Electrical Engg. Department

Semester : 3

Teaching Scheme for Electrical Engineering – Semester III

Course Code	Course Title	Lecture Hours	Tutorial Hours	Practical Hours	Credit
HS 2001	Introduction to Sociology	3	0	0	4
MA2001	Mathematics III (Complex Analysis and Differential Equations II)	3	2	0	4
CE 2001	Mechanics of Solids	3	2	0	4
EE 2001	Network Theory	2	1	0	3
EE 2002	Signal and Systems	3	0	0	4
EE 2003	Introduction to Analog and Digital Electronics	3	1	0	4
EE 2103	Electnonics Ergineering Lab	0	0	3	2
	Total	17	6	3	25

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<table>
<tr><td>I</td><td>Course Code</td><td colspan="4">HS 2001</td></tr>
<tr><td>II</td><td>Course Title</td><td colspan="4">Introduction to Sociology</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Credit Structure</td><td>L</td><td>P</td><td>T</td><td>C</td></tr>
<tr><td>3</td><td>0</td><td>0</td><td>4</td></tr>
<tr><td>IV</td><td>Prerequisite(If any for the student)</td><td colspan="4">Nil</td></tr>
<tr><td>V</td><td>Course Content</td><td colspan="4">Orientations to the discipline of Sociology: Primary concepts, Methodology, Sociological perspectives. Key Thinkers: August Compte, Herbert Spenser, Emile Durkheim, Max Weber, Karl MarxSocial Structure and Social Change: Social Stratification, Agrarian Societies, Social Interaction, Culture, Socialization: Agencies of Socialization,Theories of Socialization, Social Control, Social Protest: Forms of social protest, Theories of social movements, Social movements in India, Sociology of Organizations: Formal and informal Organizations, Individuals in Organizations, Power and conflict in organizations, Culture in Organizations.Sociology of Science and Technology: Technology and Society, Technology and Development, Social context of production of scientific knowledge, social responsibilities of scientists and technocrats.</td></tr>
<tr><td>VI</td><td>Text/References</td><td colspan="4">1. Harlambos, M. (1998): Sociology: Themes and Perspectives, London: Harper Collins
2. MacIver and Page (1974): Society: An Introductory Analysis, New Delhi: Macmillan & Macmillan
3. Bottomore, T.B. (1972): Sociology
4. Das, Veena (2005): Handbook of Indian Sociology, New Delhi: Oxford University Press
5. Giddens, Anthony (2009): Sociology, Polity Press
6. Ahuja, Ram (2001): Indian Social System, New Delhi: Rawat Publication.
7. Inkeles, Alex (1987): What is Sociology? New Delhi: Prentice-Hall of India
8. Johnson, Harry M. (1995): Sociology: A Systematic Introduction, New Delhi: Allied Publishers
9. Ahuja, Ram (2003): Society in India, New Delhi: Rawat Publication.
10. Abercrombie, N., Hill, S., Turner, B.S: Dictionary of Sociology (2005): Penguin Reference</td></tr>
</table>

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<table>
<tr><td>I</td><td>Course Code</td><td colspan="4">MA 2001</td></tr>
<tr><td>II</td><td>Course Title</td><td colspan="4">Maths III - Complex Analysis and Differential Equations II</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Credit Structure</td><td>L</td><td>P</td><td>T</td><td>C</td></tr>
<tr><td>3</td><td>0</td><td>2</td><td>4</td></tr>
<tr><td>IV</td><td>Prerequisite(If any for the student)</td><td colspan="4">Nil</td></tr>
<tr><td>V</td><td>Course Content</td><td colspan="4">Complex Analysis: Definition and properties of analytics functions; Cauchy-Riemann equations, Harmonic functions; Power series and their properties; Elementary functions; Cauchys theorem and its applications; Taylor series and Laurent expansions; Residues and the Cauchy residue formula; Evaluation of improper integrals; Conformal mappings.
Differential Equations:Laplace transforms, Shifting theorems, Convolution theorem,Review of power series and series solutions of ODEs; Legendres equation and Legendre polynomials; Regular and irregular singular points, method of Frobenius; Bessels equation and Bessels functions; SturmLiouville problems; Fourier series; DAlembert solution to the Wave equation; Classification of linear second order PDE in two variables; Vibration of a circular membrane; Fourier Integrals, Heat equation in the half space.</td></tr>
<tr><td>VI</td><td>Text/References</td><td colspan="4">1. Kreyszig, E., Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons, 1999.
2. Boyce, W.E., and DiPrima, R., Elementary Differential Equations, 8th Edition, John Wiley & Sons, 2005.
3. Churchill, R.V., and Brown, J.W., Complex variables and applications, 7th edition, McGrawHill, 2003.
4. Churchill, R.V., and Brown, J.W., Fourier series and boundary value Problems, 7th Edition, McGraw-Hill, 2006.
5. Howie, J.M., Complex Analysis, Springer-Verlag, 2004.
6. Ablowitz, M.J., and Fokas, A.S., Complex variables: Introduction and Applications, Cambridge University Press, 1998 (Indian Edition).</td></tr>
</table>

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Semester : 3

I	Course Code	**CE 2001**			
II	Course Title	**Mechanics of Solids**			
III	Credit Structure	L	P	T	C
		3	0	2	4
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	Free body diagram, Modelling of supports, Conditions for Equilibrium, Friction Force-deformation relationship and geometric compatibility (for small deformations) with illustrations through simple problems on axially loaded members and thin walled pressure vessels, Axial force, shear force, bending moment, and twisting moment diagrams of slender members, Concept of stress and strain at a point, Transformation of stresses and strain at a point, Principal stresses and strains, Mohrs circle (only for plane stress and strain case), Displacement field, Strain Rosette, Modelling of problem as a plane stress or plane strain problem, Discussion of experimental results on 1-D material behaviour. Concepts of elasticity, plasticity, strain-hardening, failure (fracture/yielding), idealization of 1-D stressstrain curve, Concepts of isotropy, orthotropic, anisotropy, Generalized Hookes law, (without and with thermal strains), Notions of elasticity, Torsion of circular shafts and thin-walled tubes, Bending of beams with symmetric cross-section (normal and shear stresses),Combined stresses, Yield criteria, Deflection due to bending, Integration of the moment-curvature relationship for simple boundary conditions, Superposition principle, Concepts of strain energy and complementary strain energy for simple structural elements (those under axial load, shear force, bending moment, and torsion), Castiglianos theorems for deflection analysis and indeterminate problems, Concept of elastic instability and a brief introduction to column buckling and Eulers formula.			
VI	Text/References	1. Mechanics of Solids by Beer, Johnston, DeWolf &Mazurek (McGraw Hill) 2. Strength of Materials by Purushothama Raj &Ramasamy (Pearson) 3. Mechanics of Solids by Abdul Mubeen (Pearson)			

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Semester : 3

I	Course Code	**EE 2001**			
II	Course Title	**Network Theory**			
III	Credit Structure	L	P	T	C
		2	0	1	3
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	Introduction transition from field model to circuit model, assumptions; electrical circuit described in terms of devices and topology, their mutually exclusive nature. Classification of elements and circuits lumped/distributed, linear/nonlinear, passive/active, bilateral/non-bilateral; independent voltage and current sources, dependent sources, ideal transformer, gyrator. Elements of graph theory graph, subgraphs, paths, connected graphs, trees, co-trees, twigs, links, loops, cut-sets; incidence matrix A, loop matrix B, cut-set matrix Q, orthogonality and interrelations; independent sets of KCL and KVL equations, Tellegens theorem and applications. Circuit analysis basis sets of voltage and current variables, sparse tableau analysis, mesh and loop currents, node and cut-set voltages, state variable analysis. Two-port networks Description in terms of different sets of parameters and interrelations, interconnection of twoport networks and their applications, introduction to filter design.			
VI	Text/References	1. Network Analysis & Synthesis By Franklin S. KUO, Wiley Publication 2. Engineering Circuit Analysis : - By W H Hayt, J E Kemmerly, S M Durbin 6th Edition TMH Publication 3. Electrical Engineering Fundamentals, Toro, V. D., Second edition, Prentice Hall India, 2009. 4. Network Analysis :- By M.E Van Valkenburg PHI Publication 5. Linear Network Theory: Analysis, Properties, Design and Synthesis by N Balabanian and T.A. Bickart, Matrix Publishers, Inc. 1981 6. Linear and Nonlinear Circuits by L.O. Chua, C.A. Desoer, E.S. Kuh, McGraw - Hill International Edition 1987			

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Semester : 3

I	Course Code	**EE 2002**			
II	Course Title	**Signal & System**			
III	Credit Structure	L	P	T	C
		3	0	0	4
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	Motivation and Basic Preliminaries of Signals & Systems Their manifestations, Prospects of modeling a wide variety of situations in terms of Signals & Systems; Classifications of Signals in Continuous and Discrete cases, Basic Signals-Unit Impulse, Unit Ramp, Exponential (real and complex)functions, Significance of Basic Signals; Basic Operations on signals. Vector-space interpretations in terms of Basic Signals useful for evolving various transforms; Classifications of Systems Concepts of Linearity, Causality, Stability, Time-invariance, Convolution for CT & DT signals and systems; Necessity of representations of Signals & Systems in Time- and Transformeddomains; Time-domain Analysis of CT & DT dynamic systems represented by Differential & Difference equations; Fourier-domain analysis of CT & DT for Periodic and aperiodic signals & systems- FS, FT, DFS and DTFT and inter-relations amongst them; Sampling and the associated concepts; Laplace- and Z-Transforms; Brief introduction toDFT/FFT and Wavelet Transforms: A few typical applications.			
VI	Text/References	1. Signals and Systems - Continuous and Discrete by R.F.Ziemer,W.H.Tranter and D.R.Fannin, 4th Edn. Prentice Hall, 1998 2. Signals and Systems by A.V. Oppenheim, A.S. Willsky and I.T. Young, Prentice Hall, 1983 3. Signal Processing and Linear Systems by B.P. Lathi, Oxford University Press, 1998			

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Semester : 3

I	Course Code	**EE 2003**			
II	Course Title	**Introduction to Analog & Digital Electronics**			
III	Credit Structure	L	P	T	C
		3	0	1	4
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	Introduction to signals and spectra, analog and digital signals, basic amplifier characterization, frequency characteristics and Bode plots; Ideal operational amplifiers, inverting and no-inverting amplifier circuits, instrumentation amplifier, integrators, differentiators; effects of finite (frequency dependent) gain, DC imperfections, and slew rate on performance; terminal characteristics of ideal and practical diodes, rectifiers, limiters and clampers, voltage doublers, Zener diodes; terminal characteristics of MOSFETs and BJTs; biasing, small signal analysis, simple amplifier circuits; basic feedback theory, simple oscillators; number systems; Boolean algebra and logic gates, minimization with Karnaugh maps; adders, comparators, decoders, encoders, multiplexers; sequential circuits basic flip-flops, asynchronous and synchronous counters, registers; programmable devices PLA, PAL and ROM; Memories.			
VI	Text/References	1. Op-Amp and Linear integrated Circuit technology- Ramakant A Gayakwad, PHI Publication 2. Digital Fundamentals by Morris and Mano, PHI Publication 3. Fundamental of digital circuits by A. Anandkumar, PHI Publication 4. Micro Electronics Circuits by Sedar/Smith. Oxford Pub 5. Operational Amplifier and Linear integrated Circuits By Robert Coughlin, Frederick F. Driscoll 6. Operational Amplifier and Linear integrated Circuits By K. Lal Kishore. Pearsons 7. Digital Fundamentals by Floyd & Jain, Pearsons Pub 8. Fundamentals of Logic Design by Charles H. Roth Thomson 9. Introduction to Operational Amplifier theory and applications by J. V. Wait, L. P. Huelsman and GA Korn, 2nd edition, McGraw Hill, New York, 1992. 10. Microelectronics by J. Millman and A. Grabel, 2nd edition, McGraw Hill, 1988.			

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Semester : 3

I	Course Code	**EE 2103**			
II	Course Title	**Electronics Engineering Laboratory**			
III	Credit Structure	L	P	T	C
		0	3	0	2
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	1. Characteristics of diodes/Zener diode/Rectifier Circuits 2. Clipper/Clamper Circuits 3. Characteristics of BJT and MOSFET/BJT Amplifier 4. Oscillator and Astablemultivibrator using BJT 5. Filter and Oscillator design using operational amplifiers 6. Design of half and full adders 7. Study of flip-flops and shift registers 8. Design of 4-bit Johnson and ring counters 9. Monostable and astablemultivibrators using 555 10. Study of multiplexer/de-multiplexer circuits			