
 <p>NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY</p>	<p>NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY</p> <p>NAAC Accredited with “A” grade(An ISO 9001 – 2008 Certified Institution)</p> <p>Affiliated to Visvesvaraya Technological University (VTU)</p> <p>Recognized by Govt. of Karnataka & Approved by A.I.C.T.E. New Delhi</p> <p>DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING</p>	 <p>DEPARTMENT OF E.C.E. NCET</p>
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Course Handout

General Handout for all courses appended to the time table

Course No. : 23BEE13	Dept.: Electronics and Communication Engineering
Course Title : Basic Electronics	Semester: I
Instructor-in-charge : Mr. Nanda Kishore C V nanda_div@ncetmail.com	Academic Year: 2022-23
	Date: 26-06-2022

Subject Description:

This course covers electronics components that make up a part of everyday electronics equipment. These electronic components for various designs of analog and digital electronic circuits and their applications. Discussion on transducers and their real time applications in embedded systems and also basic fundamental information of communication system and importance of modulation in the field of communication..

TEXT BOOKS:

Text Books:

1. Electronic Devices and Circuits, David A Bell, 5th Edition, Oxford, 2016
2. Op-amps and Linear Integrated Circuits, Ramakanth A Gayakwad, Pearson Education, 4th Edition
3. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-8
4. Electronic Instrumentation and Measurements (3rd Edition) – David A. Bell, Oxford University Press, 2013
5. Electronic Communication Systems, George Kennedy, 4th Edition, TMH
6. Basic Electronics, M V Rao, Edition:2013.

Activity-Based Learning (Suggested Activities in Class)/ Practical Based learning developing electronic applications using Raspberry Pi – Text 1: Chapter 18

e-RESOURCES:**E-Resources:**

1. <https://nptel.ac.in/courses/122106025>
2. <https://nptel.ac.in/courses/108105132>
3. <https://nptel.ac.in/courses/117104072>

PREREQUISITES:

1. Physics concepts	Self-study	Remarks Students have completed this Courses
2. Fundamentals of Mathematics		
3. Electronics		

LECTURE PLAN:

Topic	Topic Details	Number of Lectures	Unit/ Chapter Reference
Module I Semiconductor Diodes and its applications	Introduction, PN Junction diode,	1	T1 2.1
	Characteristics, Rectification, Half Wave Rectifier,	2	T1 2.2,3.1
	Full Wave Rectifier, clipping,	3	T1 3.2,3.8
	Clamping, Power Supply: Capacitor Filter Circuit. (Includes numerical)	4	T1 3.10,3.3
	Zener Diodes: Junction Breakdown, Circuit Symbol and Package, Characteristics and Parameters,	5	T1 2.9
	Equivalent Circuit, Zener Diode Voltage Regulator.	6	T1 3.7
Module II Bipolar Junction Transistors	Introduction, working of transistor,	7	T1 4.1,
	BJT Voltages & Currents, BJT Amplification,	8	T1 4.2 4.3
	Common Base Characteristics, Common Emitter Characteristics	9	T1 4.5, 4.6
	BJT Biasing: Introduction, DC load line,	10	T1 5.1
	bias point, Field Effect Transistor: Introduction, Junction Field Effect Transistor,	11	T1 5.1, 9.1
	JFET Characteristics	12	T1 9.2
CCE 1		13	
Module III	Introduction, The Operational Amplifier, Block Diagram	14	T2 1.1,1.2,1.3

Operational Amplifiers and its applications	Representation of Typical Op-Amp,		
	Schematic Symbol, Op-Amp parameters - Gain, input resistance, Output resistance, CMRR, Slew rate,	15	T2 1.4, 2.2
	Bandwidth, input offset voltage, Input bias Current and Input offset Current,	16	T2 2.2
	The Ideal Op-Amp, Equivalent Circuit of Op-Amp, Differential Amplifier,	17	T2 2.3, 2.4
	Inverting & Non Inverting Amplifier. Voltage Follower, Summing amplifier,	18	T2 2.6 T6 6.9
	Subtractor, Integrator circuit, Differentiator circuit.	19	T2 6.9
Module IV Boolean Algebra and Logic Circuits, Combinational logic, Sequential logic	Binary numbers, Number Base Conversion,	20	T3 1.2, 1.3
	octal & Hexa Decimal	21	T3 1.4, 1.5
	Numbers, Complements, subtraction using 1's and 2's complements, Basic definitions, Axiomatic Definition of Boolean Algebra,	22	T3 1.5, 2.1, 2.2
	Basic Theorems and Properties of Boolean Algebra, Boolean Functions, digital logic gates.	23	T3 2.3, 2.4, 2.7
	Combinational logic: Introduction, Design procedure, Adders- Half adder, Full adder	24	T3 4.1, 4.2, 4.3
	Sequential logic: Introduction to flip flops, RS flip flop.	25	T3 6.1, 6.2, 6.3
	CCE 2		26
Module V Introduction to Transducers, Communications	Introduction, Resistive Transducers,	27	T4 18.1
	Inductive Transducers, Capacitive Transducers,	28	T4 18.2, 18.3
	Piezoelectric transducers	29	T4 18.4
	Communications: Introduction to communication, Communication System,	30	T5 1.1
	Modulation, Need for modulation,	31	T5 1.2
	types of modulation.	32	T5 1.3

Course Outcomes

At the end of the course the student will be able to:

CO1: Develop the basic knowledge on operation and characteristics of semiconductor diode and its application.

CO2: Apply the acquired knowledge to construct various configurations of bipolar junction transistor.

CO3: Develop the knowledge on linear Op-AMP circuits and its applications.

CO4: Develop competence knowledge to construct basic digital circuit and logic circuits with its types.

CO5: Apply the knowledge of various transducers principle in sensor system and basics of communication system.

CO- PO Mapping:

POS		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C103.1		3	3	2	2	2	2		1	2	2	1	1	3	2	1
C103.2		3	2	3		2	1		1	1	1	1		3	2	1
C103.3		3	2	3	2	3				1	2	1		3	2	1
C103.4		2	1	1	2	2	1		1	1	2	1	1	3	1	1
C103.5		2	1	1		2	1		1	1		1	1	3	1	1

Evaluation Details

Component		Weightage				
IAT's	IAT 1 7 th week	25	15	25 Marks		
	IAT 2 13 th week	25				
CCE's	CCE 1 (Open book Test) 8 th week	10	10			
	CCE 2 (Quiz) 14 th week	10				
	Lab Test	50	10			25 Marks
	Lab Record	15	15			
Internal Assessment Test (IAT) Total Marks: 100. Reduced to 50 Marks						
The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50)						
Semester End Examination (SEE) Total Marks: 100. Reduced to 50 Marks						
The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50)						

Notices: All notices will be displayed on NCET and in Department website.

Chamber Consultation Hour: Wednesday 2:00 pm to 4:00 pm

Makeup Policy: To be granted only in case of serious illness or emergency.

Email Policy: Communication through email. If you want to discuss anything, you are most welcome to meet me during chamber consultation hours or immediately after the class. Academic queries/doubts can be posted in Moodle.

Signature of the course teachers

HOD

1. Mr. Nanda Kishore C V (Course coordinator)
2. Ms. Sunitha M