BACHELOR OF TECHNOLOGY

Electrical and Computer Science Engineering Department

Semester - III

Course Scheme

Course Code	Course Name	Lecture hours	Tutorial hours	Practical hours	Credit
HS 192001	HSS-2: Introduction to Sociology	3	0	0	3
MA 192001	Mathematics-III (Cplx Analysis and Diff. Eq. II)	4	2	0	6
EE 192001	Electronic Devices and Circuits	3	1	3	5.5
EE 192002	Network Theory	3	1	0	4
EE 192003	Signals and System	3	1	0	4
EE 192501	Measurements & Instrumentation (Lab only)	0	0	3	1.5
	Total	**16**	**5**	**6**	**24**

I	Course Code	EE 192001			
II	Course Title	Electronic Devices and Circuits			
III	Credit Structure	L	T	P	C
		3	1	3	5.5
IV	Prerequisite (If any for the student)	Basic Electrical and Electronics Engineering			
V	Course Content	Energy bands in silicon, intrinsic and extrinsic silicon, direct and indirect bandgap semiconductors, Carrier transport in silicon: diffusion current, drift current, mobility, and resistivity. Generation and recombination of carriers; Introduction to semiconductor equations and carrier statistics: Poisson's and continuity equations, Fermi-Dirac statistics and Boltzmann approximation to the Fermi-Dirac statistics. PN Junction diode: operation, characteristics, applications, fabrication process, junction capacitance, small signal model. Zener diode and tunnel diode. BJT: operation, characteristics, applications, fabrication process, equivalent circuit models (Ebers-Moll and Hybrid-Pi). Review of BJT Biasing. BJT as Amplifier and Switch. Common Emitter (CE), Common Base (CB) and Common Collector Amplifier (CC). MOSFET Biasing. Common Source (CS), Common Gate (CG), Common Drain (CD) Amplifier. Class A, Class B, Class AB, Class C and Class D Amplifiers, Single- and Multi-Stage Amplifiers; BJT and FET Amplifier Frequency response; Miller's theorem; Current Mirror, Cascade and Cascade amplifiers; differential amplifiers; OPAMPs, feedback and stability, Barkhausen criterion, effect of feedback on amplifier poles; positive feedback and sinusoidal oscillators-Wien bridge oscillator, other op-amp based RC oscillators; 555 Timers.			
VI	Text/References	1. S. M. Sze, Semiconductor Devices Physics and Technology, John Wiley and Sons, Third Edition, 2012 2. D. A. Neamen, Semiconductor Physics and Devices (IRWIN), Times Mirror High Education Group, Chicago) 1997. 3. Boylestad, Electronic Devices and Circuit Theory, Pearson. 4. B.G. Streetman, Solid State Electronic Devices, Prentice Hall of India, New Delhi, 1995. 5. J. Millman and A. Grabel, Microelectronics, McGraw Hill, International, 1987. 6. A.S. Sedra and K.C. Smith, Microelectronic Circuits, Saunder's College Publishing, 1991. 7. R.T. Howe and C.G. Sodini, Microelectronics : An integrated Approach, Prentice Hall International, 1997. 8. T. M. Floyd, Electronic Devices, Prentice Hall; 9 edition, 2011			

I	Course Code	EE 192002			
II	Course Title	Network Theory			
III	Credit Structure	**L**	**T**	**P**	**C**
		3	1	0	4
IV	Prerequisite (If any forthe student)	Basic Electrical and Electronics Engineering			
V	Course Content	Classification of elements and circuits, modified nodal and mesh analysis, time domain analysis, initial conditions, introduction of Laplace transform, steady state analysis, natural and forced response, state variable analysis, active and reactive power, balanced and unbalanced 3-phase circuits, elements of graph theory and application, Tellegen's theorem, two-port networks description in terms of different sets of parameters and interrelations, transition from field model to circuit model, introduction to network synthesis.			
VI	Text/References	1. Network Analysis by M.E Van Valkenburg, PHI Publication 2. Linear Network Theory: Analysis, Properties, Design and Synthesis by N Balabanian and T.A. Bickart, Matrix Publishers, Inc. 1981			

I	Course Code	EE 192003			
II	Course Title	Signals and System			
III	Credit Structure	L	T	P	C
		3	1	0	4
IV	Prerequisite (If any forthe student)				
V	Course Content	Introduction to signals, signal classification, continuous & discrete time signals, significance of basic signals, basic operations on signals, vector-space interpretations in terms of basic signals useful for evolving various transforms, definition and classification of systems, linear time invariant (LTI) systems, properties of LTI systems, impulse response, convolution, causality, stability, impulse Response of discrete time systems, discrete time convolution, difference equations and analysis, necessity of representations of signals & systems in time and transformed-domains, introduction to Fourier Analysis, Fourier Series for periodic signals, properties of Fourier Series, introduction to Fourier transform, properties of Fourier transform, frequency response of continuous time systems, Laplace transform, properties of Laplace transform, inverse Laplace transform, introduction to z-transform, properties of z-transform, region of convergence, inverse z-transform, Fourier analysis of discrete signals, discrete time Fourier transform (DTFT), properties of DTFT, frequency response of discrete time Systems, discrete Fourier transform DFT, sampling, sampling theorem.			
VI	Text/References	1. Allan V.Oppenheim, S.Wilsky and S.H.Nawab, Signals and Systems, Pearson Education. 2. Edward W. Kamen & Bonnies Heck, Fundamentals of Signals and Sys¬tems, Pearson Education. 3. H. P. Hsu, RakeshRanjan Signals and Systems, Schaums Outlines, Tata McGrawHill. 4. Simon Haykins and Barry Van Veen: Signals and Systems, John Wiley & sons. Gabel. 5. Roberts, Signals and Linear Systems Wiley India Pvt. Ltd, 2012. 6. Rao: Signal and system (TMH). 7. R.F.Ziemer,W.H.Tranter and D.R.Fannin, "'Signals and Systems - Continuous and Discrete"' 4th Edn. Prentice Hall, 1998 8. B.P. Lathi,"'Signal Processing and Linear Systems"' Oxford University Press, 1998			

I	Course Code	EE 192501			
II	Course Title	Measurements & Instrumentation (Lab only)			
III	Credit Structure	**L**	**T**	**P**	**C**
		0	0	3	1.5
IV	Prerequisite (If any for the student)				
V	Course Content	1. To increase range of Voltmeter and Ammeters. 2. To measure the displacement using different sensors. 3. To measure the temperature using different sensors. 4. To measure weights using different load sensors 5. To measure pressure using different pressure sensor 6. To measure light intensity using different light sensors. 7. To measure phase of the unknown signal. 8. To measure frequency of the unknown signal. 9. To determine the value of unknown resistance 10. To determine the value of unknown capacitance 11. To determine the value of unknown Inductance			
VI	Text/References	1. J.F.Wakerly: Digital Design, Principles and Practices,4th Edition, Pearson Education, 2005 2. Tocci, R. J., Widmer, N. S., & Moss, G. L. Digital Systems: Principles and Applications. 10th Edition. Pearson,2010 3. A. K. Sawhney - A course in Electrical Measurement and Measuring Instruments 4. U.A.Bakshi - Electrical and Electronic Measuring Instruments Text Books			