

Course code	Course Name	L-T-P - Credits	Year of Introduction
EE307	SIGNAL AND SYSTEMS	3-0-0-3	2016
Prerequisite: Nil			
Course Objectives			
<ul style="list-style-type: none"> To impart knowledge about the representation and properties of signal and systems and applications in engineering 			
Syllabus:			
Classification of signals - Basic operations on signals- properties of systems- Convolution- Laplace transform-applications-Fourier series and Fourier transforms- properties- Discrete time systems-sampling- ZT-properties-applications- DFS-DFT-properties-Basics of Nonlinear systems			
Expected Outcome:			
After the completion of the course student will be able to:			
<ol style="list-style-type: none"> Represent various signals and systems Analyse the continuous time system with Laplace transform Represent and analyse signals using Fourier representation Analyse the discrete time system using ZT Analyse the DT systems with DFS Acquire basic knowledge in nonlinear systems 			
Text books:			
<ol style="list-style-type: none"> Haykin S. & Veen B.V., Signals & Systems, John Wiley Oppenheim A.V., Willsky A.S. & Nawab S.H., Signals and Systems, Tata McGraw Hill Signals and Systems: I J Nagrath- Tata McGraw Hill 			
References:			
<ol style="list-style-type: none"> Bracewell R.N., Fourier Transform & Its Applications, McGraw Hill Farooq Husain, Signals and Systems, Umesh pub. Papoulis A., Fourier Integral & Its Applications, McGraw Hill Taylor F.H., Principles of Signals & Systems, McGraw Hill 			
Course Plan			
Module	Contents	Hours	Sem. Exam Marks
I	Introduction to signals and systems - Classification of signals - Basic operations on signals – Elementary signals – Concept of system - Properties of systems - Stability, inevitability- time invariance- Linearity -Causality – Memory- Convolution- Impulse response- Representation of LTI systems - Differential equation representations of LTI systems	7	15%
II	Laplace transform analysis of systems - Relation between the transfer function and differential equation –Causality and stability - Inverse system - Determining the time domain and frequency response from poles and zeros	7	15%
FIRST INTERNAL EXAMINATION			
III	Fourier representation of continuous time signals –Fourier	7	15%

	Series-Harmonic analysis of common signals- Fourier transform - Existence –properties of FT- Energy spectral density and power spectral density - Frequency response of LTI systems -		
IV	Sampled data systems- Sampling process-sampling theorem-signal re construction- Zero order and First order hold circuits- Difference equation representations of LTI systems - Discrete form of special functions- Discrete convolution and its properties	7	15%
SECOND INTERNAL EXAMINATION			
V	Z Transform - Region of convergence- Properties of the Z transform – Inverse ZT-methods Z-transfer function- Analysis of difference equation of LTI systems – Basic idea on Stability and causality conditions-	7	20%
VI	Fourier representation of discrete time signals - Discrete Fourier series–properties- Frequency response of simple DT systems Basics of Non linear systems-types and properties Introduction to random signals and processes (concepts only)	7	20%
END SEMESTER EXAM			

QUESTION PAPER PATTERN:

Maximum Marks: 100

Exam Duration: 3Hours.

Part A: 8 compulsory questions.

One question from each module of Module I - IV; and two each from Module V & VI.

Student has to answer all questions. (8 x5)=40

Part B: 3 questions uniformly covering Modules I & II. Student has to answer any 2 from the 3 questions: (2 x 10) =20. Each question can have maximum of 4 sub questions (a,b,c,d), if needed.

Part C: 3 questions uniformly covering Modules III & IV. Student has to answer any 2 from the 3 questions: (2 x 10) =20. Each question can have maximum of 4 sub questions (a,b,c,d), if needed.

Part D: 3 questions uniformly covering Modules V & VI. Student has to answer any 2 from the 3 questions: (2 x 10) =20. Each question can have maximum of 4 sub questions (a,b,c,d), if needed.