Date: 4 January 2016

SECOND SEMESTER 2015-2016

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course Handout

Course No	: EEE F243 / INSTR F243
Course Title	: Signals & Systems
Instructor-in-charge	: Pawan K. Ajmera (pawan.ajmera@pilani.bits-pilani.ac.in)
Instructors	: Dr. Anantha Krishna (anantha.krishna@pilani.bits-pilani.ac.in)
	Meenakshi Sundaram (sundarmeenakshi2000@gmail.com)
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Scope and Objective:

This course is a preparatory course in which the basics of signal processing are covered. It deals with the basic transforms used in signal processing & prepares the knowledge base for the design of analog & digital filters. For better clarity and understanding of this subject evaluation components like, assignments and/or tests are included. The students are required to review following mathematical topics: Calculus, Vector analysis, coordinate systems, arithmetic and geometric progression, probability and Complex variables.

Text Book:

T1: B. P. Lathi, "Signal Processing & Linear Systems", Oxford University Press, 2009.

T2: V. Oppenheim, A. S. Willsky with S. H. Nawab, Signals and Systems, Prentice- Hall of India Private Limited, Second Edition, 1997.

Reference Book:

R1: S. Haykin and B. V. Veen, Signals and Systems, John Wiley and Sons, Inc., Second Edition, 1999.

R2: M. J. Roberts, Signals and Systems: Analysis using, Transform Methods and MATLAB, Tata McGraw-Hill Publishing Company Limited, Second Edition, 2003.

Course Plan

Lecture No.	Main Topic	Contents	Reference
01	Introduction	Introduction	
02-05	Continuous–Time (CT) and Discrete –Time (DT) Signals:	Classifications; Mathematical Representation; Elementry signals: Unit Impulse, Unit Step, Unit Ramp, and Exponential; Transformations of the Independent Variable; Arithmetic Operations;	T1-1.1 to 1.5 T2-1.1 to 1.4
06-09	CT and DT Systems:	Interconnections of Systems; Basic System Properties (Causality, Stability, Time-Invariance, Linearity, Invertibility, systems with and without memory).	T1-1.6 to 1.8 T2-1.5 to 1.6
10-14	Linear Time – invariant systems (CT and DT)	Unit Impulse Response; Convolution Sum and Convolution Integral Representation; Properties of LTI Systems; The Unit Step Response of an LTI System; LTI Systems Described by Differential and the Difference Equations; Block Diagram Representations;	T1- ch2, ch3 T2- ch2
15-19	Fourier Series (CT and DT)	Fourier Series Representation; Convergence of the Fourier Series; Properties of Fourier Series.	T1-ch6, ch9 T2-ch3
20-24	CT Fourier Transform:	The Fourier Transform for Periodic and Aperodic Signals; Properties of CT Fourier Transform; CT Fourier Transform and LTI Systems.	T1- ch7 T2- ch4
25-29	DT Fourier Transform:	DT Fourier Transform for Periodic and Aperodic Signals; Properties of the DT Fourier Transform; Discrete-Time LTI Systems and DT Fourier Transform.	T1- ch9 T2- ch5
30-33	Sampling:	Representation of a CT Signal by its Samples; The Sampling Theorem; Reconstruction of Signals; Effect of Under Sampling (Frequency Domain Aliasing).	T1- ch8 T2- ch7
34-37	The Laplace Transform:	The Laplace Transform; Region of Convergence for Laplace Transform; Properties of Laplace Transform; LTI Systems and Laplace Transform;	T1- ch4 T2- ch9
38-41	The Z Transform:	The Z Transform; The Region of Convergence for the Z-Transform; Properties of Z-Transform; DT LTI Systems and Z-Transform;	T1- ch5 T2- ch10

Evaluation Scheme:

EC No.	Evaluation Component	Duration	Marks	Date and Time	Nature of Component
1	Weekly Quiz (7)	15 Min	40	Continuous	Close Book
2	MATLAB Quiz (1)	40 Min	10	To be Announced	Close Book
3	Mid-Semester Exam	90 Min	50	15/3 9:00 - 10:30 AM	Open Book
4	Comprehensive Exam	180 Min	100	5/5 FN	Close Book
		Total	**200**		

Chamber Consultation Hours: To be announced in the class.

Notices: Notices regarding the course will be displayed only on the EEE (FD II) notice board/NALANDA.

Makeup Policy: Makeup will be granted to ***extremely genuine*** cases only, *provided the IC has been informed.*

Instructor - in - charge
EEE F243 / INSTR F243