electrical engineering courses. As an electrical and electronic graduate, you could be developing the next smartphone, finding better ways to detect cancer, developing renewable micro-grids, or leading the robotics revolution. Taylor, Amy and James share their experiences of electronic and electrical engineering undergraduate study at Bath. Browse our courses. Find out about the latest funded and self-funded PhD project and studentship opportunities in our Department and Doctoral Training Centres. Join our EPSRC Centre for Doctoral Training in Advanced Automotive Propulsion Systems (AAPS). Our CDT goes beyond the traditional engineering disciplines to bring together students from backgrounds in sciences, mathematics and social sciences. Department of Electronic Engineering, Mehran University of Engineering & Technology, Jamshoro Jamshoro 76060. 0222771334. www.muet.edu.pk/departments/electronics-engineering. Dear students. Please find the reports on two Webinars recently organised by the department of Electronics, on the following links. https://www.muet.edu.pk/pdf/webinar-latex-document-preparation.pdf https://www.muet.edu.pk/pdf/webinar-academic-writing-technique.pdf See More. Official website of Mehran University of Engineering and Technology, Jamshoro, Pakistan and Constituent College of Engineering and Technology Khairpur Mirs. Electrical, Electronic & Mechatronic Engineering with an Integrated Foundation Year BEng/MEng Electrical and Electronic Engineering BEng Electrical and Electronic Engineering MEng Electrical and Electronic Engineering with Industrial Experience BEng Electrical and Electronic Engineering with Industrial Experience MEng Electronic Engineering with Industrial Experience BEng Electronic Engineering with Industrial Experience MEng Mechatronic Engineering BEng Mechatronic Engineering MEng Mechatronic Engineering. Explore the Department's distinguished history, which includes a long list of firsts. A new home for engineering.