Signals and Systems
TIU-UEE-T208
LTP: 3-1-0
Credits: 4

Lecture Plan

Module	Pds.	Topic	Reference
1	2	Definition of signal and systems Classification of systems	——
	2	Properties of systems: memory, causality, invertibility, stability, linearity and time-invariance.	OW : 44 – 56
2	2	Singularity functions: Heaviside step, ramp, parabolic and Dirac delta	OW : 30 – 38
	2	Classification of signals: periodicity, energy, power and causality	OW : 5 – 7 OW: 11 – 12
3	2	Time domain signal operations	OW : 7 – 14
	2	Signal representation: decomposition of simple periodic and aperiodic waveforms in terms of singularity-function components	PP : 54 – 59
4	4	LTI systems: transfer functions, poles and zeros, damping and natural frequency Time response of first and second order systems	OW : 654 – 681 OW : 693 – 703
5	4	Modelling of dynamic systems Electrical: RLC circuits Mechanical: MKB systems Hydraulic: Two-tank systems Electromechanical: Servomotors	OW : 700 KO : 63 – 68 KO : 72 – 74 KO : 100 – 106
6	2	Convolution of two signals: analytical and graphical methods	OW : 90 – 102
7	2	CT Fourier series and Fourier transform	OW : 182 – 195 OW : 284 – 296
	2	Properties of Fourier transform	OW : 296 – 334
8	2	Parseval's theorem: power and energy spectrum	OW : 312 – 314
9	4	Frequency response of LTI systems and Bode plots	OW : 423 – 460
10	2	State variable representations of LTI systems	PP : 398 – 403
	2	Conversion between transfer function and state space models, different standard forms	PP : 403 – 408 PP : 420 – 424
	2	State transition matrix: time domain solution of state equations for LTI systems	PP : 408 – 420

Textbooks

OW : Oppenheim, Willsky and Nawab, "Signals and Systems," 2nd edition, PHI
PP : Phillips, Parr and Riskin, "Signals, Systems and Transforms," 4th edition, Pearson
KO : Ogata, "Modern Control Engineering," 5th edition, PHI