	NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY NAAC Accredited with "A" grade (An ISO 9001 – 2008 Certified Institution) Affiliated to Visvesvaraya Technological University (VTU) Recognized by Govt. of Karnataka & Approved by A.I.C.T.E. New Delhi	

COURSE HANDOUT

General Handout for all courses appended to the time table

Course No.: 23ESC143	**Dept.: Electronics and Communication Engineering**
Course Title: Introduction to Electronics Engineering	**Semester:1st**
Instructor-in-charge : Dr.Mahesh Shastri, Mrs. Rashmi G P	**Academic Year: 2023-24**
Lab. Instructor: No Lab	**Date:**

SUBJECTDESCRIPTION:

This Course covers the fundamental principles and techniques of To prepare students with fundamental knowledge/overview in the field of Electronicsand Communication Engineering and understand the concepts of designing combinational circuits. Study the basic knowledge of different types of rectification, and amplification.Study the Op-Amp inverting and non-inverting amplifiers and their applications.
Understand the concept of microprocessors, microcontrollers, Embedded systems, and sensors.
Understand the elements of analog and digital communication systems.

Text Books:

1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications',4th Edition, Elsevier, 2015.DOIhttps://doi.org/10.4324/9781315737980. eBookISBN9781315737980.
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-84
3. Basic Electronics Solid state, B L Theraja, S Chand & Company Ltd. 2008 ISBN: 81-219-2555-X.
4. D P Kothari, I J Nagrath, 'Basic Electronics', 2nd edition, McGraw Hill Education (India),PrivateLimited,2018.
5. K V Shibu, "Introduction to Embedded Systems", 2nd Edition, McGraw Hill Education (India) Pvt. Ltd, 2016.
6. S L Kakani and Priyanka P, "Communication Systems" New age International Publisher 2017.

PREREQUISITES:

1. 2.	Self-study	Remarks Students have completed this Courses

LECTURE PLAN:

Topic	Topic Details	Number of Lectures	Unit/ Chapter Reference
Module I **Digital Circuits**	Introduction to Binary numbers, Number Base Conversion, Basic, Digital Logic Gates	1	T21.11.2
	octal &Hexa Decimal Numbers	2	T2 1.3
	Complements, Basic definitions	3	T2. 1.4
	Axiomatic Definition of Boolean Algebra	4	T2 1.5
	Theorems and Properties of Boolean Algebra	5	T2 2.1,2.2
	Boolean Functions, Other Logic Operations	6	T2 2.3,2.4
	Introduction, Design procedure, Combinational logic- Adders- Half adder	7	T2 2 5,2.6,2.8
	Full adder, multiplexer, De-multiplexer.	8	T3 22.1,22.2,22.3,22.4
Module II **Rectifiers and Amplifiers**	Introduction, Half-wave rectifiers and Voltage multipliers.	9	T1 6.1,6.2,6.3
	Full-wave rectifiers, bridge wave rectifiers and filters,	10	T1 6.4,6.5
	Voltage Regulators	11	T1 6.6,6.7
	Output resistance and voltage regulation,	12	T1 6.8,6.9
	Types of amplifiers, gain, frequency response	13	T1 7.1,7.2
	Input and output resistance	14	T1 7.7 to 7.12
	Bandwidth, phase shift,	15	7.13,7.14
	multistage amplifier	16	7.15
AAT 1		17	
Module III **Op-Amp and Oscillators**	Ideal op-amp; characteristics of ideal and practical op-amp;	18	T 1:8,9.

	Practical op-amp circuits:	19	T 3:18.1
	Inverting and non-inverting amplifiers	20	T 18.4
	voltage follower, summer,	21	T 19.1
	integrator, differentiator.	22	T 19.2
	Barkhausen criterion, sinusoidal and non-sinusoidal oscillator	23	T 19.3
	Wein bridge oscillator	24	T 19.4
	Multivibrators	25	T 19.5
Module IV Embedded Systems	Definition, Embedded systems vs general computing system	26	T 5: 1.1, 1.2
	Classification of Embedded Systems, Major application areas of Embedded Systems	27	T 1.4, 1.5
	Elements of an Embedded System	28	T 2.1, 2.1
	Core of the Embedded System, Microprocessorvs Microcontroller	29	T 2.1.1.4, 2.1.1.6
	RISC vs CISC Sensors and Interfacing –	30	T 2.1.1.7
	Instrumentation and control systems	31	T 2.3.2
	Transducers, Sensors, LED	32	T 2.3.3.1
	7-Segment LED Display	33	T 2.3.3.8
AAT2		34	
Module V Introduction to Analog/Digital Communication	Modern communication system block diagram,	35	T 6: 1.2
	Information source, and input transducer	36	1.2.1, 1.3
	Transmitter, Channel or Medium– wired and wireless,Noise.	37	1.4, 1.4.1, 1.5, 1.5.2
	Receiver, Multiplexing. Types of communication systems,	38	1.6, 1.14, 1.15
	Types of modulation (only concepts) – AM , FM, PM.	39	T 6: 6A 1.1
	Digital Modulation	40	1.7
	Advantages of digital communication over analog communication,	41	1.9
	ASK, FSK, PSK.	42	2.2, 6.1, 6.2

COURSE OUTCOMES:

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

CO1	Analyze and Design Combinational logic circuits and number systems.
CO2	Understand the concept of Amplifiers and rectifiers.
CO3	Analyze and design the Op-Amp inverting and non-inverting amplifiers and their applications.
CO4	Illustrate the basic concept of microprocessors, microcontrollers, Embedded systems, and sensors.
CO5	Describe analog and digital communication systems.

CO-PO MAPPING:

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

EVALUATION SCHEME:

Component		**Weightage (%)**		
IAT's	IAT 1 7th week	25	50	(Scaled down to 25 marks) 25 marks
	IAT 2 13th week	25		
CCE's	CCE 1 (Open book Test) 8th week	25	50	(Scaled down to 25 marks) 25 marks
	CCE 2 (Quiz) 14th week	25		
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)				

HoDCourse-in-charge

Dr. Nagesh K. N