

PANDIT DEENDAYAL PETROLEUM UNIVERSITY
SCHOOL OF TECHNOLOGY
COURSE STRUCTURE FOR B.TECH. ELECTRICAL ENGINEERING

SEMESTER II			B.TECH. ELECTRICAL ENGG											
Sr · No	Course Code	Course Name	Teaching Scheme					Exam Scheme						Total Mark s
			L	T	P	C	Hrs/w k	Theory			Practical			
								MS	ES	IA	LW	LE/Viva	IA	
1	MA 103T	Mathematics-II	3	1	-	7	3	30	60	10	-	-	-	100
2	ME/IE 101T	Engineering Graphics	1	-	-	2	1	30	60	10	-	-	-	100
3	CE 101T	Applied Mechanics	3	1	-	7	4	30	60	10	-	-	-	100
	CE 101P		-	-	2	1	2	-	-	-	25	25	-	50
4	ME/IE 104P	W.S. Practice	-	-	2	1	2	-	-	-	25	25	-	50
5	HS 104T	Basic Environmental Studies	1	-	-	2	1	30	60	10	-	-	-	100
6	SC 101T	Chemistry	3	-	-	6	3	30	60	10	-	-	-	100
	SC 101P		-	-	2	1	2	-	-	-	25	25	-	50
7	MA 102T	Computer Programming	2	-	-	4	2	30	60	10	-	-	-	100
	MA 102P		-	-	2	1	2	-	-	-	40	50	10	100
8	NO101/ NS101	*National Sports Organization (NSO)/National Service Scheme(NSS)				PP/ NP	2							
Total			13	02	08	32	24							850

IA = Internal assessment (like quiz,
assignments etc)
LW = Laboratory work; LE = Laboratory
Exam

MA 103T MATHAMETICS-II										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs./Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	---	7	3	30	60	10	---	---	100
UNIT I					10					
<p>Complex Analysis: Complex numbers, Function of a Complex variable, Analytic function, C-R equations, Conformal mapping and its type, Some standard & special conformal mappings, Complex line integral, Cauchy's Integral theorem, Cauchy's Integral formula, Residue theorem, Calculation of Residues, Application of Residues.</p>										
UNIT II					10					
<p>Ordinary differential equation: Differential equations of first order and higher degree, Linear independence and independence of vectors. Higher order differential equations with constant coefficient, Rules for finding C.F. and P.I., Method of variation of parameter and method of undetermined coefficients, Cauchy and Legendre's linear differential equations, Simultaneous linear equations with constant coefficients. Orthogonal trajectories, Various applications of higher order differential equations in solution of engineering problems (Rectilinear Motion, Simple Pendulum, Damped motion, Forced Motion, Resonance, Electric Circuit).</p>										
UNIT III					10					
<p>Partial Differential Equations: Formation of P.D.E, Equations solvable by direct integration, Linear and non-linear equations of first order, Lagrange's equations. Homogeneous and non-homogeneous linear P.D.E. with constant coefficients. Rules for finding C.F. & P.I.</p>										
UNIT IV					09					
<p>Laplace transforms: Piecewise continuous functions and exponential order functions, Definition, Existence and Properties of Laplace transform, unit step function and Heaviside function, Inverse Laplace transform, Laplace transform of derivative, Convolution theorem, Applications for solving ordinary differential equations.</p>										
APPROXIMATE TOTAL										39 Hours
Texts and References										
<ol style="list-style-type: none"> 1. R.V. Churchill & J.W. Brown, Complex Variables and Applications, 7th Ed., Tata McGraw-Hill (2003). 2. J.M. Howie, Complex Analysis, Springer-Verlag (2008) 3. R. K. Jain & S. R. K. Iyengar, Higher Engineering Mathematics, 3rd Ed., Narosa (2007). 4. E. Kreyszig, Advanced Engineering Mathematics, 8th Ed., John Wiley (1999). 5. W.E. Boyce & R. DiPrima, Elementary Differential Equations, 8th Ed., John Wiley (2005). 6. M.D. Raisinghania, Ordinary and Partial Differential Equations by, 8th edition, S. Chand Publication (2010). 7. K. Sankara Rao, Introduction to Partial Differential Equations, PHI Learning Pvt.Ltd. (2010). 										

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ME/IE 101T Engineering Graphics
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Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
1	0	--	2	1	30	60	10	--	--	100

<p>UNIT I</p> <p>Introduction to Engineering Graphics, Drawing instruments and accessories, lettering, lines and dimensioning. BIS - SP46. Use of plane scales and Representative Fraction, Free hand sketching</p> <p>Engineering Curves: Classification of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutives and Spirals.</p> <p>Projections of Points & Lines: Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length of the line and its inclination with the reference planes.</p> <p>UNIT II</p> <p>Projections of Solids & Section of Solids: Classification of solids. Projections of solids like Cylinder, Cone, Pyramid and Prism with its inclination to one reference plane and with two reference planes.</p> <p>Development of Lateral Surfaces: Concept of development of the different surfaces. Parallel Line Development and Radial Line Development.</p> <p>UNIT III</p> <p>Orthographic Projections: Principle of projection, Principal planes of projection, Projections from the pictorial view of the object on the principal planes for View from Front, View from Top and View from Side using first angle projection method and third angle projection method, Full Sectional View.</p> <p>UNIT IV</p> <p>Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.</p>	<p>3</p> <p>3</p> <p>3</p> <p>4</p>
APPROXIMATE TOTAL 13 Hours	

<p>Texts and References</p> <ol style="list-style-type: none"> 1. N.D.Bhatt and V.M.Panchal “Engineering Drawing”, Charotar Publishing House, Anand 2. K. Venugopal, “Engineering Drawing & Graphics”, New Age International (P) Ltd. 3. D.A.Jolhe, “Engineering Drawing with an Introduction to AutoCAD”, Tata McGraw-Hill Publishing Co.Ltd., New Delhi

CE 101T Applied Mechanics										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs./Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	---	7	4	30	60	10	---	---	100
<p>UNIT I 10</p> <p>Introduction: Scalar and Vector Quantities, composition and resolution of vectors, system of units, definition of space, time, particle, rigid body, force.</p> <p>Fundamentals of Statics: Principles of statics, coplanar, concurrent and non-concurrent, parallel and non-parallel forces, composition and resolution of forces, moments & couples - their properties, combination of coplanar couples and forces, equilibrant, equilibrium, free body diagrams, analytical conditions of equilibrium for coplanar force systems.</p>										
<p>UNIT II 10</p> <p>Truss: Simple determinate plane trusses and analysis for member forces using methods of joints and methods of sections.</p> <p>Distributed forces, center of gravity and moment of inertia: Center of gravity of lines, plane areas, volumes and bodies, Pappus – Goldinus theorems, moment of inertia, polar moment of inertia & radius of gyration of areas, parallel & perpendicular axes theorems.</p>										
<p>UNIT III 10</p> <p>Friction: Theory of friction, static and sliding friction, laws of friction, angle and coefficient of friction, inclined plane friction, ladder friction, wedges, belt and rope friction.</p> <p>Simple Machines: Velocity ratio, mechanical advantage, efficiency, reversibility of machines, simple machines such as levers, pulley and pulley blocks, wheel and differential axle, Single purchase/double purchase crab, compound screw jacks.</p>										
<p>UNIT IV 09</p> <p>Simple stresses & strains: Elastic, homogeneous, isotropic materials; limits of elasticity and proportionality, yield limit, ultimate strength, strain hardening, section of composite materials, prismatic and non-prismatic sections. Strains: Linear, shear, lateral, thermal and volumetric, Poisson's ratio.</p> <p>Stresses: Normal stresses, axial – tensile & compressive, shear and complementary shear, thermal and hoop, Applications to composite material stepped & tapered bars</p>										
APPROXIMATE TOTAL 39 Hours										
<p>Texts and References</p> <ol style="list-style-type: none"> 1. Engineering Mechanics (Statics) Beer and Johnston, TMH 2005, N.D. 2. Engineering Mechanics: Jaget Babu 3. Engineering Mechanics Statics and Dynamics: R.C.Hibler, Ashok Gupta 4. Applied Mechanics S. B. Junnarkar & H. J. Shah, Charotar Publishing House, Anand 5. Mechanics of Structure Vol. I S. B. Junnarkar & H. J. Shah, Charotar Publishing House, Anand 6. Mechanics of Materials Beer and Johnston, TMH, N.D. 										

7. Mechanics of solids: Abdul Mubeen

CE 101P Applied Mechanics										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs./Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
-	-	2	1	2	--	--	--	25	25	50
<ol style="list-style-type: none"> 1. To verify the polygon law of forces for a coplanar-concurrent force system in equilibrium. 2. To determine the weight of a plate by equilibrium of coplanar, non-concurrent, non- parallel forces. 3. To verify the principle of moment. 4. To calculate the stresses in various member of the jib crane and find the percentage (%) error between the calculated and the observed values. 5. To determine the co-efficient of static friction between glass and wood; wood and cloth; and wood and aluminum. 6. To determine various machine parameters of given wheel and differential axles. 7. To determine various machine parameters of given single purchase crab. 8. To determine various machine parameters of given double purchase crab. 9. To determine various machine parameters of given Screw Jack. 10. To determine the reactions at supports and verify the condition of equilibrium for a beam simply supported at ends. 										

ME/IE 104P WORKSHOP PRACTICES																																																						
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<ol style="list-style-type: none"> Chapman, W.A.J., Workshop Technology, ELBS Low Price Text, Edward Donald Pub. Ltd. Tejwani, V.K., Basic Machine Shop Practice Vol. I & II, Tata McGraw Hill Pub. Co. Arora, B.D., Workshop Technology Vol. I & II, Satya Prakashan, New Delhi Bava, H.S., Workshop Technology, Tata McGraw Hill Publishing Co. Ltd. Hajra Chaudhary, S.K, Elements of Workshop Technology Vol. I, Asia Publishing House Gupta, K.N. & Kaushish, J.P., Workshop Technology Vol. I & II, New Delhi Heights Pub., New Delhi Raghuwanshi, B.S., Course in Workshop Technology, Dhanpat Rai & Sons, NewDelhi 																																																						

HS 104T Basic Environmental Studies										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
1			2	1	30	60	10	--	--	100
UNIT-1										
1. Multidisciplinary nature of environmental studies, Ecosystems, Biodiversity and its conservation, Indicators of environmental pollution, Environment and human health										
UNIT-2										
2. Consumption of natural resources and environmental degradation (forests, water, coal, minerals, energy, and land), Sustainable development, Environmental policy and legislation, Environmental impact assessment.										
UNIT-3										
3. Pollution of lakes, rivers, ground water, coasts, and oceans, Science and technology for drinking water and waste water treatment and issues in management of systems, Solid and hazardous waste management (causes, effects and control measures)										
UNIT-4										
4. Air and noise pollution (science and engineering of pollution control), Global Issues including climate change, global warming, acid rain, ozone layer depletion, nuclear hazards, Disaster management (industrial accidents, floods, earthquakes, cyclones and landslides)										
TOTAL HOURS									14	
Reference Books:										
1. Principles of Environmental Science, Cunningham W.P. and Cunningham M.A. (2002), Tata McGraw-Hill Publishing Company, New Delhi.										
2. Basic Environmental Technology, Nathanson, J.A. (2002), Prentice Hall of India, New Delhi.										
3. Wastewater Treatment for Pollution Control and Reuse, Arceivala, S.J. and Asolekar, S.R. (2006), 3rd Edition, Tata McGraw Publishing Co. Ltd., New Delhi.										
4. Preventive Environmental Management – An Indian Perspective, Asolekar, S.R. and Gopichandran, R. Foundation Books Pvt. Ltd., New Delhi, 2005.										
5. Environmental Studies: R. Rajagopalan, Oxford University Press										

SC 101T CHEMISTRY										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical/Viva	Total Marks
3	0	--	6	3	40	60	--	--	--	100
UNIT I										10
Water and its Treatment: Introduction, sources of water Impurities in water, hard and soft water, Degree of hardness, Types of hardness, Scale and sludge formation in boiler, Priming and Foaming, Softening of water.										
UNIT II										12
Corrosion and its Control: Introduction, Theories of corrosion, Types of corrosion, Protection of metals from corrosion – organic and inorganic materials, Inhibitors, Cathodic protection.										
Chemistry of Fuels: Origin, Classification and properties of Solid, Liquid, Gaseous Fuels, Proximate and Ultimate analysis, Petroleum- Distillation and Uses, Calorific Value, Determination of Calorific Value of solid and liquid fuels, Fuel Cell and Fuel Cell technology										
UNIT III										12
Cements: Introduction, Manufacturing of Portland cement, chemical composition of cement, Properties and application of different types of cement, Setting and hardening of cement, Heat of hydration, Environmental impact of cement manufacturing.										
Green Chemistry: Principles of Green Chemistry, Acid rain, Green house effect, Depletion of Ozone layer, Green chemical technology										
UNIT IV										10
Polymers: Classification, Types of polymerization reactions, Preparation of some commercially important polymers, Resins- Phenol formaldehyde Resins, Urea formaldehyde resin, Epoxy resins. Some aspects of supramolecular chemistry										
										Total: 44 Hrs
Texts and References										
<ol style="list-style-type: none"> 1. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publication 2. James G. Speight, The Chemistry and Technology of Petroleum, CRC Press, New York. 3. Vasily Simanzhenkov & Raphael Idem, Crude Oil Chemistry, Marcel Dekker, New York. 4. James G. Speight, Fuel Science and Technology Hand Book, Marcel Dekker, New York. 5. M.A. Famin, T.A. Al-Sahhaf, A.S. Elkilani, Fundamental of Petroleum Refining, Elsevier 										

SC101P CHEMISTRY PRACTICAL

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical/Viva	Total Marks
--	--	2	1	2	--	--	--		25+25	50

List of Experiments:

1. To determine the strength of given solution of ferrous ammonium sulphate by titrating against standard N/40 K₂Cr₂O₇ using potassium ferricyanide as an external indicator
2. To determine the strength of given copper sulphate solution by titrating against N/20 sodium thiosulphate (hypo) solution
3. To prepare phenol formaldehyde resin (Bakelite)
4. To prepare p-nitro acetanilide from acetanilide
5. To determine the total, permanent and temporary hardness of given water by complexometric titration using standard 0.01M EDTA solution
6. To determine the strength of given HCl solution using a standard NaOH solution by performing a pH-metric titration
7. To determine the strength of given HCl solution using a standard NaOH solution by performing a conductometric titration
8. To determine the strength of given ascorbic acid by titrating against standard N/10 iodine solution
9. To study the kinetics of decomposition of sodium thiosulphate by a mineral acid
10. Determination of Chloride in the given water sample by Mohr Method
11. To determine the smoke point of the given oil sample.
12. To determine the viscosity of sucrose solutions of different concentrations by Ostwald viscometer, and thereby concentration of an unknown solution.
13. To evaluate the saponification value of given oil sample.
14. To determine the acid value of given oil samples.
15. To Prepare Soap by Hot Process.
16. To determine the viscosity of the given petroleum products and to study the variation of viscosity with respect to temperature and concentration.

MA 102T Computer Programming										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	--	--	4	2	30	60	10	--	--	100
UNIT I					6 Hours					
How does computer execute a program?, Number Systems, Algorithm, Flowchart, Writing Simple C programs										
UNIT II					8 Hours					
Program requiring decisions, Writing Functions in various ways, Programs having loop, Recursive Functions, Array										
UNIT III					10 Hours					
Pointer, String Handling, Bit Level Programming, Managing Files										
UNIT IV					4 Hours					
Introduction to C++										
					APPROXIMATE TOTAL 28 Hours					
Texts and References										
<ol style="list-style-type: none"> 1. Let Us C, Yashavant Kanetkar, BPB Publication, 9th Edition 2. C: The Complete Reference, Herbert Schildt 3. Object Oriented Programming with C++, E. Balaguruswami, TMH, 3rd Edition 										

MA102PComputer Programming											
Teaching Scheme					Examination Scheme						
L	T	P	C	Hrs/Week	Theory			Practical			Total Marks
					MS	ES	IA	LW	LE/Viva	IA	
--	--	2	1	2	--	--	--	40	50	10	100
<p>UNIT I 8Hours Practice Work related to Number Systems, Algorithm, Flowchart, Writing Simple C programs</p> <p>UNIT II 8Hours Program-writing requiring decisions, Writing Functions in various ways, Programs having loop, Recursive Functions, Array</p> <p>UNIT III 10Hours Program related to Pointer, String Handling, Bit Level Programming, Managing Files</p> <p>UNIT IV 2Hours Programs related to C++</p> <p style="text-align: right;">APPROXIMATE TOTAL 28 Hours</p>											
Texts and References											
<ol style="list-style-type: none"> 1. Let Us C, YashavantKanetkar, BPB Publication,9th Edition 2. Object Oriented Programming with C++, E. Balaguruswami, TMH, 3rd Edition 3. C: The Complete Reference, Herbert Schildt 											