



**B.E CIVIL ENGINEERING
 (SEVEN SEMESTER PART TIME)
 CURRICULUM 2008
 SEMESTER I**

Code No.	Course Title	L	T	P	C
THEORY					
PCE101	Numerical Methods	3	1	0	4
PCE102	Mechanics of Solids-I	3	1	0	4
PCE103	Mechanics of Fluids-I	3	0	0	3
PCE104	Surveying – I	3	0	0	3
PRACTICAL					
PCE105	Concrete and Strength of Materials Lab	0	0	3	2

Total Hours:17

Total Credits:16

SEMESTER II

Code No.	Course Title	L	T	P	C
THEORY					
PCE201	Mechanics of Solids II	3	1	0	4
PCE202	Mechanics of Fluids-II	3	0	0	3
PCE203	Surveying –II	3	0	0	3
PCE204	Geotechnical Engineering-I	3	0	0	3
PRACTICAL					
PCE205	Hydraulic Engineering Lab	0	0	3	2

Total Hours:16

Total Credits:15

SEMESTER III

Code No.	Course Title	L	T	P	C
	THEORY				
PCE301	Environmental Engineering-I	3	0	0	3
PCE302	Structural Analysis - I	3	1	0	4
PCE303	Design and Detailing of Steel Structures	3	1	0	4
PCE304	Transportation Engineering – I	3	0	0	3
	PRACTICAL				
PCE305	Geo technical Laboratory	0	0	3	2

Total Hours:17

Total Credits:16

SEMESTER IV

Code No.	Course Title	L	T	P	C
	THEORY				
PCE401	Social Engineering	3	0	0	3
PCE402	Design and Detailing of RCC Structures - I	3	1	0	4
PCE403	Environmental Engineering – II	3	0	0	3
PCE404	Structural Analysis – II	3	1	0	4
	PRACTICAL				
PCE405	Environmental Engineering Lab	0	0	3	2
	Total	12	2	3	16

Total Hours:17

Total Credits:16

SEMESTER V

Code No.	Course Title	L	T	P	C
THEORY					
PCE501	Design and Detailing of RCC Structures – II	3	1	0	4
PCE502	Transportation Engineering - II	3	0	0	3
PCE503	Water Resources Planning and Management	3	0	0	3
PCE504*	Elective - I	3	0	0	3
PRACTICAL					
PCE505	Design and Drawing – II (Irrigation and Environmental Engg.)	0	0	4	2
Total		12	1	4	15

Total Hours:17

Total Credits:15

Semester VI

Code No.	Course Title	L	T	P	C
THEORY					
PCE601	Professional Ethics and Human Values (CE)	3	0	0	3
PCE602	Basics of Earthquake Engineering and Seismic Design	3	1	0	4
PCE603	Prestressed Concrete Structures	3	1	0	4
PCE604*	Elective – II	3	0	0	3
PRACTICAL					
PCE605	Computer Aided Structural Design and Detailing	0	0	4	2

Total Hours:18

Total Credits:16

* Denotes A, B, C, D and E

SEMESTER VII

Code No.	Course Title	L	T	P	C
	THEORY				
PCE701	Entrepreneurial Development Management	3	0	0	3
PCE702	Estimation, Costing and Valuation	3	0	0	3
PCE703*	Elective – III	3	0	0	3
	PRACTICAL				
PCE704	Main Project	0	0	12	6

Total Hours:21

Total Credits:15

* Denotes A, B, C, D and E

Over all Credits: 109

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LIST OF ELECTIVES
Elective I

Code No.	Course Title	L	T	P	C
PCE504A	Industrial and tall Structure	3	0	0	3
PCE504B	Smart Material and Structures	3	0	0	3
PCE504C	Design of plate and shell Structures	3	0	0	3
PCE504D	Traffic Engineering and Management	3	0	0	3
PCE504E	Urban and Regional Planning	3	0	0	3

Elective II

Code No.	Course Title	L	T	P	C
PCE604A	Air pollution control and management	3	0	0	3
PCE604B	Solid and Hazardous waste Management	3	0	0	3
PCE604C	Industrial waste water management	3	0	0	3
PCE604D	Environmental Impact Assessment	3	0	0	3
PCE604E	Unit operations and Processes in Environmental Engineering	3	0	0	3

Elective III

Code No.	Course Title	L	T	P	C
PCE703A	Advanced foundation Engineering	3	0	0	3
PCE703B	Geo Environment Engineering	3	0	0	3
PCE703C	Finite Element Method	3	0	0	3
PCE703D	Disaster Management	3	0	0	3
PCE703E	Advanced Pavement Design	3	0	0	3

TEXT BOOKS:

1. Gerald, C.F, and Wheatley, P.O, “ Applied Numerical Analysis”, Sixth Edition, Pearson Education Asia, New Delhi , 2002.
2. “Numerical Methods Scientific and Engineering Computation ”Jain M.K., Iyengar. New Age International (P) Ltd, Publishers, 2003

REFERENCES:

1. Kandasamy P, Thilakavathy K and Gunavathy K, Numerical methods” S. Chand and Co. New Delhi,1999.
2. Venkatraman M. K., “ Numerical Methods” National Pub. Company, Chennai 1991.

UNIT – I SIMPLE STRESSES & STRAINS 9

Stress, Strain, Hooke's Law, Elastic Constants, Thermal stress, deformation of simple and compound bars – shear modulus, bulk modulus, relationship between elastic constants, biaxial state of stress – stress at a point – stress on inclined plane – principal stresses and principal planes.

UNIT – II ANALYSIS OF PLANE TRUSS, THIN CYLINDERS / SHELLS 9

Stability and equilibrium of plane frames – types of truss – analysis of forces in truss members method of joints, method of sections– Graphical Method - Thin cylinders and shells – under internal pressure – deformation of thin cylinders and shells.

UNIT – III TRANSVERSE LOADING AND STRESSES OF BEAMS 9

Beams – types of supports – simple and fixed, types of load – concentrated, uniformly distributed, varying distributed load, combination of above loading – relationship between bending moment and shear force – bending moment, shear force diagram for simply supported, cantilever and over hanging beams, Theory of simple bending – analysis of stresses.

UNIT – IV TORSION AND SPRINGS 9

Stresses and deformation in circular (solid and hollow shafts) – stepped shafts – shafts fixed at both ends – leaf springs – stresses in helical springs – deflection of springs.

UNIT – V DEFLECTIONS AND SHEAR STRESSES OF BEAMS 9

Introduction, Equation of Elastic Curve, Methods for Determining Deflections (Double Integration, Macaulay's Method, Moment-Area Method, Conjugate-beam method) variation of shear stress – shear stress distribution in rectangular, I sections, solid circular sections, hollow circular sections, angle and channel sections.

L: 45; T: 15; Total:60

TEXT BOOKS:

1. Dr. R.K.Bansal, " Strength of Materials", Laxmi Publications Pvt Ltd, New Delhi, 8th Edition
2. R.K. Rajput, " Strength of Materials", S.Chand and Company Ltd, New Delhi, 8th Edition
3. R.S. Khurmi, "Strength of Materials", S. Chand & Company Ltd, New Delhi, 2003

REFERENCES:

1. William Nash, Theory and Problems of Strength of Materials, Schaum's Outline Series, McGraw-Hill International Edition.
2. Srinath L.N, Advanced Mechanics of Solids, Tata McGraw-Hill Publishing Co., New Delhi, 2003.

UNIT – I FLUID PROPERTIES 9

Introduction to Fluid statics, Kinematics and Dynamics, Properties of fluids, Classification of fluids, Concepts of pressure, Pressure measurement with Manometers, Buoyancy and equilibrium of floating bodies.

UNIT-II FLUID KINEMATICS 9

Classification of fluid flow, Path lines, Streamlines, streak lines and stream tubes, Stream function and Velocity Potential function, Continuity equation for one, two and three dimensional flow, Flow nets, Acceleration of fluids.

UNIT-III FLUID DYNAMICS 9

Bernoulli's equation, Energy and Momentum equation, Energy loss due to pipe friction, Moody's diagram, Energy loss due to sudden transitions, Flow measurement through pipes, Flow through orifice and mouthpiece, Venturimeter, orifice meter and Notches.

UNIT –IV BOUNDARY LAYER 9

Laminar boundary layer, turbulent boundary layer – Combined drag due to laminar and turbulent boundary layer – Displacement thickness –Laminar sub layer- Boundary layer separation

UNIT – V MODEL ANALYSIS 9

Dimensional analysis, dimensional homogeneity, use of Buckingham - pi theorem, dimensionless numbers, similarity laws, Model investigations both submerged and partially submerged bodies.

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TEXT BOOKS:

1. Dr. R.K.Bansal, " Fluid Mechanics and Machinery", Laxmi Publications Pvt Ltd, New Delhi, 8th Edition
2. Kumar, K.L., "Engineering Fluid Mechanics", Eurasia Publishing House (P) Ltd., New Delhi, 1995.
3. Garde, R.J. and Mirajgaoker, A.G., "Engineering Fluid Mechanics", Nem Chand Bros., Roorkee

REFERENCES:

1. Streeter, Victor, L. and Wylie, Benjamin E., "Fluid Mechanics", McGraw-Hill Ltd., 1998.
2. E.John Finnemore and Joseph B.Franzini, "Fluid Mechanics with Engineering Applications", McGraw-Hill International Edition.
3. Pernard Messay, "Mechanics of Fluids" 7th Edition, Nelson Thornes Ltd. U. K. 1998.

UNIT – I CHAIN SURVEYING 9

Introduction to Plane and Geodetic Surveying, Chain surveying, Instruments used in chain surveying, Ranging and chaining lines, Chaining past obstacles, Chaining on sloping ground, Corrections applied, Field book, Trapezoidal and Simpson's rule for computation of areas with irregular boundaries.

UNIT –II COMPASS SURVEYING 9

Compass Instrument, Measurement of angles and directions, Bearing, WCB & RB, Magnetic declination and its variation, Local attraction, Plotting of compass traverse, Latitude and departure

UNIT –III PLANE TABLE SURVEYING 9

Plane Table Surveying: Principle, equipment, methods, orientation, two point and three point problem and their solutions, errors & precautions, advantages and disadvantages of plane tabling.

UNIT –IV LEVELING 9

Leveling, terms and definitions, Instruments and its parts, Temporary and permanent adjustments, Reduction of level, Height of collimation and Rise and fall methods, Inverted levels, Reciprocal leveling, Longitudinal and cross sectioning, Capacity of reservoirs, Contouring

UNIT V THEODOLITE 9

Description of theodolite, Measurement of horizontal angles and vertical angles , Methods of repetition and reiteration, Problems of heights and distances by single plane and double plane method .

L:45; T: 15;Total: 60

TEXT BOOKS:

1. Punmia B.C. Surveying, Vols. I, II and III, Laxmi Publications, 1989
2. Bannister A. and Raymond S., Surveying, ELBS, Sixth Edition, 1992.
3. Kanitkar T.P., Surveying and Levelling, Vols. I and II, United Book Corporation, Pune, 1994.

REFERENCES:

1. Clark D., Plane and Geodetic Surveying, Vols. I and II, C.B.S. Publishers and Distributors, Delhi, Sixth Edition, 1971.
2. James M.Anderson and Edward M.Mikhail, Introduction to Surveying, McGraw-Hill Book Company, 1985.
3. Heribert Kahmen and Wolfgang Faig, Surveying, Walter de Gruyter, 1995.

1. Test on small clear specimens of timber (a) Compressive strength parallel and perpendicular to the grain (b) tensile strength (c) Shear strength and (d) Static bending test to determine modulus of rupture and modulus of elasticity.
2. Tension test on MS Rod / HYSD bars / MS wire and determination yield strength, ultimate tensile strength, percentage elongation, percentage reduction in area and modulus of elasticity.
3. Determination of Young's Modulus and verification of Maxwell Reciprocal theorem by deflection test on MS flat.
4. Mixing of Mortar – Testing of Mortar Cubes
5. Mixing of concrete – Testing of Fresh Concrete – slump Cone – Flow Table- Compaction Factor Test – Strength of concrete cubes

REFERENCES:

1. The testing of Engineering materials - H.F.Davis, Troxell.G.E. and Hanck.G.R.H., Mc Graw Hill International Book Co.,
2. Relevant IS codes on testing of metals, timber, bricks and concrete, BIS New Delhi.
3. Strength of materials, Timoshako,, S.P. , and yound, Mc Graw Hill Int. Engineering materials, Sushil kumar, Metropolitan book Co. Pvt.

UNIT – I STATE OF STRESS IN THREE DIMENSIONS 9

Spherical and deviatoric components of stress tensor - determination of principal stresses and principal planes – volumetric strain – dilatation and distortion – theories of failure – principal stress dilatation – principal strain – shear stress – strain energy and distortion energy theories – application in analysis of stress, load carrying capacity – interaction problems and interaction curves – residual stresses

UNIT – II INDETERMINATE BEAMS 9

Propped cantilever and fixed beams-fixed end moments and reactions for concentrated load, uniformly distributed load, uniformly varying load and combined load – Theorem of Three Moments – Analysis of continuous beams – Shear force and Bending moment diagrams for continuous beams – Slope & Deflections in continuous beams (qualitative study only)

UNIT – III COLUMNS AND THICK CYLINDERS 9

Introduction – Short and Long Columns, Euler's Theory, Rankine-Gordon Formula, Empirical Formulae - Eccentrically Loaded Columns – Middle Third and middle Fourth Rule - Thick cylinders – compound cylinders.

UNIT – IV ENERGY PRINCIPLES 9

Strain energy and strain energy density – strain energy in traction, shear in flexure and torsion – Castigliano's theorems – principle of virtual work – application of energy theorems for computing deflections in beams and trusses – Maxwell's reciprocal theorems.

UNIT – V ADVANCED TOPICS 9

Unsymmetrical bending of beams of symmetrical and unsymmetrical sections – curved beams in plan – Winkler Bach formula – stress concentration – fatigue and fracture. Shear flow – shear centre.

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2. Dr. R.K.Bansal, " Strength of Materials", Laxmi Publications Pvt Ltd, New Delhi, 8th Edition
3. R.K. Rajput, " Strength of Materials", S.Chand and Company Ltd, New Delhi, 8th Edition

REFERENCES:

1. Kazimi S.M.A, "Solid Mechanics", Tata McGraw-Hill Publishing Co., New Delhi, 2003
2. William Nash, "Theory and Problems of Strength of Materials", Schaum's Outline Series, McGraw Hill International Edition
3. Srinath L.N, Advanced Mechanics of Solids, Tata McGraw-Hill Publishing Co., New Delhi, 2003.

UNIT – I OPEN CHANNEL FLOW 8

Open channel flow – Types and regimes of flow – Velocity distribution in open channel – Wide open channel – Specific energy – Critical flow and its computation – Flow measurement by current meter and cross masonry works

UNIT – II UNIFORM FLOW 8

Uniform flow – Velocity measurement – Manning's and Chezy's formula – Determination of roughness coefficients – Determination of normal depth and velocity – Most economical sections – Non-erodible channels

UNIT – III VARIED FLOW 8

Dynamic equations of gradually varied flow – Assumptions – Characteristics of flow profiles – Draw down and back water curves – Profile determination – Graphical integration, direct step and standard step method – Flow through transitions - Hydraulic jump – Types – Energy dissipation – Surges – Surge channel transitions.

UNIT – IV PUMPS 9

Centrifugal pump - minimum speed to start the pump – multistage Pumps – Jet and submersible pumps - Positive displacement pumps - reciprocating pump - negative slip - flow separation conditions - air vessels -indicator diagram and its variation - savings in work done - rotary pumps.

UNIT – V TURBINES 10

Turbines - draft tube and cavitations – Application of momentum principle – Impact of jets on plane and curved plates - turbines - classification - radial flow turbines - axial flow turbines – Impulse and Reaction

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TEXT BOOKS:

1. Subramanya K., "Flow in Open channels", Tata McGraw-Hill Publishing Company, 1994.
2. Kumar K.L., "Engineering Fluid Mechanics", Eurasia Publishing House (P) Ltd., New Delhi, (7th Edition), 1995.
3. Jain A.K., "Fluid Mechanics (including Hydraulic Machines)", Khanna Publishers, 8th edition, 1995.
4. Ranga Raju, K.G., "Flow through Open Channels", Tata McGraw-Hill, 1985

REFERENCES:

1. Streeter, Victor, L. and Wylie, Benjamin E., "Fluid Mechanics", McGraw-Hill Ltd., 1998.
2. E. John Finnemore and Joseph B. Franzini, "Fluid Mechanics with Engineering Applications", McGraw-Hill International Edition.
3. P. N. Chou, "Mechanics of Fluids" 7th Edition, Nelson Thornes Ltd. U. K. 1998.

UNIT –I TACHEOMETRY 9

Tachometry, Tachometric systems and principles of stadia and tangential methods, Determination of Instrument constants, Theory of anallactic lens, Subtense method

UNIT –II TRIANGULATION 9

Triangulation system, Requirements for selection of triangulation stations, Intervisibility of stations, Satellite station, Problems, signals, Phase of signal, Trigonometrical leveling Both base of object accessible and inaccessible, problems.

UNIT –III THEORY OF ERRORS AND ADJUSTMENTS 9

Errors, Most probable values, weights of observations, Determination of most probable values of angles, Normal equations, Principle of least squares, Method of correlates, Method of differences, Station Adjustment and Figure adjustment, Adjustment of level net work.

UNIT –IV ASTRONOMY 9

Introduction to astronomy, terms and definitions, Properties of spherical triangle, Coordinate systems, Correction to observed altitudes, Time systems, Determination of Azimuth of sun

UNIT –V ENGINEERING SURVEYS 9

Types of curves, Simple, compound, reverse and transition curves , Rankine' s method of deflection angles - Hydrographic surveying - Methods of observation and location of soundings, Three point problems, Introduction to photogrammetry, Types of photographs, Stereoscopes - EDM

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2. Punmia B.C., Surveying, Vols. I, II and III, Laxmi Publications, 1989.
3. Kanetkar T.P., Surveying and Levelling, Vols. I and II, United Book Corporation, Pune,1994.

REFERENCES:

1. Clark D., Plane and Geodetic Surveying, Vols. I and II, C.B.S. Publishers and Distributors, Delhi, Sixth Edition, 1971.
2. James M.Anderson and Edward M.Mikhail, Introduction to Surveying, McGraw-Hill Book Company, 1985.
3. Wolf P.R., Elements of Photogrammetry, McGraw-Hill Book Company, Second Edition, 1986.
4. Robinson A.H., Sale R.D. Morrison J.L. and Muehrche P.C., Elements of Cartography, John Wiley and Sons, New York, Fifth Edition, 1984

UNIT – I : INTRODUCTION 9

Soil problems in civil Engineering – soil structure and clay minerals water – air void relationship – soil grain and soil aggregate properties. Index properties including consistency limits and grain size distribution – identification and classification of soil – textural HRB and BIS specification – Field identification.

UNIT – II : SOIL PROPERTIES 9

Soil water – Concept effective and neutral stresses – Permeability – Field and Laboratory permeability tests – Factors affecting Permeability – Effect of stratification – Capillary phenomena – Seepage flow, seepage pressure, exit gradient – significance of Laplace equation – quick sand condition, liquefaction - Introduction - Flownet, properties, application and construction methods – piping – Design of filters

UNIT – III : STRESS DISTRIBUTION 9

Vertical stress distribution in soil - Boussinesq's and Westergaard's equations – Newmark's influence chart – Principle, Construction and use - Equivalent point load and other approximate procedures, stress isobars & pressure bulbs.

UNIT – IV : COMPRESSIBILITY AND CONSOLIDATION 9

Compaction – Factors affecting compaction – proctor test – Field compaction – Field compaction controls, CBR value and CBR test.

Compressibility of soils – Terzaghi's one dimensional consolidation theory – pressure void ratio relationship – prediction of preconsolidation pressure – Total settlement and time rate settlement – secondary compression – coefficient of consolidation – Curve fitting methods.

UNIT – V : SHEAR STRENGTH 9

Shear Strength; Mohr – Coulomb failure criterion – laboratory and field tests – Pore pressure coefficients – Different drainage conditions- shear properties of cohesionless and cohesive soils - Shear Strength. Parameters for under consolidated, normally consolidated and over consolidated clays.

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TEXT BOOKS:

1. Punmia P.C., "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd., New Delhi, 1995.
2. Venkatramaiah, C. "Geotechnical Engineering", New Age International Publishers, New Delhi, 1995
3. Murthy, V.N.S. Soil mechanics and foundation Engineering, Dhantpat Raj

REFERENCES:

1. Alam singh “Soil Mechanics and Foundation Engineering” asia Publishing.
2. Purushothamaraj. P. Geotechnical Engineering, Tata MCGraw Hill, 1994.
3. Khan I.H., “A text book of Geotechnical Engineering”, Prentice Hall of India, New Delhi, 1999.
4. McCarthy D.F., “Essentials of Soil Mechanics and Foundations Basic Geotechniques”, Sixth Edition, Prentice-Hall, New Jersey, 2002.
5. Das, B.M, “Principles of Geotechnical Engineering”, (fifth edition), Thomas Books/ cole, 2002

Flow experiments

1. Determination of Coefficient of Discharge, Coefficient of velocity for Orifice, Mouthpiece, Orificemeter, Venturimeter, Notches.
2. Determination of Friction factor for pipes
3. Verification of Bernouli's theorem
4. Impact of jet on vanes
5. Reynold's experiments on flow visualization

Study on performance characteristics of Pumps

1. Centrifugal pump
2. Reciprocating pump
3. Jet pump
4. Submersible pump
5. Gear Pump
6. Vane pump

Study on performance characteristics of Turbines

1. Impulse turbine (Pelton turbine)
2. Reaction turbine (Francis Turbine)

REFERENCES:

1. Subramanya K., "Flow in Open channels", Tata McGraw-Hill Publishing Company, 1994.
2. Kumar K.L., "Engineering Fluid Mechanics", Eurasia Publishing House (P) Ltd., New Delhi, (7th Edition), 1995.
3. Jain A.K., "Fluid Mechanics (including Hydraulic Machines)", Khanna Publishers, 8th edition, 1995.
4. Ranga Raju, K.G., "Flow through Open Channels", Tata McGraw-Hill, 1985