ECE112: Analog Electronics Lab

Programme: B.Tech. (ECE) Year: 1st Semester : II
Course : Core for ECE, MME and CCE Credits : 2 Hours : 30

Course Context and Overview (100 words):
The objective of the course is that student would appreciate the significance of different electronics devices in real world applications and verify them in the laboratory using different circuits. He would know about diodes and applications of diodes in rectifiers, power supplies and various signal shaping circuits. Design amplifiers and switches using BJTs. Would be able to design AC and DC biasing for different BJTs. Student would get to know about different Analog to digital and Digital to Analog converters.

Prerequisites Courses: NIL

Course outcomes (COs):

On completion of this course, the students will have the ability to:
CO1: Know the basics of Diode and diode based circuits.
CO2: Describe both AC and DC biasing of BJTs.
CO3 design flash ADC and DACs.
CO4: Analyze and design various oscillators.
CO5: Design NE555 based circuits for real world applications.

Course Topics:

Topics	Lab Sessions	Hours
UNIT - I **1. Topic** Diode	3	9
1.1 To analyze and design of a clipping and clamping circuit	1	
1.2 To analyze and design of a dc power supply.	1	
1.3 To analyze and study about amplification of difference and common mode signals by difference amplifier.	1	
UNIT - II **2. Topic** Oscillators	2	6
2.1 To analyze and design of a dc power supply.	1	

2.2 To analyze and study about amplification of difference and common mode signals by difference amplifier.	1	
Unit III **3. Topic:** BJT Biasing	3	9
3.1 To analyze and learn how to make a current source.	1	
3.2 To know how to biasing of BJT and measurement of DC current gain (β).	1	
3.3 To analyze and design a common emitter amplifier	1	
UNIT - IV **4. Topic** ADC and DAC	2	6
4.1 To design R-2R Ladder DAC	1	
4.2 To design counting ADC with R 2R DAC	1	

Textbook references (IEEE format):
Text Book:

1. Sedra and Smith, "*Microelectronic Circuits",* Oxford University Press.
2. Millman and Halkias, "*Electronic Devices and Circuits"*, Tata McGraw Hill.

Reference books:
Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.):

1. *http://www.nptel.ac.in/courses/Webcourse-contents/IIT-ROORKEE/BASIC-ELECTRONICS/home_page.htm*
2. *http://nptel.ac.in/video.php?subjectId=117103063*

Evaluation Methods:

Item	Weightage
Lab Evaluations	30
Viva	20
Final Examination	50