

ANALOG AND DIGITAL ELECTRONICS LABORATORY

IV Semester: EEE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AEEEC17	Core	L	T	P	C	CIA	SEE	Total
		0	0	2	1	30	70	100
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 36		Total Classes:36		
Prerequisite: There are no prerequisites to take this course.								
I. COURSE OVERVIEW:								
<p>The course has been designed to introduce fundamental principles of analog and digital electronics. The students completing this course will understand basic analog and digital electronics, including semiconductor properties, operational amplifiers, combinational and sequential logic and analog-to digital digital-to-analog conversion techniques. Finally, students will gain experience in with the design of analog amplifiers, power supplies and logic device</p>								
II. COURSE OBJECTIVES:								
The students will try to learn:								
<ol style="list-style-type: none"> I. Implement and study the characteristics of diodes and transistors. II. Illustrate the concept of rectification using half wave and full wave rectifiers. III. Design and construct different amplifier circuits. IV. Build the concept of digital and binary system. V. Design and analyze the combinational logic circuits. 								
III. COURSE SYLLABUS:								
Week – 1: PN JUNCTION DIODE CHARACTERISTICS								
Verification of V-I characteristics of PN diode and calculate static and dynamic resistance using Hardware.								
Week – 2: ZENER DIODE CHARACTERISTICS AND VOLTAGE REGULATOR								
Verification of V-I characteristics of Zener diode and perform Zener diode as a Voltage regulator using Hardware								
Week – 3: HALF WAVE AND FULL WAVE RECTIFIER								
Verification of Half wave rectifier and Full wave rectifier without and with filters using hardware								
Week – 4: TRANSISTOR CE CHARACTERISTICS								
Verification of Input and Output characteristics of CE configuration using hardware								
Week – 5: TRANSISTOR CB CHARACTERISTICS								
Verification of Input and Output characteristics of CB configuration using hardware								
Week – 6: FREQUENCY RESPONSE OF CE AMPLIFIER								
Determine the Gain and Bandwidth of CE amplifier using hardware								
Week – 7: BOOLEAN EXPRESSIONS USING GATES								
Realization of Boolean Expressions using Gates								
Week – 8: UNIVERSAL GATES								
Design and realization of logic gates using universal gates								
Week – 9: NAND / NOR GATES								
Generation of clock using NAND / NOR gates								

Week – 10: ADDER/ SUBTRACTOR

Design a 4 – bit Adder / Subtractor

Week – 11: BINARY TO GRAY CONVERTER

Design and realization of a 4 – bit Gray to Binary and Binary to Gray Converter.

Week – 12: TRUTH TABLES AND EXCITATION TABLES

Verification of truth tables and excitation tables.

Week – 13: SHIFT REGISTER

Design and realization of an 8 bit parallel load and serial out shift register using flip-flops

Week – 14: MULTIPLEXER

Design and realization of 8x1 using 2x1 MUX

IV. REFERENCE BOOKS:

1. Jacob Millman, Herbert Taub, Mothiki S PrakashRao, “Pulse Digital and Switching Waveforms”, Tata McGraw-Hill, 3rd Edition, 2008.
2. David A. Bell, “Solid State Pulse Circuits”, PHI, 4th Edition, 2002.
3. D Roy Chowdhury, “Linear Integrated Circuits”, New Age International (p) Ltd, 2nd Edition, 2003.
4. Ramakanth A. Gayakwad, “Op-Amps & linear ICs”, PHI, 3rd Edition, 2003.

V. WEB REFERENCES:

1. <http://www.tedpavlic.com/teaching/osu/ece327/>
2. <http://www.ee.iitkgp.ac.in>
3. <http://www.citchennai.edu.in>
4. <http://american.cs.ucdavis.edu/academic/ecs154a.sum14/postscript/cosc205.pdf>
5. <http://www.ece.rutgers.edu/~marsic/Teaching/DLD/slides/lec-1.pdf>