

Velammal College of Engineering and Technology [Autonomous], Madurai – 625 009
Department of Electronics and Communication Engineering

Course Code-Title	21EC203/ Signals and Systems				
Course Component	Professional Core				
Contact Hours	Lecture	Tutorial	Practical	Total Hours	Credit
	3	0	0	45	3
Course Assessment methods	Continuous			Semester-end assessment	
	IAT 1, IAT II, IAT III / Model Exam, Assignments			Student Course exit survey	
Prerequisite Courses:	Knowledge in <ul style="list-style-type: none"> Basic knowledge in Matrices and Calculus, Sampling Techniques and Numerical Methods. 				
Course Objective	<ul style="list-style-type: none"> To learn the basic properties of signals and systems. To expose to continuous time signals and systems in the Fourier and Laplace domain. To study discrete time signals and systems in the Fourier and Z transform domain. To be familiar with the analysis of differential equation of continuous time systems. To introduce different methods of analysis of discrete time systems. 				
Course Outcomes	At the end of the course, the student should be able to: CO1: Interpret the classification of signals and systems. CO2: Apply Fourier and Laplace transform for continuous time signals. CO3: Apply Z transform and DTFT for discrete time signals. CO4: Make use of Laplace transform, Fourier transform to analyze the continuous time systems. CO5: Utilize Fourier and Z transform in discrete time system analysis.				
TOPICS TO BE COVERED					
1.CLASSIFICATION OF SIGNALS AND SYSTEMS				9	
Standard signals- Step, Ramp, Pulse, Impulse, Real and Complex exponentials and Sinusoids_ Classification of signals – Continuous Time (CT) and Discrete Time (DT) signals, Periodic & Aperiodic signals, Deterministic & Random signals, Energy & Power signals - Classification of systems- CT systems and DT systems – Linear & Nonlinear, Time-variant & Time-invariant, Causal & Non-causal, Stable & Unstable.					
2. ANALYSIS OF CONTINUOUS TIME SIGNALS				9	
Fourier series for periodic signals - Fourier transform – properties - Laplace transform and properties.					
3. ANALYSIS OF DISCRETE TIME SIGNALS				9	
Baseband signal sampling – Fourier transform of discrete time signals (DTFT) – Properties of DTFT - Z transform and properties.					
4. LINEAR TIME INVARIANT - CONTINUOUS TIME SYSTEMS				9	
Convolution integrals - Differential equation- Interconnection of LTI systems, Analysis of CT systems using Fourier and Laplace transforms- Stability and Causality.					
5. LINEAR TIME INVARIANT - DISCRETE TIME SYSTEMS				9	

Linear and Circular convolutions- Sectioned convolution- Difference equations- Interconnection of LTI systems – Analysis of DT systems using discrete time Fourier and Z transform - Stability and Causality.

Total :45

TEXT BOOK(S):

1. Allan V.Oppenheim, S.Wilsky and S.H.Nawab, “Signals and Systems”, 2 nd Edition, Pearson, 2013.
2. S.Haykin and B.VanVeen “Signals and Systems, 2 nd Edition, Wiley, 2007.

REFERENCES:

1. B. P. Lathi, “Principles of Linear Systems and Signals”, 2 nd Edition, Oxford, 2009.
2. R.E.Zeimer, W.H.Tranter and R.D.Fannin, “Signals & Systems - Continuous and Discrete”, Pearson, 2007.
3. John Alan Stuller, “An Introduction to Signals and Systems”, Thomson, 2007.
4. Samir S. Soliman and Mandyam Dhathi Srinath, "Continuous and Discrete Signals and Systems", 2 nd Edition, Prentice-Hall International, 1998.
5. Hsu.H.P and Rakesh Ranjan, "Signals and Systems", Schaums's Outlines, 2 nd Edition, Tata Mc Graw Hill, 2008.

WEB MATERIALS:

- W1: www.cdeep.iitb.ac.in/nptel/Electrical%20&%20Comm%20Engg/Signals%20and%20System/Course%20Objective
W2: <http://nptel.ac.in/courses/117104074/>
W3: http://users.ece.gatech.edu/~bonnie/book/worked_problems.html
W4: <http://www.nptelvideos.in/2012/12/signals-and-system.html>
W5: http://ocw.usu.edu/Electrical_and_Computer_Engineering/Signals_and_Systems/
W6: <http://stanford.edu/~boyd/ee102/>

Course I/C/Co-ordinator

Module Coordinator

HoD/ECE