NAGARJUNACOLLEGEOFENGINEERINGANDTECHNOLOGY
NAAC Accredited with "A+" grade(AnISO9001 – 2008CertifiedInstitution)
Affiliated to Visvesvaraya Technological University (VTU)
Recognized by Govt.of Karnataka & Approved by A.I.C.T.E. New Delhi
DEPARTMENT OF ELECTRONICS COMMUNICATION ENGINEERING

COURSE PLAN

(Tobesubmittedbeforecommencementofsemester)

CourseTitle:Basic Signals Processing	**CourseCode**: 22ECI33
CourseCredit:4	**Semester:3rd**
CourseTeacher's: Dr. Vinay N A, Dr.Ravikumar M G	**AcademicYear:**2023-24
Lab.Instructor:NA	**DateofCommencement ofClass:**17/11/2023

SUBJECTDESCRIPTION:

This introductory course on signals processing provides a foundational understanding of the fundamental concepts, techniques, and applications of signals in various engineering and scientific domains. Signals processing is a crucial aspect of many fields, including telecommunications, audio processing, image processing, and biomedical engineering. The course aims to equip students with the essential knowledge and skills to analyze, manipulate, and interpret signals.By the end of the course, students will have gained a solid foundation in basic signals processing, enabling them to apply these principles in various engineering and scientific disciplines.

PREREQUISITES:

1. Basic Electronics
2. Laplace Transforms

LECTUREPLAN:

Topic	TopicDetails	Number ofLectures	Prediction	Unit/Chapter Reference	Percentageof Modulecoverage
Module-I Introduction and Classification of signals, Elementary signals/Functions and Basic Operations on signals	Definition of signal and systems	1	**Week 1**	T1 2.3	**20%**
	Communication and control system as examples	2		T1 4.1	
	Classification of signals	3		T1 4.2	
	Exponential, sinusoidal, step, impulse and ramp functions	4	**Week 2**	T1 4.3	
	Triangular, rectangular and other waveforms in terms of elementary signals	5		T1 4.4, 10.6	
	Amplitude scaling, addition, multiplication, differentiation	6	**Week 3**	R2 7.2	
	Integration, time scaling, time shift and time reversal	7		R2 7.4	
	Numerical	8		R2 7.5, 9.7	
	CumulativeCoverage				**20%**
Module-II System Classification and properties and Time domain representation of LTI System	Linear-nonlinear, Time variant-invariant	9	**Week 4**	R2 3.2	**20%**
	causal-noncausal, static-dynamic	10		R2 3.3	
	Stable-unstable, invertible	11		R2 3.4	
	Impulse response, convolution sum using graphical method-unit step and unit step, unit step and exponential	12	**Week 5**	R2 3.6	
	convolution sum using graphical method-exponential and	13		R2 3.5	

	exponential, unit step and rectangular				
	convolution sum using graphical method- rectangular and rectangular	14		R1 13.2	
	convolution integral using graphical method- exponential and exponential, unit step and rectangular	15	**Week 6**	T1 13.5	
	convolution integral using graphical method- rectangular and rectangular	16		T1 13.11	
	CumulativeCoverage				**40%**
AAT-1		**17**	**Week 7**		
Module-III **Time domain representation of LTI System andLTI system Properties in terms of impulse response**	Computation of convolutionsum using graphical method for unit step and unit step, and exponential	18	**Week 7**	T2 1.1	**20%**
	Computation of convolution sum using exponential and exponential	19		T2 2.1	
	Computation of convolution sum using unit step and rectangular	20	**Week 8**	T2 2.2	
	System interconnection, Memory less, Causal	21		T2 2.4	
	Computation of step response	22	**Week 9**	T2 2.5	
	CumulativeCoverage				**60%**
Module-IV **Discrete Fourier Transforms**	Frequency domain sampling and Reconstruction of Discrete Time	23	**Week 10**	T2 5.3	**20%**

(DFT) andPropertie s of the DFT	Signals				
	he Discrete Fourier Transform	24			
	DFT as a linear transformation	25			
	Numerical	26	**Week 11**	T2 5.4	
	Numerical	27			
	Periodicity, Linearity and Symmetry properties	28			
	Circular Convolution	29	**Week 12**	T2 5.5	
	Additional DFT properties	30			
	CumulativeCoverage				**80%**
AAT-1		31	**Week 13**		
Module-V **Linear filtering methods based on the DFT and Z-Transform**	DFT in Linear Filtering	32	**Week 14**	T2 8.2	**20%**
	Filtering of Long data Sequences	35		T2 8.3	
	Z-transform, properties of the region of convergence	36		T2 8.3	
	Properties of the Z-transform	37	**Week 15**	T1 8.4	
	Inverse Z-transform by partial fraction	38		T1 8.4	
	Causality and stability and Transform analysis of LTI systems	39		T1 8.4	
	CumulativeCoverage				**100%**

TEXTBOOKSANDREFERENCEBOOKS:

Book Type	**Code**	**Title& Author**	**PublicationInformation**		
			Edition	**Publisher**	**Year**
Text Books	**T1**	Simon Haykins and Barry Van Veen, "Signals and Systems"	2nd	Wiley India	2008
	T2	Proakis&Monalakis, "Digital signal processing	4th	Pearson education	2007
Referenc eBooks	**R1**	D.GaneshRao and Vineeth P Gejji, "Digital Signal Processing"	3rd	Cengage India Private Limited	2017
	R2	2. Alan V Oppenheim, Alan S, Willsky and A Hamid Nawab, "Signals and Systems"	2nd	Pearson education	2002

COURSEOUTCOMES:

Attheend ofthecoursethestudentwill beableto:

CO1	Analyze the different types of signals and systems
CO2	Represent continuous and discrete systems in time and frequency domain using different transforms Test whether the system is stable
CO3	Determine response of LTI systems using time domain and DFT techniques
CO4	Compute DFT of real and complex discrete time signals
CO5	Computation of DFT for linear filtering approach and Z –transform for the signals

CO-POMAPPING:

POS / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C203.1	3	3	2	2	3	--	--	--	--	--	--	--
C203.2	3	3	3	3	3	--	--	--	--	--	--	--
C203.3	3	2	3	3	3	--	--	--	--	--	--	--
C203.4	3	3	3	3	1	--	--	--	--	--	--	--
C203.5	3	3	3	3	3	--	--	--	--	--	--	--

EVALUATIONSCHEME:

Component		**Weightage(%)**		
CIE's	CIE15thweek	20	60	(Scaled down to 30 marks)30 marks
	CIE210thweek	20		
AAT's	AAT1(Quiz)	20	40	(Scaled down to 20 marks)20 marks
	AAT2(Surprisetest)	20		
ContinuousInternal Evaluation Total Marks:100.Reducedto50 Marks Theminimumpassingmarkfortheis40%of themaximummarks(20marksoutof 50)				
SemesterEndExamination(SEE)TotalMarks:100.Reduced to50Marks Theminimum passingmark fortheSEEis35% ofthemaximummarks(18marksoutof 50)				

Signature of the Course Co-Ordinator **Signature of the HOD**

Date:

Note:

1. TheCourseplanis anattempt toensure **continuousimprovement**in theTLP ofthecourse.
2. TheproposedCoursePlanissubmitted to**DAC**beforethecommencementof thesemester.
3. Attheend ofthesemester, thefacultyshall submitthe**actual implementedplan**.
4. CalendarofEventsincluded.