



**List of Courses Focus on Employability/ Entrepreneurship/
Skill Development**

Department : Civil Engineering

Programme Name : B.Tech.

Academic Year : 2016-17

List of Courses Focus on Employability/ Entrepreneurship/Skill Development

Sr. No.	Course Code	Name of the Course
01.	CE3TPC01	Fluid Mechanics-I
02.	CE3TES05	Strength Of Materials
03.	CE3TBS05	Engineering Mathematics-III
04.	CE3TES06	Building Materials & Construction
05.	CE3TPC02	Surveying-I
06.	CE3LPC01	Surveying-I Lab
07.	CE3LPC02	Fluid Mechanics Lab
08.	CE3LES05	Material Testing Lab
09.	CE4THS03	Engineering Economics
10.	CE4TPC03	Building Planning And Drawing
11.	CE4TBS06	Numerical Analysis & Computer Applications
12.	CE4TPC04	Surveying-II
13.	CE4TPC05	Structural Analysis-I
14.	CE4TPC06	Fluid Mechanics-II
15.	CE4LPC03	Civil Engg. Drawing
16.	CE4LPC04	Surveying-II Lab
17.	CE4LBS03	Numerical Analysis & Computer Applications Lab`
18.	31CE01T	STRUCTURAL ANALYSIS - II
19.	31CE02T	DESIGN OF CONCRETE STRUCTURES-I
20.	31CE03T	FLUID MECHANICS-II
21.	31CE04T	GEO-TECHNICAL ENGINEERING - I
22.	31CE05T	TRANSPORTATION ENGINEERING - II
23.	32CE01T	DESIGN OF STEEL STRUCTURES
24.	32CE02T	GEO-TECHNICAL ENGINEERING - II
25.	32CE03T	ENVIRONMENTAL ENGINEERING - I
26.	32CE04T	WATER RESOURCES ENGINEERING - I
27.	32CE05T	ESTIMATING & COSTING
28.	41CE01T	DESIGN OF CONCRETE STRUCTURES-II



29.	41CE02T	ENVIRONMENTAL ENGINEERING - II
30.	41CE03T	WATER RESOURCES ENGINEERING-II
31.	41CE04T	DESIGN OF PRESTRESSED CONCRETE
32.	41CE17T	MANAGEMENT INFORMATION SYSTEM
33.	42CE01T	BRIDGE & TUNNEL ENGINEERING
34.	42CE02T	CONSTRUCTION PLANNING & MANAGEMENT
35.	42CE05T	AIR POLLUTION CONTROL ENGINEERING
36.	42CE13T	ADVANCE TRANSPORTATION ENGG.



Scheme and Syllabus

CIVIL ENGG. IT GGV. CBCS

Course Scheme for B.Tech. Civil Engg. IT.,GGV.
(Effective from Session 2016-17 onwards)

III SEMESTER B.TECH. (CIVIL ENGG.)

Sl No	Subject Code	Subjects	Periods /Week		Evaluation Scheme							Grand Total	Credits
					Internal Assessment				ESE	Total			
					Theory	Practical	Mid Sem	TA					
1	CE3TPC01	Fluid Mechanics-I	3	0	0	10	20	10	-	40	60	100	3
2	CE3TES05	Strength of Materials	3	1	0	10	20	10	-	40	60	100	4
3	CE3TB505	Engineering Mathematics-III	3	0	0	10	20	10	-	40	60	100	3
4	CE3TES06	Building Materials & Construction	3	1	0	10	20	10	-	40	60	100	4
5	CE3TPC02	Surveying-I	3	0	0	10	20	10	-	40	60	100	3
		Practical											
1	CE3LPC01	Surveying-I Lab	0	0	3	-	-	-	30	30	20	50	2
2	CE3LPC02	Fluid Mechanics Lab	0	0	3	-	-	-	30	30	20	50	2
3	CE3LES05	Material Testing Lab	0	0	3	-	-	-	30	30	20	50	2
											Total Credits	23	

IV SEMESTER B.TECH. (CIVIL ENGG.)

Sl No	Subject Code	Subjects	Periods /Week		Evaluation Scheme							Grand Total	Credits
					Internal Assessment				ESE	Total			
					Theory	Practical	Mid Sem	TA					
1	CE4TH503	Engineering Economics	3	0	0	10	20	10	-	40	60	100	3
2	CE4TPC03	Building Planning & Drawing	3	0	0	10	20	10	-	40	60	100	3
3	CE4TB506	Numerical Analysis & Computer Applications	3	0	0	10	20	10	-	40	60	100	3
4	CE4TPC04	Surveying-II	3	0	0	10	20	10	-	40	60	100	3
5	CE4TPC05	Structural Analysis-I	3	1	0	10	20	10	-	40	60	100	4
6	CE4TPC06	Fluid Mechanics-II	3	0	0	10	20	10	-	40	60	100	3
		Practical											
1	CE4LPC03	Civil Engineering Drawing	0	0	3	-	-	-	30	30	20	50	2
2	CE4LPC04	Surveying-II Lab	0	0	3	-	-	-	30	30	20	50	2
3	CE4LB503	Numerical Analysis & Computer Applications Lab	0	0	3	-	-	-	30	30	20	50	2
											Total Credits	25	

¹Lecture Hours, ²Tutorial Hours, ³Practical Hours, ⁴Mid Sem. Exam, ⁵Class Test, ⁶Teacher Assessment (Attendance & Assignments), ⁷Lab Work Assessment

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SYLLABUS (SEMESTER-III)
Subject Code: CE3TPC01
Subject: Fluid Mechanics-I

CREDITS: 3			SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	-	-	10	20	10	40
						60

UNIT 1: Introduction: Fluid, physical properties of fluids ideal and real fluid, Newtonian and Non-Newtonian Fluid Fluid Statics: Pressure density height relationship, pressure measurement by Manometers, Pressure on plane and curved surfaces, centre of pressure, buoyancy, stability of immersed and floating bodies, metacentric height.

UNIT 2: Kinematics of fluid flow : Steady and unsteady flow, uniform and non-uniform flow, laminar and turbulent flow, one, two and three dimensional flow, streamlines and path lines, rotational and irrotational flow, continuity equation, three dimensional continuity equation. velocity potential and stream function.

UNIT 3: Dynamics of fluid flow: Euler's equation of motion along a streamline and its integration, Bernoulli's equation and its applications – Pitot tube, Venturimeter, orificemeter, problems related to application of momentum equations.

UNIT 4: Flow in Pipes: Major and minor losses in pipe lines, loss due to sudden contraction & expansion, Pipes in series and parallel Flow in open Channel: Comparison between open channel and pipe flow, definition of uniform and non-uniform flow, Chezy's and Manning's Formula, Hydraulically efficient channel section of rectangular, trapezoidal.

UNIT 5: Flow through mouthpieces and orifices: Hydraulic coefficients of orifice, flow through large rectangular orifice, mouthpieces, Borda's mouthpieces. Notches and Weirs: Rectangular, triangular and trapezoidal notches and weir, cippoletti and broad crested weir.

NAME OF TEXT BOOKS:

Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)
Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)
Fluid Mechanics & Hydraulic Machines – Dr.P.N.Modi&S.M.Seth,(Narosa Publishing House)

NAME OF REFERENCE BOOKS:

Mechanics of Fluid – Irving H. Shames (McGraw Hill)
Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)
Fluid Mechanics – R.J. Garde (New Age International Publication)
Fluid Mechanics – Streeter V.L. & Wylie E.B. (Tata McGraw Hills)
Fluid Mechanics – John F Douglas (Pearson Publication)
Introduction to Fluid Mechanics Fox, R.W. and McDonald, A.T., John Wiley & Sons.
Fluid Mechanics", Streeter, V.L. and Benjamin, W.E., "McGraw-Hill.
Fluid Mechanics and Fluid Mechanics Som, S.K. and Biswas, G., Tata McGraw Hill.
Introduction to Fluid Mechanics, Fox, R. W. and A. T. McDonald, 6th ed., John Wiley, New York, (2004)

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SYLLABUS (SEMESTER-III)
Subject Code: CE3TES05
Subject: Strength of Materials

CREDITS: 4			SESSIONAL - IA			ESE	
L	T	P	CT	MSE	TA	TOTAL	ESE
3	1	-	10	20	10	40	60

UNIT 1: Simple Stresses - Strain and compound stresses: Types of stresses and strains, Mechanicals properties, Hooke's law, stress-strain curve for mild & Cast iron, hardness, impact strength, Poisson's ratio, Relation between the elastic moduli & Poisson's ratio, Bars subjected to varying loads, Temperature stresses in composite bars, Elongation of bars of constant and varying sections. Stress at a point. Components of stress in rectangular coordinates, stresses on an inclined plane, Principal stresses & principle plane, Mohr's circle of stresses.

UNIT 2: Shear Force - Bending Moment and Bending Stress: Shear Force & Bending Moment diagrams in statically determinate beams loaded with different load combination, Relationship between Load intensity- Shear Force - Bending Moment, Thrust diagram, Point of contraflexure, loading diagram & Bending moment diagram from shear force diagram, beam with internal hinge.

UNIT 3: Shear Stresses in Beams and Slope-Deflections of Beams: Derivation of Shear Stress formula, assumptions, Shear stresses in symmetrical elastic beam with different sections. Derivation of differential equation for deflection, Slope & Deflection of Beams by Double integration method, Macaulay's method & Moment area method. Propped cantilever.

UNIT 4: Torsion and Columns: Equation of Pure Torsion, Assumptions, Power transmitted, Stiffness of Shafts, Comparison of Solid & Hollow shaft, Strain energy in Torsion. Stable and unstable equilibrium, Short columns, Euler's formula for long columns, Equivalent length, Limitation of Euler's formula, Rankine's formula.

UNIT 5: Thin -Thick Cylinders-Spheres and Rivet-welded Connection: Stresses in Thin Cylinders, Changes in Dimensions of Cylinder, Rivetted Cylinders, Thin Spherical Shells. Thick Cylinders, Lamé's equation. Riveted Joints, Method of riveting, Types of joints, assumptions made in analysis of riveted joints, pitch of Rivets, Failure of a Riveted joint, Strength of a riveted joint, Efficiency of a Joint, Design of Riveted joints for axial load. Welded connection, Types of joints, strength of joints, size of weld, comparison of welded & Riveted joints.

TEXT BOOKS: Strength of Materials - R.K. Rajput (S. Chand & Co.)

NAME OF REFERENCE BOOKS:

Mechanics of Structures (Vol. - I) - Junarkar (Charotar Publications)

Strength of Materials - Timoshenko, S. & Gere (CBS Publishers)

Introductions to Solid Mechanics - Shames & Pitarresi (Prentice Hall of India)

Engineering Mechanics of Solid - Popov (Pearson Publication)

Strength of Materials - S. Ramamurtham (Dhanpat Rai Publications)

Strength of Materials (Part-I) - Timoshenko (CBS Publishers)

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SYLLABUS (SEMESTER-III)
Subject Code: CE3TBS05
Subject: Engineering Mathematics-III

CREDITS: 3			SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	-	-	10	20	10	40
						60

UNIT-I Functions of a complex variable: Complex variable, function of complex variable, limit, continuity, and differentiability, of a function of a complex variable. Analytic functions, Cauchy-Riemann equations, Orthogonal curves, harmonic functions, conformal mapping, bilinear transformation (Möbius transformation) Cauchy integral theorem, Cauchy integral formula, Cauchy's inequality Taylor theorem, Laurent's theorem.

UNIT-II Fourier series and Fourier transform: Periodic function, Fourier series, Dirichlet's conditions for a Fourier series. Advantages of Fourier series and determination of Fourier coefficients, Fourier series of function of periods 2π , change of interval, Even Odd functions, Half range sine and cosine series, practical harmonic analysis, Fourier transformation, Fourier sine and cosine transform, properties of Fourier transform.

UNIT-III Laplace transformation: Laplace transformation, properties of Laplace transformation, first shift theorem, Laplace transform of the derivative of $f(t)$, multiplication and division by t . Unit step function: Laplace transformation of unit function, second shifting theorem, Laplace transform of function and periodic function. Inverse Laplace transformation Multiplication by s , division by s , first shifting property, second shifting property, inverse Laplace transform of derivatives, solution of differential equations by Laplace transform

UNIT-IV Correlation & Regression : Scatter diagram, Linear Correlation, Measures of Correlation. Karl Pearson's Coefficient of correlation, Limits for correlation coefficients, Coefficient of correlation for bivariate frequency distribution, Rank correlation, Linear Regression, Equations to the line of Regression. Regression coefficient. Angle between two lines of Regression.

UNIT-V Theoretical Distributions: Discrete and Continuous probability distribution's. Mathematical expectation, Mean and Variance, Moments, Moments generating function, probability distribution, Binomial, Poisson and Normal distribution, Test of significance based on chi-square, T, F, and Z distribution, degree of freedom, conditions for applying χ^2 (chi-square) test, student's test.

TEXT BOOKS:

- 1) Prasad C "Advanced Engineering mathematics", 2) Pati T "Functions of complex variables", 3) Dass - H.K. " Advanced Engineering mathematics", 4) Ray M. " Mathematics statistics", 5) Higher Engg. Mathematics by Dr. B.S. Grewal- Khanna Publishers., 6) Advanced Engg. Mathematics by Erwin Kreyszig - John Wiley & Sons, 7) Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar - Narosa Publishing House., 8) Applied Mathematics by P.N. Wartikar & J.N. Wartikar. Vol- II- Pune Vidyarthi Griha Prakashan, Pune., 9) Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH

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SYLLABUS (SEMESTER-III)
Subject Code: CE3TES06
Subject: Building Materials & Construction

CREDITS: 4			SESSIONAL - IA			ESE	
L	T	P	CT	MSE	TA	TOTAL	
3	-	-	10	20	10	40	60

UNIT I: Stones, Bricks, Tiles, Timber; Properties, Classification & Uses
UNIT 2: Miscellaneous Engineering Materials; Ceramics & glass; Plastics & Rubber; Paints, Varnishes and distempers; Composite materials; Adhesives; Thermal, Electrical & Sound Insulators.
UNIT III: Cement, Aggregate, Concrete and Steel; classification, properties & uses.
UNIT-IV: Foundations, Masonry, Arches & Lintels; Classification, Requirements & Uses.
UNIT-V: Shoring, Underpinning, Formwork, Advanced construction materials & Techniques.

NAME OF TEXT BOOKS:

Building Materials – S.K. Duggal (New Age Publication)
Building Materials – S. C. Rangwala (Charotar Publication)
Building Construction by S.G. Rangwala, Charter Publishing House, Anand, India.
Building Construction by Sushil Kumar, Standard Publ. and Distributors, New Delhi
Building Construction by Punmia B.C., Lakshmi Publications, New Delhi.
Advanced Building Materials and Construction by Mohan Rai and Jai Sing, CBRI Publications, Roorkee
Concrete Technology – A.M. Neville & J.J. Brooks (Pearson Education)
Concrete Technology – M.S. Shetty (S. Chand & Co.)
Engineering Materials – Surendra Singh (Laxmi Publication)
Construction Engineering and Management – S. Seetharaman (Umesh Publication)
Building Materials – Gurucharan Singh (Standard Publishers, Delhi)

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SYLLABUS (SEMESTER-III)
Subject Code: CE3TPC02
Subject: Surveying-I

CREDITS: 3			SESSIONAL - TA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	-	-	10	20	10	40
						60

UNIT-I: INTRODUCTION AND CHAIN SURVEYING: Definition - Principles - Classification - Fields and office work - Scales - Conventional signs - Survey instruments, their care and adjustment - Ranging and chaining - Reciprocal ranging - Setting perpendiculars - well-conditioned triangles.

COMPASS SURVEYING: Prismatic compass - Surveyor's compass - Bearing - Systems and conversions - Local attraction - Magnetic declination - Dip

UNIT-II: Different methods of determining elevations: Spirit, Trigonometric and Barometric methods Spirit leveling-Definitions of terms, Principle, Temporary and permanent adjustment of levels. Sensitivity of bubble tube, Auto & Dumpy levels, Levelling staff, Methods of spirit leveling Booking and reduction of field notes. Types of leveling:- Reciprocal, Profile, Differential, Precise leveling, Plotting of profiles Correction:- Curvature and refraction. **CONTOURING;** Direct and Indirect methods of contouring. Interpolation of contours, Drawing section from contour map, Application and Modern methods of depicting relief on a Map.

UNIT - III: THEODOLITE AND TRAVERSING: Vernier theodolites, Temporary and permanent adjustments, Requirements of nonadjustable parts, Measurement of horizontal angle by repetition and reiteration method, Measurement of vertical angles.

AREA AND VOLUMES; Computation of area and volume by different mathematical methods.

UNIT - IV: PLANE TABLE SURVEYING: Principles, Advantages and disadvantages, Plane table equipment, Use of Telescopic Alidade, Different methods of Plane Table Surveying, Resection-Two and Three point problems. Fields work in Plane Table Surveying.

UNIT-V: CURVES: Classification of curves; Elements of Simple, Compound, Reverse and Transition curves, Method of setting out Simple and Compound curves. Special field problems.

NAME OF TEXT BOOKS:

Surveying (Vol. I & II) - Punmia, B.C. (Laxmi Publications, New Delhi, 1996)

Surveying (Vol. I & II) - Kanetkar (Pune VidyarthiGrihaPrakashan, Pune)

Surveying (Vol. II & III) - Agor, R (Khanna publications, Delhi, 1995)

Surveying (Vol. II & III) - Arora, K.R. (Standard Book House, Delhi, 1993)

Fundamentals of Surveying - S.K. Roy (Prentice Hall of India)

Surveying (Vol. I & II) - S.K. Duggal (Tata McGraw Hill)

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SYLLABUS (SEMESTER-III)
Subject Code: CE3LPC01
Subject: Surveying-I Lab

CREDITS: 2			SESSIONAL - IA		ESE
L	T	P	IA	MSE	TOTAL
-	-	3	30	-	30
					20

List of experiments


1. Linear measurement & offsetting using metric chain.
2. Determination of the area of the given field by cross staff survey.
3. Compass open traversing using prismatic compass and elimination of local attraction.
4. Compass closed traversing using prismatic compass and elimination of local attraction by bowditch method.
5. To find the difference in elevation between the two non intervisible stations by the method of differential levelling.
6. To draw longitudinal sectional profile of the road by the method of profile levelling.
7. To draw cross-sectional profile of the road by the method of profile levelling.
8. Contour and its plotting by grid method.
9. Measurement of horizontal angle by repetition method.
10. Measurement of horizontal angle by reiteration method.
11. Traversing of the given area by radiation method using plane table survey.
12. Traversing of the given area by intersection method using plane table.

Text Book:

Surveying and Leveling. N.N.Basak, 1st Edition, Tata McGraw Hill
Surveying (Vol. I & II) - Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
Surveying (Vol. I & II) - Kanetkar (Pune Vidyarthi Griha Prakashan, Pune)
NAME OF REFERENCE BOOKS:
Surveying (Vol. II & III) - Agor, R (Khanna publications, Delhi, 1995)
Surveying (Vol. II & III) - Arora, K.R. (Standard Book House, Delhi, 1993)
Fundamentals of Surveying - S.K. Roy (Prentice Hall of India)
Surveying (Vol. I & II) - S.K. Duggal (Tata McGraw Hill)


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CIVIL ENGG. IT GGV.

CBCS

SYLLABUS (SEMESTER-III)
Subject Code: CE3LPC02
Subject: Fluid Mechanics Lab

CREDITS: 2			SESSIONAL - IA		ESE
L	T	P	IA	MSE	TOTAL
-	-	3	30	-	30
					20

List of experiments

1. To calculate the total energy at different points and plot the graph between total energy vs. distance.
(Verification of Bernoulli's equation)
2. To determine the Meta centric height with angle of ship model.
3. To determine the co-efficient of Discharge C_d for Venturimeter
4. To determine the co-efficient of Discharge C_d for Orificemeter.
5. To determine the co-efficient of discharge and the co-efficient of velocity for Orifice.
6. To determine the co-efficient of discharge and the co-efficient of velocity for Mouthpiece.
7. To determine the coefficient of discharge C_d of Rectangular Notch.
8. To determine the coefficient of discharge C_d V Notch - 45°
9. To determine the coefficient of discharge C_d V Notch - 60°
10. To determine the friction factor for Darcy-Weisbach equation
11. Experimental determination of critical velocity in pipe.
12. To determine the coefficient of impact for vanes
13. To find the co-efficient of pitot tube
14. To plot velocity profile across the cross section of pipe
15. To determine the Reynold's Number in pipe
16. Calibration of rectangular sharp cornered weir and to study the pressure distribution on the upstream face of the weir.
17. Calibration of rectangular streamlined weir and to study the pressure distribution on the upstream face of the weir

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SYLLABUS (SEMESTER-III)
Subject Code: CE3LE505
Subject: Material Testing Lab

CREDITS: 2			SESSIONAL - IA			ESE
L	T	P	IA	MSE	TOTAL	-
-	-	3	30	-	30	20

List of experiments

Testing of cement

1. Normal Consistency, Fineness of Cement, Setting times of Cement
2. Specific Gravity of Cement
3. Soundness of Cement
4. Compressive strength of cement

Testing of aggregate

5. Fineness modulus of Fine and Coarse aggregate
6. Bulk density of aggregate
7. Specific Gravity and Water Absorption of Aggregate
8. Bulking of Sand

Testing of bricks

9. Compressive strength, Water Absorption & Efflorescence of Bricks

Testing of concrete

10. Workability of Concrete
11. Compressive strength
12. Modulus of Elasticity
13. Tensile Strength of Concrete
14. NDT Test of Concrete

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CIVIL ENGG. IT GGV.

CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4THS03
Subject: Engineering Economics

CREDITS: 3			SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	-	-	10	20	10	40
						60

Unit 1: Basic Concepts and Definitions, Methodology of Economics, Demand and Supply – elasticity, Theory of the Firm and Market Structure, Price and output determinations in different types of market

Unit 2: Public Sector Economics – Welfare economics, Central and commercial banks and their functions, Industrial policies, theory of localization, Weber & Sargent Florence theory, investment analysis-NPV, ROI, IRR, Payback period, SWOT analysis.

Unit 3: Monetary and Fiscal Policy; Tools, impact on the economy, Inflation, Business Cycle, Cash Flow-2,3,4 Model.

Unit 4: Business Forecasting – Elementary techniques, Cost and Revenue Analysis, Capital Budget, Break Even Analysis.

Unit 5: Indian economy; Urbanization, Unemployment–Poverty, Regional Disparities, Unorganized Sectors- Roll of Plans, Reforms-Post Independent period.

Text/Reference Books:

1. Mankiw Gregory N.(2002), Principles of Economics, Thompson Asia
2. V. Mote, S. Paul, G. Gupta(2004), Managerial Economics, Tata McGraw Hill
3. Misra, S.K. and Puri (2009), Indian Economy, Himalaya
4. Pareek Saroj (2003), Textbook of Business Economics, Sunrise Publishers

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CIVIL ENGG. IT GGV. CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4TPC03
Subject: Building Planning & Drawing

CREDITS: 3			SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	-	-	10	20	10	40
						60

Part-A (60% weight age)

UNIT – I Principles of building Planning;
UNIT – II BUILDING BYELAWS AND REGULATIONS: Introduction – Terminology – Objectives of building byelaws – Floor Area Ratio (FAR) – Floor Space Index (FSI) – Principles underlying building byelaws – classification of buildings – Open space requirements – built up area limitations – Height of Buildings – Wall thickness – lighting and ventilation requirement. UNIT – III RESIDENTIAL & PUBLIC BUILDINGS: Minimum standards for various parts of residential and public buildings – requirements of different rooms and their grouping – characteristics of various types of residential buildings.
UNIT – IV SIGN CONVENTIONS AND BONDS: Brick, Stone, Plaster, Sand filling, Concrete, Glass, Steel, Cast iron, Copper alloys, Aluminum alloys etc., Lead, Zinc, tin, white lead etc., Earth, Rock, Timber and Marble. English bond & Flemish bond odd & even courses for one, one and half, two and two and half brick walls in thickness at the junction of a corner.

Part-B (40% weight age)

UNIT – V BUILDING DRAWING: Preparation of plan, elevation and section of residential buildings-single storey (load bearing structures), double storey (R.C.C.Framed structure) by using principles of planning and local building bye- laws. For this unit students have to draw the problem on the drawing sheet in the examination.

Text books: 1. Building planning designing and scheduling, (5th Edition) by Gurucharan Singh and Jagdish Sing, Standard Publications Distributers, Delhi, 2010.
2. Building planning and drawing, (3rd edition) by Kumara Swami N., Anand Charotar Publishing House Pvt Ltd, 2010.

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CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4TBS06
Subject: Numerical Analysis & Computer Applications

CREDITS: 3			SESSIONAL - IA			ESE	
L	T	P	CT	MSE	TA	TOTAL	-
3	0	-	10	20	10	40	60

UNIT – I Approximations and Errors in Computation: Errors and their analysis, Types of errors Curve fitting : Method of Least squares , fitting of a straight line , polynomial fit : Non linear Regression (second degree parabola), Numerical Solution of Algebraic and Transcendental Equations: Secant Method ,Regulafalsi Method, Newton Raphson Method, Solution of a system of simultaneous linear algebraic Equations Direct method: Gauss elimination Method, Gauss Jordan method, Iterative methods .Jacobi iterative Method, Gauss Seidel Iterative method.

UNIT – II The Calculus of Finite Differences: Finite differences, Difference formula, operators and relation between operators. Inverse Operator, Interpolation with equal intervals: - Newton's forward and backward interpolation formula. Interpolation with Unequal intervals: - Lagrange's interpolation Newton's difference formula, inverse interpolation,

UNIT –III Numerical Differentiation and Integration: - Numerical Differentiation Newton's forward and Backward difference interpolation formula. Maxima and Minima of a Tabulated function, Numerical Integration :- Trapezoidal rule , simpson is (1/3)rd and (3/8) th rule , Boole's rule, weddle rule , Difference Equations :- Definition ,order and degree of a difference equation ., Linear difference equations, Difference equations reducible to Linear form . simultaneous difference equations with constant coefficients

UNIT – IV Numerical solution of ordinary differential equation : Taylor series method , Euler's method, Modified Euler method Runge's method RungeKutta method ,. Numerical solution of partial differential Equations : Classification of P.D.E. of the second order Elliptic equations , solution of Laplace equation , solution of poisson's Equation, solution of elliptic equations by Relaxation method parabolic equations ,

UNIT – V

Programming in ANSI 'C' language: Overview of 'C', Constants, Variables, Data types, Operators and Expression, Decision making and Branching, Decision making and looping, Arrays, Programs in C or C++ language.

Name of Text Books:

1. JAIN & IYNGAR Numerical Methods for Scientific and Engineering Computations.
2. RAO G.S. Numerical Anlysis.
3. Grewal B S Numerical Methods In Engineering and Science.
4. Das K K Advance Engineering Methods.
5. Rajaraman V Computer Oriented Numerical Methods
6. E Balagurusamy-Programming in ANSI 'C'

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CIVIL ENGG. II SEM.

CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4TPC04
Subject: Surveying-II

CREDITS: 3				SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL	
3	-	-	10	20	10	40	60

UNIT 1: Tacheometry: Definitions, Principles of stadia systems, Instrument constants, Substance and Tangential Systems. Construction and use of Reduction Tacheometers.

UNIT 2: Triangulation::Principle and classification of Triangulation System, Triangulation chains, Strength of Figures, Station marks and Signals, Satellite station, intersected and Resected points, field work-Reconnaissance, Intervisibility of station, Angular measurement, Base line measurement and its extension.

UNIT 3: Adjustment Computations: Weighting of observations. Treatment of random errors, probability equation, Normal law of error, Most Probable Value, Propagation of errors and variances. Most probable value, Principle of Least square, Observations and correlative Normal Equations. Adjustment triangulation figures and level nets.

UNIT 4: Photographic surveying: Photo theodolite, principle of the method of terrestrial photogrammetry, stereo Photogrammetry. Aerial surveying; Aerial surveying, scale and distortion of the vertical and tilted photograph, comparison between air photograph and map.

UNIT 5: Hydrographic surveying: Introduction, shore line survey, soundings methods, gauges, equipment required for hydrographic surveying. EDM : Principle, Type, Use

TEXT BOOKS:

Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications; New Delhi, 1996)

Surveying (Vol. I & II) – Kanetkar T.P. (Pune VidyarthiGrihaPrakashan, Pune)

REFERENCE BOOKS:

Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)

Surveying (Vol. I & II) – Kanetkar (Pune VidyarthiGrihaPrakashan, Pune)

Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995)

Surveying (Vol. II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)

Fundamentals of Surveying – S.K. Roy (Prentice Hall of India)

Surveying (Vol. I & II) – S.K. Duggal (Tata McGraw Hill)

Borden D. Dent, Jeffrey Troguson, Thomas W. Hodler, Cartography: Thematic Map Design, McGraw-Hill Higher Education, 2008.

Gopi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson Education India, 2007.

Hoffman.B, H.Lichtenegga and J.Collins, Global Positioning System - Theory and Practice, Springer -Verlag Publishers, 2001.

Punmia B. C, Ashok K. Jain, Arun K. Jain, Higher Surveying, Laxmi Publications, 2005.

Engg Surveying Technology – Kennie, T.J.M. and Petrie G. (Blackie & Sons Pvt.Ltd., London, 1990)

Solving Problems in Surveying – Bannister A. and Baker, R. (Longman Scientific Technical)

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CIVIL ENGG. IT GGV.

CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4TPC05
Subject: Structural Analysis-I

CREDITS: 4			SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	1	-	10	20	10	40
						60

UNIT-I: Principle of superposition, virtual work principle, Maxwell reciprocal theorem, deflection of beams using conjugate beam method. Deflection of beams and truss using energy method (Castigliano theorem), Analysis of plane truss using tension coefficient method (determinate),
UNIT-II: Three-hinged Arches: Bending Moment, Shear force, axial force for three-hinged arches, Analysis of Suspension bridge without stiffening girders.
UNIT-III: Influence Lines: Basic concept of moving load and influence line; influence lines for reactions, Shearing forces and bending moments for determinate beams; absolute maximum shearing force and bending moment.
UNIT-IV: Influence lines for three-hinged arches and stresses in simply supported plane determinate trusses
UNIT-V: Static and kinematic indeterminacy of structure, Method of structural analysis, Analysis of fixed beam, continuous beam using Theorem of three moments Effect of yielding of supports.

REFERENCE BOOK:

Elementary structural Analysis by A.K. Jain
Advanced Structural Analysis by A. K. Jain

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CIVIL ENGG. IT GGV.

CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4TPC06
Subject: Fluid Mechanics-II

CREDITS: 3			SESSIONAL - IA			ESE
L	T	P	CT	MSE	TA	TOTAL
3	-	-	10	20	10	40
						60

UNIT 1: Turbulent flow in pipe: Nature of turbulence, free and wall turbulence, turbulent flow in pipes, equation for velocity distribution over smooth and rough surfaces, Colebrook-White equation, Moody's diagram, Explicit equation for friction factors.

UNIT 2: Boundary layer Analysis: Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, and laminar sub layer, Application of momentum equation, local and average friction coefficient. Fluid flow past submerged bodies. Drag and lift, drag on sphere and cylinder Magnus effect.

UNIT 3: Non-uniform flow in open channel: Specific energy, critical flow, analysis of flow over hump and transition, equation of gradually varied flow, hydraulic jump and evaluation of its elements in rectangular channel.

UNIT 4: Compressibility effect in pipe flow: Transmission of pressure waves in rigid and elastic pipes, water hammer Dimensional analysis and Hydraulic similitude. Dimensional analysis, Buckingham's theorem, important dimensionless numbers and their significances, geometric, kinematics and dynamic similarity, model study.

UNIT 5: Hydraulic Machines: Turbines: Classification of turbines, draft tube, specific speed, unit quantities, and characteristics curves of turbines, and governing of turbine. Pump: Introduction, Centrifugal pumps, efficiencies, specific speed, cavitations, slip, percentage slip

NAME OF TEXT BOOKS:

Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)
Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)
Fluid Mechanics – Dr. P.N. Modi (Standard Book House)
Mechanics of Fluid – Irving H. Shames (McGraw Hill)
Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)

NAME OF REFERENCE BOOKS:

Fluid Machines – Dr. Jagdish Lal (Metropolitan Book Company Private Ltd.)
Fluid Machines – John P. Douglas (Pearson Publication)

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CIVIL ENGG. IT GGV.

-CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4LPC03
Subject: Civil Engineering Drawing

CREDITS: 2			SESSIONAL - IA		ESE	
L	T	P	IA	MSE	TOTAL	ESE
-	-	3	30	-	30	20

Name of drawing plates

1. Graphical Symbols: Doors, Windows, Drains, Pipes, Sanitary, Plumbing, Alphabetical, Fitment, Electrical fitting symbols
2. To draw the foundation details of internal walls of load bearing structure showing all detail.
3. To draw the foundation details of external walls of load bearing structure showing all detail.
4. To draw the single line plan of a single storey residential building.
5. To draw the double line plan, elevation and section of single story residential building.
6. To draw the single line plan of a primary school building.
7. To draw the single line plan of a primary health centre building.
8. To draw the double line plan, elevation and section of a primary health centre building.
9. To draw section and elevation of flush shutter, paneled shutter doors and windows.
10. To draw section and elevation of fully glazed, half glazed, half glazed and half paneled doors and windows.
11. To draw king post truss showing all detail.
12. To draw Queen post truss showing all detail.
13. To draw the two point perspective view of simple blocks.
14. To draw the two point perspective view of stepped blocks.

Recommended Books:

A course in Civil Engineering Drawing – V.B. Sikka (Katson Technical Publications)
Civil Engineering Drawing – Shah, Kala and Patki (Tata McGraw Hill)

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CIVIL ENGG. IT GGV.

CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CE4LPC03
Subject: Surveying-II Lab

CREDITS: 2			SESSIONAL - IA			ESE
L	T	P	IA	MSE	TOTAL	
-	-	3	30	-	30	20

Name of surveying field work

1. Find the plane table instrument station using Resection method (Two point problem)
2. Find the plane table instrument station using Resection method (Three point problem)
3. Determination of Tacheometric constants.
4. Determination of elevation and height by tangential method when both angles are angles of elevation.
5. Determination of elevation and distance when line of sight inclined upward.
6. Determination of elevation and distance when line of sight inclined downward.
7. To perform the experiment for reduction to centre from different positions of a satellite station when:
i) Satellite station in north position, (ii) Satellite station in left position.
8. To perform the experiment for reduction to centre from different positions of a satellite station when:
i) Satellite station in south position, (ii) Satellite station in right position.
9. To find the most probable value of angle for combined triangle by method of difference.
10. To find the most probable value of triangles of a quadrilateral shapes by method of correlates.
11. Adjustment of two connected triangles.
12. Adjustment of quadrilateral by method of least square.
13. Adjustment of geodetic triangles with central station by method of least square.
14. Study of Total Station


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CIVIL ENGG. IT GGV.

CBCS

SYLLABUS (SEMESTER-IV)
Subject Code: CECTB506
Subject: Numerical Analysis & Computer Applications

CREDITS: 3			SESSIONAL - 2A			ESE	
L	T	P	CT	MSE	TA		TOTAL
3	0	-	10	20	10	40	60

UNIT - I Approximations and Errors in Computation: Errors and their analysis, Types of errors Curve fitting : Method of Least squares , fitting of a straight line , fitting of an exponential curves , polynomial fit : Non linear Regression (second degree parabola) ; Least Square Approximation , Method of moments.

UNIT - II Numerical Solution of Algebraic and Transcendental Equations: Graphical method bisection Method, Secant Method ,RegulaFalsi Method, Newton Raphson Method, Iteration Method Solution of a system of simultaneous linear algebraic Equations Direct method: Gauss elimination Method, Gauss Jordan method, iterative methods .Jacobi iterative Method, Gauss Seidel Iterative method.

UNIT - III The Calculus of Finite Differences: Finite differences, Difference formula, operators and relation between operators. Inverse Operator, Interpolation with equal intervals: - Newton's forward and backward interpolation formula. Central difference interpolation formula-gauss's forward and backward interpolation formula, Sterling's formula Bessel's formula, Laplace - Everett is formula, choice of interpolation formula. Interpolation with Unequal intervals: - Lagrange's interpolation Newton's difference formula, inverse interpolation,

UNIT -IV Numerical Differentiation and Integration: - Numerical Differentiation Newton's forward and Backward difference interpolation formula. Maxima and Minima of a Tabulated function, Numerical Integration -> Newton-cotes's quadrature formula Trapezoidal rule , simpson 1/3rd and 3/8 th rule , Boole's rule, weddle rule , Difference Equations :- Definition ,order and degree of a difference equation , Linear difference equations, Difference equations reducible to linear form . simultaneous difference equations with constant coefficients

UNIT - V Numerical solution of ordinary differential equation : Taylor series method , Picard's Method , Euler's method, Modified Euler method Runge's method RungeKutta method , Numerical solution of partial differential Equations : Classification of P.D.E. of the second order Elliptic equations , solution of Laplace equation , solution of poisson's Equation, solution of elliptic equations by Relaxation method parabolic equations ,

Name of Text Books:

1. IJIN & IYNGAR Numerical Methods for Scientific and Engineering Computations.
2. RAO G.S. Numerical Analysis.
3. Grewal B S Numerical Methods in Engineering and Science.
4. Das K.K Advance Engineering Methods.
5. Rajaraman V Computer Oriented Numerical Methods

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GURU GHASIDAS VISHWAVIDYALAYA, INSTITUTE OF TECHNOLOGY; DEPARTMENT OF CIVIL ENGINEERING
SCHEME of B.TECH. - V - SEMESTER - CIVIL ENGINEERING
W.E.F : ODD SEMESTER OF SESSION - 2013-2014

S N	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS	
			L	T	P	SESSIONAL TA			ESE		SUB- TOTAL
						IA	MSE	TOTAL			
THEORY											
1	31CE01T	STRUCTURAL ANALYSIS - II									
2	31CE02T	DESIGN OF CONCRETE STRUCTURES - I	3	1	-	20	20	40	60	100	4
3	31CE03T	FLUID MECHANICS - II	3	1	-	20	20	40	60	100	4
4	31CE04T	GEO- TECHNICAL ENGINEERING - I	3	1	-	20	20	40	60	100	4
5	31CE05T	TRANSPORTATION ENGINEERING - II	3	1	-	20	20	40	60	100	4
PRACTICAL											
6	31CE06P	FLUID MECHANICS - II									
7	31CE07P	GEO- TECHNICAL ENGINEERING - I - LAB	-	-	3	30	-	30	20	50	2
8	31CE08P	COMPUTER APPLICATIONS IN CIVIL ENGG. LAB	-	-	3	30	-	30	20	50	2
GRAND TOTAL			15	5	9	190	100	290	360	650	26

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA: INTERNAL ASSESSMENT; MSE: MID SEMESTER EXAM; ESE: END SEMESTER EXAM

SCHEME of B.TECH. - VI - SEMESTER - CIVIL ENGINEERING
W.E.F : EVEN SEMESTER OF SESSION - 2013-2014

S N	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS	
			L	T	P	SESSIONAL TA			ESE		SUB- TOTAL
						IA	MSE	TOTAL			
THEORY											
1	32CE01T	DESIGN OF STEEL STRUCTURES	3	1	-	20	20	40	60	100	4
2	32CE02T	GEO- TECHNICAL ENGINEERING - II	3	1	-	20	20	40	60	100	4
3	32CE03T	ENVIRONMENTAL ENGINEERING - I	3	1	-	20	20	40	60	100	4
4	32CE04T	WATER RESOURCES ENGINEERING - I	3	1	-	20	20	40	60	100	4
5	32CE05T	ESTIMATING & COSTING	3	1	-	20	20	40	60	100	4
PRACTICAL											
6	32CE06P	STEEL STRUCTURES DETAILING	-	-	3	30	-	30	20	50	2
7	32CE07P	ENVIRONMENTAL ENGINEERING - I - LAB.	-	-	3	30	-	30	20	50	2
8	32CE08P	GEO- TECHNICAL ENGINEERING - II - LAB	-	-	3	30	-	30	20	50	2
GRAND TOTAL			15	5	9	190	100	290	360	650	26

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA: INTERNAL ASSESSMENT; MSE: MID SEMESTER EXAM; ESE: END SEMESTER EXAM



SEMESTER V

31CE01T : STRUCTURAL ANALYSIS-II

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit-I: Analysis of indeterminate beams by Consistent Deformation methods, Analysis of indeterminate rigid plane frames and truss using energy method.

Unit-II: Slop Deflection Method: Continuous beams and portals by moment distribution due to load and yielding of supports.

Unit-III: Moment-distribution method. Continuous beams and portals by moment distribution due to load and yielding of supports.

Unit-IV. Introduction to Flexibility matrix and Stiffness Matrix methods: Applications of the methods to simple indeterminate beams.

Unit-V: Analysis of symmetrical two hinge arches (parabolic and circular). Influence lines for propped cantilevers, continuous beams using Muller-Breslau's principle.

*Reference book: Indeterminate Structural Analysis by C. K. Wang
Fundamental of Structural Analysis by Leet.*

31CE02T : DESIGN OF CONCRETE STRUCTURES - I

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit - I: Introduction to design of concrete structures-limit state analysis and design of beams for flexure, bond.

Unit- II: Shear and torsion

Unit-III: one way slabs, stair cases, Two-way slabs

Unit- IV: Axially and eccentrically loaded columns (uni-axial only)

Unit-V: Footings – different types of isolated footings, synthesis of limit state and working Stress methods.

*Reference book: Reinforced Concrete Design by Pillai & Menon
Limit State Design of Reinforced Concrete by P.C. Verghese*

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31CE03T : FLUID MECHANICS - II

	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit 1: Turbulent flow in pipe

Nature of turbulence, free and wall turbulence, turbulent flow in pipes, equation for velocity distribution over smooth and rough surfaces, Colebrook-White equation, Moody's diagram, Explicit equation for friction factors.

Unit 2: Boundary layer Analysis

Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, and laminar sub layer, Application of momentum equation, local and average friction coefficient.

Fluid flow past submerged bodies

Drag and lift, drag on sphere and cylinder Magnus effect.

Unit 3: Non-uniform flow in open channel

Specific energy, critical flow, analysis of flow over hump and transition, equation of gradually varied flow, hydraulic jump and evaluation of its elements in rectangular channel.

Unit 4: Compressibility effect in pipe flow

Transmission of pressure waves in rigid and elastic pipes, water hammer

Dimensional analysis and Hydraulic similitude

Dimensional analysis, Buckingham's theorem, important dimensionless numbers and their significances, geometric, kinematics and dynamic similarity, model study.

Unit 5: Hydraulic Machines

Turbines: Classification of turbines, draft tube, specific speed, unit quantities, and characteristics curves of turbines, and governing of turbine.

Pump: Introduction, Centrifugal pumps, efficiencies, specific speed, cavitations, slip, percentage slip

Name of Text Books:

Fluid Mechanics and Machines - Dr. A.K. Jain (Khanna Publications)

Fluid Mechanics and Machines - Dr. R.K. Bansal (Laxmi Publications)

Name of Reference Books:

Fluid Mechanics - Dr. P.N. Modi (Standard Book House)

Mechanics of Fluid - Irving H. Shames (McGraw Hill)

Introduction to Fluid Mechanics - James A. Fay (Prentice Hall India)

Fluid Machines - Dr. Jagdish Lal (Metropolitan Book Company Private Ltd.)

Fluid Machines - John P. Douglas (Pearson Publication)



31CE04T : GEOTECHNICAL ENGINEERING - I

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit-I: Introduction, Classification of soils, Soil compaction, Effective stresses, Surface tension and Capillarity

Unit-II: Permeability of soils, Seepage analysis.

Unit-III: Stress distribution in soils, Compressibility and consolidation, soil compaction.

Unit-IV: Shear strength of soils, Earth pressure theories.

Unit-V: Stability of slopes, Sub-soil exploration, Design principles of shallow and deep foundation.

*Reference book: Geotechnical Engineering by B. M. Das, Bharat Singh, Samsher Alam
Geotechnical Engineering by S. K. Gulathi & Dutta
Soil Mechanics by Lambe & Whiteman
Soil Mechanics by B.C.Punamia,*

31CE05T : TRANSPORTATION ENGINEERING - II

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1

Necessity, classification and systems of Railways, Historical Development of railways in India. Alignment and Survey: Track Alignment, Requirements of good alignment, Factor affecting alignment, Surveys.

Permanent Way: Introduction, Component parts, Requirement of Permanent Way, Typical Cross-section.

Gauge: type & factor affecting.

UNIT 2

Rails: Function, Type, Weight, Selection, Length of rails, Rails joints: type & requirement, Coning of wheels, Tilting of rails, Roaring of rails, Creep of rails, Wear of rails, Welding of rails.

Sleepers: Requirements of an ideal sleeper, functions, types, sleeper density.

Ballast: Function, characteristics, types, size and section, quantity.

Fixtures & Fastenings: Function, types.

UNIT 3

Geometries: Terms related to cross section, typical cross section, Gradient, Grade composition of curves, Curves, Super-elevation, cant deficiency, Negative cant, widening of gauges on curves.

UNIT 4

Points and Crossings: Necessity, Important technical terms in point and crossings.

Turnout: Component parts and functions.

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Crossing: Component parts, requirement, types. Points and switches: Types. Track junctions: Types. Signaling: Object, type. Station & yards: Introduction, Types of stations, platforms, minimum horizontal, yards level crossing.

UNIT 5

Tunnel Engineering: Consideration in tunneling shape and size, methods of tunnel, constructions, tunneling in soft soil and rocks, lining of tunnels, ventilations, drainage of tunnels. Harbour Engineering: Harbour of early period, Dry docks and spillways, warehouses, Quays, jetties, wharves, piers and berthing facilities, maintenance of ports and harbours.

Name of Reference Books:

- Railway Engineering - S.C. Saxena & Arora (Dhanpat Rai Publications)
- A textbook of Transportation Engineering - S.P. Chandola (S. Chand)
- Transportation Engineering - A.K. Upadhyay (S.K. Kataria & Sons)
- Tunneling Engineering - S.C. Saxena (Dhanpat Rai Publications)
- Railway Engineering - Rangawala (Charotar Publications)
- Harbour Engineering - Srinivas
- Tunnel and Harbour - Seetharaman S. (Umesh Publications)



SEMESTER VI

32CE01T : DESIGN OF STEEL STRUCTURES

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit-I: Introduction-Building system, Load Path, Loading as per IS 875, load combinations; Design philosophy-Rolled Sections and Built-up sections; Connections-Welded and Riveted
Unit-II: Failure Modes; Design of Tension, Compression Members-effective length, buckling Load
Unit-III: Design of Flexural Members-Lateral Buckling; Design of Built-up column using lacing and batten plates. Design of column bases
Unit-IV: Design of Anchor bolts, Design of plate Girder and Gantry Girder. Industrial Structures
Unit-V: Elements of Plastic Design: Introduction, plastic hinges, shape factor, load factor, collapse loads for beams and portals, effect of axial force and shear on the plastic moment of the section, uniqueness

Reference books: *Design of Steel Structures by-S. K. Duggal.*
Design of Steel Structures by- B. C. Punmia & A. K. Jain.

32CE02T : GEOTECHNICAL ENGINEERING - II

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit-I: Analysis and design of Shallow Foundations, Foundation failure (Case histories)
Unit-II: Pile foundations, Foundations on problematic soils
Unit-III: Shoring and underpinning, Mat foundation
Unit-IV: Pier and Caisson foundation, Cofferdam, Diaphragm walls
Unit-V: Environmental aspects for design/protection of foundation structures

Reference Books: *Basic & Applied Soil Mechanics. by- Gopal Ranjan & A. S. R. Rao*
Foundation Analysis & Design by - J. E. Bowles

32CE03T: ENVIRONMENTAL ENGINEERING - I

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Introduction

Necessity and importance of water supply schemes.
 Water demand

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Classification of water demands, Estimation of quantity of water required by a town, per capita demand, factors affecting per capita demand, design period and population forecasting, variation in water demand.

Sources of water supply

Surface sources and underground sources, Intake works, site selection, type of intake works.

UNIT 2: Quality of water

Common impurities, physical, chemical and biological characteristics of water, water quality standards for municipal and domestic supplies.

Water Processing

Object of water processing, flow diagrams of typical ground water system and surface water systems. **Sedimentation**

Theory of sedimentation, sedimentation tanks and its types, design parameters related with sedimentation tanks, sedimentation with coagulations, coagulants and coagulant aids, Jar test for determining coagulant dosage.

Unit 3 Filtration

Theory of filtration, slow sand and rapid sand filters, Construction and operation.

Disinfection

Methods of disinfection, Chlorination, Types of chlorination, Break Point chlorination.

Unit 4 Softening

Methods of Softening, Iron Removal, Fluoridisation.

Distribution System

Methods of distribution, layout of distribution system, methods of analysis, pressure in the distribution system, distribution reservoirs, functions and its types, storage capacity of distribution reservoir.

Unit 5 Air Pollution

Introduction, causes, sources, characteristics, effects of air pollution on plants, humans, animals and materials and atmosphere, air pollution control methods and equipment.

Noise Pollution

Definition, sources, effects of noise pollution on humans, animals and non-living things, methods of noise control.

Name of Text Books:

Water Supply Engineering – S.K. Garg (Khanna Publication).

Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)



Name of Reference Books:

- Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).
Water Supply and Sanitary Engineering – G.S. Birdi (Dhanpat Rai Publications).
Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications)
Environmental Science and Engineering – Henry and Heinke (Pearson Education)

32CE04T: WATER RESOURCES ENGINEERING - I

L	T	P	SESSIONAL - TA			ESE
			IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit 1

Introduction

Need for Irrigation, Advantages and Disadvantages of irrigation, Types of Irrigation systems – Flow Irrigation, Lift Irrigation

Methods of Irrigation

Introduction, requirement of irrigation methods, surface and sub surface irrigation

Water Requirement of Crops

Introduction, Water requirement of crop, crop season and crops of India, crop period and base period, delta, duty of water, relationship between delta duty and base period, factors affecting duty.

Unit 2

Canal Irrigation

Classification of canal, parts of canal irrigation system, canal alignment, typical canal cross section, command areas, losses in irrigation systems.

Design of Stable Channels in Alluvium

Introduction, Kennedy's silt theory, Lacey's Theory, Lacey's regime equations, Lacey's shock theory, Design of channels by Kennedy's and Lacey's theories, maintenance of Irrigation channels.

Unit 3

Water Logging and its Control

Causes and ill effects of water logging, prevention and control, reclamation of water logged lands, surface drainage.

Design of Lined Channels

Introduction, benefits of lining, types of lining, economics of lining, procedure and design of lined canals.



Unit 4

River Behavior, Control and Training

Objects, river characteristics, river patterns, classification of river training works, methods of river training embankments, bank protection, cutoffs, meandering causes and parameters

Flood Control

Introduction, levees and embankments, channel improvement, flood ways evacuation and flood plain zoning, National Policy of floods.

Unit 5

Reservoir Planning

Introduction, Type of reservoirs, storage zones of a reservoir, mass curve and demand curve, determination of reservoir capacity, safe field.

Flood Routing

Flood Routing principle, inflow storage discharge method, reservoir losses, reservoir sedimentation, life of reservoir,

Name of Text Books:

Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications)
Irrigation Engineering – B.C. Punmia (Laxmi Publications)

Name of Reference Books:

Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House)
Theory and Design of Irrigation Structures (Volume – I & II) – Varshney (Nem Chand & Bros.)
Irrigation and Water resources Engineering – Asawa G.L. (New Age International Publications)
Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand & Bros)
Water Resources Engineering Larry -W. Mays (Wiley, John & Sons)

32CE05T : ESTIMATING & COSTING

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit-I: Method of estimating, measurements, taking out quantities.

Unit-II: Typical estimates for buildings and Civil Engineering Works, Specifications for all types building items.

Unit-III: Analysis of rates, data for various building items.

Unit-IV: Earthwork calculations.

Unit-V: Introduction to Departmental procedures, tender, contracts, arbitrations, valuation of buildings.

Reference Books: B.N Dutta, Estimating and Costing in Civil Engineering Theory and Practice

M. Chakraborti, Estimating, Costing and Specifications in Civil Engineering.



GURU GHASIDAS VISHWAVIDYALAYA, INSTITUTE OF TECHNOLOGY, DEPARTMENT OF CIVIL ENGINEERING
SCHEME of B.TECH. - VII - SEMESTER - CIVIL ENGINEERING
WEF : ODD SEMESTER OF SESSION - 2014-2015

S N	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS	
			L	T	P	SESSIONAL TA		ESE	SUB-TOTAL		
						IA	MSE				TOTAL
THEORY											
1	41CE01T	DESIGN OF CONCRETE STRUCTURES - II	3	1	-	20	20	40	60	100	4
2	41CE02T	ENVIRONMENTAL ENGINEERING - II	3	1	-	20	20	40	60	100	4
3	41CE03T	WATER RESOURCES ENGINEERING - II	3	1	-	20	20	40	60	100	4
4	41CE04T to 41CE22T	ELECTIVE - I	3	1	-	20	20	40	60	100	4
5		ELECTIVE - II	3	1	-	20	20	40	60	100	4
PRACTICAL											
6	41CE23P	ENVIRONMENTAL ENGG.-II - LAB	-	-	3	30	-	30	20	50	2
7	41CE24P	MINOR PROJECT	-	-	3	30	-	30	20	50	2
8	41CE25P	SEMINAR	-	-	3	30	-	30	20	50	2
GRAND TOTAL			15	5	9	190	100	290	360	650	26

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA: INTERNAL ASSESSMENT; MSE: MID SEMESTER EXAM; ESE: END SEMESTER EXAM

LIST OF ELECTIVE - I & II

SN	COURSE CODE	SUBJECT	SN	COURSE CODE	SUBJECT
1	41CE04T	DESIGN OF PRESTRESSED CONCRETE	11	41CE14T	ADVANCED CONCRETE TECHNOLOGY
2	41CE05T	THEORY OF PLATE & SHELLS	12	41CE15T	ENGINEERING ECONOMICS
3	41CE06T	THEORY OF ELASTICITY & PLASTICITY	13	41CE16T	QUALITY CONTROL, ASSURANCE & SAFETY IN CONSTRUCTION
4	41CE07T	REHABILITATION OF STRUCTURES	14	41CE17T	MANAGEMENT INFORMATION SYSTEM
5	41CE08T	ADVANCE STRUCTURAL ANALYSIS	15	41CE18T	VALUE ENGINEERING
6	41CE09T	STRUCTURAL DYNAMICS	16	41CE19T	ENTERPRISE RESOURCE PLANNING
7	41CE10T	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES	17	41CE20T	FINANCE MANAGEMENT
8	41CE11T	FRACTURE OF CONCRETE SYRUCTURES	18	41CE21T	SAFETY IN CONSTRUCTION
9	41CE12T	ADVANCED STEEL DESIGN	19	41CE22T	CONSTRUCTION MATERIALS & MATERIALS MANAGEMENT
10	41CE13T	ADVANCED CONCRETE DESIGN			



GURU GHASIDAS VISHWAVIDYALAYA, INSTITUTE OF TECHNOLOGY; DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF B.TECH.- VIII - SEMESTER - CIVIL ENGINEERING
W.E.F : EVEN SEMESTER OF SESSION - 2014-2015

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME				CREDITS
			L	T	P	SESSIONAL - TA		ESE	SUB-TOTAL	
						IA	MSE			
THEORY										
1	42CE01T	BRIDGE & TUNNEL ENGINEERING								
2	42CE02T	CONSTRUCTION PLANNING & MANAGEMENT	3	1	-	20	20	40	60	100
3	42CE03T to 42CE19T	ELECTIVE - III	3	1	-	20	20	40	60	100
4		ELECTIVE - IV	3	1	-	20	20	40	60	100
PRACTICAL										
5	42CE20P	CONCRETE STRUCTURES DETAILING								
6	42CE21P	MAJOR PROJECT	-	-	3	30	-	30	20	50
7	42CE22P	PROFESSIONAL ETHICS	-	-	9	90	-	90	60	150
GRAND TOTAL			12	4	15	250	80	330	320	650

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA: INTERNAL ASSESSMENT; MSE: MID SEMESTER EXAM; ESE: END SEMESTER EXAM

LIST OF ELECTIVE - III & IV

SN	COURSE CODE	SUBJECT	SN	COURSE CODE	SUBJECT
1	42CE03T	AIR AND WATER QUALITY MODELLING	10	42CE12T	RAIN WATER HARVESTING
2	42CE04T	INDUSTRIAL WASTEWATER MANAGEMENT	11	42CE13T	ADVANCE TRANSPORTATION ENGG.
3	42CE05T	AIR POLLUTION CONTROL ENGINEERING	12	42CE14T	GROUND IMPROVEMENT TECHNIQUES
4	42CE06T	ENVIRONMENTAL IMPACT ASSESSMENT	13	42CE15T	DYNAMICS OF SOIL & FOUNDATION
5	42CE07T	SOLID AND HAZARDOUS WASTE MANAGEMENT	14	42CE16T	GEO-INFORMATICS & GIS APPLICATIONS
6	42CE08T	ENVIRONMENTAL GEO- TECHNOLOGY	15	42CE17T	ROCK MECHANICS
7	42CE09T	WATER RESOURCES PLANING & MANAGEMENT	16	42CE18T	PLANING & DESIGN OF BUILDING SERVICES
8	42CE10T	GROUND WATER HYDROLOGY	17	42CE19T	DISASTER MITIGATION & MANAGEMENT
9	42CE11T	ADVANCE FLUID MECHANICS			



SEMESTER VII

41CE01T : DESIGN OF CONCRETE STRUCTURES-II

L	T	P	SESSIONAL - TA			ESE
			LA	MSE	TOTAL	
3	1	-	20	20	40	60

- Unit-I:** continuous beam and slab systems (one way and two way).
Unit II: Combined footings (Rectangular, Trapezoidal and strap footing)
Unit-III: Design of Cantilever retaining wall and introduction to counter fort retaining walls
Unit-IV: Water tanks-resting on ground
Unit-V: Elevated water tanks (Intze Tank)

*Reference book: Design of Reinforced Concrete Structures by P. Dayaratnam
 Reinforced Concrete Design by S.N .Sinha
 Reinforced Concrete Design by Pillai & Menon
 Limit State Design of Reinforced Concrete by P.C. Verghese*

41CE02T : ENVIRONMENTAL ENGINEERING - II

L	T	P	SESSIONAL - TA			ESE
			LA	MSE	TOTAL	
3	1	-	20	20	40	60

- Unit - I** Objective, design period, Physical, Chemical and Biological characteristics. Waste water sampling, Self-purification of natural streams, effluents Standards, Oxygen Sag Curve, Sources of sewage. Design of sanitary sewers, Minimum size of sewer, velocities in sewers and gradient of sewers. Sewer appurtenances viz manholes, street inlets, flushing devices, Vent pipes etc.
- Unit - II** **Waste Water primary Treatment:** characteristics of wastewater, effluent discharge standards, Primary, secondary and tertiary treatment of wastewater. Types of screens, design of screen chamber, Sources of grit, design of grit chamber, disposal of grit, Oil and grease removing skimming tanks, Design of PST with inlet and outlet details, Primary Sludge and its disposal
- Unit - III** **Aerobic Treatment Units :** Biological principle of ASP, SVI, sludge bulking and control; Biological principle of Trickling filter, Re-circulation, Operational troubles.; Rotating Biological Contactor.
- Low Cost Treatment methods:** Principle of Oxidation pond, symbiosis, principle of Aerated Lagoons, aeration method, Principle of Oxidation Ditches, sewage farming, ground water recharge .
- Unit- IV** **Anaerobic Treatment Units :** Septic tanks, biological Principle, method of treatment and disposal of Tank effluent. Anaerobic Digester, principle of anaerobic digestion, Stages of digestion, Bio-gas production. Sludge disposal methods, advantages and disadvantages
- Unit - V** **Municipal Solid Wastes:** Characteristics, generation, collection & transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment & disposal), environmental & health implications, disposal of solid waste by land filling, composting and



incineration methods. Hazardous waste management, environmental and health implications due to Exposure, incineration, landfill disposal, site remediation, disposal of refuse by Composting.
Text Books: Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).
Waste Water Engineering – S.K. Garg (Khanna Publication).
Manual on sewerage & sewage Treatment published by Ministry of Urban Dev. GOI, Ministry of Urban development
Reference Books: Waste Water Engineering – Metcalf Eddy (Tata McGraw Hill, New Delhi).
Hazardous Waste management : M.D. LaGrega, P.L. Buckingham, J.C. Evans
Manual on Municipal Solid Waste Management : CPHEEO (Ministry of Urban Dev.)
Environmental Engineering-II.P. Venugopala Rao Tata McGraw Hill Pub.2003
Water and Wastewater Technology ,Hammer (PHI)

4ICE03T : WATER RESOURCES ENGINEERING - II

L	T	P	SESSIONAL - TA			ESE
			1A	MSE	TOTAL	
3	1	-	20	20	40	60

Unit 1

Dams

Types of Dams, Forces, failure of dams and criteria for structural stability, principal and shear stress, stability analysis, Elementary profile of a gravity dam, Profile from practical considerations, Openings in dams .

Unit 2

Spillways and Energy Dissipaters

Introduction, essential requirements of a spillway, spillway capacity, components, Types of spillways, Ogee Spillway, Energy Dissipation below spillways, Types of Energy dissipater, USBR stilling basins

Unit 3

Diversion Head-works

Introduction, Types of diversion works, location and components, Weir and Barrage, Effect of construction of weir on the river regime, Bligh's creep theory, Theory of seepage flow, Khosla's theory, Vertical drop Weir.

Unit 4

Regulation Works

Introduction, Definition of falls, necessity and location of falls, comparative study of the main types of falls.

Hydraulic Gates

Spillway gates, types, Tainter gates, Roller gates.

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Unit 5

Cross Drainage Works

Introduction, suitability, various types of C-D Works, Design principles of C-D Works

Name of Text Books:

Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications)
Irrigation Engineering – B.C. Punmia (Laxmi Publications)

Name of Reference Books:

Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House)
Theory and Design of Irrigation Structures (Volume – I & II) – Varshney (Nem Chand Bros.)
Irrigation Engineering – Asawa G.L. (New Age International Publications)
Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand & Bros.)
Dams and weirs- William G Bligh, Kessinger Publishing

LIST OF ELECTIVE – I & II

SN	COURSE CODE	SUBJECT
1	41CE04T	DESIGN OF PRESTRESSED CONCRETE
2	41CE05T	THEORY OF PLATE & SHELLS
3	41CE06T	THEORY OF ELASTICITY & PLASTICITY
4	41CE07T	REHABILITATION OF STRUCTURES
5	41CE08T	ADVANCE STRUCTURAL ANALYSIS
6	41CE09T	STRUCTURAL DYNAMICS
7	41CE10T	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES
8	41CE11T	FRACTURE OF CONCRETE STRUCTURES
9	41CE12T	ADVANCED STEEL DESIGN
10	41CE13T	ADVANCED CONCRETE DESIGN
11	41CE14T	ADVANCED CONCRETE TECHNOLOGY
12	41CE15T	ENGINEERING ECONOMICS
13	41CE16T	QUALITY CONTROL, ASSURANCE & SAFETY IN CONSTRUCTION
14	41CE17T	MANAGEMENT INFORMATION SYSTEM
15	41CE18T	VALUE ENGINEERING
16	41CE19T	ENTERPRISE RESOURCE PLANNING
17	41CE20T	FINANCE MANAGEMENT
18	41CE21T	SAFETY IN CONSTRUCTION
19	41CE22T	CONSTRUCTION MATERIALS & MATERIALS MANAGEMENT

(Handwritten signatures and initials)



41CE04T : DESIGN OF PRESTRESSED CONCRETE

S	T	P	SESSIONAL - TA			ESE
			SA	MSE	TOTAL	
3	1	-	20	20	40	60

Unit-I Methods, Systems and Materials

Basic principles, methods and systems of prestressing, external, internal, full, partial, pre-tensioning and post-tensioning, quality of concrete and steel, I.S. Code provisions for allowable stresses, Advantages of prestressing and importance of high strength materials.

Unit-II Analysis of Structures for Flexure

Cases of axial and eccentric prestressing allowing suitable percentage loss of prestress. Stresses in concrete at various stages, lever arm concept and center of pressure, pressure line, kern distances, load balancing cable profiles, critical span (for solid slabs only), Efficiency of a section.

Unit -III Losses of Prestressing ✓

Various types of losses of prestress and their calculation, loss due to friction, I.S. Code provisions, Elastic shortening due to successive tensioning of cables.

Design of section for flexure

I.S. Code provisions for cover and spacing, standard Fressinet and Gifford Udall cables, Design of beams and slabs, cable zones and profiles.

Unit-IV Composite Beams

Different types, Loading conditions, analysis for stresses, differential shrinkage.

BOND AND ANCHORAGE

Bond stress and its significance in pre-tensioned beams, transmission length, determination of bursting force due to anchor zone stresses and provision of steel according to I.S. Code for prestressed concrete.

Shear

Calculation of diagonal tension and its inclination (including vertical prestressing also) provision of steel according to elastic method and I.S. Code method, advantages of prestressing.

Unit-V Limit State Design

Limit state of serviceability and strength, calculation of ultimate bending moment for given sections, advantages of limit state method over working stress method.

Miscellaneous uses

Analysis and design of poles and circularly prestressed pipes and tanks.

NAME OF TEXT BOOKS:

Prestressed Concrete – Krishna Raju N. (New Age International)

Prestressed Concrete -



ISO 9000 in Construction – Nee, Paul A. (Wiley Interscience Publication, 1994)
IS: 14000, – Quality System – Guidelines for Selection and Use of Standards on Quality System
1988.

Name of Reference Books:

ISO 9000 in Construction – Wah, L.S., Min., L.C. & Ann, T.W. (McGraw Hill Book Company,
199 Construction Engineering and Management – S. Sectarmanun (Umesh Publication)

41CE17T : MANAGEMENT INFORMATION SYSTEM

Unit I: Management and System- Advance in management, the process
of MIS development, MIAS organization, Information dynamics.

Unit II: Planning, Design and implementation of MIS, Strategic planning,
MIS design- Group design concepts, Acquiring information system.

Unit III: System life cycle-Information flow, Entity relationship
modeling, data modeling, detailed process analysis, data flow diagrams.

Unit IV: Decision making system with MIS, System concepts for MIS.

Unit V: Data information and communication, problem solving and decision
making, security, control and failure, Future trends in MIS.

Name of Text Books:

Management Information Systems, by S. Sadagopan, PHI Learning Pvt. Ltd
Management Information Systems By . Chatterjee, PHI Learning Pvt. Ltd
Management Information Systems (11th Edition), by Ken Laudon and Jane Laudon

41CE18T : VALUE ENGINEERING

UNIT – I Basic Concepts

Meaning of the term value, basic kind, reasons for poor value, value addition, origin and history.
Benefits, relevance in Indian scenario.

UNIT – II Techniques

Different techniques, organizing value engineering study, value engineering and quality.

UNIT – III Job Plan

Different phases, General phase, Information phase, Functional Phase, Creation Phase,
Evaluation Phase, Investigation Phase, Implementation Phase, Audit.

UNIT – IV Selection of evaluation of VE Projects

Project selection, method selection, value standard, application of methodology.

UNIT – V Value Engineering Program

VE operations in maintenance and repair activities, VE Cost, life cycle, cost model, training for
VE, general value engineering, case studies.

TEXT BOOKS

Value Engineering – S.S. Iyer – New Age International Publishers, New Delhi



SEMESTER VIII

42CE01T : BRIDGE & TUNNEL ENGINEERING

L	T	P	SEMESTRAL - TA			ESE
			LA	MSE	TOTAL	
2	1	-	20	20	40	60

Unit-I: Importance of hydrologic factors in bridge design, Hydraulic geometry, linear water ways, economic span, afflux and scour.

Unit-II: Brief historical review, Different types of Bridges and span range, Bridge codes, Bridge super structures

Unit-III: Design of Reinforced concrete slab bridge decks and Tee beam bridge

Unit-IV: Types of tunnel, Survey and exploration, Planning of tunnels, Stresses in tunnel.

Tunnel V: Tunneling methods, Various construction techniques of tunnel in soil and rock.

42CE02T : CONSTRUCTION PLANNING AND MANAGEMENT

L	T	P	SEMESTRAL - TA			ESE
			LA	MSE	TOTAL	
2	1	-	20	20	40	60

Unit 1

Introduction : Objectives and functions of project management, project feasibility reports, Planning for construction projects, Cost control in construction-importance, objectives of cost control, cost control systems.

Unit 2

Scheduling: Scheduling Job layout and Line of balance, project management through networking, Bar Chart, Linked bar chart, Work-break down structures, Activity-on-arrow diagrams.

CPM: Critical Path, Probabilistic activity durations; Event based network,

PERT Network: Time-cost Study, Crashing, Resources allocation.

Economics of Project management: Economic analysis of engineering projects, economic studies, sensitivity analysis, Introduction to Management Information System (MIS)- definition, outline of MIS.

Unit 3

Safety and Quality Control: Importance, causes of Accidents safety measures, responsibility for safety, safety benefits to various parties.

Quality control in construction: Importance, Elements of quality, Quality Assurance Techniques, Quality Control Circles. Total Quality Management in construction, Introduction, Elements of

TQM, Approaches to total quality, difference between traditional management and TQM, Applications and constants of TQM in construction process.

Unit 4

Construction Equipments and Management : Classification of construction equipments, Earth moving equipments: Power shovel, hoe, dozer, dumper, trailers and tractor, rollers, sheet

foot rollers, pumps, hauling equipments, hoisting equipments, aggregate and concrete production equipments: Weight batcher, Mixer, Vibrator, Batching Plant, Concrete pump, Cranes, Lifting equipment, pile driving equipments.

Unit 5

Time and motion studies, waiting line theory, factors affecting selection of construction equipments, cost of owning and operating the construction Equipment, equipment maintenance.

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Name of Text Books:

Construction Engineering and Management – S. Seetharaman (Umesh Publications, New delhi, 1997)

PERT & CPM – Punmia, B.C. and Khandelwal, K.K. (Laxmi Publications, New Delhi 1997)

Construction Management and Planning – Sen Gupta & Guha (Tata McGraw Hill)

Name of Reference Books:

Construction Planning Equipment and Methods – Peurify/ Schexnayder, 6th Edition (Tata McGraw Hill)

PERT & CPM – Sreenath, I.S. (East West Press, New Delhi, 1975)

Construction Management and Accounts – Vazirani, V.N. & Chandola, S.P. (Khanna Publishers, New Delhi, 2002)

Construction Planning and Management – Gahlot & Dhir (New Age Publishers)

LIST OF ELECTIVES – III & IV

SN	COURSE CODE	SUBJECT
1	42CE03T	AIR AND WATER QUALITY MODELLING
2	42CE04T	INDUSTRIAL WASTEWATER MANAGEMENT
3	42CE05T	AIR POLLUTION CONTROL ENGINEERING
4	42CE06T	ENVIRONMENTAL IMPACT ASSESSMENT
5	42CE07T	SOLID AND HAZARDOUS WASTE MANAGEMENT
6	42CE08T	ENVIRONMENTAL GEO- TECHNOLOGY
7	42CE09T	WATER RESOURCES PLANING & MANAGEMENT
8	42CE10T	GROUND WATER HYDRAULICS
9	42CE11T	ADVANCE FLUID MECHANICS
10	42CE12T	RAIN WATER HARVESTING
11	42CE13T	ADVANCE TRANSPORTATION ENGG.
12	42CE14T	GROUND IMPROVEMENT TECHNIQUES
13	42CE15T	DYNAMICS OF SOIL & FOUNDATION
14	42CE16T	GEO-INFORMATICS & GIS APPLICATIONS
15	42CE17T	ROCK MECHANICS
16	42CE18T	PLANING & DESIGN OF BUILDING SERVICES
17	42CE19T	DISASTER MITIGATION & MANAGEMENT

42CE03T : AIR AND WATER QUALITY MODELLING

1. Modelling/Concept

Water and air quality management – Role of mathematical models; systems approach –systems and models – kinds of mathematical models – model development and validation effluent and stream standards; ambient air quality standards.

2. Surface Water Quality Modelling:

Historical development of water quality models; rivers and streams water quality modeling – river hydrology and flow – low flow analysis – dispersion and mixing – flow, depth and velocity – estuaries – estuarine transport, net estuarium flow, estuary dispersion coefficient; Lakes and impoundments – Water quality response to inputs; water quality modeling process – model

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References:

1. Eckenfelder, W.W., 'Industrial Water Pollution Control', Mc-Graw Hill, 2000.
2. Nelson Leonard Nemerow, "Industrial waste treatment - contemporary practice and vision for the future", Elsevier, Singapore, 2007
3. Frank Woodard, 'Industrial waste treatment Handbook', Butterworth Heinemann, New Delhi, 2001.
4. World Bank Group, 'Pollution Prevention and Abatement Handbook - Towards Cleaner Production', World Bank and UNEP, Washington D.C., 1998
5. Paul L. Bishop, 'Pollution Prevention: - Fundamentals and Practice', Mc-Graw Hill International, Boston, 2000.

42CE05T : AIR POLLUTION CONTROL ENGINEERING

1) INTRODUCTION:

Sources and classification of Air pollutants: Natural contaminants, Aerosols, Gases & Vapors; Primary & Secondary Air pollutants; Stationary & Mobile Sources.

Meteorology and Air pollution: Factors influencing Air pollution; Atmospheric stability & temperature inversions; Mixing height; Plume behavior; Wind rose; Stack effluent dispersion theories; Stack height.

2) SAMPLING PROCEDURES: Sampling Methods, Difficulties in sampling, Stages & considerations of air sampling, Instruments for sampling waste gases & atmosphere, sampling period & methods, High volume sampler, Stack sampling techniques, selection of sampling location, procedure for collection & sampling of particulate matter, Gaseous sampling, recent trends in sampling of stack effluents.

3) Control of Particulates / aerosols: Objectives & types of Collection equipment; Principle, application, working, advantages & disadvantages of: i) Settling chambers, ii) Inertial separators, iii) Cyclones, iv) Filters, v) Electrostatic Precipitators & vi) Scrubbers; Choice of equipment.

4) Control of Smoke -Gaseous Contaminants & Odour:

Smoke: Sources, measurement by Ringelmann chart, miniature chart & other method; Prevention & control of smoke. Control of exhaust emissions.

Gaseous Contaminants: Methods of control viz combustion, absorption, adsorption, closed collection & masking.

Odour Control.

5) Control measures for Industrial Applications:

Introduction to control of air pollution by process changes.

Control measures for industries such as Cement Industry, Concrete batching plant, Asphaltic concrete plant, Glass manufacture, Asbestos processing, Thermal Power plant and Coal tar industry.

References:

1. Richard W. Boubel et al "Fundamentals of Air pollution", Academic Press, New York, 1994.
2. Noel de Nevers, Air Pollution control Engineering, McGraw Hill, New York, 1995.
3. M.N. Rao et al, "Air Pollution" Tata McGraw Hill, 1989.

42CE06T : ENVIRONMENTAL IMPACT ASSESSMENT

1. Introduction

Historical development of Environmental Impact Assessment (EIA). EIA in Project Cycle. Legal and Regulatory aspects in India. - Types and limitations of EIA - Cross sectoral issues and terms of reference in EIA - Public Participation in EIA. EIA process- screening - scoping - setting - analysis - mitigation

2. Components And Methods For Eia

Matrices - Networks - Checklists - Connections and combinations of processes - Cost benefit analysis - Analysis of alternatives - Software packages for EIA - Expert systems in EIA. Prediction tools for EIA - Mathematical modeling for impact prediction - Assessment of impacts - air - water - soil - noise - biological - Cumulative Impact Assessment -

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गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur - 495009 (C.G.)



42CE13T : ADVANCE TRANSPORTATION ENGG.

Unit 1

Rail transport, Railway surveying, Rolling stock and track resistance, Permanent way, Railway gauges, Sleepers, Ballast and Track design.

Unit 2

Track maintenance, Station and yards, Points and crossings, Signaling, Tractive power and tractive resistance.

Unit 3

Introduction, Highway Surveys and plans, Highway alignment, Road Drainage, Road geometrics.

Unit 4

Traffic engineering, Road materials: Soil, Aggregate, Binders: Bitumen. Road Pavement, Soil stabilization, Design factor, Design of flexible pavements, Design of rigid pavements.

Unit 5

Road Maintenance: General causes, Failure of flexible pavements, typical flexible pavement failures, Failure in cement concrete pavements, typical failure of rigid pavements, maintenance of bituminous roads, formation of waves and corrugations in flexible pavements, remedial measures for waves and corrugations.

Tunnels: Advantages and disadvantages, Economics, Selection of routes, classification. Tunnel surveying, methods of tunnelling in soft strata, compressed air methods, tunneling in rock, safety precaution, tunnel lining, tunnel drainage, tunnel ventilation.

Name of Text Books:

S. Chandra & M. M. Agarwal, *Railway Engineering*, Oxford University Press, New Delhi, 1st Ed. 2007.
R. Srinivasan, *Harbour Dock and Tunnel Engineering*, Charotar Publishing House, 20th Ed. 2006.

Traffic Engineering and Transport Planning – Kadiyali, L.R. (Khanna Publishers, Delhi, 1996)
Transport Planning and Traffic Engineering – Flaherty, CAO (John Wiley & Sons, Inc., New York, 1997)
Traffic Engineering – McShane, W.R. and Roes, R.P. (Prentice Hall, New Jersey, 1990)

Name of Reference Books:

Principles of Urban Transport Systems Planning – Hutchinson, B.G. (Scripta Book Company, Washington, D.C., 1974)
Modelling Transport – Ortuzar, title D. and Willumson, L.G. (John Wiley & Sons, New York, 1995)
M. M. Agrawal, *Railway Engineering*, Standard Publishers New Delhi, 2002.
S. C. Saxena & S. P. Arora, *A text Book of Railway Engineering*, Dhanpat Rai & Sons.
S. C. Saxena, *Tunnel Engineering*, Dhanpat Rai & Sons, 2006.
Transport Planning and Traffic Engineering – Flaherty, CAO (Ed.) (John Wiley & Sons, Inc., New York, 1997)
Traffic Flow Fundamentals – May, A.D. (Prentice Hall, Englewood Cliffs, New Jersey, 1990)