ECE106: Basic Electronics Lab

Programme: B.Tech. (ECE)	Year: I	Semester : Odd
Course : Core for CCE, CSE, ECE and MME	Credits : 2	Hours : 30

Course Context and Overview (100 words):
The objective of the course is that student would appreciate the significance of signal processing in different applications. Understand and apply different Network analysis theorems to analyze and design the circuits. They would be able to apply the theoretical knowledge in practical lab experiments and verify the hypotheses. They would be able to analyze time and frequency domain characteristics of system, compile the different building blocks in digital electronics using logic gates and implement simple logic function using basic universal gates.

Prerequisites Courses: NIL

Course outcomes (COs):

On completion of this course, the students will have the ability to:
CO1: Analyse basics of Circuits analysis and Design them on breadboard
CO2: Analyze time and frequency domain characteristics of networks
CO3: Analyse and design Op-Amp based circuits
CO4: To analyze and design basic arithmetic operation like addition and subtraction.
CO5. To analyze and design a Sequential Circuits

Course Topics:

Topics	Lab Sessions	Hours
UNIT – I **1. Topic** Network	3	
1.1 To analyze and design a resistive network	1	9
1.2 To analyze and study the time response of RC and RL circuits	1	
1.3 To analyze and study the frequency response of RC and RL circuit	1	
UNIT – II **2. Topic** Operational Amplifiers	3	
2.1 Designing and analyzing an inverting and non- inverting mode amplifier using Op-Amp.	1	9
2.2 To analyze and design an adder and scalar circuit using IC 741	1	
2.3 To analyze and design a band pass circuit.	1	
UNIT – III	3	9

3.	**Topic** Digital Circuits		
3.1	To study and analyze the basic logic gate and universal gate	1	
3.2	To analyze and design digital circuits used for performing basic arithmetic operation as addition and subtraction	1	
3.3	To analyze and design a Sequential Circuits (Flip Flops and latches).	1	

Textbook references (IEEE format):

1.   Sedra and Smith, "*Microelectronic Circuits*", Oxford University Press.
2.   A. Ramkalyan, "*Linear Circuits Analysis and Synthesis*", Oxford University Press, 2005.
3.   D. R. Cunningham and J. A. Stuller, "*Basic Circuit Analysis*", published by Jaico Publishing House, Mumbai, 1996.

Reference books:

1.   Herbert Taub and Donald Schilling, "*Digital Integrated Electronics*", McGraw Hill, New York, 1977.

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	20
Lab Records	20
Viva	30
Final Examination	30