

PANDIT DEENDAYAL PETROLEUM UNIVERSITY

SCHOOL OF TECHNOLOGY

COURSE STRUCTURE FOR B.TECH.FIRST YEAR*

SEMESTER -I

SR. NO	COURSE CODE	COURSE TITLE	LECTURE	TUTORIAL	PRACTICAL	CREDITS	HRS/WEEK
1.	HS 101	Maths-I	3	1	0	7	4
2.	ME 101	Engineering Graphics	1	0	2	3	3
3.	CE 101	Applied Mechanics	3	1	2	8	6
4.	HS 102	Chemistry	3	0	2	7	5
5.	HS 103	Communication Skills	1	0	2	3	3
6.	HS 104	Environmental Studies	1	0	0	2	1
7.	HS 105	Computer Programming	2	0	2	5	4
8.		**NSO/NSS				PP/NP	2
		Total	14	2	10	35	28

****Compulsory registration for any one**

HS- Humanities & Science Dept.; CE-Civil Engg Dept.; EE- Electrical Engg Dept.; ME- Mechanical Engg Dept.

Description of subject code: **HS 101 Maths-I**

HS	1	01	Maths-I
Humanities & Science Department (Dept. offering the subject)	Level i.e.Year	Sr. number of subject offered by the department	Name of the Subject

***Subject to approval by Academic Council**

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
HS 101 MATHAMETICS-I										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES (3.0Hrs)	MS (2.0Hrs)				
3	1	0	7	4	60	40	25	--	--	125

1. Review of limits, continuity, and differentiability.
2. Mean value theorem, Taylors Theorem, Maxima and Minima.
3. Riemann integrals, Fundamental theorem of Calculus, Improper integrals, applications to area, volume.
4. Convergence of sequences and series, power series.
5. Partial Derivatives, gradient and directional derivatives, chain rule, maxima and minima, Lagrange multipliers.
6. Curve Tracing, Double and Triple integration, Jacobians and change of variables formula.
7. Parametrization of curves and surfaces, vector Fields, line and surface integrals.
8. Divergence and curl, Theorems of Green, Gauss, and Stokes.

References/ Books:

1. Calculus - Single and Multivariable (3rd Edition), Hughes-Hallett et al., John-Wiley and Sons (2003).
2. Calculus (5th Edition), James Stewart, Thomson (2003).
3. Calculus, Volumes 1 and 2 (2nd Edition), T. M. Apostol, Wiley Eastern 1980.
4. Calculus and Analytic Geometry, G. B. Thomas and R. L. Finney
5. Differential Calculus by B.C. Das and B.N. Mukherjee, Publ: U.N.Dhur 1975
6. Integral Calculus by B.C. Das and B.N. Mukherjee, Publ: U.N.Dhur 1975

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
ME 101 ENGINEERING GRAPHICS										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES	MS (2.5Hrs)				
1	0	2	3	3	--	50	--	25	25	100

1. Introduction to Engineering Graphics, Drawing instruments and accessories, lettering, lines and dimensioning. BIS - SP46. Use of plane scales and Representative Fraction, Free hand sketching
2. Engineering Curves: Classification of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutives and Spirals.
3. 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.
4. Projections of Planes: Concept of different planes, Projections of planes with its inclination to one reference plane and with two reference planes. Concept of auxiliary plane method for projections of the plane.
5. 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. Section of such solids and the true shape of the section.
6. Development of Lateral Surfaces: Concept of development of the different surfaces. Parallel Line Development and Radial Line Development.
7. 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.
8. Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.
9. Introduction to computer aided drawing using graphic packages like Auto-CAD/Solid Edge/Solid Works

Note: Topic No. 1, 8 and 9 of the above syllabus to be covered in Practical Hours.

References/ Books:

1. Engineering Drawing By N.D.Bhatt and V.M.Panchal, Charotar Publishing House, Anand,2007
2. Engineering Drawing & Graphics, K. Venugopal, New Age International (P) Ltd., 1995
3. Engineering Drawing with an Introduction to AutoCAD By D.A.Jolhe, Tata McGraw-Hill Publishing Co. Ltd., New Delhi
4. Engineering Graphics – I and II By Arunoday Kumar, Tech – Max Publication, Pune
5. Engineering Drawing and Graphic Technology, French Thomas E. and Vierck Charles J. McGraw-Hill, 1993
6. Fundamentals of Engineering Drawing, Luzadder Warren J. and Duff Jon M. Prentice Hall of India,2001

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
CE 101 APPLIED MECHANICS										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES (3.0Hrs)	MS (2.0Hrs)				
3	1	2	8	6	60	40	25	25	--	150
<ol style="list-style-type: none"> 1. Introduction: Scalar and Vector Quantities, composition and resolution of vectors, system of units, definition of space, time, particle, rigid body, force. 2. 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. 3. Truss: Simple determinate plane trusses and analysis for member forces using methods of joints and methods of sections. 4. Distributed forces, center of gravity and moment of inertia: Center of gravity of lines, plane areas, volumes and bodies, Pappus – Guldinus theorems, moment of inertia, polar moment of inertia & radius of gyration of areas, parallel & perpendicular axes theorems. 5. 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. 6. 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. 7. 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. Stresses: Normal stresses, axial – tensile & compressive, shear and complementary shear, thermal and hoop, Applications to composite material stepped & tapered bars. 8. Beam: <ol style="list-style-type: none"> (a) Types of loads, Types of supports, Types of beams, Support reactions for statically determinate beams (b) Bending moment and Shear force , Bending moment and shear force diagrams for statically determinate beams subjected to couples, concentrated forces, uniformly distributed loadings, relation between bending moment, shear force and rate of loading, point of contra flexure. 9. Stresses in beams: Theory of simple bending, bending stresses and their distribution, moment of resistance, modulus of sections, distribution of shear stresses in different sections. 10. Principal stresses and strains: Compound stresses, analysis of principal planes and principal stresses, principal strains, angle of obliquity of resultant stress, principal stresses in beams. 										
References/ Books :										
<ol style="list-style-type: none"> 1. Engineering Mechanics (Statics) Beer and Johnston, TMH 2005, N.D. 2. Applied Mechanics S. B. Junnarkar & H. J. Shah, Charotar Publishing House, Anand 3. Mechanics of Structure Vol. I S. B. Junnarkar & H. J. Shah, Charotar Publishing House, Anand 4. Mechanics of Materials Beer and Johnston, TMH, N.D. 										

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
HS 102 CHEMISTRY										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES (3.0Hrs)	MS (2.0Hrs)				
3	0	2	7	5	60	40	--	--	25	125
<p>1. Fundamentals of Organic Chemistry: Modern concepts of Bonding, (sp^3, sp^2, sp hybridizations), Organic Reactions (Addition, Elimination, Substitution and Rearrangement reactions), Fundamentals of reaction mechanism, Chemistry of Benzene, Conjugation and aromaticity, stereoisomerism, structural representation of stereo-isomers, Optical and geometrical isomers.</p> <p>2. Fundamentals of Inorganic Chemistry: Bonding: Types of bonds, Atomic structure and periodic table, Transition metal complexes: Crystal field theory, basic concepts, crystal field effects in linear (ML2), tetrahedral, square planar (ML4) and octahedral geometry (ML6), pairing energies, weak field and strong field case, crystal field stabilization energy, factors affecting magnitude of $10Dq$, high and low spin complexes, evidences for crystal field stabilization, tetragonal distortions from octahedral geometry, electronic spectra and magnetism.</p> <p>3. Chemistry of Fuels: Origin, Classification, Solid, Liquid, Gaseous, and Biofuels, 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.</p> <p>4. Water and it's Treatment: Introduction, sources of water Impurities in water, hard and soft water, Degree of hardness, Types of hardness, Scale and sludge formation in boiler, Boiler corrosion. Caustic embrittlements, Priming and Foaming, Softening of water. Potable water, Break point of chlorination, Desalination of Brackish water etc.</p> <p>5. Corrosion and its Control : Introduction, Theories of corrosion, Types of corrosion, Protection of metals from corrosion – organic and inorganic materials, Inhibitors, Cathodic protection.</p> <p>6. Cements : Introduction, Manufacturing of Portland cement, chemical composition of cement, chemical constituents of Portland cement, Setting and hardening of cement, Heat of hydration, Special cement.</p> <p>7. Analytical Techniques: Instrumental Analysis: Spectroscopic (NMR, IR, UV, Visible) and chromatographic (GC, HPLC, TLC, Column, Ion exchange, GPC etc.) techniques.</p> <p>References/ Book:</p> <ol style="list-style-type: none"> Organic Chemistry ELBS, I.L.Finar, Longman Publisher, 6th Edition, 2007 Organic Chemistry, R.T.Morrison and R.N. Boyd, Prentice Hall of India Pvt. Ltd., 5th Ed, 1990 Organic Chemistry, L. G. Wade, Pearson Education 6th Ed, 2006. Concise Inorganic Chemistry, J.D.Lee, Blackwell Publishing, 6th Edition, 2009 Inorganic Chemistry, , 4th Edition, Shriver & Atkins, Oxford University Press, New York Physical Chemistry, P.W.Atkins, Oxford University Press, 7th Edition, 2006. Physical Chemistry, 5th Edition, G.M.Barrow, Tata McGraw-Hill, New Delhi, 1992. Engineering Chemistry, Jain and Jain, Dhanpat Rai Publication 										

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
HS 103 COMMUNICATION SKILLS										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES (3.0Hrs)	MS (2.0Hrs)				
1	0	2	3	3	60	40	--	--	25	125
<ol style="list-style-type: none"> 1. Communication skills: Process, types and levels of communication. Technical Communication and General Communication. Factors to be considered in technical communication. 2. Verbal and non-verbal communication (Kinesics): Components of Non-verbal Communication (Kinesics) Barriers to effective communication. (Noise in oral and written communication) Communication across cultures. 3. Listening skills: Types of Listening Active Listening V/s Passive Listening Empathetic Listening. Traits of a good listener, barriers in effective listening, Tips for effective listening. 4. Effective presentation strategies: Defining purpose, analysis of audience and locate, organizing contents. Preparing an outline of the presentation. Visual aids, nuances of delivery, Body language and effective presentation. 5. Interviews: Introduction, General preparations for an interview, Types of questions generally asked at the interviews. Types of interviews, Importance of nonverbal aspects. 6. Group Discussions: Introduction, Group discussions as a part of the selection process, guidelines for group discussion. Role functions in group discussion. 7. Paragraph Development: Introduction, Topic sentence and supporting sentences. Attributes of a good paragraph. Types of paragraphs. 8. Letter – Writing: Business Letters, Structure and types of a business letter, Letter of Inquiry, Letters of complaint, regret and adjustment. 9. Technical reports: Introduction, types of reports, structure of reports, objectives and characteristics of reports. 10. Technical Proposals: Definition, Purpose, Types, Characteristics, Structure, Style and appearance. 11. Technical Descriptions: Introduction, Definition of an object or a process. Guidelines for writing good description – organization, content, structure. 12. Effective Reading Skills: Purpose of reading, skimming and scanning. Tips for improving comprehension skills. 13. Job application: Essential parts - Cover Letter and the 'resume'. Types of 'resumes' (Curriculum Vitae) Chronological 'resume', functional 'resume'. 14. Grammar and Vocabulary: Tense and the concept of Time. Passive Voice, Conditionals Prepositions, Concord. Idioms, Confusables, one-word substitutes, homonyms, homophones eponyms. 										
References/Books:										
<ol style="list-style-type: none"> 1. Technical Communication-Principles and Practice - Meenakshi Raman, Sangeeta Sharma (Oxford University Press) 2. Personality Development, Harold Wallace and Ann Masters, Cengage Publishers. 3. Basic Communication Skills for Technology, Andrea J. Rutherford (Pearson Education) 4. Communication Skills for Technical Students, T.M. Farhathullah (Orient Longman) 5. A Textbook of English for Engineers and Technologists. Prepared by Humanities & Social Sciences Division. Anna University, Chennai. (Orient Longman) 6. Communication Skills for Engineers - Sunita Mishra, C, Murali Krishna (Pearson Education) 7. English for Technical Communication- K.R. Lakshminarayanan (Scitech Publications, Chennai.) 8. Chennai.) 9. Basics of Management and Communication Skills- Dr. P.C. Shejwalkar (Everest Publishing House) 10. Business Communication Strategies- Matthukutty M. Monippally, (Tata – McGraw – Hill) 11. Body Language- Allan Pease (Sheldon Press, London) 12. A Communicative Grammar of English- Geoffrey Leech, Jan Swartvik (ELBS – with Longman) 										

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
HS 104 ENVIRONMENTAL STUDIES										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES	MS (2.5Hr)				
1	0	0	2	1	--	50	--	--	--	50
<p>1. Multidisciplinary nature of environmental studies, Ecosystems, Biodiversity and its conservation, Indicators of environmental pollution, Environment and human health</p> <p>2. Consumption of natural resources and environmental degradation (forests, water, coal, minerals, energy, and land), Sustainable development, Environmental policy and legislation, Environmental impact assessment.</p> <p>3. Pollution of lakes, rivers, ground water, coasts, and oceans, Science and technology for drinking water and wastewater treatment and issues in management of systems, Solid and hazardous waste management (causes, effects and control measures)</p> <p>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),</p>										
<p>References/ Books:</p> <ol style="list-style-type: none"> 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 										

PANDIT DEENDAYAL PETROLEUM UNIVERSITY										
SCHOOL OF TECHNOLOGY										
HS 105 COMPUTER PROGRAMMING										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory		Tutorial	Term Work	Practical /Viva	Total Marks
					ES(2.5Hrs)	MS(2.00Hrs)				
2	0	2	5	4	60	40	--	25	25	150
<p>Introduction to computer software and programming; Understanding various number systems used in the computer; Writing Algorithm and Drawing Flowchart; Writing simple C++ programs to complex C++ programs; Understanding Object Oriented Programming (OOP); Implementation of OOP concepts through C++.</p>										
<p>References/Books:</p> <ol style="list-style-type: none"> 1. Let Us C, Yashavant Kanetkar, BPB Publications, 9th Edition 2. The Complete Reference C++ (4th Edition), Herbert Schildt, Tata McGraw-Hill 3. C++ Program Design: An introduction to Programming and Object-Oriented Design (3rd Edition), Tata McGraw Hill. Coohoon and Davidson 4. C++ How to Program (5th Edition), Deitel & Deitel, Prentice-Hall India 5. How to Solve It by Computer, G. Dromey, Prentice-Hall, Inc., Upper Saddle River, NJ 6. How to Solve It (2nd ed.), Polya, G., Doubleday and co. 7. Object Oriented Programming with C++, E Balagurusamy, Tata McGraw-Hill 										