



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

**Department : *Civil Engineering***

**Programme Name : *B.Tech.***

**Academic Year : *2018-19***

***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.	CE5TPC07	DESIGN OF CONCRETE STRUCTURES
19.	CE5TPC08	STRUCTURAL ANALYSIS - II
20.	CE5TPC09	HIGHWAY ENGINEERING
21.	CE5TPC10	ESTIMATION AND COSTING
22.	CE5TPC11	GEOTECHNICAL ENGINEERING - I
23.	CE5TPC12	ENVIRONMENTAL ENGINEERING - I
24.	CE5LPC04	HIGHWAY ENGINEERING LAB
25.	CE5LPC05	ENVIRONMENTAL ENGINEERING LAB
26.	CE6TPC13	WATER RESOURCES ENGINEERING-I
27.	CE6TPC14	ENVIRONMENTAL ENGINEERING - II



28.	CE6TPC15	DESIGN OF STEEL STRUCTURES
29.	CE6TPC16	GEOTECHNICAL ENGINEERING- II
30.	CE6TPE1D	HIGHWAY SAFETY
31.	CE6TOE1A	CONSTRUCTION PLANNING & MANAGEMENT
32.	CE6LPC05	GEOTECHNICAL ENGINEERING- LAB
33.	CE6LPC06	COMPUTER APPLICATION IN CIVIL ENGG. LAB
34.	CE7TPC17	WATER RESOURCES ENGINEERING-II
35.	CE7TPE2A	DESIGN OF PRESTRESSED CONCRETE
36.	CE7TPE4A	GROUND WATER HYDROLOGY
37.	CE7TPE5C	RAILWAY ENGINEERING
38.	CE7TOE2D	QUALITY CONTROL ASSURANCE AND SAFETY IN
39.	CE7LPS01	SEMINAR
40.	CE7LPS02	MINOR PROJECT
41.	CE8TPC18	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES
42.	CE8TPE6C	BRIDGE ENGINEERING
43.	CE8TPE7A	AIR AND WATER TRANSPORTATION
44.	CE8TOE3A	MANAGEMENT INFORMATION SYSTEM
45.	CE8LPS03	MAJOR PROJECT
46.	CE8LPC07	STRUCTURAL DETAILING LAB



## 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
		<b>Practical</b>											
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
											<b>Total Credits</b>	<b>23</b>	

**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
		<b>Practical</b>											
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
											<b>Total Credits</b>	<b>25</b>	

<sup>1</sup>Lecture Hours, <sup>2</sup>Tutorial Hours, <sup>3</sup>Practical Hours, <sup>4</sup>Mid Sem. Exam, <sup>5</sup>Class Test, <sup>6</sup>Teacher Assessment (Attendance & Assignments), <sup>7</sup>Lab 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 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
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, Lame'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  $2\pi$ , 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  $\chi^2$  (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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CIVIL ENGG. IT GGV.

CBCS

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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CBCS

**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)

urveying (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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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 -  $45^\circ$
9. To determine the coefficient of discharge  $C_d$  V Notch -  $60^\circ$
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: CE3LES05  
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: CE4TH503  
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 marks and their functions, Industrial policies, theory of localization, weber & surgent 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.

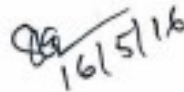
Text/Reference Books:

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. PareekSaroj (2003), Textbook of Business Economics, Sunrise Publishers

  
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**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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CIVIL ENGG. IT GGV.

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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**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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**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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**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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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.

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SYLLABUS (SEMESTER-IV)  
Subject Code: CERTBS06  
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, Regula Falsi 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's 1/3rd and 3/8th rule, Boole's rule, wedge 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 Runge-Kutta 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. JAIN & INNGAR 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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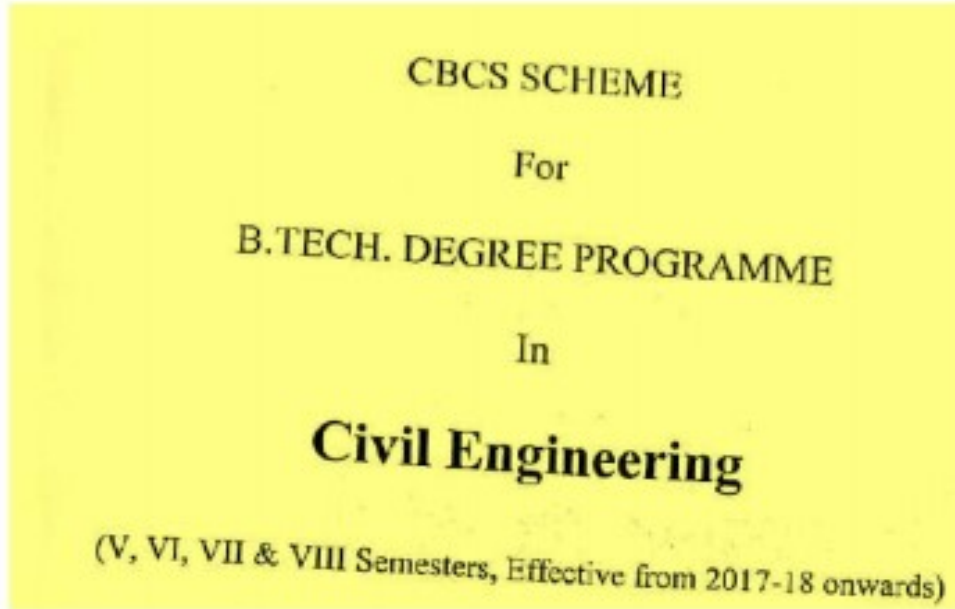
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गुरु घासीदास विश्वविद्यालय  
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)  
कोनी, बिलासपुर - 495009 (छ.ग.)



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



INSTITUTE OF TECHNOLOGY



GURU GHASIDAS VISHWAVIDYALAYA,  
(A CENTRAL UNIVERSITY)  
BILASPUR (C.G.) - 495009

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**V SEMESTER B.TECH. (CIVIL ENGG.)**

Sl No	Subject Code	Subjects	Periods/Week		Evaluation Scheme						Grand Total	Credits	
					Internal Assessment					E.S.E			
					L <sup>1</sup>	T <sup>2</sup>	P <sup>3</sup>	C.T. <sup>4</sup>	M.S.E. <sup>5</sup>				T.A. <sup>6</sup>
		<b>Theory</b>											
1	CESTPC07	Design of Concrete Structures	3	1	0	10	20	10	-	40	60	100	4
2	CESTPC08	Structural Analysis - II	3	1	0	10	20	10	-	40	60	100	4
3	CESTPC09	Highway Engineering	3	0	0	30	20	10	-	60	60	100	3
4	CESTPC10	Estimation and Costing	3	0	0	10	20	10	-	40	60	100	3
5	CESTPC11	Geotechnical Engineering - I	3	0	0	30	20	10	-	60	60	100	3
6	CESTPC12	Environmental Engineering - I	3	0	0	30	20	10	-	60	60	100	3
		<b>Practical</b>											
1	CESLPC04	Highway Engineering Lab	-	-	3	-	-	-	30	30	20	50	2
2	CESLPC05	Environmental Engineering Lab	-	-	3	-	-	-	30	30	20	50	2
<b>Total Credits</b>											<b>24</b>		

**VI SEMESTER B.TECH. (CIVIL ENGG.)**

Sl No	Subject Code	Subjects	Periods/Week		Evaluation Scheme						Grand Total	Credits	
					Internal Assessment					E.S.E			
					L <sup>1</sup>	T <sup>2</sup>	P <sup>3</sup>	C.T. <sup>4</sup>	M.S.E. <sup>5</sup>				T.A. <sup>6</sup>
		<b>Theory</b>											
1	CE6TFC13	Water Resources Engineering - I	3	0	0	10	20	10	-	40	60	100	3
2	CE6TFC14	Environmental Engineering - II	3	0	0	30	20	10	-	60	60	100	3
3	CE6TFC15	Design of Steel Structures	3	1	0	10	20	10	-	40	60	100	4
4	CE6TFC16	Geotechnical Engineering - II	3	0	0	30	20	10	-	60	60	100	3
5	CE6TFC1X	Professional Elective -IX	3	1	0	10	20	10	-	40	60	100	4
6	CE6TCE1X	Open Elective -IX	3	0	0	10	20	10	-	40	60	100	3
		<b>Practical</b>											
1	CE6LPC05	Geotechnical Engineering - Lab	0	0	3	-	-	-	30	30	20	50	2
2	CE6LPC06	Computer Applications in Civil Engg. Lab	0	0	3	-	-	-	30	30	20	50	2
<b>Total Credits</b>											<b>24</b>		

Note: Industrial Training for one month is mandatory after end semester examination

X<sub>i</sub> indicates the serial alphabet of a subject in the subject group  
<sup>1</sup>Lecture Hours, <sup>2</sup>Tutorial Hours, <sup>3</sup>Practical Hours, <sup>4</sup>Mid Sem. Exam, <sup>5</sup>Class Tests/Assignments, <sup>6</sup>Lab Work Assessment

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(R.V. Anand)

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(Dr. J.K. Dewangan)  
NIT Raipur.

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**List of Professional (Core) Electives**

Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CEGTPE1X	Professional Elective-1 (PE Group-1)	4	VI
A	CEGTPE1A	Advanced Concrete Technology		
B	CEGTPE1B	Advanced Surveying		
C	CEGTPE1C	Advanced Concrete Design		
D	CEGTPE1D	Highway Safety		
E	CEGTPE1E	Advanced Fluid Mechanics		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CETTPE2X	Professional Elective-2 (PE Group-2)	4	VII
A	CETTPE2A	Design of Prestressed Concrete		
B	CETTPE2B	Structural Dynamics		
C	CETTPE2C	Theory of Elasticity & Plasticity		
D	CETTPE2D	Fracture of Concrete Structures		
E	CETTPE2E	Advance Structural Analysis		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CETTPE3X	Professional Elective-3 (PE Group-3)	3	VII
A	CETTPE3A	Environmental Geotechnical Engineering		
B	CETTPE3B	Air Pollution Control Engineering		
C	CETTPE3C	Industrial Waste Water Management		
D	CETTPE3D	Water Resources Planning & Management		
E	CETTPE3E	Environmental Impact Assessment		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE7TPE4X	Professional Elective-4 (PE Group-4)	3	VII
A	CE7TPE4A	Ground Water Hydrology		
B	CE7TPE4B	Ground Improvement Techniques		
C	CE7TPE4C	Geo-Informatics & GIS Applications		
D	CE7TPE4D	Rock Mechanics		
E	CE7TPE4E	Design of Hydraulic Structures		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE7TPE5X	Professional Elective-5 (PE Group-5)	3	VII
A	CE7TPE5A	Industrial Structures		
B	CE7TPE5B	Systems Analysis in Civil Engineering		
C	CE7TPE5C	Railway Engineering		
D	CE7TPE5D	Pavement Construction and Maintenance		
E	CE7TPE5E	Planning & Design of Building Services		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE8TPE6X	Professional Elective-6 (PE Group-6)	4	VIII
A	CE8TPE6A	Machine Foundation		
B	CE8TPE6B	Earthquake Geotechnical Engineering		
C	CE8TPE6C	Bridge Engineering		
D	CE8TPE6D	Solid and Hazardous Waste Management		
E	CE8TPE6E	Construction Equipment & Techniques		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE8TPE7X	Professional Elective-7 (PE Group-7)	3	VIII
A	CE8TPE7A	Air and Water Transportation		
B	CE8TPE7B	Theory of Plates & Shells		
C	CE8TPE7C	Repair and Rehabilitation of Structures		
D	CE8TPE7D	Finite Element Analysis		
E	CE8TPE7E	Hydropower Engineering		

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**List of Open Electives**

Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE6TOE1X	Open Elective-1 (OE Group-1)	3	VI
A	CE6TOE1A	Construction Planning and Management		
B	CE6TOE1B	Rural Technology and Community Development		
C	CE6TOE1C	Engineering System Design Optimization		
D	CE6TOE1D	Engineering System Modelling and Simulation		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE7TOE2X	Open Elective-2 (OE Group-2)	3	VII
A	CE7TOE2A	Value Engineering		
B	CE7TOE2B	Supply Chain Management-Planning		
C	CE7TOE2C	Travel Demand Analysis		
D	CE7TOE2D	Quality Control Assurance and Safety in Construction		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE8TOE3X	Open Elective-3 (OE Group-3)	3	VIII
A	CE8TOE3A	Management Information System		
B	CE8TOE3B	Enterprise Resource Planning		
C	CE8TOE3C	Engineering Risk-Benefit Analysis		
D	CE8TOE3D	Fluid Dynamics		

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SYLLABUS		[SEMESTER-V]							ESE
Subject Code:	CESTPC07	CREDITS: 4			SESSIONAL - TA				
Subject:	Design of Concrete Structures	L	T	P	CT	MSE	TA	TOTAL	
		3	1	-	10	20	10	40	60
<p>UNIT - 1: Introduction to design of concrete structures-limit state analysis and design of beams flexure, bond</p> <p>UNIT- 2: Shear and torsion</p> <p>UNIT-3: One way slabs, stair cases, Two-way slabs</p> <p>UNIT- 4: Axially and eccentrically loaded columns. (uniaxial only)</p> <p>UNIT-5: Footings – different types of isolated footings, synthesis of limit state and working St methods.</p> <p>REFERENCE BOOK: Reinforced Concrete Design by Pillai &amp; Menon Limit State Design of Reinforced Concrete by P.C. Verghese</p>									

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SYLLABUS		(SEMESTER-V)							
Subject Code:	CESTPCOB	CREDITS: 4			SESSIONAL - TA			ESE	
Subject:	Structural Analysis - II	L	T	P	CT	MSE	TA		TOTAL
		3	1	-	10	20	10	40	50
<p>UNIT-1: Analysis of indeterminate beams by Consistent Deformation methods, Analysis of indeterminate rigid plane frames and truss using energy method.</p> <p>UNIT-2: Slop Deflection Method: Continuous beams and portals by moment distribution due to load and yielding of supports.</p> <p>UNIT-3: Moment-distribution method. Continuous beams and portals by moment distribution due to load and yielding of supports.</p> <p>UNIT-4: Introduction to Flexibility matrix and Stiffness Matrix methods: Applications of the methods to simple indeterminate beams.</p> <p>UNIT-5: Analysis of symmetrical two hinge arches (parabolic and circular). Influence lines for propped cantilevers, continuous beams using Muller-Breslau's principle.</p> <p>REFERENCE BOOK: Indeterminate Structural Analysis by C. K. Wang Fundamental of Structural Analysis by Leet.</p>									

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SYLLABUS		(SEMESTER-V)						ESE
Subject Code:	CESTPC09	CREDITS: 3			SESSIONAL - TA			
Subject:	Highway Engineering	L	T	P	CT	MSE	TA	TOTAL
		3	-	-	10	20	10	40
<p><b>UNIT 1: Introduction:</b> Importance of highway transportation, Modes of transportation, characteristics of highway transport. Historical development &amp; planning: Historical development of roads, Road development and planning in India, Necessity of planning, Roads classification, patterns, Planning surveys. Highway alignment and surveys: Engineering Surveys for highway location Maps and Drawing. Highway drainage: Importance, Surface and subsurface drainage.</p> <p><b>UNIT 2: Geometric Design:</b> Cross Section elements, Sight Distance, Design of horizontal and vertical Alignment.</p> <p><b>UNIT 3: Traffic Engineering:</b> Traffic characteristics, studies such as volume, density, Speed, 'Q' and 'D' and their uses, Traffic control devices and road accidents.</p> <p><b>UNIT 4: Highway Materials:</b> Behaviour of highway materials, properties of Subgrade materials and pavement component materials. Tests on subgrade soil, aggregate and bitumen.</p> <p><b>UNIT 5: Pavement Design:</b> Types of pavements, Factors affecting design of flexible and rigid pavements, Design of flexible pavements: Group Index, I.R.C. recommended method, California highway department method, U. S. Corp method Design of Rigid pavement: Westergard's stress analysis of wheel loads for design of pavement, effect of temperature and warping stress in design</p> <p><b>TEXT BOOK:</b> Principle and Practices of Highway Engineering – Kadiyali &amp; Lab (Khanna Publishers, Delhi) Highway Engineering – S. K. Khanna &amp; C.E.G. Justo (Khanna Publishers, Delhi) Highway Engineering – Rangawala S.C. (Charotar Publishers) A textbook of Transportation Engineering – S.P. Chandola (S. Chand) Transportation Engineering – A.K. Upadhyay (S.K. Kataria &amp; Sons)</p> <p><b>REFERENCE BOOK:</b> Specifications for Road and Bridge Works – MOST (IRC Publishers) Manual for Survey, Investigation and Preparation of Road Projects – IRC Publication 2001.</p>								

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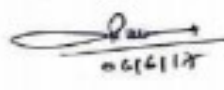


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SYLLABUS		(SEMESTER-V)						
Subject Code:	CE5TPC10	CREDITS:			SESSIONAL - TA			ESE
		L	T	P	CT	MSE	TA	TOTAL
Subject:	Estimation and Costing	3	-	-	10	20	10	40
								60
<p>UNIT-1: Method of estimating, measurements, taking out quantities.</p> <p>UNIT-2: Typical estimates for buildings and Civil Engineering Works, Specifications for all types building items.</p> <p>UNIT-3: Analysis of rates, data for various building items.</p> <p>UNIT-4: Earthwork calculations.</p> <p>UNIT-5: Introduction to Departmental procedures, tender, contracts, arbitrations, valuation of buildings.</p> <p>REFERENCE BOOKS: B.N Dutta, Estimating and Costing in Civil Engineering Theory and Practice M. Chakraborti, Estimating, Costing and Specifications in Civil Engineering.</p>								



SYLLABUS	(SEMESTER-V)								
Subject Code:	CESTPC11	CREDITS : 3			SESSIONAL - TA			ESE	
Subject:	Geotechnical Engineering - I	L	T	P	CT	MSE	TA		TOTAL
		3	-	-	10	20	10	40	60

Unit 1: Introduction, Basic Definitions and Relationships, Determination of Index Properties, Classification of Soils.

Unit 2: Soil Water: Types of soil water, Capillarity in soils, Permeability of soils, Darcy's law, Determination of permeability of soils, Permeability of stratified soils, Seepage velocity, Absolute coefficient of permeability, Factors affecting permeability- Effective stress principle- Effective stress under different field conditions- Seepage pressure-Quick sand condition.

Unit 3: Stress distribution in Soils: Importance of estimation of stresses in soils – Boussinesq's and Westergaard's theories for point loads, uniformly loaded circular and rectangular areas, pressure bulb, variation of vertical stress under point load along the vertical and horizontal planes – Newmark's influence chart.

Unit 4: Compaction of Soils: Definition and importance of compaction – Standard Proctor compaction test, Modified compaction test- Factors affecting compaction- Influence of compaction on soil properties – Field compaction and its control.  
Consolidation: Types of compressibility – Immediate settlement – Primary consolidation and secondary consolidation – Stress history of clay, normally consolidated soil, over consolidated soil and under consolidated soil- pre consolidation pressure and its determination- Estimation of settlements - Terzaghi's 1-D consolidation theory – Coefficient of consolidation and its determination.

Unit 5: Shear Strength: Definition and use of shear strength - Source of shear strength- Normal and Shear stresses on a plane – Mohr's stress circle- Mohr-Coulomb failure theory- Measurement of shear strength, Drainage conditions -Direct shear test, Triaxial shear test, Unconfined compression test and Vane shear test – Factors affecting shear strength of granular soils and cohesive soils.  
Stability of Soil Slopes: Types of slopes – Types of slope failures – Slip circle method, Determination of centre of most critical slip circle – Taylor's stability charts and their use. Stabilisation of soil slopes.

REFERENCE BOOKS:

1. "Basic and Applied Soil Mechanics" by Gopal Ranjan and A.S.R. Rao, Wiley Eastern Ltd., New Delhi, 2009.
2. "Soil Mechanics and Foundation Engg" by V.N.S. Murthy, CBS Pub. New Delhi. 2007.
3. Geotechnical Engineering by B. M. Das, Bharat Singh, Samsher Alam
4. Geotechnical Engineering by S. K. Gulathi & Dutta
5. Soil Mechanics by Lambe & Whitman
6. Soil Mechanics by B.C.Punamla,

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SYLLABUS		(SEMESTER-V)						ESE
Subject Code:	CESTPC12	CREDITS: 3			SESSIONAL - TA			
Subject:	Environmental Engineering - I	L	T	P	CT	MSE	TA	TOTAL
		3	-	-	10	20	10	40
								60

UNIT 1: Introduction: Necessity and importance of water supply schemes. Water demand: 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.

TEXT BOOKS:  
Water Supply Engineering – S.K. Garg (Khanna Publication).  
Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)

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)

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SYLLABUS		(SEMESTER-V)						
Subject Code:	CE5LPC04	CREDITS:			SESSIONAL - TA			ESE
		2						
Subject:	Highway Engineering Lab	L	T	P	CT	MSE	TA	TOTAL
		-	-	3	-	-	30	30
								20

Minimum 10 experiments to be performed

1. To determine the crushing value of the given aggregate sample.
2. To determine 10% finer value of the given aggregate sample.
3. To determine the abrasion value of the given aggregate sample by los angeles apparatus.
4. To determine the impact value of the given aggregate sample.
5. To determine the elongation index of the given aggregate sample.
6. To determine the flakiness index of the given aggregate sample.
7. To determine the water absorption of the given coarse aggregate.
8. To determine the specific gravity of the given coarse aggregate.
9. To determine the penetration value of the given bitumen material.
10. To determine the softening point of the given bitumen material.
11. To determine the ductility of the given bitumen material.
12. To determine the viscosity of the given bitumen material.

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SYLLABUS										
(SEMESTER-VI)										
Subject Code:	CESLPC05		CREDITS: 2			SESSIONAL - TA			ESE	
Subject:	Environmental Engineering Lab		L	T	P	CT	MSE	TA		TOTAL
			-	-	3	-	-	30	30	20

Determination of the following Parameters in the given Water Sample:

1. Turbidity by Nephelometer.
2. TDS and fixed solids by Gravimetric method.
3. pH using pH-meter.
4. Carbonate, Bi-Carbonate & Hydroxide Alkalinity.
5. Dissolved Oxygen (DO) using DO meter.
6. Concentration of Chlorides.
7. Optimum coagulant dose for coagulation by Jar test apparatus.
8. Chlorine Demand of Water.
9. Total Hardness and Calcium Hardness.
10. Study of Weather Monitoring Station.
11. Study of Sound Level Meter.

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SYLLABUS		(SEMESTER-VI)							
Subject Code:	CE6TPC13	CREDITS: 3			SESSIONAL - TA			ESE	
Subject:	Water Resources Engineering - I	L	T	P	CT	MSE	TA	TOTAL	
		3	-	-	10	20	10	40	60
<p><b>UNIT 1: Introduction:</b> Need for Irrigation, advantages and disadvantages of irrigation, types of irrigation systems – flow irrigation, lift irrigation. <b>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.</b></p> <p><b>UNIT 2: Canal Irrigation:</b> 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, <b>Design of channels by Kennedy's and Lacey's theories, maintenance of irrigation channels.</b></p> <p><b>UNIT 3: Water Logging and its Control.</b> 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 <b>design of lined canals.</b></p> <p><b>UNIT 4: River behaviour, control and training.</b> Objects, river characteristics, classification of river training works, methods of river training embankments, bank protection, cut-offs, meandering causes and parameters. Flood Control; introduction, channel improvement, flood ways evacuation and flood plain zoning. National Policy of floods.</p> <p><b>UNIT 5: Reservoir Planning: Introduction, type of reservoirs, storage zones of a reservoir, mass curve and demand curve, determination of reservoir capacity, safe field. Hydrograph, unit hydrograph, Flood Routing: flood Routing principle, inflow storage discharge method, reservoir losses, reservoir, sedimentation, life of reservoir.</b></p> <p><b>TEXT BOOKS:</b> Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications) Irrigation Engineering – B.C. Punmia (Laxmi Publications)</p> <p><b>REFERENCE BOOKS:</b> Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House) Theory and Design of Irrigation Structures (Volume – I &amp; II) – Varshney (Nem Chand &amp; Bros.) Irrigation and Water resources Engineering – Asawa G.L. (New Age International Publications) Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand &amp; Bros) Water Resources Engineering Larry -W. Mays (Wiley, John &amp; Sons)</p>									

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SYLLABUS		(SEMESTER-VI)							
Subject Code:	CE6TPC14	CREDITS: 3			SESSIONAL - TA			ESE	
Subject:	Environmental Engineering - II	L	T	P	CT	MSE	TA		TOTAL
		3	-	-	10	20	10	40	60

**UNIT - 1:** 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 - 2:** 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 - 3:** Aerobic Treatment UNITS: Biological principle of ASP, SVI, sludge bulking and control; biological principle of Tricking 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 - 4:** 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 - 5:** 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-ILP.Venugopala Rao Tata McGraw Hill Water and Wastewater Technology ,Hammer ( PHI)

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SYLLABUS		(SEMESTER-VI)							
Subject Code:	CE6TPCL5	CREDITS:			SESSIONAL - TA			ESE	
Subject:	Design of steel Structures	L	T	P	CT	MSE	TA		TOTAL
		3	1	-	10	20	10	40	60

**UNIT 1: Introduction:** General, types of Steel, mechanical behaviour of steel, measures of Yielding, measures of Ductility, Types of Structures, Structural Steel Sections.

Methods of Structural design: Introduction- Design Philosophies-Working Stress method-Ultimate Strength method-Load and Resistant factor- Limit State Method-Partial safety factor-Load-Load combinations-Classification of Cross sections- General aspects in the design.

**UNIT 2: Design of Steel fasteners:** Types of fasteners – riveted connections- Bolted connections- Assumptions- Failure of bolted joints – Strength of bolted joints – Design examples – Design of Welded connections – Butt weld- fillet weld – Design examples.

**UNIT 3: Design of Tension Members:** General – Modes of Failure of Tension member- Analysis of Tension members- Example - Design steps – Design examples – Lug angles – Design.  
**Design of Compression Members:** General – Strength of Compression members- Design Compressive strength- Example on analysis of Compression members – Design of Angle struts – Design Examples- Built up Columns- Design of Lacing – Design of Battens- Design Examples- Design of Roof members.

**UNIT 4: Design of Beams:** General- Lateral Stability of Beams- Bending Strength of Beams – Plastic Section Modulus - Design Examples.

**Design of Beam Columns:** Behaviour of members under combined loading – Modes of Failures – Design Examples.

**Design of Column Splices and Column Base:** Design of Column Splice-Design Examples- Design of Column Base- Slab Base- Gusseted Base- Design Examples.

**UNIT 5: Design of Eccentric Connections:** Design of Brackets- Type-1 and Type 2 – Moment Resistant connections - Design Examples.

**Design of Plate Girder:** General- Components of Plate Girder- Optimum depth – Bending Strength – Shear Strength – Shear Buckling- Simple Post critical method- Tension Field method- Stiffeners- Bearing- Transverse stiffeners - Design Examples.

Reading:

1. Limit state Design of Steel Structures – Duggal.
2. Limit state Design of Steel structures – Bhavikatti S S.
3. IS-800-2007.
4. Limit state Design of Steel Structures - Arya & Azmani.

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SYLLABUS		(SEMESTER-VI)							
Subject Code:	CE6TPC16	CREDITS:			SESSIONAL - TA			ESE	
Subject:	Geotechnical Engineering- II	L	T	P	CT	MSE	TA		TOTAL
		3	-	-	10	20	10	40	60
<p>UNIT 1: Lateral Earth Pressures: Lateral earth pressure theory, different types of earth pressures, Rankine's active and passive earth pressures, pressure distribution diagram for lateral earth pressures against retaining walls for different conditions in cohesion less and cohesive soils, Coulomb's active and passive earth pressure theory, Culmann's graphical construction, Problems.</p> <p>UNIT 2: Bearing capacity of foundation: Bearing capacity – Basic Definitions, Factors affecting bearing capacity, estimation of Bearing capacity by different methods. Analytical measures – Terzaghi's and Meyerhof methods and calculations. Field measures – SPT, CPT and Plate load tests. Settlement of foundation: Settlement analysis – Types of foundation settlement, Components of settlements - their estimation, allowable settlement values, effects, causes and remedial measures of total and differential settlements</p> <p>UNIT 3: Shallow foundations: Types of shallow foundations and choice, basic requirements, significance of these foundations Pile foundations: Classification and uses, load carrying capacity calculations by different methods – static methods, dynamic methods, in-situ penetration tests, piles load test; Negative skin friction; under reamed pile foundations; Pile groups – Necessity, Efficiency, Group capacity and settlements.</p> <p>UNIT 4: Well foundations; Types of caissons and their construction; Different shapes of wells, component parts and forces; Estimation of bearing capacity, sinking of wells and remedial measures for tilts and shifts.</p> <p>UNIT 5: Soil Exploration: Introduction and different methods – Direct methods, Semi-direct and Indirect methods; Sampling In soils and rocks; Subsurface exploration program - Preparation of bore logs and preparation of exploration report</p> <p>Reading: 1. Murthy V.N.S (2007): Soil Mechanics and Foundation Engineering – CBS publications, Delhi. 2. Das, BM (2009): Geotechnical engineering – Cengage learning, New Delhi. 3. Gopal Ranjan, Rao ASR (2000): Basic and applied soil mechanics – New age publication, Delhi. 4. Iqbal H Khan (2007): Geotechnical Engineering – Prentice Hall, Delhi. 5. Basic &amp; Applied Soil Mechanics. by- Gopal Ranjan &amp; A. S. R. Rao 6. Foundation Analysis &amp; Design by - J. E. Bowles</p>									

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SYLLABUS		(SEMESTER-VI)							ESE
Subject Code:	CEGTPE1D	CREDITS: 4			SESSIONAL - TA				
Subject:	Highway Safety	L	T	P	CT	MSE	TA	TOTAL	
		3	1	-	10	20	10	40	60

UNIT 1: Introduction to safety - Accident characteristics and factors: road - driver - vehicle-environment.

UNIT 2: Statistical Interpretation and Analysis of Crash Data - Accident recording and analysis.

UNIT 3: Advanced statistical methods, Crash Reconstruction - Driver behaviour and crash "causality", crash reporting and collision diagrams, basics of crash statistics, before-after methods in crash analysis.

UNIT 4: Road Safety Audits - Safety Programs, safety education, Traffic Law Enforcement. Elements of highway safety management systems, Safety countermeasures.

UNIT 5: Safety management process, Mitigation Measures - Crash Facts, Exclusive pedestrian signal phasing, Roadway lighting, pedestrian refuge islands and curb extension. Road Safety Management System.

Reading:

- Institute of Transportation Engineers (ITE), The Traffic Safety Toolbox: A Primer on Traffic Safety, ITE, 1999.
- Lynn B. Fricke, Traffic Accident Reconstruction, Northwestern University Center for Public Safety, 1990.
- Ogden, K.W. Safer Roads: A Guide to Road Safety Engineering, Avebury Technical, 1996.
- Rune Elvik and Truls Vaa, The Handbook of Road Safety Measures, Elsevier, 2004.
- Leonard Evans, Traffic Safety, Science Serving Society, 2004.
- Ezra Hauer, Observational Before-After Studies in Road Safety, Pergamon Press, 1997 (reprinted 2002).
- Simon Washington, Matthew Karlaftis, and Fred Mannering, Statistical and Econometric Methods for Transportation Data Analysis, Chapman & Hall/CRC Press, 2003.
- J. Stannard Baker, Traffic Collision Investigation, Northwestern University Center for Public Safety, 2002.
- Lynn B. Fricke, Traffic Accident Reconstruction, Northwestern University Center for Public Safety, 1990.

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SYLLABUS		(SEMESTER-VI)						
Subject Code:	CE6TOE1A	CREDITS: 3			SESSIONAL - TA			ESE
Subject:	Construction Planning and Management	L	T	P	CT	MSE	TA	TOTAL
		3	-	-	10	20	10	40
<p><b>UNIT 1: Introduction:</b> Objectives and functions of project management, project feasibility reports, Planning for construction projects: Steps, factors, advantages and disadvantages for different stake holder. 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.</p> <p><b>UNIT 2: PERT:</b> Network analysis, critical path, probability of project.</p> <p><b>UNIT3: CPM:</b> Network analysis, Critical Path, Difference between CPM and PERT.</p> <p><b>UNIT 4: Safety:</b> Importance, causes of Accidents safety measures, responsibility for safety, safety benefits to various parties. Quality control in construction: Importance, Elements of quality, Characteristics, factors affecting, specification , inspection, quality control circle.</p> <p><b>UNIT 5: Time and motion studies,</b> Standard and special equipment, factors affecting selection of construction equipment, cost of owning and operating the construction Equipment, Excavatory equipment: Mass haul diagram, terms related with excavatory equipment, types, factors for selection, factors affecting output.</p> <p><b>TEXT BOOKS:</b> Construction Engineering and Management – S. Seetharaman (Umesh Publications, New delhi, 1997) PERT &amp; CPM – Punmia, B.C. and Khandelwal, K.K. (Laxmi Publications, New Delhi 1997) Construction Management and Planning – Sen Gupta &amp; Guha (Tata McGraw Hill) Construction planning and management by U K Srivastava</p> <p><b>REFERENCE BOOKS:</b> Construction Planning Equipment and Methods – Peurify/ Schexnayder, 6th Edition (Tata McGraw Hill) PERT &amp; CPM – Sreenath, I.S. (East West Press, New Delhi, 1975) Construction Management and Accounts – Vazirani, V.N. &amp; Chandola, S.P. (Khanna Publishers, New Delhi, 2002) Construction Planning and Management – Gahlot &amp; Dhir (New Age Publishers)</p>								

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SYLLABUS		(SEMESTER-VI)							
Subject Code:	CE6LPC05	CREDITS:			SESSIONAL - TA			ESE	
Subject:	Geotechnical Engineering - Lab	L	T	P	CT	MSE	TA		TOTAL
		-	-	3	-	-	30	30	20

Minimum 10 experiments to be performed

1. Specific Gravity of soil particles.
2. Sieve Analysis.
3. Liquid Limit, Plastic Limit & Shrinkage Limit.
4. Proctor's Standard Compaction Test.
5. Determination of Field Density.
6. Constant Head Permeability Test.
7. Variable Head Permeability Test.
8. Unconfined Compression Test.
9. Triaxial Compression Test (U.U Test).
10. Consolidation Test.

Reading:  
Soil Mechanics Laboratory Manual.

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SYLLABUS		(SEMESTER-VI)						
Subject Code:	CE6LPC06	CREDITS: 2			SESSIONAL - TA			ESE
Subject:	Computer Application in Civil Engg. Lab	L	T	P	CT	MSE	TA	TOTAL
		-	-	3	-	-	30	30
Minimum 10 problems to be solved either by using STAAD Pro/Excel Programming <b>USING MS EXCEL Programs</b> <ol style="list-style-type: none"> <li>1. Analysis of simple beams</li> <li>2. Design of simply supported RCC beams</li> <li>3. Design of columns</li> <li>4. Design of isolated footing (Flat, stepped and sloped)</li> <li>5. Design of combined footings</li> <li>6. Design of cantilever retaining walls</li> <li>7. Design of slabs (one way and Two way)</li> </ol> <b>USING STAAD Pro</b> <ol style="list-style-type: none"> <li>8. Analysis of simple beams and Frames (2-D)</li> <li>9. Analysis of multi storey frames for DL and LL</li> <li>10. Analysis of multi storey frames for DL, LL, WL/EQL</li> <li>11. Design of structural elements</li> <li>12. Analysis and design of combined footing</li> <li>13. Analysis and design of roof truss</li> <li>14. Analysis of simple beams for rolling loads</li> </ol>								

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**VII SEMESTER B.TECH. (CIVIL ENGG.)**

Sl No	Subject Code	Subjects	Periods /Week			Evaluation Scheme					Grand Total	Credits	
						Internal Assessment				E.S.E			
						L <sup>1</sup>	T <sup>2</sup>	P <sup>3</sup>	CT <sup>4</sup>				MSE <sup>5</sup>
1	CE7TPC17	Water Resources Engineering-II	3	0	0	10	20	10	-	60	100	3	
2	CE7TPE2X	Professional Elective -2X	3	1	0	10	20	10	-	60	100	4	
3	CE7TPE3X	Professional Elective -3X	3	0	0	10	20	10	-	60	100	3	
4	CE7TPE4X	Professional Elective -4X	3	0	0	10	20	10	-	60	100	3	
5	CE7TPE5X	Professional Elective -5X	3	0	0	10	20	10	-	60	100	3	
6	CE7TOE2X	Open Elective -2X	3	0	0	10	20	10	-	60	100	3	
<b>Practical</b>													
1	CE7LPS01	Seminar	0	0	3	50			50	-	50		2
2	CE7LPS02	Minor project	0	0	2	60			60	40	100		4
											<b>Total Credits</b>	<b>25</b>	

X<sub>i</sub> indicates the serial alphabet of a subject in the subject group

**VIII SEMESTER B.TECH.(CIVIL ENGG.)**

Sl No	Subject Code	Subjects	Periods /Week			Evaluation Scheme					Grand Total	Credits	
						Internal Assessment				E.S.E			
						L <sup>1</sup>	T <sup>2</sup>	P <sup>3</sup>	CT <sup>4</sup>				MSE <sup>5</sup>
1	CE8TPC18	Earthquake Resistant Design of structure	3	1	0	10	20	10	-	40	60	100	4
2	CE8TPE6X	Professional Elective -6X	3	0	0	10	20	10	-	40	60	100	3
3	CE8TPE7X	Professional Elective -7X	3	1	0	10	20	10	-	40	60	100	4
4	CE8TOE3X	Open Elective -3X	3	0	0	10	20	10	-	40	60	100	3
<b>Practical</b>													
1	CE8LPS03	Major Project	0	0	15	120			120	80	200		8
2	CE8LPC07	Structural Detailing Lab	0	0	3	-	-	-	30	30	20	50	2
											<b>Total Credits</b>	<b>24</b>	

X<sub>i</sub> indicates the serial alphabet of a subject in the subject group

<sup>1</sup>Lecture Hours, <sup>2</sup>Tutorial Hours, <sup>3</sup>Practical Hours, <sup>4</sup>Mid Sem. Exam, <sup>5</sup>Class Tests/Assignments, <sup>6</sup>Lab Work Assessment

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**List of Professional (Core) Electives**

Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE6TPE1X	Professional Elective-1 (PE Group-1)	4	VI
A	CE6TPE1A	Advanced Concrete Technology		
B	CE6TPE1B	Advanced Surveying		
C	CE6TPE1C	Advanced Concrete Design		
D	CE6TPE1D	Highway Safety		
E	CE6TPE1E	Advanced Fluid Mechanics		
x	CE7TPE2X	Professional Elective-2 (PE Group-2)	4	VII
A	CE7TPE2A	Design of Prestressed Concrete		
B	CE7TPE2B	Structural Dynamics		
C	CE7TPE2C	Theory of Elasticity & Plasticity		
D	CE7TPE2D	Fracture of Concrete Structures		
E	CE7TPE2E	Advance Structural Analysis		
x	CE7TPE3X	Professional Elective-3 (PE Group-3)	3	VII
A	CE7TPE3A	Environmental Geotechnical Engineering		
B	CE7TPE3B	Air Pollution Control Engineering		
C	CE7TPE3C	Industrial Waste Water Management		
D	CE7TPE3D	Water Resources Planning & Management		
E	CE7TPE3E	Environmental Impact Assessment		
x	CE7TPE4X	Professional Elective-4 (PE Group-4)	3	VII
A	CE7TPE4A	Ground Water Hydrology		
B	CE7TPE4B	Ground Improvement Techniques		
C	CE7TPE4C	Geo-Informatics & GIS Applications		
D	CE7TPE4D	Rock Mechanics		
E	CE7TPE4E	Design of Hydraulic Structures		
x	CE7TPE5X	Professional Elective-5 (PE Group-5)	3	VII
A	CE7TPE5A	Industrial Structures		
B	CE7TPE5B	Systems Analysis in Civil Engineering		
C	CE7TPE5C	Railway Engineering		
D	CE7TPE5D	Pavement Construction and Maintenance		
E	CE7TPE5E	Planning & Design of Building Services		
x	CE8TPE6X	Professional Elective-6 (PE Group-6)	4	VIII
A	CE8TPE6A	Machine Foundation		
B	CE8TPE6B	Earthquake Geotechnical Engineering		
C	CE8TPE6C	Bridge Engineering		
D	CE8TPE6D	Solid and Hazardous Waste Management		
E	CE8TPE6E	Construction Equipment & Techniques		
x	CE8TPE7X	Professional Elective-7 (PE Group-7)	3	VIII
A	CE8TPE7A	Air and Water Transportation		
B	CE8TPE7B	Theory of Plates & Shells		
C	CE8TPE7C	Repair and Rehabilitation of Structures		
D	CE8TPE7D	Finite Element Analysis		
E	CE8TPE7E	Hydropower Engineering		

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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.)**



List of Open Electives

Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE6TOE1X	Open Elective-1 (OE Group-1)	3	VI
A	CE6TOE1A	Construction Planning and Management		
B	CE6TOE1B	Rural Technology and Community Development		
C	CE6TOE1C	Engineering System Design Optimization		
D	CE6TOE1D	Engineering System Modelling and Simulation		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE7TOE2X	Open Elective-2 (OE Group-2)	3	VII
A	CE7TOE2A	Value Engineering		
B	CE7TOE2B	Supply Chain Management-Planning		
C	CE7TOE2C	Travel Demand Analysis		
D	CE7TOE2D	Quality Control Assurance and Safety in Construction		
Sl. No.	Subject Code	Name of Subject	Credits	SEMESTER
x	CE8TOE3X	Open Elective-3 (OE Group-3)	3	VIII
A	CE8TOE3A	Management Information System		
B	CE8TOE3B	Enterprise Resource Planning		
C	CE8TOE3C	Engineering Risk-Benefit Analysis		
D	CE8TOE3D	Fluid Dynamics		

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SYLLABUS (SEMESTER-VII)									
Subject Code:	CE7TPC17	CREDITS: 3			SESSIONAL - TA				ESE
Subject:	Water Resources Engg.-II	L	T	P	CT	MSE	TA	TOTAL	
		3	-	-	10	20	10	40	60
<p><b>UNIT 1: Dams: Types of Dams, Forces, failure of dams and criteria for structural stability, principle and shear stress, stability analysis, Elementary profile of a gravity dam, Profile from practical considerations, Openings in dams.</b></p> <p><b>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</b></p> <p><b>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.</b></p> <p><b>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.</b></p> <p><b>UNIT 5: Cross Drainage Works: Introduction, suitability, various types of C-D Works, Design principles of C-D Works</b></p> <p><b>NAME OF TEXT BOOKS:</b> Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications) Irrigation Engineering – B.C. Punmia (Laxmi Publications)</p> <p><b>Name of Reference Books:</b> Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House) Theory and Design of Irrigation Structures (Volume – I &amp; II) – Varshney (Nem Chand Bros.) Irrigation Engineering – Asawa G.L. (New Age International Publications) Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand &amp; Bros.) Dams and weirs- William G Bligh, Kessinger Publishing</p>									

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SYLLABUS									
Subject Code:	CE7TPE2A	CREDITS : 4			SESSIONAL - TA			ESE	
Subject:	Design of Prestressed Concrete	L	T	P	CT	MSE	TA	TOTAL	
		3	1	-	10	20	10	40	60
<p>UNIT 1: Introduction: Fundamentals of prestressing - Classification and types of prestressing- Concrete Strength and strain characteristics - Steel mechanical properties - Auxiliary Materials like duct formers.</p> <p>UNIT 2: Prestressing Systems: Principles of pretensioning and post tensioning - study of common systems of prestressing for wires strands and bars. Losses of Prestress: Losses of prestress in pre tensioned and post tensioned members - I.S. code provisions.</p> <p>UNIT 3: Analysis of Sections: In flexure, simple sections in flexure, kern distance - cable profile - limiting zones - composite sections cracking moment of rectangular sections.</p> <p>UNIT 4: Design of Simply Supported Beams: Allowable stress as per I.S. 1343 - elastic design of rectangular and I-sections.</p> <p>UNIT 5: Shear and Bond: Shear and bond in prestressed concrete beams - conventional design of shear reinforcement - Ultimate shear strength of a section - Prestress transfer in pretensioned beams-Principles of end block design.</p> <p>Reading:</p> <ol style="list-style-type: none"> <li>1. Krishna Raju, N "Prestressed Concrete", Tata Mc Graw Hill.</li> <li>2. Liu, T.Y, "Prestressed concrete", Mc Graw Hill Pub. Co.</li> <li>3. Rajagopalan, "Prestressed concrete", Narosa Publishing House.</li> </ol>									

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		SYLLABUS						
Subject Code:	CE7TPE4A	CREDITS:			SESSIONAL - TA			ESE
Subject:	Ground Water Hydrology	L	T	P	CT	MSE	TA	TOTAL
		3	-	-	10	20	10	40
<p>UNIT 1: Hydrologic cycle, Water balance, Occurrence of ground water; Origin, geological formations as aquifers, type of aquifers, groundwater basins, springs. Darcy's Law, validity of Darcy's Law permeability,</p> <p>UNIT 2: Laboratory and field measurement of permeability, groundwater Flow lines. Steady flow to a well, steady radial flow to a well in confined aquifer and unconfined aquifer, Unsteady radial flow system; Methods of constructions of deep and shallow wells: The percussion (or cable tool) method of drilling. Direct circulation hydraulic rotary method, Down the hole hammer method, well logs-receptivity logging, testing of wells for yield, Effect of Irrigation, stream flow, rainfall on groundwater fluctuations, seasonal and secular variations, fluctuation due to miscellaneous causes;</p> <p>UNIT 3: Surface and Subsurface investigations of groundwater: Geophysical exploration, Electrical resistivity method, aerial photo interpretation, remote sensing applications to ground water exploration, test drilling, Artificial recharge by water spreading, through pits and shaft, recharge through other methods;</p> <p>UNIT 4: Ground water pollution: Municipal sources, liquid wastes from domestic uses, solid wastes, Industrial sources, tank and pipeline leakage, Mining activity, agricultural sources, septic tank and cesspools, saline water intrusion in coastal aquifers, methods to control saline water intrusion ;</p> <p>UNIT 5: Groundwater management: Concepts of Basin management, Equation of hydrologic equilibrium, groundwater basin investigations, conjunctive use of surface and groundwater.</p> <p>TEXT BOOK: K. C. Patra, Hydrology and Water Resources Engg., Narosa Publishing house, New Delhi. D. K. Todd, Groundwater Hydrology, John Wiley and Sons.</p> <p>REFERENCES: H. M. Raghunath, Ground Water. S. P. Garg, Groundwater and Tube Wells, Oxford and IBH Publishing Co., New Delhi. V. T. Chow, Hand book of Applied Hydrology, McGraw-Hill Publishing Company, New York.</p>								

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Subject Code:	CE7TPESC	SYLLABUS							ESE
		CREDITS: 3			SESSIONAL - TA				
Subject:	Railway Engineering	L	T	P	CT	MSE	TA	TOTAL	
		3	-	-	10	20	10	40	60

**UNIT 1:** Introduction to Railways in India: Role of Indian Railways in National Development - Railways for Urban Transportation  
Alignment of Railway Lines: Engineering Surveys for Track Alignment. -LRT & MRTS.  
Permanent Way: Components and their Functions

**UNIT 2:** Rails - Types of Rails, Length of rail, Weight of Rail, Rail Joints, Creep of rail, Buckling of rail, Kinks of Rail Fastenings. Coning of Wheels & tilting of rails.  
Sleepers - Types, Functions, sleeper density  
Ballasts - Types, function, advantage & disadvantage of each type.

**UNIT 3:** Geometric Design of Railway Tracks: Gradients and Grade Compensation, Super-Elevation, Widening of Gauges in Curves, Transition Curves, Horizontal Curves.

**UNIT 4:** Points and Crossings, Turnouts: Working Principles, Cross overs.

**UNIT 5:** Signalling: Types and their function.  
Station and Yards: Types, Requirements, factors for site selection.

**Reading:**

1. Chandra S. and M.M. Agarwal, Railway Engineering, Oxford University Press, New Delhi, India, 2007.
2. Saxena, S.C. and S.P. Arora, Railway Engineering, Dhanpat Rai and Sons, New Delhi, India, 1997.
3. Agarwal, M.M., Indian Railway Track, Prabha and Co., New Delhi, India, 1988.
4. Rangwala, S.C., Principles of Railway Engineering, Charotar Publishing House, Anand, India, 1988.
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SYLLABUS								
Subject Code:	CE7TOE2D	CREDITS: 3			SESSIONAL - TA			ESE
Subject:	Quality Control Assurance and Safety in Construction	L	T	P	CT	MSE	TA	TOTAL
		3	-	-	10	20	10	40
ESE								
60								
<p>UNIT 1: Construction Projects: Agencies involved in Construction Projects, mutual relationship, quality control at site; and whose job is it.</p> <p>UNIT 2: ISO / IS Requirements: IS 9000 (Parts 1 to 4) [Pt 1; 1994, Pt 2; 1993, Pt 3; 1991, Pt 4; 1993] for Total Quality Management. ISO 14000 – 1988 for environment – Impact of large construction projects.</p> <p>UNIT 3: Quality Control on Construction Projects: Inspection of reinforced concrete, masonry and steel works, testing techniques and quality at reports.</p> <p>UNIT 4: Statistical Analysis: Sampling frequencies, statistical and reliability analysis, optimum sample size.</p> <p>UNITS: Quality Assurance: Quality Assurance in construction.</p> <p>Name of Text Books: ISO 9000 in Construction – Nee, Paul A. (Wiley Inter science Publication, 1994) IS: 14000, – Quality System – Guidelines for Selection and Use of Standards on Quality System 1988.</p> <p>NAME OF REFERENCE BOOKS: ISO 9000 in Construction – Wah, L.S., Min., L.C. &amp; Ann, T.W. (McGraw Hill Book Company, 199 Construction Engineering and Management – S. Seetaraman (Umesh Publication)</p>								

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SYLLABUS	(SEMESTER-VII)							
Subject Code:	CE7LPS01			CREDITS: 2		SESSIONAL - TA	ESE	
Subject:	Seminar			L	T	P		IA
				-	-	3	50	-

SYLLABUS	(SEMESTER-VII)							
Subject Code:	CE7LPS02			CREDITS: 4		SESSIONAL - TA	ESE	
Subject:	Minor project			L	T	P		IA
				-	-	8	60	40

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SYLLABUS Subject Code:	CE8TPC18	(SEMESTER-VIII)							ESE
		CREDITS: 4			SESSIONAL - TA				
Subject:	Earthquake Resistant Design of Structures	L	T	P	CT	MSE	TA	TOTAL	60
		3	1	-	10	20	10	40	

UNIT-I: Elements of structural dynamics, Sources of vibrations; Types of vibrations; Degrees of freedom; Spring action and damping; Free vibration of undamped system having single degree of freedom; Free vibration of viscous damped system having single degree of freedom; Forced vibration of a viscous damped single degree freedom system subjected to harmonic excitation;

UNIT-II: Elements of Earth Quake Ground motion, Earthquake size- intensity and magnitude; Seismic Zoning-Introduction; Analysis of single storey and single bay RCC Plane Frame (Columns vertical): (As per IS:1893(part-I)). Calculation of lateral force due to earthquake using equivalent static method; Analysis for different load combinations.

UNIT III: Design forces and moments in beam and columns (As per IS:456 and IS13920). Design of column; Design of beam.

UNIT-IV: Ductility factor, Ductility of singly reinforced rectangular beam, Detailing of beam, column, beam-column junction as per relevant IS codes (IS13920). Introduction and basic principle of design of shear wall.

UNIT-V: Masonry Structures :House types and damages, cause and location of damage, Making houses earthquake resistant, Earthquake resistant features, summary of earthquake resistant features, improving housing designs.

**TEXT BOOKS:**

Elements of Earthquake Engineering by Jal Krishna, A.R.Chandrasekaran and Brijesh Chandra, Second Edition(1994), South Asian Publishers, New Delhi.  
Geotechnical Engineering - S.K.Gulati & Manoj Datta, Tata McGraw-Hill Publishing Company Ltd.  
Earthquake Resistant Design of Structures by Pankaj Agarwal, Manish Shrikhande, First edition(2006), Prentice Hall of India Private Ltd., New Delhi .  
Earthquakes and Buildings - A.S.Arya, A.Revi, Pawan Jain  
CODES: IS:1893(part-I), IS13920, IS:456-2000, SP34

**REFERENCE BOOK**

Dynamics of Structures by A.K.Chopra, Second edition (2001), Prentice Hall India Private Ltd

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SYLLABIUS		(SEMESTER-VIII)						
Subject Code:	CERTPEGC	CREDITS:			SESSIONAL - TA			ESE
Subject:	Bridge Engineering	L	T	P	CT	MSE	TA	TOTAL
		3	-	-	10	20	10	40
								60

UNIT-I: Brief historical review, Different types of Bridges and span range, Bridge codes, importance of hydrologic factors in bridge design, Hydraulic geometry, linear water ways, economic span, afflux and scour.

UNIT-II: Design of Reinforced concrete deck slab bridges.

UNIT-III: Design of Reinforced Concrete Tee beam bridges.

UNIT-IV: Design of Box culverts.

UNIT-V: Design of Piers and Abutments.

Text Books:

- 1) Xanthakos, P. P. (1993) Reinforced Concrete Bridges, in Theory and Design of Bridges, John Wiley & Sons, Inc., Hoboken, NJ, USA. doi: 10.1002/9780470172889.ch3
- 2) Design of Bridge Structures by M A Jayaram, Prentice-Hall Of India Pvt. Limited, 01-Aug-2004 - Bridges - 292 pages
- 3) Design of Bridges by N. Krishna raju , Oxford and IBH Publishing, ISBN 8120417410, 9788120417410
- 4) Essentials Of Bridge Engineering, 6/E, Viktor , Oxford and IBH Publishing, 2007, ISBN 8120417178, 9788120417175

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SYLLABUS								
Subject Code:	CEBTPE7A	[SEMESTER-VIII]						
Subject:	Air and water transportation	CREDITS:			SESSIONAL - TA			ESE
		L	T	P	CT	MSE	TA	TOTAL
		3	1	-	10	20	10	40
								60
<p>UNIT 1: Air Transportation: Aircraft Characteristics - Landing gear configurations, aircraft weight, engine types, Aircraft performance characteristics: speed, payload and range, runway performance, distances, wingtip vortices.</p> <p>UNIT 2: Geometric Design of the Airfield - Airport classification, Runways, wind rose, estimating runway length, sight distance and longitudinal profile, transverse gradient, Taxiways and taxi lanes: design of taxiway curves and intersections, end-around taxiways, Aprons: holding aprons, terminal aprons and ramps, surface gradients, Control tower visibility requirements.</p> <p>UNIT 3: Structural Design of Airport Pavements - Soil investigation and evaluation, FAA pavement design methods. Airport Lighting, Marking, and Signage. Terminal Area - Passenger terminal apron layout, apron circulation, passenger conveyance to aircraft.</p> <p>UNIT 4: Water Transportation: Ports and Harbours - Types of water transportation, water transportation in India, Ports and harbours: requirements, classification, ship characteristics, Harbour works: breakwaters, jetties, fenders, piers, wharves, dolphins, etc., Navigational aids: types, requirements, light house, beacon lights, buoys, Port facilities: general layout, development, planning, facilities, terminals.</p> <p>Docks, Dredging, Coastal Erosion and Protection.</p> <p>UNIT 5: Docks and repair facilities: design, dry docks, wet docks, slipways, Locks and lock gates: materials, size, Dredging: classification, dredgers, uses of dredged materials, Coastal erosion and protection: seal wall, revetment, and bulkhead.</p> <p>Reading:</p> <ol style="list-style-type: none"> <li>1. Ashford, N. J., Mumayiz, S. A., and Wright, P. H. Airport Engineering: Planning, Design and Development of 21st Century Airports, Fourth Edition, John Wiley &amp; Sons, New Jersey, USA, 2011.</li> <li>2. Horonjeff, R., McKelvey, F. X., Sproule, W. J., and Young, S. B. Planning and Design of Airports, Fifth Edition, McGraw-Hill, New York, USA, 2010.</li> <li>3. Kazda, A., and Caves, R. E. Airport Design and Operation, Second Edition, Elsevier, Oxford, U.K., 2007.</li> <li>4. Khanna, S. K., Arora, M. G., and Jain, S. S. Airport planning and Design, Sixth Edition, Nem Chand and Bros, Roorkee, India, 2012.</li> <li>5. Kumar, V., and Chandra, S. Air Transportation Planning and Design, Galgotia Publications Pvt. Ltd., New Delhi, India, 1999.</li> <li>6. Neufville, R. D., and Odoni, A. Airport Systems: Planning, Design, and Management, McGraw-Hill, New York, USA, 2003.</li> <li>7. Young, S. B., and Wells, A. T. Airport Planning and Management, Sixth Edition, McGraw-Hill, New York, USA, 2011.</li> <li>8. Bindra, S.P. A Course in Docks and Harbour Engineering, Dhanpat Rai and Sons, New Delhi, India, 1992.</li> <li>9. Seetharaman, S. Dock and Harbour Engineering, Umesh Publications, New Delhi, India, 1999.</li> <li>10. Srinivasan, R. Harbour, Dock and Tunnel Engineering, Charotar Publishing House, Anand, India, 1987.</li> </ol>								

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SYLLABUS		(SEMESTER-VIII)							
Subject Code:	CE8TOE3A	CREDITS:			SESSIONAL - TA			ESE	
Subject:	Management Information System	L	T	P	CT	MSE	TA		TOTAL
		3	-	-	10	20	10	40	60
<p>UNIT 1: Management and System- Advance in management, the process of MIS development, MIAS organization, Information dynamics.</p> <p>UNIT 2: Planning, Design and implementation of MIS, Strategic planning, MIS design- Group design concepts, Acquiring information system.</p> <p>UNIT 3: System life cycle-information flow, Entity relationship modelling, data modelling, detailed process analysis, data flow diagrams.</p> <p>UNIT 4: Decision making system with MIS, System concepts for MIS.</p> <p>UNIT 5: Data information and communication, problem solving and decision making, security, control and failure, Future trends in MIS.</p> <p>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</p>									

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SYLLABUS		(SEMESTER-VIII)					
Subject Code:	CEBLP503	CREDITS: 8			SESSIONAL - TA		ESE
Subject:	Major Project	L	T	P	IA	TOTAL	
		-	-	15	120	120	80

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SYLLABUS	(SEMESTER-VIII)								
Subject Code:	CE8LPC07	CREDITS: 2			SESSIONAL - TA			ESE	
Subject:	Structural Detailing Lab	L	T	P	CT	MSE	TA		TOTAL
		-	-	3	-	-	30	30	20
<p><b>Part A: (Steel Structures)</b></p> <ol style="list-style-type: none"> <li>1. Detailing of Tension Members.</li> <li>2. Detailing of Built up Compression Members.</li> <li>3. Detailing of Column Bases.</li> <li>4. Detailing of connections.</li> <li>5. Detailing of an Industrial shed.</li> <li>6. Detailing of a Plate girder/Gantry girder.</li> </ol> <p><b>Part B: (Reinforced Concrete Structures)</b></p> <ol style="list-style-type: none"> <li>1. Details of reinforcement in RCC Continuous Beams.</li> <li>2. Details of reinforcement for RCC column with isolated footings.</li> <li>3. Details of reinforcement in a one way/two way slabs.</li> <li>4. Details of reinforcement in stair cases.</li> <li>5. Detailing of Combined footings.</li> <li>6. Detailing of Retaining walls/Water Tanks.</li> </ol>									

