LAKIREDDY BALIREDDY
COLLEGE OF ENGINEERING
(AUTONOMOUS)
(Approved by AICTE, Affiliated to JNTUK, Accredited by NBA,
ISO 9001 : 2008 Certified & Accredited by **NAAC with "A" Grade)**

B.TECH. FOUR YEAR DEGREE COURSE
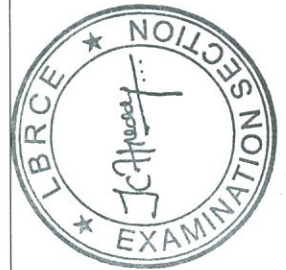# (Applicable for the batches admitted from 2012-13)

CIVIL ENGINEERING

L.B.Reddy Nagar :: Mylavaram – 521 230 :: Krishna District
ANDHRA PRADESH STATE

COURSE STRUCTURE(2012-2013 Admitted Batch)

I-SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination				Credits
		Periods per Week			Maximum Marks		Total		
		Lectures	Tutorial	Lab	Internal	External			
T118	Applied Mathematics- I	4	1	--	25	75	100		4
T131	C Programming	4	1	--	25	75	100		4
T197	English-I	4	--	--	25	75	100		3
T191	Engineering Chemistry	4	-	--	25	75	100		3
T192	Engineering Graphics	2	--	5	25	75	100		4
P806	C Programming Lab	--	--	3	25	75	100		2
P812	Computer Aided Engineering Graphics	-	-	3	25	75	100		2
P831	Engineering Workshop	--	--	3	25	75	100		2
	TOTAL	18	2	14	200	600	800		24

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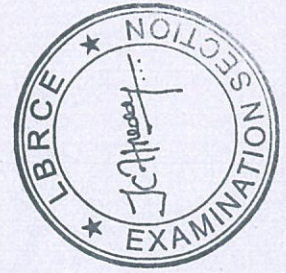MYLAVARAM-521230, KRISHNA Dist.

II-SEMESTER

Code No.	Name of the Course	Scheme of Instruction — Periods per Week			Scheme of Examination — Maximum Marks			Credits
		Lectures	Tutorial	Lab	Internal	External	Total	
T119	Applied Mathematics- II	4	1	-	25	75	100	4
T198	English – II	4	-	-	25	75	100	3
T199	Environmental Studies	4	-	-	25	75	100	3
T383	Engineering Mechanics	4	1	-	25	75	100	5
T195	Engineering Physics	4	1	-	25	75	100	4
T376	Construction Materials	4	-	-	25	75	100	3
P832	English Language Communication Skills Lab	-	-	3	25	75	100	2
P830	Engineering Physics and Chemistry Lab	-	-	3	25	75	100	2
P856	Mini Project - I	--	--	3	25	25	50	2
	TOTAL	24	3	9	225	625	850	28

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EXAMINATION SECTION

III - SEMESTER

Code No.	Name of the Course	Scheme of Instruction Periods per Week			Scheme of Examination Maximum Marks			Credits
		Lectures	Tutorial	Lab.	Internal	External	Total	
T367	Applied Mathematics - III	4	1	-	25	75	100	4
T377	Construction techniques, equipment And practices	4	-	-	25	75	100	3
T177	Electrical and Electronics Engineering	4	-	-	25	75	100	3
T395	Mechanics of Fluids	4	1	-	25	75	100	4
T396	Mechanics of Solids	4	1	-	25	75	100	4
T409	Surveying	4	-	-	25	75	100	4
P888	Computer Aided Building Drawing	-	-	3	25	75	100	2
P893	Strength of Materials lab	-	-	3	25	75	100	2
P896	Survey Field Work	-	-	3	25	75	100	2
P870	Seminar - I	-	-	-	50	-	50	1
	TOTAL	24	03	09	275	675	950	29

IV – SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits
		Periods per Week			Maximum Marks		Total	
		Lectures	Tutorial	Lab.	Internal	External		
T365	Advanced Surveying	4	-	-	25	75	100	4
T366	Applied Hydraulic Engineering	4	1	-	25	75	100	4
T374	Concrete Technology	4	-	-	25	75	100	4
T383	Engineering Geology	4	-	-	25	75	100	3
T391	Hydrology	4	-	-	25	75	100	4
T397	Mechanics of structures	4	1	-	25	75	100	4
P834	Fluid Mechanics and Hydraulics Machines Lab	-	-	3	25	75	100	2
P891	Engineering Geology Lab	-	-	3	25	75	100	2
P857	Mini Project - II	-	-	2	25	25	50	2
	TOTAL	24	02	08	225	625	850	29

V - SEMESTER

Code No.	Name of the Course	Scheme of Instruction Periods per Week			Scheme of Examination Maximum Marks			Credits
		Lectures	Tutorial	Lab.	Internal	External	Total	
T369	Basic Structural Analysis	4	1	-	25	75	100	4
T378	Design of RCC Elements	4	1	-	25	75	100	4
T380	Design of Steel structures	4	1	-	25	75	100	4
T393	Irrigation and Water Resources Engineering	4	-	-	25	75	100	4
T407	Soil Mechanics	4	-	-	25	75	100	4
T412	Water Supply Engineering	4	-	-	25	75	100	4
P889	Concrete Laboratory	-	-	3	25	75	100	4
P886	Advanced Survey Field Work	-	-	3	25	75	100	2
P871	Seminar - II	-	-	-	50	-	100	2
							50	1
	TOTAL	24	03	06	250	600	850	29

VI - SEMESTER

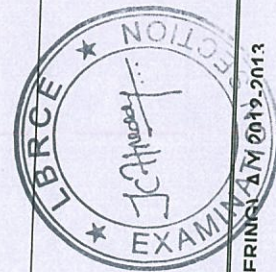| Code No.	Name of the Course	Scheme of Instruction — Periods per Week			Scheme of Examination — Maximum Marks			Credits
		Lectures	Tutorial	Lab.	Internal	External	Total	
T371	Classical Structural Mechanics	4	1	-	25	75	100	4
T379	Design of RCC structures	4	1	-	25	75	100	4
T388	Foundation Engineering	4	1	-	25	75	100	4
T390	Highways and Air Port Planning	4	1	-	25	75	100	4
T405	Sanitary Engineering	4	-	-	25	75	100	4
	ELECTIVE – I	3	--	--	25	75	100	3
T385	Environmental Impact Assessment							
T387	Finite Element Method in Civil Engineering							
T389	Ground Improvement Techniques							
T400	Prestressed Concrete							
T372	Coastal Engineering							
P890	Computer Applications in Civil Engineering Lab	-	-	3	25	75	100	2
P895	Soil Mechanics Laboratory	-	-	3	25	75	100	2
P810	Comprehensive Viva-Voce - I	-	-	-	100	-	100	2
	TOTAL	23	04	06	300	600	900	29

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VII - SEMESTER

Code No.	Name of the Course	Scheme of Instruction Periods per Week			Scheme of Examination Maximum Marks			Credits
		Lectures	Tutorial	Lab.	Internal	External	Total	
T373	Computational Methods of Structural Analysis	4	1	-	25	75	100	4
T386	Estimation and Quantity Surveying	4	1	-	25	75	100	4
T402	Railways, Docks and Harbour Engineering	4	-	-	25	75	100	4
T401	Principles of Management and Professional Ethics	4	-	-	25	75	100	4
T382	Engineering Economics and Accountancy	4	-	-	25	75	100	3
	ELECTIVE –II	4	-	-	25	75	100	3
T370	Bridge Engineering							
T408	Solid Waste Management							
T381	Earthquake Resistant Design of Structures	4	-	-	25	75	100	3
T411	Traffic Engineering							
T403	Remote sensing and GIS							
P887	Computer Aided Analysis and Design Laboratory	-	-	3	25	75	100	2
P897	Transportation Engineering Lab	-	-	3	25	75	100	2
P892	Environmental Engineering Lab	-	-	3	25	75	100	2
P843	Internship	-	-	-	50	-	100	2
P878	Term Paper	-	-	3	25	25	50	2
	TOTAL	24	02	12	300	700	1000	31

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VIII – SEMESTER

Code No.	Name of the Course	Scheme of Instruction Periods per Week			Scheme of Examination Maximum Marks			Credits
		Lectures	Tutorial	Lab.	Internal	External	Total	
T375	Construction Management	3	1	-	25	75	100	3
	ELECTIVE – III							
T404	Repair and Rehabilitation of Structures							
T398	Modern Construction Systems and Techniques	4	-	-	25	75	100	3
T406	Shoring, Scaffolding and Form Work							
T394	Machine Foundations							
	ELECTIVE – IV							
T368	Architecture and Town Planning							
T392	Industrial structures	4	-	-	25	75	100	3
T399	Pavement Analysis and Design							
T410	Total Quality Management							
P894	Quantity Estimation and Project management	-	-	3	25	75	100	2
P867	Project Work	-	-	8	60	140	200	8
P811	Comprehensive Viva-Voce - II	-	-	-	100	-	100	2
	TOTAL	11	1	11	260	440	700	21

TOTAL CREDITS : 220

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I - SEMESTER

T118 APPLIED MATHEMATICS – I	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Differential equations of first order and first degree – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.

UNIT - II

Linear differential equations of second and higher order with constant coefficients and with variable coefficients, method of variation of parameters and their simple applications to Simple Harmonic Motion and Electrical Circuits.

UNIT - III

Generalized Mean Value theorems (without proof), Functions of several variables, Maxima and Minima of functions of two variables with constraints and without constraints. Lagrangian Multiplier method.

UNIT - IV

Curve tracing – Cartesian curves. Applications of Integration to Lengths, Volumes and Surface areas of revolution in Cartesian Coordinates. Multiple integrals - double and triple integrals (Cartesian Coordinates only) – Changing of order of Integration. (Cartesian Coordinates only)

UNIT - V

Vector Differentiation: Gradient- Divergence - Curl and their related properties of sums-products - Laplacian and second order operators. Vector Integration - Line integral – work done – Potential function – area - surface and volume integrals Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems.

TEXT BOOKS

1. Higher Engineering Mathematics by Dr. B.S. Grewal
2. Higher Engineering Mathematics by Dr. B. V. Ramana – TMGH

REFERENCES

1. Advanced Engineering Mathematics by M. D. Greenberg – TMGH
2. Advanced Engineering Mathematics by Erwin Krezig - John Wiley & sons
3. Elementary Differential equations by W. E. Boyce and R. C. Diprima - John Wiley & sons
4. Advanced Engineering Mathematics by Peter V. O. Neil – Thomson

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T131	L	T	P	Credits	Internal	External	TOTAL
C - PROGRAMMING	4	1	0	4	25	75	100

UNIT - I

Algorithm / pseudo code, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation.

Input-output statements, statements and blocks, if and switch statements, loops-while, do-while and for statements, break, continue, goto and labels, programming examples.

UNIT - II

Designing structured programs, Functions, basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor, example c programs.

UNIT - III

Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two dimensional and multi-dimensional arrays, applications of arrays. pointers- concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments, c program examples.
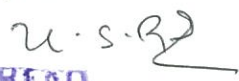
UNIT - IV

Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

UNIT - V

Input and output – concept of a file, text files and binary files, streams, standard I/o, Formatted I/o, file I/o operations, error handling, C program examples.

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TEXT BOOKS

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education

REFERENCES

1. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
2. Programming in C – Stephen G. Kochan, III Edition, Pearson Eductaion
3. C and Data Structures:A Snap Shot Oriented Treatise Using Live Engineering Examples by Prof. N.B.Venkateswarlu and, Prof.E.V.Prasad, S Chand & Co, New Delhi
4. C/C++ for Engineers and Scientists, Harry H.Cheng ,McGrawHill,

T197 ENGLISH - I	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

English Language continues to be regarded as an important tool for global communication and employability. Hence, it is imperative that students need to acquire communicative competence besides their core skills. The syllabus has been designed to develop linguistic and communicative competence of Engineering students with special emphasis on professional and functional aspects of English language i.e., on Listening, Speaking, Reading and Writing (LSRW Skills).

OBJECTIVES

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To develop the study skills and Communication skills of the students in both formal and informal situations.
- To enable the students to face the academic and professional challenges of the present day scenario.
- To help students acquire the ability to speak effectively in English in the real life situations.
- To inculcate reading as a habit and to develop reading skills among students.
- To train students to improve their active and passive vocabulary.
- To familiarize the students with different rhetorical functions of Technical English.
- To enable the students write letters and reports effectively in formal and professional situations.

UNIT - I

Chapter – 1: "Read & Proceed" from Step by Step (*Pearson*)
Extensive Reading - Masterminds– The Trailblazers – **Jagadis Chandra Bose** (*Orient Longman*)

UNIT - II

Chapter – 2: "Travel" from Step by Step (*Pearson*)
Extensive Reading - Masterminds– The World of Figures and Physics – **Chandra SekharaVenkata Raman** (*Orient Longman*)

UNIT - III

Chapter – 3: "Gender" from Step by Step (*Pearson*)
Extensive Reading - Masterminds–The Institution Builders– **Shanti SwarupBhatnagar** (*Orient Longman*)

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UNIT - IV

Vocabulary – Synonyms, Antonyms, Words often Confused, Gerunds & Infinitives, Prefixes & Suffixes, Word plurals, Analogy
Grammar – Parts of Speech, Sentence Completion, Question Tags, Tense and Aspect

UNIT - V

Analytical Writing – Sentence Construction – Types of sentences, Exercises with scrambled words & Jumbled sentences, Paragraph writing, Dialogue writing (Formal & Informal), Letter Writing (Formal & Informal), Resume writing, Expansion (of a given topic), Abstract Writing (Summarizing / Synopsis), Decision-making, Drafting E-Mails & Memo writing, Essay writing.

TEXT BOOKS

- Step by Step (*Pearson*)
- Masterminds by EnakshiChatterjee (*Orient Longman*)

REFERENCES

1. Andrea J Rutherford. *Basic Communication Skills for Technology*: Pearson Education, New Delhi, 2009.
2. Murphy. *English Grammar with CD*: Cambridge University Press, New Delhi, 2004.
3. Rizvi, M Ashraf. *Effective Technical Communication*: Tata McGraw Hill, New Delhi, 2008.
4. Blum Rosen. *Word Power*: Cambridge University Press, New Delhi, 2009.

T191	L	T	P	Credits	Internal	External	TOTAL
ENGINEERING CHEMISTRY	4	0	0	3	25	75	100

T191 - ENGINEERING CHEMISTRY

Lecture	: 3 Periods/week	Internal Marks	: 25
		External Marks	: 75
Credits	: 3	External Examination	: 3 Hrs

UNIT - I

WATER TECHNOLOGY: Introduction, Hardness of Water - Temporary and Permanent hardness. Units and inter conversions of Units. Problems on Temporary and Permanent hardness. Boiler troubles – scale & sludge formation, Caustic embrittlement, Corrosion, priming & foaming, softening of water Methods of Treatment of Water for Domestic Purposes - Sedimentation, Coagulation, Filtration, Disinfection – Sterilization, Chlorination, Break point chlorination, Ozonization.
Water Treatment: Internal Treatment - Colloidal, Phosphate, Calgon, Carbonate, Sodium aluminates Conditioning of Water. External Treatment - Lime-Soda Process, Zeolite Process, Ion- Exchange Process.

UNIT - II

FUELS AND COMBUSTION: Definition and classification of Fuels- conventional fuels (solid, liquid, gaseous), Solid fuels- coal - analysis, Proximate and ultimate analyses of coal – significances, Liquid Fuels – primary- petroleum- refining of petroleum- cracking, knocking, synthetic petrol – Bergius and Fischer Tropsech's process; Gaseous fuels- octane number – cetane number,– water gas, producer gas CNG, and biogas - gross and net calorific values – (definition only) – flue gas analysis – Orsat's apparatus.

UNIT - III

CORROSION: Definition, Examples, Types of Corrosion: Theories of Corrosion and Mechanism - Dry Corrosion (Direct Chemical corrosion), Wet Corrosion (Electro Chemical corrosion) Principles of Corrosion, Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion, Mechanism of Wet and Chemical Corrosion - Hydrogen evolution type, Oxygen absorption type. Factors Influencing Corrosion. Control of Corrosion - Proper Design, Use of pure metal and metal alloys, Passivity, Cathodic Protection - Sacrificial anode and Impressed Current, Modifying the Environment and use of Inhibitors.

UNIT - IV

Polymer Science and Technology: Types of polymerization, Mechanism (Chain growth & step growth), Plastics –Thermosetting and Thermoplastic resins – preparation, properties and engineering applications of Polyethylene, PVC, Polystyrene, Teflon, Bakelite, Nylon, Conducting polymers: polyacetylene, polyaniline, conduction, doping, application. Characteristics and uses Rubber - Natural Rubber, Vulcanization and significance, Elastomers – Buna S, Buna N, Thiokol, Fibers- Polyester, fiber reinforced plastics (FRP), applications.

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UNIT - V

1. REFRACTORIES & INSULATORS: Definition, Classification with Examples, Criteria of a Good Refractory Material, Causes for the failure of a Refractory Material, Insulators – Definition and Classification with Examples. Characteristics of Insulating Materials, Thermal Insulators, Electrical Insulators - Their Characteristics and Engineering Applications.

2. LUBRICANTS: Introduction to Lubricants, Principles and function of lubricants - Types of Lubrication and Mechanism - Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants-Viscosity, flash and fire point, cloud and pour point, aniline point, Neutralization Number and mechanical strength, Selection of lubricants.

TEXT BOOKS

1. A text book of Engineering Chemistry by Jain & Jain, Dhanpat Rai Publishing Company, New Delhi (15th Edition) (2006).
2. A Text book of Engineering Chemistry by Dr. Y. Bharathi Kumari and Dr. Jyotsna Cherukuri, VGS Publications, First Edition, 2009.

REFERENCES

1. A Text book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company, First Edition, 2002.
2. Advanced Engineering Chemistry by Dr. M. R. Senapati, University Science Press (Impart from Laxmi Publications), 3rd Edition 2009.
3. N. Krishnamurthy, P. Vallinayagam and D. Madhavan, Engineering Chemistry, 2nd Edition. PHI Learning PVT., LTD, New Delhi, 2008.
4. A Text book of Engineering Chemistry by S. S. Dara, S CHAND Publications.

T192	L	T	P	Credits	Internal	External	TOTAL
ENGINEERING GRAPHICS	2	0	5	4	25	75	100

UNIT - I

INTRODUCTION TO ENGINEERING DRAWING:
Principles of Engineering Graphics and their significance - Drawing Instruments and their use-Conventions in Drawing- Lettering and Dimensioning – BIS conventions – Geometrical Constructions.
Curves used in engineering practice:
- a) Conic Sections- Ellipse, Parabola, Hyperbola and rectangular hyperbola- General method and other methods.
- b) Cycloid, Epi-Cycloid and Hypo-Cycloid.
- c) Involutes.

UNIT - II

ORTHOGRAPHIC PROJECTIONS:(First angle projection only)
Principle of orthographic projection-Method of Projection – First and third angle projection methods- Projections of Points –Projection of straight lines-True lengths and traces.

UNIT – III

PROJECTIONS OF PLANES
Planes parallel to one of the reference planes-Inclined to one reference plane and perpendicular to other-Oblique planes.

UNIT – IV

PROJECTIONS OF SOLIDS
Projection of solids in simple position - Axis inclined to one of the reference planes and parallel to the other-Axis inclined to both H.P and V.P.

UNIT - V

SECTIONS OF SOLIDS:
Introduction-Sections of Prisms,Pyramids,Cylinders,Cones and Spheres

TEXT BOOK

Engineering Drawing, N.D. Bhat / Charitor publishers

REFERENCES

1. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
2. Engineering Drawing, R.K.Dhawan / S.Chand Company LTD.
3. Engineering Drawing and Graphics – Venugopal –New Age publishers
4. Engineering Drawing by Dhananjay A. Jolhe, Tata McGraw Hill Publishers.

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P806	L	T	P	Credits	Internal	External	TOTAL
C - PROGRAMMING LAB	0	0	3	2	25	75	100

1. Write a programme in 'C' language to cover the following problems.
    a) Roots of Quadratic Equation.
    b) Example program which shows the usage of various Operators available in C Language.
    c) Example program which shows the usage of various preliminary Data types available in C Language.
    d) Example programs to illustrate the *order of* evaluation.

II) WRITE EXAMPLE PROGRAMS

a) To check whether the given year is leap year (or) not

b) Converting given two digit number into words using switch statement

c) To illustrate the usage of 'goto' statement.

d) Finding smallest& biggest number from the given set of 4 numbers using 'if' statement.

e) Calculate the student grade in the examination – assume suitable constraints.

f) Prepare electricity bill for the consumed units – assume suitable constraints.

III) EXAMPLE PROGRAMS

a) To Display first N natural numbers
b) To find whether the given number is Armstrong (or) not
c) To find reverse of the given number and to check whether it is palindrome (or) not.
d) To find whether given number is strong number (or) not.
e) To check whether given number is Prime (or) not
f) To display prime numbers with in the given range(Nesting of Loops).
g) To display the following structure(Nesting of Loops)

```
i)                  1                     ii)    5   4   3   2

            1           2                       4   3   2   1
        1       2           3                   3   2   1
    1       2       3       4                   2   1
    1       2       3       4       5           1
```

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IV) Write example programs in C Language:
a) To find factorial of a given number using functions.
b) Swap two numbers using functions.
c) To find GCD of two numbers using recursion
d) Write a recursive function to solve Towers of Honai problem.
e) Write an example program to illustrate use of external & static storage classes.

V) Write example programs in C Language to perform following operations:
a) Finding the sum and average of given numbers using Arrays.
b) To display elements of array in reverse order
c) To search whether the given element is in the array (or) not using linear search & binary search.
d) Write a C program to perform the following operations
i) Addition, subtraction and multiplication of Matrices
ii) Transpose of given matrix (The above operations are to be exercised using functions also by passing arguments)
e) Write a C program to find whether the given string is palindrome (or) not.
f) To accept line of text and find the number of characters, number of vowels and number of blank spaces in it.
g) Write an example program to illustrate the use of any 5 string handling functions.

VI) a) Example program to bring clarity on pointer declaration & initialization and Pointer arithmetic.
b) Write an example program to describe the usage of call by reference.
c) Write a program to find sum of the elements of the array using functions.
d) Write an example program to illustrate the usage of command line arguments.
e) Program to illustrate the usage of dynamic memory management functions.

VII) a) Write an example program using structures to process the student record. Assume suitable fields for student structures (Different kinds of initialization of structure variables are to be exercised)
b) Write a program to read records of 10 employees and find their average salary (exercise array of structures & Nested structures concepts through this program).
c) Write a program to handle a structure variable using pointers and implement self referential structure(i.e. A structure variable having a pointer to itself)

VIII) Write an example program on file to perform following operations:
a) Accessing content from files and writing content in to it. (Exercise different file operation modes)
b) Copy the contents of one file into another (Exercise different file operation modes)

P812	L	T	P	Credits	Internal	External	TOTAL
COMPUTER AIDED ENGINEERING GRAPHICS	0	0	3	2	25	75	100

UNIT - I

COMPUTER AIDED DRAFTING
Introduction - Computer Aided drafting system – Advantages, Applications of AUTOCAD. Drafting software – AUTOCAD – Advantages, Initial setup commands, utility commands, Drawing Aids, Entity Draw commands, Display commands, Edit Commands.
Introduction Lettering – Basic types of Dimensioning, Linear, Angular and Radial Dimensioning.

UNIT - II

ORTHOGRAPHIC PROJECTIONS:
Introduction to orthographic Projections
Projections of Solids: Types of Solids, Prisms, pyramids , solids of revolution-simple positions Sections of Solids : Introduction – section & section planes – Types of section planes – True shape of a section.

UNIT - III

ISOMETRIC DRAWING :
Introduction - Theory of Isometric projection, Isometric view and Isometric drawing. Non – Isometric Lines – Methods to generate an Isometric Drawing.

UNIT - IV

DEVELOPMENT OF SURFACES OF SOLIDS:
Introduction – Theory of development - Methods of developments – Developments of lateral surfaces along with base.

UNIT - V

INTERSECTION OF SURFACES:
Introduction – Rules for visibility – Line of intersection – Intersection of Lines & Solids – Intersection of plane Vs plane - Intersection of surfaces of two solids, Interpenetration of two solids.

TEXT BOOKS

1. Engineering Graphics with AutoCAD by Bethune PHI Learning Private Limited, New Delhi, 2009.
2. Engineering Graphics with AutoCAD by M. Kulkarni, A.P. Rastogi, and A.K. Sarkar; PHI Learning Private Limited, New Delhi, 2009.

P831 ENGINEERING WORKSHOP	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

TRADES FOR EXERCISES: (Common to EEE, ECE, CSE, EIE, IT & CIVIL)

At least three exercise from each trade :

1. Carpentry
2. Fitting
3. House – Wiring
4. Plumbing

TRADES FOR EXERCISES : (MECHCHANICAL ENGINEERING)

At least two exercise from each trade :

1. Carpentry
2. Fitting
3. Tin - Smithy
4. Black - Smithy
5. House - Wiring
6. Plumbing

TEXT BOOK

Workshop manual / P. Kannaiah / K.L. Narayana Scitech Publications, India Pvt Ltd, Chennai.

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II-SEMESTER
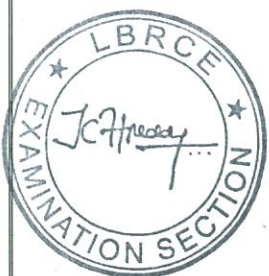
T119	L	T	P	Credits	Internal	External	TOTAL
APPLIED MATHEMATICS – II	4	1	0	4	25	75	100

T119 - APPLIED MATHEMATICS – II

Lecture	: 4 Periods/week	Internal Marks	: 25
Tutorial	: 1 Period/Week	External Marks	: 75
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Laplace transforms of standard functions –Shifting Theorems, Transforms of derivatives and integrals – Unit step function –Dirac's delta function. Inverse Laplace transforms– Convolution theorem - Applications of Laplace transforms to ordinary differential equations

UNIT - II

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval– Half-range sine and cosine series.

UNIT - III

Fourier integral theorem (only statement) – Fourier sine and cosine integrals – Fourier transform – sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

UNIT - IV

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation. Method of Separation of Variables - Applications to wave equation one dimensional, heat equation and Laplace Equation.

UNIT - V

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems - Inverse z-transform -Convolution theorem – Solution of difference equation by z-transforms.

TEXT BOOKS

1.   Higher Engineering Mathematics by Dr. B.S. Grewal
2.   Higher Engineering Mathematics by Dr. B. V. Ramana – TMGH

REFERNCES

1.   Advanced Engineering Mathematics by Michael D. Greenberg – TMGH
2.   Advanced Engineering Mathematics by Erwin Krezig - John Wiley & sons
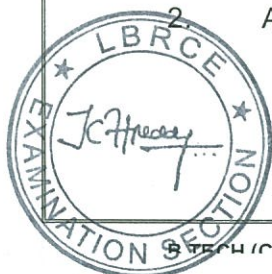
T198 ENGLISH - II	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

English Language continues to be regarded as an important tool for global communication and employability. Hence, it is imperative that students need to acquire communicative competence besides their core skills. The syllabus has been designed to develop linguistic and communicative competence of Engineering students with special emphasis on professional and functional aspects of English language i.e., on Listening, Speaking, Reading and Writing (LSRW Skills).

OBJECTIVES

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To develop the study skills and Communication skills of the students in both formal and informal situations.
- To enable the students to face the academic and professional challenges of the present day scenario.
- To help students acquire the ability to speak effectively in English in the real life situations.
- To inculcate reading as a habit and to develop reading skills among students.
- To train students to improve their active and passive vocabulary.
- To familiarize the students with different rhetorical functions of Technical English.
- To enable the students write letters and reports effectively in formal and professional situations.

UNIT - I

Chapter 4: **"Disaster Management"** from *Step by Step* (Pearson)
Extensive reading – *Masterminds* - The institution builders - **MeghanadSaha** *(*Orient Longman*)*

UNIT - II

Chapter 5: **"Health"** from *Step by Step* (Pearson)
Extensive reading – *Masterminds*- The New Age – **HomiJehangirBhabha** *(*Orient Longman*)*

UNIT - III

Chapter 6: **"Sports"** from *Step by Step* (Pearson)
Extensive reading – *Masterminds* - The New Age – **Vikram Sarabhai** *(*Orient Longman*)*

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UNIT - IV

Grammar – Articles, Prepositions, Voice, Speech, Concord, Correction of Sentences
Vocabulary – Phrasal verbs, Gerunds, Infinitives, One word Substitutes.

UNIT - V

Analytical writing – Comprehension, Technical dialogue writing,
Presentation skills - Note making, Information transfer / Data interpretation (Tables, Pie-charts, Bar graphs, Tree diagrams, Pictograms, etc.), Report writing

TEXTBOOK

Step by Step, Pearson Education, New Delhi 2010.
*Master Minds, (*Orient Longman*).*

REFERENCES

1. KoneruAruna. *Professional Communication:* Tata McGraw-Hill, New Delhi, 2007.
2. Effective Technical Communication, Rizvi, Tata McGraw-Hills, New Delhi, 2009.
3. Basic Communication Skills for Technology, Andrea J. Rutherford, Pearson Education.
4. GRE and TOEFL, Kaplan and Baron's, Latest editions.

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T199	L	T	P	Credits	Internal	External	TOTAL
ENVIRONMENTAL STUDIES	4	0	0	3	25	75	100

UNIT - I

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness.

Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems -Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.   **[11 Lectures]**

UNIT – II

Ecosystems : Concept of an ecosystem. - Structure and function of an ecosystem.- Producers, consumers and decomposers. - Energy flow in the ecosystem – Ecological succession. - Food chains, food webs and ecological pyramids.

Biodiversity and its conservation: Introduction - Definition: genetic, species And ecosystem diversity. - Bio-geographical classification of India - Value of Biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. - India as a mega diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

[11 Lectures]

UNIT – III

Environmental Pollution: Definition, Types, Cause, effects and control measures of:
   a. Air pollution
   b. Water pollution
   c. Soil pollution
   d. Marine pollution
   e. Noise pollution
   f. Thermal pollution
   g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.   **[11 Lectures]**

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UNIT – IV

Social Issues and the Environment: From Unsustainable to Sustainable development - Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. – Consumerism and waste products.   **[11 Lectures]**

UNIT – V

Human Population and the Environment: Population growth, variation among nations. Population explosion – Family Welfare Programme -Environment and human health. -Human Rights. -Value Education. HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. –Case Studies. Environment Protection Act. -Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.   **[11 Lectures]**

TEXT BOOKS

1.   Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2.   Environmental   Studies   by   R.   Rajagopalan,   Oxford   University   Press.

REFERENCES

Textbook of Environmental Sciences and Technology by M. Anji Reddy   BS Publication.

T383	L	T	P	Credits	Internal	External	TOTAL
ENGINEERING MECHANICS	4	1	0	5	25	75	100

UNIT - I

BASICS & STATICS OF PARTICLES
Introduction - Units and Dimensions - Laws of Mechanics - Vectors - Vectorial representation of forces and moments - Vector operations, Coplanar forces resolution and composition of forces - equilibrium of force systems – forces in space - equilibrium of a particle in space - equivalent systems of forces - principle of transmissibility – Single equivalent force.

UNIT - II

EQUILIBRIUM OF RIGID BODIES
Free body diagram - Types of supports and their reactions - requirements of stable equilibrium - Moments and Couples - Varignon's theorem - Equilibrium of Rigid bodies in two dimensions - Equilibrium of Rigid bodies in three dimensions

UNIT - III

PROPERTIES OF SURFACES AND SOLIDS
Determination of Areas - First moment of Area and the centroid - simple problems involving composite figures. Second moment of plane area - Parallel axis theorems and perpendicular axis theorems- Radius of gyration - Polar moment of Inertia - Principal moments of Inertia of plane areas - Second moment of plane area of sections like C,I,T,Z etc. - Basic Concept of Mass moment of Inertia

UNIT - IV

FRICTION
Introduction- Classification of friction-Laws of friction-Co-efficient of friction-Angle of repose-Frictional forces on motion of bodies –Ladder friction-Wedge friction.

UNIT - V

DYNAMICS OF PARTICLES
Displacement- Velocity and acceleration and their relationship - Relative motion - Curvilinear motion - Newton's Laws -D'Alembert's Principle, Work Energy Equation .

TEXT BOOK

1. Engineering Mechanics by Ferdinand . L. Singer / Harper – Collins
2. Engineering Mechanics by S.S. Bhavikatti and K.G.Rajashekarappa – New Age International Publishers, New Delhi.
3. Engineering Mechanics by AK Tayal. Umesh Publications, New Delhi
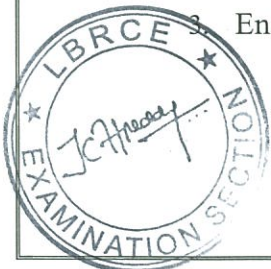
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REFERENCES

1. Engineering. Mechanics by RK Rajput – DhanpatRai and Sons, New Delhi
2. Engineering Mechanics by S.Timoshenko, D.H.Young and J.V.Rao – TATA McGraw Hill, New Delhi, Revised Fourth Edition.
3. Engineering. Mechanics by RK Bansal – Lakshmi Publishers, New Delhi.

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T195	L	T	P	Credits	Internal	External	TOTAL
ENGINEERING PHYSICS	4	1	0	4	25	75	100

UNIT - I

INTERFERENCE: Superposition of waves-double slit interference- Young's double slit experiment- Coherence – Interference from thin films- Newton's rings.
DIFFRACTION: Diffraction and wave theory of light (Fresnel and Fraunhofer diffractions) - single slit Diffraction, Intensity in single- slit diffraction, Calculating the intensity– Double slit interference and diffraction combined.
GRATINGS AND SPECTRA - Multiple slits-width of the maxima, Diffraction gratings, Grating spectrum – Dispersion and Resolving power.
POLARIZATION: Polarization by reflection Brewster's law - Double refraction -Polarization by scattering - Retarders -Optical Activity.

UNIT - II

CRYSTAL STRUCTURES: Introduction –periodic arrays of atoms-Lattice translation vectors, Basis and crystal structure, Primitive cell, fundamental types of lattices-three dimension lattice types, Crystal systems- Structure and packing fractions of Simple cubic-Body centered cubic- Face centered cubic crystals.
X-RAY DIFFRACTION: Directions and planes in crystals – Miller indices – separation between successive (h k l) planes- Diffraction of X- rays by crystal planes – Braggs law- Laue method- powder method.

UNIT - III

LASERS: Introduction – Characteristics of Lasers- Principle of laser (Absorption, Spontaneous and stimulated emission of Radiation), Einstein Coefficients- Population Inversion - Helium Neon Laser, Semiconductor laser, Applications of Lasers.
FIBER OPTICS: Introduction- Principle of optical Fiber- Acceptance angle and Acceptance cone- Numerical aperture - refractive index profile-Application of optical fibers.

UNIT - IV

SUPER CONDUCTIVITY : Phenomenon, Meissner effect, critical parameters, Type I, Type II Super conductors, BCS theory of super conductivity, Applications of Super conductors.

UNIT - V

NON-DESTRUCTIVE TESTING USING ULTRASONICS: Characteristics Production and detection of ultrasonics-Piezoelectric and magnetostiriction methods,Ultrasonic Testing - Basic Principle –Transducer – Couplant and inspection Standards – Inspection Methods – Pulse echo Testing Technique – Flaw detector- Different Types of Scans – Applications.

TEXT BOOKS
1. Fundamentals of physics Resinic, Halliday and Krane, John Wiley 2003
2. Engineering Physics by V RAJENDRAN TataMcGrahill

REFERENCES
1. Introduction to solid state physics, C. Kittel, John wiley, 1999.
2. Engineering physics by H K MALIK AK SINGH TATA McGRAHILL.

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T376 CONSTRUCTION MATERIALS	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	4	25	75	100

OBJECTIVE

At the end of this course the student should have learnt about the various materials, both conventional and modern, that are commonly used in civil engineering construction. Further he should be able to appreciate the criteria for choice of the appropriate material and the various tests for quality control in the use of these materials.

UNIT - I

STONES – BRICKS – CONCRETE BLOCKS

Stone as building material – Criteria for selection - Tests on stones - Deterioration and Preservation of stone work - Bricks - Classification - Manufacture of clay bricks - Tests on bricks - Compressive Strength - Water Absorption - Efflorescence - Bricks for special use - Refractory bricks - Cement and Concrete hollow blocks - Lightweight concrete blocks – Code Practices.

UNIT - II

LIME – CEMENT – AGGREGATES – MORTAR

Lime – Preparation of lime mortar – Cement, Ingredients – Manufacturing process – Types and Grades – Properties of cement and Cement mortar – Hydration – Compressive strength – Tensile strength – Soundness and consistency – Setting time – Aggregates – Natural stone aggregates – Industrial by products – Crushing strength – Impact strength – Flakiness – Abrasion Resistance – Grading – Sand – Bulking – Code of Practices.

UNIT - III

BITUMEN

Pavement Grade bitumen – Asphalt - cut back bitumen - Bituminous Emulsion - Mastic Bitumen - Bituminous felt – Joint filler compound – Joint sealant compound – Anti-stripping compound – Polymer modified bitumen – Latex modified bitumen – crumb rubber modified bitumen

UNIT - IV

TIMBER AND OTHER MATERIALS

Timber - Industrial timber – Plywood – Veneer – Thermocole –Bitumen –Market forms Panels of laminates – Steel – Aluminium and Other Metallic Materials – Composition – Uses – Market forms – Mechanical treatment – Paints – Varnishes – Distempers – Code Practices.
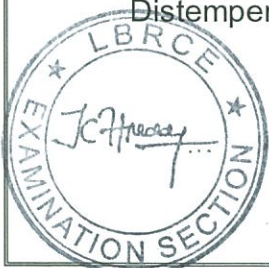
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UNIT - V

MODERN MATERIALS

Glass – Ceramics – Sealants for joints – Fibre glass reinforced plastic – Clay products – Refractories – Composite materials – Types – Applications of laminar composites – Fibre textile – Geosynthetics for Civil Engineering applications.

TEXT BOOKS

1. Surendra Singh, Building Materials, Vikas Publishing Company, New Delhi, 2002.
2. Rajput,R.K., Engineering Materials, S.Chand & Co. Ltd., New Delhi, 2000.
3. M.S. Shetty, Concrete Technology (Theory and Practice), S. Chand & Company Ltd., 2003

REFERENCES

1. P. C Varghese, Building Materials, Prentice Hall of India ca-print-prentice_hall, 2005.

2. Khanna, S.K., Justo, C.E.G, Highway Engineering, Nem Chand & Bros, Roorkee, 2007.

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P832	L	T	P	Credits	Internal	External	TOTAL
ENGLISH LANGUAGE COMMUNICATION SKILLS LAB	0	0	3	2	25	75	100

The English Language Communications Skills Lab focuses on practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts. It aims at improving the communicative competence of students and to enrich their power of expression, articulation and persuasiveness. The thrust is on developing competences, both linguistic as well as communicative, in order to improve employability potential.

OBJECTIVES

1. To expose the students to a variety of self-instructional, learner-friendly modes of English language learning and stimulate intellectual and attitudinal exercise.
2. To provide students with the required facility and practice to face computer-based competitive exams such GRE, TOEFL, IELTS etc.
3. To enable them to learn better pronunciation through emphasis on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To develop necessary attitudes and behaviors so as to improve their employability quotient.

SYLLABUS

The following course content is prescribed for the English Language Communication Skills Laboratory sessions:

1. Dimensions of Phonetics: Phonetic Transcription, Sounds, Stress, Intonation, Rhythm, Varieties of Spoken English: Indian, British and American
2. Oral Presentations -- Prepared and Extempore -- JAM
3. Role Play
4. Describing Objects / Situations / People
5. Information Transfer
6. Debates
7. Group Discussions

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SUGGESTED SOFTWARE/BOOKS

*   *Digital Mentor*, Globarena, Hyderabad, 2005
*   *Sky Pronunciation Suite: Young India Films, Chennai, 2009*
*   Mastering English in Vocabulary, Grammar, Spelling, Composition, Dorling Kindersley, USA, 2001
*   Dorling Kindersley Series of Grammar, Punctuation, Composition, Dorling Kindersley, USA, 2001
*   *Oxford Talking Dictionary,* The Learning Company, USA, 2002
*   *Cambridge Advanced Learners English Dictionary* (with CD). Cambridge University Press, New Delhi, 2008.
*   Learning to Speak English - 4 CDs. The Learning Company,USA,2002
*   Herbert Puchta and Jeff Stranks with Meredith Levy: *English in Mind*: Cambridge University Press, New Delhi, 2009.
*   Krishna Mohan, Effective English Communication, Tata McGraw Hills, New Delhi,2007

P830 ENGINEERING PHYSICS AND CHEMISTRY LAB	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

ENGINEERING PHYSICS LABORATORY
(Any 5 experiments)

LIST OF EXPERIMENTS

1. LCR Resonance circuit

2. Newton's Rings – Determination of Radius of curvature of plano convex lens

3. Verification of laws by using sonometer

4. Meldy's experiment

5. Wedge shaped film

6. Volume Resonator

7. Refractive index of light

8. Diffraction Grating – Normal incidence method

9. Rigidity modulus of a given wire

10. Frequency of AC supply – Sonometer

ENGINEERING CHEMISTRY LABORATORY
(Any 5 experiments)

1. Estimation of total Hardness of water by EDTA method

2. Determination of Temporary and permanent hardness of water.

3. Iodometric Titration of $K_2Cr_2O_7$ v/s $Na_2S_2O_3$ to determine the percentage purity of $K_2Cr_2O_7$ sample.

4. Preparation of Stanard Potassium Dichromate and Estimation of Copper by Iodometry.

5. Determine the amount of Oxalic acid and Sulphuric acid in 1 liter solution by using given standard Sodium Hydroxide and Potassium Permanganate solution

6. Determination of alkalinity of water sample.

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7.   Determination of Dissolved Oxygen (DO) content by Winkler's method.
8.   Preparation of Urea formaldehyde resin.

III - SEMESTER

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T367	L	T	P	Credits	Internal	External	TOTAL
APPLIED MATHEMATICS - III	4	1	0	4	25	75	100

UNIT – I

Solution of Algebraic and Transcendental Equations: Introduction – The Method of False Position – Newton –Raphson Method. Interpolation: Introduction – Errors in Polynomial Interpolation – Finite difference- Forward Differences – Backward differences- Central differences

UNIT – II

Symbolic representation of forward, backward, central and shifting operators. Relations between them. Differences of a polynomial –Newton's formulae for interpolation (both forward and backward)- Lagrange's Interpolation formula. Numerical Differentiation and Integration – Differentiation using finite differences –Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

UNIT – III

Numerical solution of Ordinary Differential equations: Solution by Taylor's series- Picard's Method of successive Approximations – Euler's Method - Runge - Kutta Methods. Curve fitting: Fitting a straight line- Second degree curve-exponential curve by method of least squares.

UNIT – IV

Probability: Sample space and events – Probability - The axioms of probability.

Random variables – Discrete and continuous distributions – Distribution function. Binomial, Poisson, normal distribution – related properties

UNIT –V

Statistical Hypothesis – Errors of Type I and Type II errors. One tail and two – tailed tests. Testing of hypothesis concerning means, proportions and their differences using Z-test. Tests of hypothesis using Student's t-test, F-test and (Chi - square) $\chi 2$ test. Applications of decision making use the above tests.

TEXT BOOKS

*1. Higher Engineering Mathematics by Dr.B.S.Grewal

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2. Higher Engineering Mathematics by Dr.B.V. Ramana-TMGH
3. Probability and Statistics, Guupta & Kapoor

REFERENCE

1. Introductory Methods of Numerical Analysis by S.S. Sastry – PHI
2. Numerical Methods for Engineers with programming and software application by Steven.C.Chopra and Ra.P.Canale-TMGH
3. Numerical Methods for scientific and engineering by M.K.Jain, S.R.K.lyengar-New Age International ltd.
4. Probability and Statistics for Engineers, Miller, John E. Freund, PHI.
5. Probability , Statistics and Queuing theory applications for Comp. Sciences,2/e ,Trivedi,John Wiley

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T377 CONSTRUCTION TECHNIQUES, EQUIPMENT AND PRACTICES	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

OBJECTIVE

The main objective of this course is to make the student aware of the various construction techniques, practices and the equipment needed for different types of construction activities. At the end of this course the student shall have a reasonable knowledge about the various construction procedures for sub to super structure and also the equipment needed for construction of various types of structures from foundation to super structure.

UNIT - I

Functional planning of building: Introduction-man made environment-general principles of site selections-site plan-planning regulations and by laws-principles of planning. Masonry construction: General Discussion-masonry classifications-deifications of terms-stone masonry-brick masonry-hollow concrete masonry-reinforced masonry-composite masonry.

UNIT-II : Supporting structures and concrete constructions

General-foam work-scaffolding-shoring-underpinning –reinforced concrete constructions-precast concrete constructions prestressed concrete constructions- joints in concrete works

UNIT-III

A) Damp preventions and fire protections-Source of Dampness- effect of dampness-techniques and methods of damp preventions-material used for damping(d.p.c)-treatment in building-treatment of dampness-
B) Fire protection: important considerations in fire protections- properties of fire resisting materials –fire resistant constructions- general measurement of fire safety in buildings
C) Arches& lintels: arches and their stability considerations- technical terms in arch work-types of arches- methods of constructions of arches..

UNIT-IV

Acoustics of building –characteristics of audible sound, Behaviour of sound and its effects acoustical defects and acoustic buildings air conditions of buildings-classifications –system of air conditions-essetials of an air conditioned system & anti –terminate in building essential –types of proofing methods.

UNIT-V

Construction Equipment: selection of Equipment-excavation equipment-compaction equipment-hauling equipment-hoisting equipment-conveying equipment-pumping equipment-pile driving equipment-

TEXT BOOKS

1. Peurifoy, R.L., Ledbetter, W.B. and Schexnayder, C., "Construction Planning, Equipment and Methods", 5th Edition, McGraw Hill, Singapore, 1995.
2. Arora S.P. and Bindra S.P., Building Construction, Planning Techniques and Method of Construction, Dhanpat Rai and Sons, 1997.
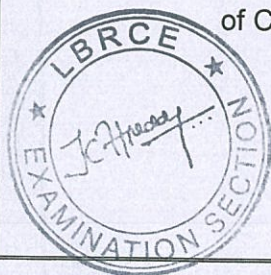
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T177 ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Electrical Circuits: Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchhoff's Laws, Inductive networks, capacitive networks, Series, Parallel circuits and Star-delta and delta-star transformations

UNIT - II

AC Machines: Principle of operation of alternators – regulation by synchronous impedance method – MMF and zero power factor methods. Principle of operation of induction Principle of operation of three-phase induction motors –Slip ring and Squirrel cage motors – Slip-Torque characteristics

UNIT - III

Transformers: Principle of operation of single phase transformers, Ideal transformer, Practical transformer, phasor diagram.– emf equation – losses – efficiency and regulation..

UNIT - I V

Diode and Transistors: P-n junction diode, symbol, V-I Chacracteristics, DiodeApplications, Rectifiers – Half wave, Full wave and Bridge rectifiers (simple Problems).PNP and NPN Junction transistor, Transistor as an amplifier, SCR characteristicsand applications.

UNIT - V

Electrical and Electronics Measuring Instruments.
Electrical Instruments: Basic Principle of indicating instruments – permanent magnet moving coil and moving iron instruments. **Electronic Instruments:** Principles of CRT (Cathode Ray Tube), Deflection, Sensitivity, Electrostatic and Magnetic deflection, Applications of CRO - Voltage, Current and frequency measurements.

TEXT BOOK
Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin/Pearson.
REFERENCES
1.   Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.
2.   Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition.
Electrical Technology by JB GUPTA

T395	L	T	P	Credits	Internal	External	TOTAL
MECHANICS OF FLUIDS	4	1	0	4	25	75	100

UNIT – I

FLUID PROPERTIES

Density, specific weight, specific volume, specific gravity, compressibility, viscosity, surface tension, capillarity, vapour pressure. Fluid Statics: Pressure in a fluid, pressure head, Measurement of pressure, Hydrostatic forces on submerged plane and curved surfaces, Buoyancy, Metacentre, stability of floating and submerged bodies.

UNIT- II

FLUID KINEMATICS

Stream line, streak line, Path line and stream tube. Types of flow, steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows. Equation of continuity for one, two, three dimensional flows, Stream function and velocity potential function, flow net analysis,.Dynamics of Flow: Euler's equation of motion, Bernoulli's equation, simple applications of Bernoulli's equation, Momentum equation. Kinetic energy and Momentum correction factors.

UNIT – III

BOUNDARY LAYER THEORY

Boundary Layer thickness, Displacement thickness, Momentum thickness, Energy thickness, Boundary layer growth and separation. Laminar flow: Laminar flow through pipes, Hagen - poissuille flow, energy loss. Turbulent flow: Turbulent flow through pipes, Darcy's equation,
Minor losses, Energy and hydraulic gradients, pipes in series and parallel.

UNIT- IV

FLOW MEASUREMENT

Pitot tube, Venturimeter, orificemeter, Flow nozzle, and mouthpieces, flow over notches and weirs, Venturiflume and Standing wave flume, Velocity measurement in open channel.

UNIT – V

DIMENSIONAL ANALYSIS AND SIMILITUDE

Dimensional analysis - Rayleigh's method, Buckingham's fi theorem, Dimensionless numbers, Laws of similitude, Model Analysis, Distorted models, Principles of analogy.

TEXT BOOKS

1. Modi, P.N., and Seth, S.M., Hydraulics, Fluid Mechanics and Hydraulic Machines, Standard Book Home, New Delhi, 2005.
2. Rajput,R.K., Text Book of Fluid Mechanics and Hydraulic Machinery, S.Chand & Company, Ltd., New Delhi, 2005.

REFERENCES

1. Douglas, J.F., Gasiorek, J.M and Swaffield, J.A., Fluid Mechanics 4th Edn. Pearson Education India, 2002.
2. Das M.M Fluid Mechanics and Turbimachines , Prentice Hall of India (P) Ltd New Delhi, 2008.
3. Arora, K.R Fluid Mechanics, Hydraulic and Hydraulic Machines , Standard Publishers and Distributors , New Delhi , 2005.

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T396	L	T	P	Credits	Internal	External	TOTAL
MECHANICS OF SOLIDS	4	1	0	4	25	75	100

UNIT – I

Simple stresses and strains

Introduction – Stress – Strain – Tensile, compressive and shear stress – Elastic limit – Hooke's law – stress strain diagram – Stresses in composite sections – Thermal stresses – Young's modulus – Rigidity modulus – Bulk modulus – Poisson's ratio – Volumetric strain – Relationship between elastic constants. Analysis of trusses by methods of joints and sections.

UNIT – II

Shear Force and Bending Moment

Introduction – Types of beams – Cantilever – Simply supported – Over handing – fixed and continuous beams – types of loads – concentrated load – Uniformly distribute load – Uniformly varying load – Couples – Shear force and bending moment diagram for statically determinate beams (Cantilever, simply supported and over handing) Relationship between load, shear force and bending moment.

UNIT – III

Bending and shear stresses

Theory of simple bending – Assumption – Derivation of Flexure Formula - bending stresses in simply supported, cantilever beams. Shear stress in beams – Shear stress distribution like Rectangular, Circular, Triangular, I and T Sections.

UNIT – IV

Torsion of circular shafts and springs

Introduction – Derivation of torsion equation – Assumptions – Power transmitted by shafts – Design of shafts – Combined bending and torsion Closed coiled and open coiled helical springs subjected to axial load.

UNIT – V

Thin and Thick cylinders

Thin cylinders – Circumferential stress – Longitudinal stress – Volumetric strain - Stresses in thick cylindrical shell – Lame's equation – Stresses in compound cylinders – Shrink fit.

TEXT BOOKS

1. Bhavikatti. S. S., Strength of Materials, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2002.
2. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vols. I & II, XI Edition, Laxmi Publications (P) Ltd., New Delhi, 2002.
3. Hearn, E. J., Strength of Materials, Pergamon Press, Oxford, 1997.

T409 SURVEYING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	4	25	75	100

UNIT – I

Linear Measurements
Principles - Ranging and Chaining - Errors in chaining-overcoming obstacles in ranging and chaining - uses of cross staff and optical squares - Traversing - Plotting.

UNIT – II

Compass Survey
Prismatic compass - Surveyor's compass - Bearings - Whole circle and Reduced Bearing - traversing - Local attraction - Magnetic declination.

UNIT- III

Plane Table Survey
Plane table survey-accessories - Methods - Intersection - Radiation - Resection - Traversing – Two point and three point problems - Bowditch's Correction.
Study of Minor Instrucments
Planimeter - Sextant - Pentograph - Ceylon Ghat Tracer.

UNIT- IV

Leveling
Principles - Levels and Staves - Bench Marks - Temporary and permanent adjustments – Booking - Reduction - Arithmetic checks - Fly leveling – Reciprocal leveling – check leveling - longitudinal and cross sectioning - Plotting.

UNIT- V

Contouring, Areas and Volumes
Contouring - Characteristics and uses - Interpolation - Calculation of areas and volumes field notes and plan - Earth work - Capacity of reservoirs - alignment of hill roads.

TEXT BOOKS

1. Kanetkar T.P and Kulkarni S.V., "**Surveying and leveling part I and II**", Vidyarthi Prakasam,Pune - 411 030, 1997.
2. Punmia B.C., "**Surveying Vol I and II**", Laxmi Publications 9th / 10th Edition, 1987.
3. Basak N.N., "**Surveying and Leveling**", Tata McGraw Hill Publishing Company Ltd., New Delhi, 1994.
4. Agor R "**Text Book of Surveying and Leveling**", Khanna Publishers, 2BNath Market, Nai Sarak, Delhi - 110 006, 1998.

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P888 COMPUTER AIDED BUILDING DRAWING	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

1. Fully Panelled Window

2. Fully Panelled Door with wooden panel

3. Fully Panelled Door with RCC frame

4. Panelled and glazed door with wooden panel

5. Steel roof truss

6. King post and Queen post trusses

7. Single floor residential building - Plan, Elevation and Cross section

8. Storied residential building- Plan, Elevation and Cross section

9. Framed office building- Plan, Elevation and Cross section

10. Institution building- Plan, Elevation and Cross section

11. 3D view of a single floor residential building

12. 3D view of a dog legged stair case

13. 3D view of a spiral stair case

REFERENCES

1. Sikka V.B., "**A Course in Civil Engineering Drawing**", 4th edition, S.K.Kataria & Sons, New Delhi – 1998.
2. Shah M.G. Kale C.M. & Patki S.Y., "**Building Drawing with an Integrated Approach to Built Environment**", 4th edition, Tata McGraw Hill Publishing Co. Ltd. New Delhi – 2002.

IS Codes

1. IS: 962 – 1967 Code of Practical for Architectural and Building Drawing
2. IS: 4021 – 1983 Specification for Timber Door, Window and Ventilator Frames
3. IS: 6523 – 1983 Specification for Precast Reinforced Concrete Door and Window Frames
4. IS: 1003 – 1977 Part I, II Specification for Timber Panelled and Glazed Shutters
5. IS: 2191 – 1983 Part I, II Specification for Wooden Flush Door Shutters
6. IS: 6198 – 1983 Specification for Ledged, Braced and Battened Door and Window Frame.

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P893 STRENGTH OF MATERIALS LAB	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of 8 experiments from the following

1. Study of stress-strain characteristics of mild steel bars by UTM.

2. Study of stress-strain characteristics of HYSD bars by UTM.

3. Determination of modulus of elasticity of the material of the beam by conducting bending test on simply supported beam.

4. Determination of modulus of rigidity by conducting torsion test on solid circular shaft.

5. Determination of hardness of the given material by Brinnel's/Vicker's/ Rockwell hardness test.

6. Determination of impact strength of the given material by conducting Charpy/Izod test

7. Determination of ultimate shear strength of steel by conducting direct shear test.

8. Determination of modulus of rigidity of the material of closely coiled helical spring.

9. Determination of compressive strength of wood with grain parallel / perpendicular to loading.

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P896 SURVEY FIELD WORK	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

CHAIN SURVEYING

1. (a) Pacing
   (b) Ranging
   (c) Spreading and Folding of Chain
   (d) Chaining of a line

2. (a) Determination of Area by taking Perpendicular Offsets
   (b) Determination of Area by taking Oblique Offsets

3. Determination of Obstacle Length

4. Chain and Cross Staff Survey – Running a closed traverse around an existing building

COMPASS SURVEYING

5. Compass traverse – Plotting and Adjustments of Traverse 6. Compass Surveying – Distance between Two Inaccessible Points

PLANE TABLE SURVEYING

7. (a) Radiation method of plane table survey
   (b) Intersection method of plane table survey

8. Plane Table traverse

9. Two Point Problem

10. Three Points Problem – Trial and error method

LEVELING

11. Simple Leveling (Including an inverted staff reading)
12. Fly LEVELING
13. Check LEVELING
14. Longitudinal sectioning and Cross Sectioning
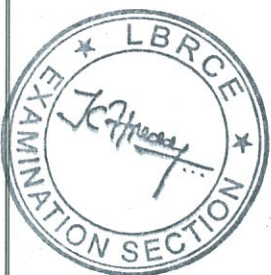
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IV - SEMESTER

T365 ADVANCED SURVEYING	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT- I

Theodolite
Parts - Temporary and permanent adjustments of vernier theodolite - optical and micro optic theodolites – Total station – advantages Distomat - Trilateration – Traversing- Omitted measurements.
Setting out works Setting out of buildings and marking for foundation.

UNIT- II

Tacheometry
Principle of stadia and tangential tacheometry - Field procedure and different system - Heights and distances - Subtense bar.

UNIT- III

Curves
Simple, Compound, Transition, Reverse and Vertical Curves.
Trignometrical levelling
Single and Reciprocal observations - Eye and Object Corrections

UNIT –IV

Triangulation survey
Principle of Triangulation - Types of Signals - Intervisibility of stations - Base line measurements and corrections - Extension of base line - Satellite stations - Problems - Adjustment of Triangulation by the method of equal shifts.

UNIT- V

Hydrographic Surveying
Control - Shore line - River surveys - Soundings gauges - Signals - Sextant - Methods of locating soundings.
Photographic surveying
Terrestrial and Aerial Photographs - Stereoscopy - Flight planning - Satellite - Image Characteristics – Concepts of Remote sensing

TEXT BOOKS

1. Kanetkar,T.P, "**Surveying and Leveling Vol. I & II**", United Book Corporation, Pune, 23rd Edition. 1997
2. Punmia B.C., "**Surveying Vol. I, II & III**" Laxmi Publications 9th Edition, 1987
3. Bannister and Raymond, S, "**Surveying**", Pitman Publishing Ltd., 5ThEdition. 1987.
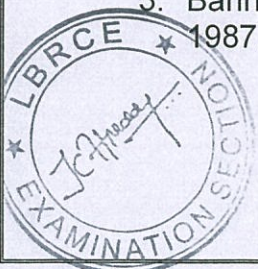
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REFERENCES

1. Clark ,D,"**Plane & Geodetic Surveying Vol. I & II**" , CBS Publishers and Distributors,   Delhi 6th Edition.1971
2. Shahani,P.B,"**Advanced surveying**", Oxford and IBH Publishing Company. 1971
3. Agor, R, "**Text Book of Advanced Surveying**", Khanna Publishers, 1981
4. Natarajan,V, "**Advanced Surveying**" , BI Publications, 54, Janpath, New Delhi. 1976
5. Arora, K.R," **Surveying Vol II & III**", Standard Book House & SBH Publishers & Distributors,1705, A Nai Sarak, New Delhi - 110 006,2nd Edition. 1993.
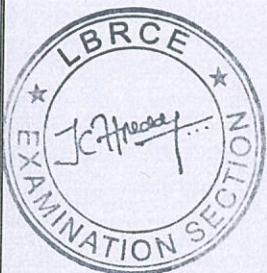
T366 APPLIED HYDRAULIC ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT – I

OPEN CHANNEL FLOW

Types of flow, Types of Channel, Velocity distribution, Chezy, Manning and Basin formulae, for uniform flow, Most economical section , critical flow ,Specific energy, specific force. Computation of uniform flow and critical flow.

UNIT-II

OPEN CHANNEL FLOW

Non-Uniform flow, Dynamic equation for Gradually varied flow, computation for length of backwater curve, Rapidly Varied flow - hydraulic jump, types, uses. Surges in open channels.

UNIT-III

BASICS OF TURBO MACHINERY

Impulse momentum equation, Hydrodynamic forces of jets on vanes, velocity Triangles, Angular momentum principle, application to radial flow turbines.

UNIT-IV

TURBINES

Classification, impulse and reaction turbines, characteristic curves, draft tubes, governing of
turbines, specific speed, unit quantities concept, similarity, cavitation.

UNIT-V

PUMPS:

Centrifugal pumps - classification, work done, minimum starting speed, losses and efficiencies, specific speed, multistage pumps, specific speed, characteristic curves, NPSH, Cavitation in pumps.
Reciprocating pumps - types, effects of acceleration and frictional resistance, separation, Air vessels, work saved by fitting air vessels.

TEXT BOOKS

1. Modi, P.N., and Seth, S.M., Hydraulics, Fluid Mechanics and Hydraulic Machines,
   Standard Book Home, New Delhi, 2005.
2. Rajput,R.K., Text Book of Fluid Mechanics and Hydraulic Machinery, S.Chand &
   Company, Ltd., New Delhi, 2005.
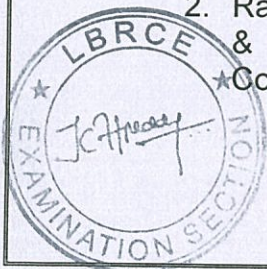
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REFERENCES

1. Douglas, J.F., Gasiorek, J.M and Swaffield, J.A., Fluid Mechanics 4th Edn. Pearson
   Education India, 2002.
2. Das M.M Fluid Mechanics and Turbimachines , Prentice Hall of India (P) Ltd
   New Delhi, 2008.
3. Arore, K.R Fluid Mechanics, Hydraulic and Hydraulic Machines , Standard Publishers
   and Distributors , New Delhi , 2005

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T374 CONCRETE TECHNOLOGY	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	4	25	75	100

UNIT –I

Concrete Making Materials
Cement –raw materials –manufacture- compound –composition- hydration of cement – types of cement-tests and specifications. Aggregates –size and shape –gradation of aggregate – fineness modulus – bulking of sand-tests and specifications – alkali aggregate reaction-quality of water for concreting and curing .

UNIT – II

Properties of Concrete
Properties of fresh concrete –workability –slump test –compaction factor test –flow test –
segregation – bleeding Properties of hardened concrete –strength development – elastic properties of concrete-durability – impermeability - shrinkage and creep- thermal properties – fire resistance-resistance to abrasion.

UNIT- III

Quality Control and Admixtures in Concrete
Control techniques –storing –batching –mixing – transporting –placing –compacting –finishingcuring– tests and specifications for fresh and hardened concrete – acceptance and rejection criteria – introduction to nondestructive testing. Accelerators – retarders –water proofing compounds - air entraining agents– workability agents –bonding admixtures –pozzolanic admixtures – silica fume –fly ash –blast furnace slag-hyper plasticizer.

UNIT – IV

Special Concrete
Light weight concrete – light weight aggregate concrete –no fines concrete –high density concrete –sulphur infiltrated concrete –fibre reinforced concrete –polymer concrete –ready mixed concrete –high strength concrete –High performance concrete- Self compacting concrete-Bacterial concrete –gunite – shotcrete –vacuum concrete – pre packed concrete-ferro cement.

UNIT- V

Concreting Plant and Mix Design
Batching plant –mixer –distributing plant –vibrators – repairs in concrete –control of cracks in
mass concrete – surface treatment of concrete Concept of mix design –ACI method, Road note method (concepts only)- Indian Standard method.
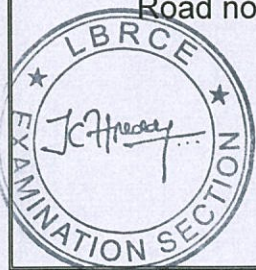
HEAD
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TEXT BOOKS

1. Shetty. M.S, "**Concrete Technology**" S.Chand & Co., Ltd., New Delhi, 2003
2. Gambhir. M.L, "**Concrete Technology**", Tata McGraw Hill Publishing Co.,New Delhi 1998.

REFERENCES

1. Orchard .D.F "**Concrete Technology**", Vol & II, Applied Science Publishers Ltd,London, 1979
2. Neville , A. M, "**Properties of Concrete**",4th Edition Pitman Publishing Ltd,London, 1995.
3. Rofat Siddique "**Special structural Concrete**" Galgotiya Publishing Pvt. Ltd.,New Delhi, 1996

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T383 ENGINEERING GEOLOGY	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

GENERAL GEOLOGY

Geology in Civil Engineering – Branches of geology – Earth structure and composition – Continental drift – Weathering – types and products – Geological work of Rivers, Wind and Sea – Seismic zones of India – Geophysical Methods – Seismic and Electrical Methods for Subsurface Investigation

UNIT - II

MINEROLOGY

Physical properties of Minerals – Crystallographic system – Study of following rock forming minerals- Quartz, Felspar, Piroxene, Amphibole, Mica, Calcite, Gypsum and Clay

UNIT - III

PETROLOGY

Classification of Rocks – Igneous, Sedimentary and Metamorphic Rocks – Origin, Structure and Classification – Metamorphism – Engineering Properties – Distribution of Dolerite, Syenite, Gabbro, Basalt, Sandstone, Limestone, Conglomerate, Breccia, Quartzite, Marble, Gneiss, and Schist.

UNIT - IV

STRUCTURAL GEOLOGY

Civil Engineering Importance of Folds, Faults, Unconformity and Joints relevance to civil engineering –Prospect of ground water

UNIT - V

ENGINEERING APPLICATIONS IN GEOLOGY

Geological consideration in construction of Dam, Tunnel, Secured Landfill - Earthquake, causes and Distribution in India – Tsunami – Remote Sensing for Civil Engineering Applications.

TEXT BOOKS

1. Parbin Singh., "Engineering and General Geology", Katson Publication House, 2009.
2. Chenna Kesavulu N., "Text book of Engineering Geology", Macmillan India Ltd, 2003.

REFERENCES

1. Legget., "Geology and Engineering", 2nd Edition, McGraw Hill Book Company, 2006.
2. Blyth. "Geology for Engineers", 7th Edition, ELBS, 1995.
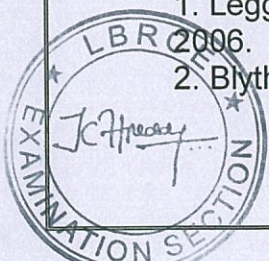
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T391 HYDROLOGY	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	4	25	75	100

UNIT – I

Introduction - Definition and scope - Hydrologic cycle – Types and Forms of precipitation -
Adequacy of rain gauges - Recording and non-recording gauges – Estimation of missing rainfall data.Mean precipitation over an area-– Thiessen and Isohyetal methods. Frequency analysis – Intensity-duration analysis - Rainfall Hyetograph - Rainfall Mass Curve - Double Mass curve.

UNIT – II

Interception – depression and detention storage – Infiltration- Measurement – Infiltrometers-
Horton's equation, Infiltration equations, Infiltration indices. Evaporation Process- Measurement of Evaporation - Pan Coefficient - Horton's equation– evaporation suppression - Evapo - transpiration – measurement.

UNIT – III

Watershed, catchment and basin – catchment characteristics – factors affecting runoff - Components of runoff - Runoff estimation using empirical, Strange's table and SCS methods
Stream flow and stream gauging – measurement of discharge- Area- velocity method, floats,
current meter- Stage – Discharge rating curve.

UNIT- IV

Hydrograph Analysis – Components of hydrograph - Baseflow separation- Unit hydrograph –
assumptions, limitation, derivation, applications- Synthetic unit hydrograph – S- hydrograph
Flood Routing- Muskingum method – Modified pulse method.

UNIT –V

Groundwater- Types of aquifer – Aquifer parameters- Dupuit's assumptions-steady flow to wells for confined and unconfined Aquifer- Pumping test- Rain Water Harvesting (RWH) in rural and urban areas – RWH from roof top and open areas – Artificial recharge structures.

TEXT BOOKS

1. Subramanya.K., "**Engineering Hydrology**", Tata McGraw Hill, New Delhi , 1999
2. Jayarami Reddy.P., "**Hydrology**", Tata McGraw Hill, New Delhi , 1999
3. Ragunath.H., "**Hydrology**", Wiley Eastern Limited, New Delhi, 1998.

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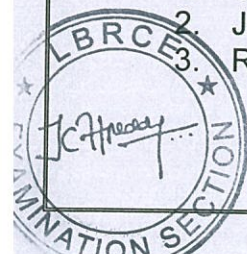
REFERENCES

1. Ven Te. Chow, Maidment D.R. and Mays L.W. "**Applied Hydrology**," McGraw Hill
   International Book Company. New York, 1995.
2. Ven Te Chow, "**Hand book of Applied Hydrology**", McGraw Hill Book Co., Inc., New York, 1964.
3. Vijay P.Singh, "**Elementary Hydrology**", Prentice Hall of India, New Delhi, 1994.
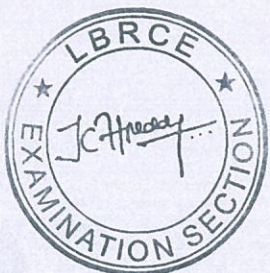
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T397 MECHANICS OF STRUCTURES	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT – I

Axial and bending stresses

Direct and bending stresses – uniaxial and biaxial eccentricities – middle third rule – core of the section – analysis of long column – different end conditions – Euler's theory – Rankine's formula – long column under eccentric loading.

UNIT – II

Principal stresses and strain

Analysis of two dimensional state of stress – biaxial state of stress – principal stresses and strains on inclined plane – Mohr's circle – Theories of failure

UNIT – III

Slope and deflections of determinate Beam.

Determination of slope and deflection of determinate beams – cantilever, simply supported and over hanging beam - Double Integration Method, Macaulay's Method and Moment Area Method

UNIT – IV

Slope and deflection of propped and fixed beams

Analysis of propped and fixed beam for shear force and bending moment – slope and deflection by Double Integration Method and Moment Area Method –Beams with yielding of supports

UNIT – V

Continuous Beams

Theorem of Three Moments – analysis of continuous beam with prismatic member - Beams with yielding of supports

TEXT BOOKS

1. Bhavikatti. S. S., Strength of Materials, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2002.

2. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vols. I & II, XI Edition, Laxmi Publications (P) Ltd, New Delhi, 2002.

3. Hearn, E. J., Strength of Materials, Pergamon Press, Oxford,

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P834 FLUID MECHANICS AND HYDRAULIC MACHINES LAB	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of twelve (12 No) shall be done and recorded

1. Verification of Bernoulli's theorem.

2. Venturimeter : Determination of Coefficient of discharge.

3. Orificemeter : Determination of Coefficient of discharge.

4. Orifices : Determination of Coefficient of discharge by steady and unsteady flow methods.

5. Mouthpieces : Determination of Coefficient of discharge by steady and unsteady flow methods.

6. Characterization of laminar and turbulent flows by Reynold's apparatus.

7. Determination of friction factor of Pipes.

8. Determination of loss of head in pipes due to bend /sudden contraction/ sudden expansion.

9. Determination of Coefficient of discharge for rectangular notch / V – notch.

10. Determination of Manning's and Chezy's coefficients in open channel.

11. Study on Characteristics of Hydraulic Jump

12. Measurement of force due to impact of jets on vanes of different types.

13. Performance studies on Pelton turbine.

14. Performance studies on Francis turbine /Kaplan turbine.

15. Performance studies on single stage centrifugal pump.

16. Performance studies on Reciprocating pump.

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P891 ENGINEERING GEOLOGY LAB	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

1. Description of Minerals by physical properties.

2. Description and Engineering uses of Rocks

3. Description and engineering consideration of Structural Models

4. Field Structural problems

5. Identification of Land forms, Drainage pattern and other features on Topo Sheets

6. Study and drawing of Geological cross sections

7. Study and Interpretation of satellite imageries

8. Electrical resistivity survey and Interpretration

9. Seismic Refraction survey using Hammer sounding method and interpretation.

10. Global positioning System (GPS) and its Functioning

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V - SEMESTER
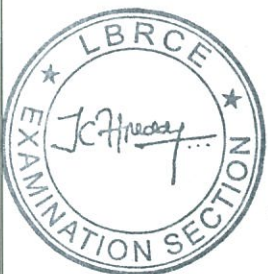
T369 BASIC STRUCTURAL ANALYSIS	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT – I

Analysis of pin jointed truss
Stability and equilibrium of pin jointed trusses – perfect frame -analysis of pin jointed plane truss by method of Joints, method of sections and tension coefficient method.

UNIT – II

Rolling loads and influence line diagrams
Single concentrated load – uniformly distributed load (longer and shorter than span) – two concentrated loads – several concentrated loads – equivalent UDL. Influence lines – ILD for reaction, shear force and bending moment for simply supported beams subjected to concentrated loads, uniformly distributed load (longer and shorter than span) – two concentrated loads – several concentrated loads.

UNIT – III

Strain energy
Strain energy – expression for different forms of strain energy – axial bending and shear - Castigliano's theorems – determination of slope and deflection of determinate and indeterminate beams and portal frames.

UNIT – IV

Arches and suspension bridges
Equation of the cable – tension in cable at different levels – cable subjected to point loads and UDL – length of cable stiffening girders – analysis of three hinged stiffening girder - moving loads and ILD in three hinged stiffening girder Types of arches - parabolic and circular arches – linear arch – Eddy's theorem – Analysis of three hinged arch - moving loads and ILD of three hinged arches.

UNIT – V

Unsymmetrical bending
Unsymmetrical bending – introduction – product of inertia – principal axes – principal moment of inertia – stresses due to unsymmetrical bending –shear center for sections with one axis of symmetry.

TEXT BOOKS

1. Bhavikatti. S. S., Strength of Materials, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2002.
2. Bhavikatti. S. S., Structural Analysis – I, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2002.
3. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vols. I & II, XI Edition, Laxmi Publications (P) Ltd, New Delhi, 2002.

T378 DESIGN OF R.C.C. ELEMENTS	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT – I

Principles of Limit State method of design – characteristic load and strength – Partial safety factor – stress block parameters Limit State of collapse – flexure – balance and under reinforced – design of singly and doubly reinforced rectangular section– analysis and design of under-reinforced flanged section – l/d ratio with medication factor for deflection calculation – cover for durability and fire resistance.

UNIT – II

Limit State of collapse – shear and torsion - design of a rectangular section for shear, shear-torsion and bending-torsion. Design for development length – end anchorages. Reinforcement details in beam for flexure, shear and torsion – serviceability requirements.

UNIT – III

Design of slabs - one way and two way – simply supported, continuous and restrained, using coefficients given in IS code Reinforcement details in one way and two way slabs – serviceability requirements.

UNIT – IV

Limit State of Collapse – compression; design of columns for axial load – square, rectangular and circular cross section with lateral and spiral ties. Design of short and long columns for uniaxial and biaxial eccentricities using interaction charts – Reinforcement details for columns – serviceability requirements.

UNIT – V

Concept of Working Stress Method – analysis and design of flexural member using working stress method – design of singly and doubly reinforced section – shear and torsion. Deflection calculation – short term and long term deflection – crack width calculation

TEXT BOOKS

1. Krishna Raju N. and Pranesh R.N., "**Reinforced concerete design IS 456-2000, Principles and practice**", New Age International (P) Ltd, publishers, New Delhi, 2003.
2. Ashok K. Jain, "**Reinforced Concrete Limit State Design**", 4th Edition Nem Chand & Bros, Roorkee,1993.
3. Punmia B.C et al, "**Comprehensive RCC Design**" Laxmi publications (P) Ltd, New Delhi,1998.
4. Gambhir M.I., "**Reinforced Concrete Design**", Macmilan India Limited, 1993.
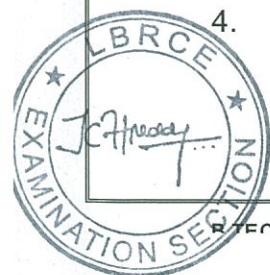
T380 DESIGN OF STEEL STRUCTURES	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT- I

What are steel structures? ; What a steel structure consists of? ; Structural steel; Products of structural steel ; Standards , Codes and Specifications; Fatigue ; Brittle fracture ; Corrosion protection of steel structures ; Design philosophies ; Methods of structural analysis ; Plate(Local) buckling ; Classification of sections, Design of Joints - Bolted and Welded Connections under axial and eccentric loadings.

UNIT- II

Compression Members: Introduction ; Euler's buckling theory ; Behaviour of real columns ; Types of sections ; Design of columns ; Validity of design strength calculations ; Design of compression members ; Design Procedure ; Built-up compression members.

UNIT- III

Tension Members: Design of Axially and Eccentrically Loaded Tension Members - Tension Splices- Design of Lug Angles, Column bases: Design of Column bases, Slab Bases, Gusseted base,

UNIT- IV

Behaviour of steel beams – Limit state of serviceability - design of laterally restrained steel beam Design of laterally unrestrained beams – lateral torsional buckling of beams – factors affecting lateral stability.

UNIT- V

Design of beam column – Short beam column – long beam column – strength of beam columns – Mode of failure.

TEXT BOOKS

1. Subramanian.P, Design of steel structures, Oxford Publishers, New Delhi, 2007.
2. Design of steel structures by K.S.Sai Ram, Pearson Education, 2010
3. Limit state design of steel structures by M.R.Shiyekar , PHI.
4. Learning Ramachandra, 'Design of Steel Structures', Vol. I & II, Standard book house, Delhi.

REFERENCES

1. Punmia B.C, Ahok Kumar Jain and Arun Kumar Jain, Comprehensive Design of Steel Structures, Lakshmi publications (P) Ltd., New Delhi, 1998.
2. Arya, A.S. and Ajmani, J.L., 'Design of Steel Structures', Nem Chand and Bros, Roorkee, 2000
3. Solmon and Johnson, 'Steel Structures- Design and Behaviour', Intext Educational Publishers, 1971

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T393 IRRIGATION AND WATER RESOURCES ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT – I

Introduction-Importance of water resources-status and development of Indian water resources-Soil- Water – Plant relationship- Wilting point- Crop rotation- Cropping season. -Crop Water relationships- Estimation of Evapotranspiration, Consumptive use – Blaney criddle method, modified Penman method- Crop factor – Critical stages of crop growth for water requirement

UNIT – II

Duty-Delta, factors affecting duty-improvement of duty- Irrigation methods: Flooding, Furrow, Contour, Drip and Sprinkler- relative merits and limitations – Evaluation of irrigation methods – Irrigation efficiency- Irrigation Water Quality

UNIT – III

Reservoir types - Planning procedure for single and multipurpose projects – Fixation of Storage capacity - Strategies for reservoir operation - Sedimentation of reservoirs –River training works-types of works.

UNIT - IV

Dams- forces acting – failures and remedies – design of gravity dam - energy dissipators ogee spillways Components of irrigation network: Weirs, failures of weirs, Bligh's theory, Lanes weighted creep theory, Khosla's theory,

UNIT – V

Diversion head works- Divide wall, Fish ladder- Sluices, Head regulator-Silt control at head works – Silt excluder and silt ejector. Cross drainage works-functions of Aqueduct, Syphon aqueduct, Level crossing, inlet and outlet Canal outlets – Canal alignment - Design of canal by Lacey's theory, Kennedy's theory. Canal regulators - Water logging and Canal lining-canal maintenance

TEXT BOOKS

1. Santhosh Kumar Garg, "**Irrigation Engineering and Hydraulic Structures**," Khanna Publishers, New Delhi, 2003
2. Punmia.B.C, "**Irrigation and Water Power Engineering**," Standard Publishers, New Delhi, 1997.

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REFERENCES

1. Michael A.M., "**Irrigation – Theory and Practice**", Vikas Publishing House, New Delhi, 1990.
2. Sharma R.K., "**Irrigation Engineering and Hydraulic Structures**", Oxford and IBH Publishing company, New Delhi, 1994.
3. Dilip Kumar Majumdar, "**Irrigation Water Management Principles and Practice**", Prentice – Hall of India, Private Limited, New Delhi, 2000.
4. Modi.P.N., "**Irrigation Water Resources and Water Power Engineering**", Standard Book House, Delhi, 1995.

T407 SOIL MECHANICS	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Types and physical properties of soil

Types of soil – Physical properties of soil and their determination – Important definitions related to three phase diagram and relationships – Field identification of soils – Classification of soils based on grain size distribution – Hydrometer analysis.

Consistency and plasticity characteristics of Soil

Determination of consistency limits and their significance to the field behaviour of soil – Classification of soils based on grain size and plasticity characteristics of soils.

UNIT - II

Permeability characteristics of soils

Darcy's Law and its validity – Factors affecting permeability – Laboratory determination of permeability for cohesive and cohesionless soils – Permeability of layered deposits

Concept of effective stress in soils

Terzaghi's effective stress concept for saturated soil deposits – seepage flow and seepage pressure – Quick sand condition and critical hydraulic gradient

UNIT - III

Shear strength of soils

Analysis of shear failure – shear and normal stress at a point – Mohr's stress circle – Relationship that can be obtained from Mohr's circle – Mohr's strength theory – Mohr's coulomb failure criterion Laboratory methods of determination of shear strength parameters of cohesive and non-cohesive soils – Direct shear test – Triaxial shear test – Unconfined compression test and Laboratory vane shear test – Advantages of triaxial test over other tests – Classification of shear test based on drainage conditions.

UNIT - IV

Stress Distribution in soils

Boussinesq's and Westergaard's theories for point loads and their comparison – Approximate methods of determination of stresses and its validity – Computation of stresses beneath circular and square loaded areas – Concept of pressure bulb – Newmark's chart and its applications.

Compressibility characteristics of soils

Terzaghi's theory of one-dimensional consolidation – Concept of consolidation – Determination of coefficient of consolidation from consolidometer test data by Square root of time method and log time method – Calculation of consolidation settlement.

UNIT –V

Soil Compaction

Concept of compaction – Methods of laboratory compaction of soils – Factors affecting compaction – Zero air voids curve and its significance – Field compaction control.

Stability of slopes

Stability analysis of finite earth slopes – Factors of safety – Taylor's stability number and its significance – Stability analysis by method of Slices and F = 0 analysis – Different conditions of slope stability analysis.

TEXT BOOKS

1. Arora. K.R, "**Soil Mechanics and Foundation Engineering**", Standard Publishers & Distributors, Nai Sarak, Delhi, 1987
2. Murthy.V.N.S, "**A Text book of Soil Mechanics and Foundation Engineering**", Kripa Technical Consultants, Bangalore, 1992
3. Venkataramaiah, "**Geotechnical Engineering**", Wiley Eastern Ltd., Madras, 1993.
4. Punmia. B.C, "**Soil Mechanics and Foundation Engineering**", A.Saurabh and Co.,(P) Ltd., Madras, 1988.

REFERENCES

1. Taylor. D.W, "**Fundamentals of Soil Mechanics**", Asia Publishing house, 1948.
2. Terzaghi and Peck, "**Soil Mechanics in Engineering**", Asia Publishing house,
3. Joseph E. Bowles, "**Physical and Geotechnical Properties of Soils**", McGraw Hill Publishing Co., Newyork, 1994.
4. Lambe.T.W., "**Soil Testing for Engineers**", John wiley & Sons, Newyork, 1990.
5. Gopalranjan and Rao.A.S.R., "**Basic and Applied Soil Mechanics**", Wiley Eastern Ltd, New Delhi, 1997.

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T412 WATER SUPPLY ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	4	25	75	100

UNIT - I

Importance and need for protected water supply - Water demands - Factors affecting per capita demand - Types of demand - fluctuations in demand - Population forecasting - Different methods – Sources of water - Classification and adequacy - Impounding reservoirs - Mass curve analysis –Well hydraulics – Darcy's law - Yield from shallow and deep wells of confined and unconfined aquifer - Infiltration wells and galleries.

UNIT - II

Intake works – Types of intakes - Methods of conveyance of water - Different types of pipe materials - Types of pipe joints - Pipe laying and testing - Corrosion of pipes - Pumps for lifting water - Quality of water - Importance of testing of water - Physical, chemical and biological analysis of water - Standards of water quality desired for domestic water supplies – BIS and WHO Standards - Water borne diseases.

UNIT - III

Treatment of water - Objectives of water treatment - Methods of treatment - Screening - Theory of sedimentation – Types of settling - Stoke's Law - Sedimentation tanks - Design of continuous flow sedimentation tanks - Sedimentation aided with coagulation - Theory of coagulation - Types of coagulants - mixing devices - Flocculator - Settling tank - optimum coagulant dosage - Jar test.

UNIT - IV

Filtration - Theory of filtration - Filter media - Sand filters - Types of sand filters - Slow sand filters - Rapid sand filters - Pressure filters - Design - Operation – Maintenance - Disinfection - Methods of disinfection - Chlorination - Dosage - Various forms - Types of chlorination - Softening of water - Removal of temporary and permanent hardness - Different methods – Other treatment methods – desalination- Reverse osmosis process – Electro dialysis – Fluoridation – Defluoridation - Aeration.

UNIT - V

Distribution of water - Layouts of distribution networks - Method of distribution – Distribution reservoirs - Storage capacity of reservoir - Leakage detection and prevention. Analysis of pipe networks - Hardy Cross method - Equivalent Pipe method - Appurtenances in distribution system – House connections.

TEXT BOOK

Garg S.K, "**Water Supply Engineering**", Khanna Publishers, Eleventh Edition, New Delhi. 1999.

REFERENCES

1. Steel E.W., "**Water Supply and Sewerage**", Mc Graw Hill Publishers, New Delhi. 1979
2. Fair & Geyer, "**Water and WasteWater Engineering Vol. I & II**",Wiley Eastern Publishers, New Delhi. 1966
3. Peavy Rowe, Tchobanoglous, "**Environmental Engineering**", McGraw Hill Publishers, New Delhi. 1985
4. Hazen William's Nomogram for C.I pipes.
5. Modi. P.N., "**Water Supply Engineering**", Standard Book House, Delhi. 1998.
6. Birdie G.S and Birdie J.S, "**Water Supply and Sanitary Engineering**" Dhatpat Rai Publishing Company New Delhi, 1998.

P889 CONCRETE TECHNOLOGY LABORATORY	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of 6 experiments from PART-A and 6-experiments from PART-B shall be done and recorded

PART-B

1. Determination of (a) Normal consistency of cement (b) Fineness of cement using 90 microns IS sieve.
2. Determination of Initial setting and final setting time of cement.
3. Determination of (a) Specific gravity of cement (b) soundness of cement.
4. Determination of Fineness modulus of (a) Fine aggregate (b) Coarse aggregate.
5. Determination of workability of concrete by conducting Slump cone test .
6. Determination of workability of concrete by conducting Compaction factor / Vee-Bee consistometer test
7. Determination of (a) Cube compressive strength (b) Split tensile strength of concrete.
8. Determination of modulus of elasticity of concrete by conducting compression test on concrete cylinder
10. Determination of Bulk density and Specific gravity of (a) fine aggregate (b) coarse aggregates.
11. Determination of Bulking of fine aggregate.

Non-destructive test on concrete using Rebound Hammer / Ultrasonic Tester

P886 ADVANCED SURVEY FIELD WORK	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Theodolite

1. Traversing and adjustment of traverse
2. Determination of Horizontal and Vertical distances by stadia methods
3. Determination of Elevations and Heights
4. Height and distances – Single plane method
5. Height and distances – Double plane method

Tacheometry

6. Tacheometry – Constants of Tacheometer
7. Stadia Tachometry
8. Tangential Tacheometry
9. Tacheometric contouring – Radial method

Total Station

10. Study of Instrument – Determination of Distances, Directions and Elevations
11. Determination of Boundaries of a Field and computation of area.
12. Determination of Heights of objects.

Setting Out

12. Setting of simple circular curve using tape and chain.
13. Setting of simple circular curve using tape or/and theodolite
14. Setting of a simple circular curve using Total Station.
15. Setting out for Building.

Survey Camp is to be conducted for a minimum period of seven days to train in one of the following areas:

i. Preparation of a contour Plan/ Map.
ii. Earth work Computations for a high way / canal projects
iii. iii.Marking of a Sewer line/ Water supply line.
iv. Any type of Execution works.

NOTE
50% Weight- age of total marks of this laboratory is to be given for total survey camp work including for Report submission by each batch.

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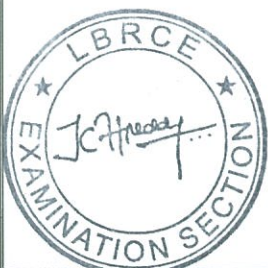
VI - SEMESTER

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T371 CLASSICAL STRUCTURAL MECHANICS	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

ILD for forces in Determinate Trusses and Indeterminate Beams

Maxwell's reciprocal theorem – Betti's reciprocal theorem – Muller Breslau's theorem – ILD for reaction, bending moment and shear force for propped cantilever and two span continuous beams (upto two degree redundancy).

UNIT - II

Energy Methods for Trusses

Analysis of indeterminate trusses by strain energy method – degree of redundancy – internal and external redundancy – lack of fit – temperature stresses (upto two degree of redundancy)

UNIT - III

Slope – Deflection Method

Derivation of Slope deflection equation - Analysis of statically indeterminate beams and frames (single storey single bay only) – continuous beams with and without support yielding – analysis of portal frames (single storey single bay only) – gable frames – box culvert.

UNIT - IV

Moment – Distribution Method

Stiffness, carry over and distribution factors – analysis of statically indeterminate beams and frames (single storey single bay only) – continuous beams with and without support yielding – portal frames (single storey single bay only) – gable frames – box culvert.

UNIT - V

Kani's method

Rotation, translation and distribution factors – analysis of statically indeterminate beams and frames up to two degree of redundancy – continuous beams with and without support yielding – analysis of portal frames (single storey single bay only)

TEXT BOOKS

1. Punmia. B. C., Jain, A. K., and Jain, A. K., Strength of Materials and Theory of Structures, Vol. II, Eleventh Edition, Laxmi Publications, New Delhi, 2002.
2. Bhavikatti. S. S., Structural Analysis, Vol. I, Vikas Publishing House (P) Ltd., New Delhi, Second Edition, 2002.

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REFERENCES

1. Wang. C. K., Intermediate Structural Analysis, McGraw Hill Publishing Co., Tokyo, Fourth Edition, 1989.
2. Jindal, R. L., Indeterminate Structural Analysis, S.Chand & Co. New Delhi, Third Edition, 1997.
3. Kinney. S.J., Indeterminate Structural Analysis, Oxford IBH Publishing Co., 1999.

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T379 DESIGN OF RCC STRUCTURES	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Design of shallow foundation – square – rectangular isolated footing of uniform thickness and sloped footing – combined – rectangular and trapezoidal footing

UNIT - II

Building frames – Effective length of column using IS charts – Substitute frame analysis – Portal and Cantilever methods of analysis – Design of frame components – Beam and Column

UNIT - III

Yield line theory – Equilibrium and virtual work method – Analysis and design of square, rectangular and circular slabs with different boundary conditions subjected to UDL and concentrated loads.

UNIT - IV

Design of stairs spanning horizontally – Design of dog legged stair. Types of retaining walls, Forces on retaining walls; Stability requirements; Design and detailing of cantilever type retaining wall.

UNIT - V

Design of elevated circular water tank – domical roof – side walls – base slab – ring beam - Staging.

TEXT BOOKS

1. Punmia B.C, Ashok Kumar Jain, Arun Kumar Jain "**Comprehensive RCC Design**" Laxmi publications (P) Ltd, New Delhi, 1998
2. Ashok K. Jain, "**Reinforced Concrete Limit State Design**", 4th Edition Nem Chand & Bros, Roorkee,1993
3. Krishnaraju. N, "**Advanced Reinforced Concrete design**", CBS Publishers & Distributors, New Delhi, 1988.

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REFERENCES

1. Varghese, "**Limit State Design of Reinforced Concrete**", Prentice Hall of India Pvt., Ltd., New Delhi, 2002
2. Varghese, "**Advanced Reinforced Concrete Design**", Prentice Hall of India Pvt., Ltd., New Delhi, 2002
3. Unnikrishna pillai and Devdas Menon, "**Reinforced concrete design**", Tata McGraw Hill Publishing company Ltd, New Delhi, 1998

IS CODES

1. IS 456:2000 Plain and Reinforced Concrete – Code of Practice.
2. SP 16:1980 Design Aids for Reinforced Concrete to IS:456-1978.
3. IS 3370 (1-4):1965 Code of Practice for Concrete Structures for the Storage of Liquids.
4. IS 875 (1-5):1987 Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures.

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T388 FOUNDATION ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Site investigation and Selection of foundations

Objective of site investigation – Methods of investigation – Planning of Site investigation – Depth of soil exploration – Significant depth – Spacing of bore holes – Standard penetration test and its significance in soil exploration – Correction to Standard penetration values – Functions and requisites of foundation – Different types of shallow foundations and situations under which they are adopted. Soil sampling techniques – Sampling Disturbance – Methods of obtaining undisturbed samples – Requirements of an undisturbed sample.

UNIT - II

Shallow Foundations and Bearing Capacity of Soils

Bearing Capacity of soils – Factors affecting Bearing capacity of soil – Terzaghi's and Meyerhof's bearing capacity theories- General principle of Design of Shallow Foundations – Floating Founadtion — Plate bearing test and its limitations – Vibro Floatation method of improving bearing capacity of sandy soils. Settlement of foundation – Causes of total and differential settlement of foundations in sand and clays – Methods of controlling settlement – Code provisions – Conventional procedure for proportioning of footing for equal settlement.

UNIT - III

Deep Foundations

Pile foundation – Consideration leading to the selection of pile foundation – Functions of piles – Types of piles – Friction pile, End bearing pile – Pile grouping – Soil structure interaction - Estimation of individual pile capacity by Static and Dynamic approaches.

Group Capacity of Piles

Pile group efficiency – Downward drag phenomenon on piles and its significance in the design of pile foundations – Pile load test (Constant rate penetration test only) and its interpretation – Impact of pile driving (within the site and neighbouring area)

UNIT - IV

Earth Pressure Theories

Rankine's and Coulomb's earth pressure theories and their comparison – Earth pressure at rest – Active and Passive earth pressures for cohesive and non cohesive soils and their determination by analytical methods only (No graphical procedures)

Retaining Walls

Different types of Retaining Walls – Design principles of Cantilever and Counterfort Retaining walls (Structural Design not included).

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UNIT - V

Special Foundations

Caisson Foundation – Necessity of selection – Types of Caisson foundation – Design principles of Caisson foundation (Structural Design not included). Foundation in filled up grounds – Foundation on expansive soil – Use of under-reamed pile foundations – Principles of Machine foundations – Design principles and code provisions.

TEXT BOOKS

1. Arora K.R, "**Soil Mechanics and Foundation Engineering**", Standard Publishers & Distributors, Nai Sarak, Delhi. 1987
2. Brahma.S.P, "**Foundation Engineering**", Tata McGraw Hill Publishing Co., Ltd., New Delhi. 1985
3. Shamsher Prakash, Swamisaran and Gopal Ranjan , "**Analysis and Design of Foundations and Retaining Structures**", Sarita Prakashan, Meerut, New Delhi. 1987.

REFERENCES

1. Wayne C. Teng, "**Foundation Design**", Printice Hall of India Ltd., New Delhi. 1965.Peck.R.B, Hanson,W.E and Thomburn.T.W, "**Foundation Engineering**", John Wiley and Sons, New York. 1974.
2. Nayak.N.V, "**Foundation Design Manual**", Dhanpat Rai and Sons. 1982.
3. Leonards.C.A, "**Foundation Engineering**", McGraw Hill Book Co., Inc., New York. 1962.

T390	L	T	P	Credits	Internal	External	TOTAL
HIGHWAYS AND AIRPORT ENGINEERING	4	1	0	3	25	75	100

UNIT - I

Highway planning and Alignment

History of road development in India – Jayakar committee recommendations - Institutions for Highway planning design and implementation at different levels - Engineering Surveys for Alignment – conventional and modern methods (Remote sensing, GIS and GPS techniques) IRC classification of urban and rural roads – Highway cross sectional elements – Right of way, Carriage way, Camber, Kerbs, Shoulders and Footpaths

UNIT - II

Geometric Elements

Geometric Standards – Super elevation, Widening of pavements and Transition curves – Ruling, Limiting, Exceptional and Minimum Gradients – Sight Distance – Factors affecting Sight Distance – PIEV Theory – Stopping Sight Distance (SSD) – Overtaking Sight Distance (OSD) – Sight Distance at Intersection Geometric Design of Hill Roads

UNIT - III

Highway Materials and Construction

Subgrade soil - Aggregates - Bituminous materials – Desirable properties – California Bearing Ratio Test and Field Density Test for soil – Crushing, Abrasion and Impact Test for aggregates – Penetration, Ductility, Viscosity, Binder content and Softening point Test for bitumen Construction of Earth, Gravel, WBM, Bituminous and Cement Concrete roads as per IRC and MORTH specifications – BOT and BOLT concepts for highway construction.

UNIT - IV

Highway Design and Maintenance

Design principles of Flexible and Rigid Pavements – Design of Flexible pavement (CBR method, IRC Recommendations – Problems) Design of Rigid Pavement (IRC Recommendations – Problems), Defects in flexible pavements – surface defects, cracks, deformation, disintegration – symptoms, causes and treatments. Failures in rigid pavements – scaling, shrinkage, warping, structural cracks, spalling of joints and mud pumping – special repairs.

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UNIT - V

Airport Engineering

Importance of Airports in National Transportation Sector – Airport Planning - Standards for planning of airports as per ICAO – Site selection survey – Airport Zoning – Runway – Orientation – Geometric design – Different types, pattern and layout Taxiways and Aprons – Holding Aprons – Planning and layout of Terminal Buildings, Hangars and Parking area

TEXT BOOKS

1. Khanna,S.K and Justo, **"Highway Engineering"**, New Chand and Bros, Roorkee, 8th edition, 2001.
2. Khanna,S.K and Arora,M.G & Jain,S.S, **"Airport Planning and Design"**, New Chand and Bros, Roorkee, 2001.

REFERENCES

1. Kadiyali,L.R., **"Principles and Practice of Highway Engineering"**, Khanna Publishers Ltd. New Delhi, 2000
2. Sehgal,S.B and Bhanot,B.L, **"Highway and Airport Engineering"**, S.Chand and Company Ltd. New Delhi, 1978
3. Venkatappa Rao,G, **"Principles of transportation and Highway Engineering"**, Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2000.

IS Codes

1. IRC Standards
2. Bureau of Indian Standards (BIS) Publications on Highway Materials
3. MORTH Guidelines for Highway Engineering.

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T405 SANITARY ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	4	25	75	100

UNIT - I

Systems of sanitation - Estimating quantity of sewage - Dry weather flow - Estimating storm run off by rational formula - Systems of sewerage - Separate, combined and partially separate system - Different shapes of sewer - Hydraulic design of sewers - Use of Nomograms & charts.

UNIT - II

Forces acting on sewers - Sewer materials – Laying and testing of sewers - Sewer appurtenances - Maintenance of sewer - cleaning and ventilation of sewers – Pumping of sewage – Types of pumps - Characteristics of sewage - Decomposition - Aerobic and anaerobic decomposition – carbon, nitrogen, sulphur cycles - Physical and chemical quality of sewage - BOD and their testing - BOD curve – BOD equation - Problems - Population equivalent.

UNIT - III

Treatment of sewage - Primary treatment - Screening - Grit chamber - Design of grit chamber - Skimming tanks - Primary sedimentation tanks and its design - Secondary treatment of sewage – Activated sludge process – Methods of aeration for activated sludge process - Bulking of sludge and its control – Design considerations in ASP, BOD loading, F/M ratio, sludge age, sludge volume index – Modifications in ASP – Other treatments viz Oxidation ponds , aerated lagoon, stabilization ponds, oxidation ditches.

UNIT - IV

Biological filtration of sewage - Contact beds, intermittent sand filters - Trickling filters – Types of trickling filter– Low rate and high rate trickling filters - Design of trickling filters – Advanced biological treatment - Sludge digestion - Sludge characteristics - Digestion process - Digestion tanks - Design - Disposal of digested sludge.

UNIT - V

Disposal of sewage - Methods of disposal - By dilution – Self purification of natural streams - Zones of pollution in a river - Oxygen deficit – Deoxygenation and reoxygenation curves – Oxygen - Deficit curve - Streeter - Phelps equation - problems - Disposal on lakes, sea - Disposal on land – Effluent irrigation and sewage farming - Sewage sickness. Disposal of sewage in isolated buildings - Septic tanks - Construction details – Design considerations - Code provisions - Dispersion trenches - Soaking pit – Sanitary practices in rural areas. Drainage and sanitation in buildings - Plumbing system - Types of traps - Systems of plumbing - Single stack system - One pipe system -Two pipe system - Sanitary fittings.

TEXT BOOK

Garg.S.K, "**Sewage disposal and Air Pollution Engineering**", Khanna Publishers New Delhi. 2001

REFERENCES

1. Birdie G.S, Birdie J.S, "**Water Supply and Sanitary Engineering**", Dhanpat Rai Publishing Company, New Delhi, 1998
2. Peavy, Rowe, Tchobanoglous , "**Environmental Engineering**", McGraw Hill Publishers, New Delhi. 1985
3. Hussain S.K, "**Water Supply and Sanitary Engineering** ", Oxford & IBH Publishers Publishing Co.Pvt Ltd., New Delhi. 1985
4. Punmia B.C, Ashok Jain, "**Waste water Engineering**", Laxmi Publications, New Delhi, 1998
5. Mark J. Hammer, Mark J.Hammer, Jr, "**Water and Wastewater Technology**", Prentice Hall of India Pvt., Ltd., New Delhi, 2002.
6. Duggal K.N., "**Elements of Environmental Engineering**", S.Chand & Company Limited, New Delhi, 2000.
7. Manual on sewerage and sewage treatment, CPHEEO, Ministry of urban affairs and employment, Govt. of India, New Delhi, 2001

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T385 ENVIRONMENTAL IMPACT ASSESSMENT	L	T	P	Credits	Internal	External	TOTAL
	3	0	0	3	25	75	100

UNIT - I

Introduction
Historical perspective of environmental protection laws and acts in India- Definition of EIA, Industrial policy statement of the Govt. of India.
Legal Aspects
Constitutional provisional - Fiscal incentives for environmental protection – National Standards - Bureau of Indian Standards and WHO standards.
Socio Economic Impact
Types of impact -Steps in performing socioeconomic impact assessment- Analysis of public services and facilities impact-Social impacts-Impacts of economic profile of the community.

UNIT - II

Air Quality Impact
Background -Typical considerations and factors-Impact of industry- Transportation- Human settlements and mitigation methods.
Noise Impact
Noise and sound-The effects of noise on people-Noise scales and rating methods- Estimating transportation noise impacts and planning.

UNIT - III

Energy Impact
Energy impact consideration- sources data - energy conservation data - EIA of hydrothermal and nuclear power plants.
Forest and Wild Life Impact
Biological concepts and terms-Impact on flora and fauna-Mitigation measures and alternatives.

UNIT - IV

Water Quality Impact
Water quality criteria and standards- water quality impacts by development projects- Assessment of water qualities-impact of water quality on Agriculture, human beings and Industries - Planning for protected water supply.

UNIT - V

Methodology of EIA
EIA methodologies, Preliminary assessment and qualification-Comparison of alternatives-Cost benefit analysis-Public involvement-Exchange of information- training- Case studies on EIA of development projects and Environmental auditing.

TEXT BOOKS

1. John .G. Rau & David G Hooten , "**Environmental impact analysis Handbook**", McGraw Hill Publishing & Co, Newyork. 1990.
2. Shukla,S.K & Srivatsava,P.R, "**Concepts in Environmental Impact Analysis**", Commonwealth Publications, New Delhi, 1992.

REFERENCES

1. Jain RK, LV,Stacey G.S., "**Environmental impact Analysis**", Van Nostrand Co. Newyork, 1977
2. **Guidelines to environmental impact assessment in developing countries**, UNEP, 1985.
3. John E. Heer and Joseph Hagerty.D "**Environmental Assessment and statements**", Van Nostrand Ranhold Co, Newyork. 1977.
4. Larry W.Canter,, "**Environmental Impact Assessment**" McGraw Hill Book Co. New Delhi, 1996.
5. Golden J. "**Environmental impact Data Book**", An Ambor Science,. 1979.

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T387 FINITE ELEMENT METHOD IN CIVIL ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	3	0	0	3	25	75	100

UNIT – I
Fundamental Concepts
Introduction - Stresses and equilibrium - Boundary conditions - Strain displacement relations - Stress strain relations - Potential energy and equilibrium – Weighted Integral and Weak Formulations – Variational Approach – Rayleigh Ritz Method

UNIT – II
One - Dimensional Problems
Introduction - Modeling - Co-ordinates and shape functions - Potential energy approach - Galerkin Approach - Assembly of global stiffness matrix and load vector - Properties of K - FE Equations - Treatment of Boundary conditions - Quadratic shape functions.

UNIT – III
Trusses
Introduction – Plane trusses – Local and Global coordinate systems – Element Stiffness Matrix – Stress Calculations – Introduction to three dimensional trusses

UNIT – IV
Two dimensional Problems
Introduction – Finite element modelling – Constant Strain Triangle – Iso-parametric representation – Potential energy approach - Element Stiffness – Force terms – Stress calculations – Introduction to beam element.

UNIT – V
Two dimensional isoparametric elements and Numerical Integration
Introduction – Four node quadrilateral – Shape functions – Element stiffness matrix – element force vectors – Higher order elements and Applications – Nine node quadrilateral – Eight node quadrilateral – Numerical Integration –One point formula – Two point formula - Two dimensional integrals

TEXT BOOKS

1. Tirupathi R. Chandrupatla, Ashok D. Belegundu, "**Introduction to Finite Elements in Engineering**", Third Edition, Prentice Hall of India,2002.
2. Finite Element Method by S.S.Bhavikatti

REFERENCES
1. Reddy.J.N, "**An Introduction to the Finite Element Method**", M/s. Tata McGraw Hill Publishing Co., Ltd., New Delhi, 2003.
2. Desai.C.S and Abel.J.F, "**Introduction to Finite Element Method**", East Western Press Pvt. Ltd., New Delhi, 1987
3. Zienkiewics.O.C, "**The finite element method**" fourth edition, M/s. Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2000.
4. Rajasekaran, S, "**Finite Element Analysis in Engineering Design**", A.H. Wheeler Publishing, 1993

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T389 GROUND IMPROVEMENT TECHNIQUES	L	T	P	Credits	Internal	External	TOTAL
	3	0	0	3	25	75	100

UNIT - I

INTRODUCTION

Role of ground improvement in foundation engineering – Ground improvement methods – Geotechnical problems in lateritic, alluvial and black cotton soils – selection of Ground improvement techniques based on soil conditions-use of piezometers-inclinometers in field

UNIT - II

DRAINAGE AND DEWATERING

Well point system – Vacuum dewatering system – Electro-osmatic method – Seepage analysis for two dimensional flow – fully penetrating slots in homogeneous deposits (simple cases only).

UNIT - III

INSITU TREATMENT OF SOILS

Insitu densification of Granular and consolidation of cohesive soils – Dynamic compaction – Vibrofloatation – Sand pile compaction – Stone Column - Preloading with sand drains and fabric drains.

UNIT - IV

GROUTING TECHNIQUE

Suspension grouts – solutions grouts – Grouting equipment and method – Grouting with soil, Bentonite – cement mixes and asphalt – Grout monitoring schemes.

UNIT - V

GEOSYNTHETICS APPLICATIONS

Types of Geosynthetic materials- Geotextile – Types – Geotextiles in Filtration, Drainage, seperation and reinforcement – Geomembranes – Containments and barriers – Application to Ground Anchors.

TEXT BOOKS

1. Koerner.R.M., *Construction and Geotechnical Methods in Foundation Engineering*, McGraw Hill Publishing Company, New york, 1984.
2. Purusothamaraj.P., *Ground Improvement Techniques*, Laxmi Publication (P) Ltd., New Delhi, 2000.
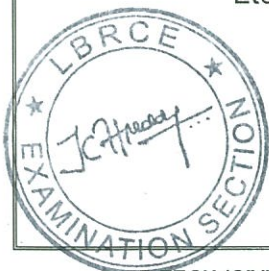
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REFERENCES

1. Moseley. M.P., *Ground Improvement*, Blackie Academic and Professional, Chapman and Hall, Glassgow,1993.
2. Manfred R.Hausmann, *Engineering Principles of Ground Modification*, McGraw Hill Publishing Company, New york, 1990.
3. John, N.W.M., *Geotextiles*, John Blackies and Sons Ltd., London, 1987.

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T400	L	T	P	Credits	Internal	External	TOTAL
PRESTRESSED CONCRETE	3	0	0	3	25	75	100

UNIT - I

General principles – Concepts of Prestress- materials used in Prestressed Concrete – Different systems of prestressing – Advantages of prestressed concrete – Losses in prestress for pretensioning & post-tensioning systems

UNIT - II

Analysis of section - Strength concept, stress concept, load balancing concept - Design of Prestressed Concrete beams in flexure - Design of beam for shear; Design of end block (Magnels, Guyon's and IS method) – Design of slabs

UNIT - III

Linear Transformation – Pressure line – Primary moment – Secondary moment – Concordant cable Profile – Analysis of two span continuous beam – Types of composite beam – Analysis of Composite beams.

UNIT - IV

Deflection of prestressed concrete beams - Different tendon profiles - long term & short term deflection of cracked members – Deflection of Composite beams. Principles of partial prestressing – Applications.

UNIT - V

Circular Prestressing – Design of water tanks (Tanks with hinged bottom) - Design of prestressed concrete pipes – Poles and sleepers - Introduction to precast structural member – Principles of erection and connections

TEXT BOOKS

1. Krishnaraju N, "**Prestressed Concrete**", Tata McGraw Hill Publishing Co.,Ltd., New Delhi, 1995.
2. Rajagopalan.N, "**Prestressed Concrete**",Narosa Publishing House, New Delhi, 2002.
3. Sinha.M.C & Roy.S.K, "**Fundamentals of Prestressed Concrete**", S.Chand & Company Ltd, New Delhi, 1994.
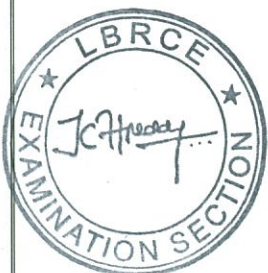
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REFERENCES

1. James R.Libby, "**Modern Prestressed Concrete**", Design principles and Construction methods - Van Standard Rainford Co., New York, 1977
2. Lin.T.Y, & Ned.H.Burns, "**Design of Prestressed Concrete Structures**",John Wiley & Sons, New York, 1981.
3. Arthur H.Nilson, "**Design of Prestressed Concrete**", John Wiley & Sons, New York, 1978.
4. Dayaratnam, P, "Prestressed Concrete Structures", Oxford and IBH, New Delhi, 1982.

IS Codes

1. IS 1343:1980 Code of Practice for Pre Stressed Concrete
2. IS 3370(Part 3):1965 Code of Practice for Concrete Structures for the Storage of Liquids-Part 3 Pre stressed Concrete
3. IS 3370(Part 4):1965 Code of Practice for Concrete Structures for the Storage - Part 4 Design Tables
4. Charts   for   the   Design   of   End   Block

T372 COASTAL ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	3	0	0	3	25	75	100

UNIT - I

Coastal zone: Definition and sub division – Factors influencing coastal topography - Waves: Definitions - Classification – Liner wave theory – Assumptions and derivations of relationships – Pressure within progressive wave – Wave energy – Problems.

UNIT - II

Wave Transformation: Wave generation – Shoaling – Refraction – Reflection – Diffraction – Breaking of waves – Near shore currents – Tides - Tsunamis - Wave Hindcasting – forecasting - Sea level changes.

UNIT - III

Wave forces on Structures: Force due to non breaking, breaking and broken waves on vertical, sloping, curved, stepped barriers and on piles – Problems.

UNIT - IV

Sediment Movement : Types – Littoral Drift – Erosion process – Near shore, long shore currents and effects - Beach profile changes – case studies – Beach process - Environmental parameters- Coastal erosion in India - Dredging – Dredgers - Environmental effects of dredging - Remote sensing and GIS application in coastal engineering.

UNIT - V

Coastal Protection: Methods – Function – Types - Design concepts – Sea walls – Bulkhead – Revetment – Groins – Artificial beach nourishment – Scour – Maintenance of coastal structures.

TEXT BOOKS

1. Narasimhan & S. kathiroli, Harbour and Coastal Engineering (Indian Scenario) Vol - I &Vol – II, NIOT- Chennai
2. Shore Protection Manual (Vol – I, II, III) U.S. Army Crops of Engg. USA.

REFERENCES

1. Ippen, A.T., Estuarine and coastline Hydrodynamics, McGraw Hill Book Co., New York
2. Wiegel. R.L. Oceanographical Engineering., Prentice Hall, Eagle Wood Cliffs, New Jercy
3. Dean .R.G. and Darymple, R.A. Water Mechanics for Engineers and scientists.

P890 COMPUTER PROGRAMMING IN CIVIL ENGINEERING LAB	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of twelve (12No) shall be done and recorded

Students are required to write and execute programmes to solve the following problems. Programmes shall be in C or C++ language or MATLAB/JAVA. *or* MS-Office Softwares

CYCLE - 1
(Write any SIX programmes)

1. Design of Reinforced Beam for flexure by limit state method.
2. Design of T- Beam for flexure by limit state method.
3. Design of Reinforced beam for Shear by limit state method.
4. Design of simply supported one-way slab.
5. Design of steel tension member
6. Design of steel compression member
7. Design of slab base for a steel column
8. Design of laterally supported steel beam
9. Design of beam to column framed connection using bolts

CYCLE - 2
(Write any THREE programmes)

1. Classification of soil by Indian standard classification system.
2. Stresses due to applied loads both Boussinesq and Westerguard analysis
3. Concentrated load b) circular loaded area c) Rectangular loaded area
4. Determination of permeability coefficient by constant head and falling permeability tests.
5. Determination of index properties of soil.

CYCLE-3
(Write any THREE programmes)

1. Design of an open channel
2. Analysis of water distribution networks (Hardy cross method).
3. Determination of the height of the building when base is accessible.
4. Determination of included angles from the given bearing and check for local attraction.

P895 SOIL MECHANICS LABORATORY	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of twelve (12No) shall be done and recorded

1. Determination of water content by oven drying method.
2. Determination of specific gravity by
   a) Density bottle method
   b) Pycnometer method.
3. Gradation analysis
   b) Mechanical Sieve analysis
   c) Hydrometer analysis.

4. Determination of Atterberg limits
5. Determination of free swell index
6. Determination of field unit weight by
   a) Core cutter method.
   b) Sand replacement method.
7. Determination of permeability by
   a) Constant head permeameter.
   b) Variable head permeameter.
8. Direct shear test.
9. Vane shear test.
10. Unconfined compression test
11. IS - Light compaction test
12. IS - Heavy compaction test
13. Triaxial shear test.
14. Consolidation test.

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VII - SEMESTER

T373 COMPUTATIONAL METHODS OF STRUCTURAL ANALYSIS	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Flexibility And Stiffness Matrices
Flexibility and stiffness; Flexibility matrix; Stiffness matrix; Relationship between flexibility matrix and stiffness matrix.

Flexibility Method (Matrix Approach)
Analysis of continuous beams and rigid jointed plane frames (Single bay, single storey with vertical legs only) by flexibility method with matrix approach.

UNIT - II

Stiffness Method (Matrix Approach)
Analysis of continuous beams, rigid jointed plane frames (Single bay, single storey with vertical legs only) and pin jointed plane frames by stiffness method with matrix approach.

UNIT - III

Plastic Behaviour Of Structures
Idealized stress - strain curve for mild steel; Ultimate load carrying capacity of members carrying axial forces; Moment - Curvature relationship for flexural members; Evaluation of fully plastic moment; Shape factor; Collapse load factor; Upper and lower bound theorems; Collapse load analysis of indeterminate beams and single bay, single storied portal frames.

UNIT - IV

Curved beams
Analysis for internal forces – circular beams supported on equally spaced columns – semi-circular beams on three equally spaced supports.

Approximate Methods for Lateral loads
Analysis of frames for lateral loads by portal and cantilever methods.

UNIT - V

Space structures
Introduction to analysis of space trusses using method of tension coefficients – Introduction to FEM.

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TEXT BOOKS

1. Structural Analysis, Vol. II by V. N. Vazirani & M. M. Ratwani; Khanna Publishers, Delhi.
2. Structural Analysis – A matrix approach by G. S. Pandit & S. P. Gupta; Tata Mc.Graw – Hill Publishing Co. Ltd., New Delhi.
3. Limit Analysis of Structures by Manicka & Selvam

REFERENCES

1. Advanced structural analysis by Devdas Menon , Narosa Publishing House.
2. Structural Analysis by Negi & Jangid.

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T386 ESTIMATION AND QUANTITY SURVEYING	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Estimate Of Buildings
Methods of estimating; Main items of work; Deduction for openings; Degree of accuracy; Units of measurement.
Methods of building estimates
Individual wall method; Centre line method; Arch masonry calculation; Estimate of steps.
Estimate of residential building
Estimate of a building from line plan.

UNIT - II

Estimate of RCC works and Roads
Standard hooks and cranks; Estimate of RCC slab; RCC beam; RCC T–beam slab and RCC column with foundation.
Road Estimating
Estimate of earthwork; Estimate of pitching of slopes; Estimate of earthwork of road from longitudinal sections; Estimate of earthwork in hill roads.

UNIT - III

Canal estimate
Earthwork in canals–different cases; Estimate of earthwork in irrigation channels.
Specifications
Purpose and method of writing specifications; General specifications. Detailed Specifications
for Brick work; R.C.C; Plastering; Mosaic Flooring; R.R.Stone Masonary.

UNIT - IV

Analysis Of Rates
Task or out – turn work; Labour and materials required for different works; Rates of materials and labour; Preparing analysis of rates for the following items of work: i) Concrete ii) RCC Works iii) Brick work in foundation and super structure iv) Plastering v) CC flooring vi) White washing.
PWD Accounts and Procedure Of Works
Organization of Engineering department; Work charged establishment; Contract; Tender; Tender notice; Tender Schedule; Earnest money; Security money; Measurement book; Administrative approval; Technical sanction; Plinth area; Floor Area; Carpet area; Approximate Estimate; Plinth area estimate; Revised Estimate; Supplementary estimate.

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UNIT - IV

Valuation

Cost; Price & value; Methods of valuation; Out goings; Depreciation; Methods for Estimating cost depreciation; Valuation of building.

Miscellaneous Topics

Gross income; Net income; Scrap value; Salvage value; Obsolescence; Annuity; Capitalized value; Years purchase; Life of structures; Sinking fund; Standard rent; Process of fixing standard rent; Mortgage.

TEXT BOOKS

1. Estimating & Costing in Civil Engineering by B.N. Dutta; U. B. S. Publishers & Distributors, New Delhi.
2. Valuation of Real properties by S. C. Rangwala; Charotar Publishing House, Anand.

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T402 RAILWAYS, DOCKS AND HARBOUR ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	1	0	4	25	75	100

UNIT - I

Railway Planning and Permanent Way

Role of Indian Railways in National Development - Alignments – Role of Remote Sensing, GIS and GPS - Permanent way – Specification of Components Gauges - Typical cross sections – Embankments and cuttings – Construction, renewal and maintenance of permanent way – Rail joints and welding of rails.

UNIT - II

Track Junctions

Points and crossings – Devices and layouts - Most commonly employed layouts – Special fittings and safety devices – Station and yard – Different types and their typical layouts – General equipments – Track junction – Movable diamond crossing

UNIT - III

Signals and Interlocking

Signals – Different types and their working – Location of signals – Principles and mechanism of interlocking – Safety devices – Different system of control on movement of trains Introduction to modern trends in Indian railways in the design of high speed tracks – MRTS and suburban railways – Electric traction – BOT and BOLT (basic concepts)

UNIT - IV

Harbour Components

Harbours and Ports – Requirement and classification - Wind and waves – Hydrographic surveying – Breakwaters and pier heads – Docking platforms – Piers, wharves, jetties and quays – Fender mooring accessories – Entrance channels – Inland water transport and container transportation

UNIT - V

Docks and Navigational Aids

Docks – Wet and dry – Marine railways – Offshore docks – Floating docks, temporary docks – Locks Dredgers and dredging – Transit sheds and warehouses – Terminal building – Navigational aids and signals
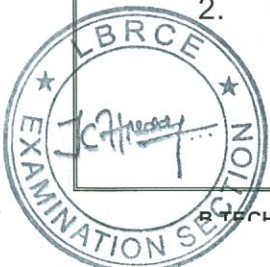
TEXT BOOKS

1. Saxena.S.C and Arora.S, "**A Text Book of Railway Engineering**", Dhanpat Rai Publications Pvt., Ltd,New Delhi, 2005
2. Bindra.S.P, "**A course work in Docks and Harbour Engineering**", Dhanpat Rai Publications Pvt., Ltd, New Delhi, 2003

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REFERENCES

1. Rangwala.S.C, "**Principles of Railway Engineering**", Charotar Publishing House, Court Road, Anand, 2000
2. Bindra.S.P, "**A course in bridge, tunnel and railway engineering**", Dhanpat Rai Publications Pvt., Ltd, New Delhi, 1996
3. Ahuja and Birdi, "**Roads, railways, bridges and tunnels engineering**", Standard Book House, New Delhi, 2000
4. Srinivasan.R, "**Dock, Harbour and Tunnel Engineering**", Charotar Publishing House, Court Road, Anand, 1989

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T401 PRINCIPLES OF MANAGEMENT AND PROFESSIONAL ETHICS	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

MANAGEMENT FUNCTIONS & STRUCTURE

Management – Definition – Basic Function – Contribution of Taylor & Fayol. Types of structure – Line, staff, Functional, Committee, Project & Matrix – Structures. Departmentalization – Centralization – Decentralization – span of control. Management By Objectives – Management By Exception.

UNIT - II

MANAGEMENT OF ORGINASATION

Forms of Business / Industrial Ownership – Sole Trader, Partnership, Company, Performance Appraisal – Basic Principles – Pitfalls – Methods to Overcome. Industrial Safety – Causes of Accidents – Cost of Accident – How to minimize Accidents. Plant Layout & Maintenance – Need, Types & Managerial Aspects.

UNIT - III

ORGANISATIONAL BEHAVIOUR

OB – Definition – Nature & Scope – Contributing Disciplines – Importance of OB to Managers. Personality – Definition – Theories – Factors Influencing Personality. Motivation – Definition – Theories. Theory X & Y – Transactional Analysis. Morale & Job Satisfaction – Factors Influencing Job Satisfaction.
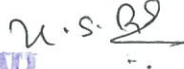
UNIT - IV

GROUP DYNAMICS

Group – Definition – Types – Determinants of Group Cohesiveness – Communication – Process – Barriers – Effective Communication. Leadership Theories – Factors Contributing to Effective Leadership – Role of Trade Union in Organizations – Functions of Trade Union – Why Trade Union is required? – Types of Trade Union.

UNIT - V

PROFESSIONAL ETHICS

Ethics in Workplace – Formulation of Ethics – Managerial Ethics – Managing Ethical Behaviour – Codes of Ethics – Encouraging Ethical Behaviour – Social Responsibility – Spirituality.

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TEXT / REFERENCE BOOKS

1. Gupta C.B., Management Theory and Practice, 14th Edition, Sultan Chand & Sons, 2009.
2. Dr. Prasad L.M., Principle & Practice of Management, 7th Edition, Sultan Chand & Sons, 2008.
3. Aswathappa, Organisational Behaviour, 8th Edition, Himalaya Publishing House, 2010.
4. Dr. Prasad L.M., Organisational Behaviour, 4th Edition, Sultan Chand & Sons, 2008.
5. Harold Koontz, Principles of Management, 1st Edition, Tata McGraw Hill, 2004.

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T382	L	T	P	Credits	Internal	External	TOTAL
ENGINEERING ECONOMICS AND ACCOUNTANCY	4	0	0	3	25	75	100

UNIT - I

INTRODUCTION

Economic Activities – Nature of economics – Significance of economics – Managerial economics and other disciplines – Micro economics and macroeconomics – Normative and positive economics, objectives of the firm– Methods of managerial economics.

UNIT - II

DEMAND UTILITY ANALYSIS AND FORECASTING

Concept of demand – Types of demand factors determining demand – Law of demand – Elasticity of demand – Point elasticity and arc elasticity – Demand forecasting – Fore casting Methods.

UNIT - III

PRODUCTION AND COST ANALYSIS

Production function – Least cost combination of inputs – Returns to scale and factor productivities – Statistical Production – Laws of production – Concept and nature of cost – Accounting costs and economic costs – Determination of cost – Cost output relation and costcurves.

UNIT - IV

PRICING

Determinants of price – Objective of Pricing – Market conduct, performance and structure – Types of Competition – Pricing under different market structure price discrimination – Pricing methods in practice.

UNIT - V

FINANCIAL ACCOUNTING SYSTEM

Significance of accounting – Branches of accounting terminology – Double entry book keeping Journals and ledgers – Mechanics of accounting – Trial balance, balance sheet – Project and loss account – Financial ratio analysis – Fund flow analysis – Cash flow analysis Capital Budgetingand its limitations.

TEXTBOOKS

1. Ramachandra Aryasri A and Ramana Murthy V V, "Engineering Economics and Financial Accounting", Tata McGraw Hill Publishing Company Limited , New Delhi, 2006.
2. Kesavan R, Elanchezhian C and Sunder Selwyn T, Engineering Economics and Financial Accounting" Laxmi Publication (P) Ltd , New Delhi, 2005.

REFERENCES

1. Mote V L Samuel Paul and Gupta G S, "Managerial Economics – Concepts and Cases" Tata McGraw Hill Publishing Company Limited , New Delhi, 1981.
2. Maheswari S N, "Financial and Management Accounting", Sultan Chand & Sons New Delhi, 1999.

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T370 BRIDGE ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Introduction & Investigation For Bridges

Components of a Bridge; Classification; Standard Specifications; Need for Investigation; Selection of Bridge Site; Preliminary Data to be Collected; Preliminary Drawings; Determination of Design Discharge; Economical Span; Location of Piers and Abutments; Vertical clearance above HFL; Scour depth; Traffic Projection; Choice of Bridge type; Importance of Proper Investigation.

UNIT – II

Concrete Bridges
Various types of bridges; I. R. C. Specifications for road bridges.
Culverts
Design of R. C. slab culvert.

UNIT – III

T – Beam Bridge
Pigeaud's method for computation of slab moments; Courbon's method for computation of moments in girders; Design of simply supported T – beam bridge.

UNIT – IV

Sub Structure For Bridges
Pier and abutment caps; Materials for piers and abutments; Design of pier; Design of abutment; Backfill behind abutment; Approach slab.

UNIT – V

Bearings For Bridges
Importance of bearings; Bearings for slab bridges; Bearings for girder bridges; Expansion bearings; Fixed bearings; Design of elastomeric pad bearing.
Foundations For Bridges
Scour at abutments and piers; Grip length; Types of foundations; Design of well foundation.

TEXT BOOK

Essentials of Bridge Engineering by Dr. Johnson Victor; Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

REFERENCE

Design of bridge structures by Jagadeesh and Jayaram, PHI Learning

T408 SOLID WASTE MANAGEMENT	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Generation and Characteristics of Solid Wastes

Goals and Objective-Public awareness-Sources and types of solid wastes-Composition of municipal solid wastes - Sampling – Physical and chemical analysis of solid wastes as per IS code – Onsite handling, storage and processing.

UNIT - II

Collection, Transfer and Transport

Collection services, collection system, equipments and labour requirements, collection routes - Transfer stations – Transport - Means and methods- Location of transfer stations.

Processing Techniques and Equipments

Purpose of processing – Mechanical volume reduction – Chemical volume reduction – Mechanical size reduction – Component separation – Drying and dewatering.

UNIT - III

Resource Recovery Technology

Materials processing and recovery systems – Recovery of chemical conversion products, recovery of biological conversion products, recovery of energy from conversion products, materials and energy recovery systems- Flow sheets.

Disposal Methods – Composting

Composting – Anaerobic and aerobic composting, vermi composting – Unit operations associated with composting – Anaerobic digestion of municipal solid waste.

UNIT - IV

Incineration

Incineration – Economic aspects – Location and design consideration – Unit operations – Description of furnaces and accessories – Pyrolysis – Waste heat recovery – Emission control.

Land Fill Methods

Methods and operations – Site selection – Reactions occurring in completed land fills – Gas and leachate movement and control – Methane recovery – Integrated waste management policy
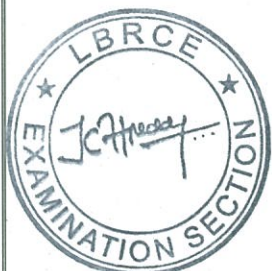
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UNIT - V

Hazardous Wastes

Identification and classification of hazardous wastes - Regulation – Generation – brief details
about onsite storage, collection, Transfer and transport – Processing and disposal, chemical fixation and encapsulation – Remediation of disposal sites.

TEXT BOOK

George Tchobanoglous, Hilary Theisen, "**Integrated Solid Waste Management**", McGraw Hill Publishers, New Delhi. 1993.

REFERENCES

1. Vesilind P.A., and Rimer A.E., "**Unit Operations in Resources Recovery Engineering**,"Prentice Hall of India Pvt Ltd, New Delhi. 1981
2. S.K.Sukhla, P.R. Srivastsva, "**Waste Management and Control**," Commonwealth Publishers, New Delhi, 1991
3. Manual on "**Solid Waste Management**" CPHEEO, Ministry of Urban affairs and Employment GOI, New Delhi,.2001
4. Joseph L. Pavani, John E. Heer and Joseph Hagerly. D,"**Hand book of Solid waste disposal**",Van Nostrand Ranhold Co, Newyork. 1975.

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T381 EARTHQUAKE RESISTANT DESIGN OF STRUCTURES	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT – I

Elements of seismology - Definitions of Magnitude, Intensity, Epicenter, etc., General features of tectonics of seismic regions, Seismographs. Seismic zones as per IS 1893-2002.

UNIT – II

Theory of vibrations - Free vibrations of single degree, two-degree and multiple degree freedom systems, damping ratio, logarithmic decrement , Transmissibility, Response spectra

UNIT – III

Principles of earthquake resistant design – Methods of dynamic analysis – Choice of the method - Architectural requirements of buildings – Plan and vertical irregularities .

UNIT – IV

Behaviour of reinforced concrete and steel elements under cyclic loading – Confinement- Ductility and absorption of energy- Introduction to Indian Standard Codes -IS:4326 – 1993 and IS13920-1993.

UNIT –V

Design of RC frames for earthquake loads – calculation of loads as per IS 1893 – 2002 – Load combinations - Design of beams and columns for earthquake resistance.

TEXTBOOKS

1. Pankaj Agrarwal & Manish Shrikhande "Earthquake resistant Design of Structures"
    Prentice Hall of India Pvt Ltd. New Delhi, 2007.
2. Mario Paz. "Structural Dynamics – Theory & Computations" CSB Publishers & Distributors Shadhdara, Delhi 1985.

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REFERENCES

1. Anil K.Chopra, "Dynamics of Structures Theory and Applications to Earthquake Engineering" Prentice Hall of India (P) Ltd., New Delhi 1996.
2. Pauley T and Priestley M.J.N, Seismic Design of Reinforced Concrete and Masonry Buildings, John Wiley & Sons, New York, 1992.
3. Stratta, J.L "Manual of seismic Design" Prentice Hall Inc. NJ 1987.

T411 TRAFFIC ENGINEERING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

INTRODUCTION

Significance and scope – Characteristics of Vehicles and Road Users – Skid Resistance and Braking Efficiency – Components of Traffic Engineering – Road, Traffic and Land Use Characteristics – Traffic forecasting – Need and Methods.

UNIT - II

TRAFFIC SURVEYS

Types of Surveys – Volume counts – Capacity – Speed and Delay – Origin and Destination – Parking – Photographic Techniques – Accident Studies – Level of Services.

UNIT - III

TRAFFIC CONTROL MEASURES

Traffic signs – Road marking – Traffic signals – Design of Traffic signal and Signal Co-ordination – Miscellaneous Traffic control Aids – Street Furniture – Street Lighting – Recent trends in signal controlling the traffic.

UNIT - IV

DESIGN OF INTERSECTIONS

Geometric Design for Elements of Traffic management – Types of Intersection – Principles and Elements of Intersection Design – Channelization and Design of Rotary intersection – Criteria for recommending Grade Separated Intersection-Conflicts at Intersections.

UNIT - V

TRAFFIC MANAGEMENT 10 hrs.

Scope of Traffic Management Measures – Traffic System Management (TSM) and Travel Demand Management (TDM) – Restrictions of turning movement – One way streets – Tidal flows – Cycle tracks and Exclusive bus lanes – Introduction to Intelligence Transport System (ITS), RTS, BRTS, MRTS.

TEXT BOOKS

1. Kadiyali L.R., "Traffic Engineering and Transport Planning", 6th Edition, Khanna Technical Publications, 2005.
2. Khanna K and Justo C.E.G., "Highway Engineering", 8th Edition, Khanna Publishers 2003.

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REFERENCES

1. Bindra S.P., "A course in Highway Engineering", Dhanpat Rai & Sons, 2001.
2. Guidelines of Ministry of Road Transport and Highways, Government of India, 2000.
3. Hobbs F.D. and Richardson P.R. "Traffic Engineering", Pergamon Press, Vol. I and II, 1997.
4. Indian Roads Congress (IRC): "Guidelines and special publications on Traffic Planning and Management", IRC: 102 - 1988
5. Subhash Saxena, "A Course in Traffic Planning and Design", 7th Edition, Dhanpat Rai Publications, 2009.

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T403 REMOTE SENSING AND GIS	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Fundamentals of Remote Sensing

Physics of remote sensing – Energy sources – Radiation Principles – Black Body Radiation – Plank's Law – Stefan – Boltzman law - Energy interaction with atmosphere – Atmospheric characteristics – Scattering – Raleigh, Mie, Non-selective and Raman scattering - Absorption – Atmospheric Windows and its significance – Energy interaction with earth surface features – Absorption, Transmission, Scattering , Radiance, Irradiance, Incident & Reflection – EMR interaction with ozone, water vapour, water, soil, vegetation and rock.

UNIT - II

Data Acquisition

Spectral reflectance of earth surface features in different wave length regions of EMR – Visible, Infrared (IR), Near IR, Middle IR, and Thermal IR. – Spectral Signature – Spectral Signature Curves. Satellites – Classification – based on orbit and Purpose -Sensors - Resolutions (Spectral, Spatial, Temporal and Radiometric) of IRS series, LANDSAT, SPOT, IKONOS AND ERS satellites – Description of Sensors in IRS series, LANDSAT, SPOT, IKONOS AND ERS satellites – description of multispectral scanning - Data Acquisition (Signal detection, Recording, and Scanning Mechanism).

UNIT- III

Data Analysis

Image interpretation elements - Visual interpretation of satellite Images – Interpretation key characteristics of digital satellite image - Digital Image Processing – Stretching – Filtering – Edge Enhancement - Band Rationing – Image Classification.

UNIT - IV

Geographical Information Systems

Definition – Components – Hardware and Software – Data structures in GIS – Raster and vector data structures – Types of Data – Spatial and Non spatial - Data base structures – Data input and output – Analysis using vector and raster data – Retrieval, Reclassification, Overlaying and Buffering - Maps – Types of maps – Projection – Types of Projection.

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UNIT - V

Applications of Remote Sensing and GIS

Introduction to GPS and its applications - Integration of Remote Sensing and GIS – Hydrological & Water resources assessment and mapping – Soil and Geological mapping – Land use and Land cover mapping – Environmental assessment and Planning – Urban sprawl mapping and Transportation studies.

TEXT BOOKS

1. Prithvish Nag and M.Kudrat ,"**Digital Remote Sensing**", Concept Publishing Company, New Delhi, 1998
2. John R.Jensen,, "**Remote Sensing of the environment – An Earth resource perspective**," Pearson Education Publication (Singapore – low prized ed.,), Indian branch, Delhi, 2005
3. Anji Reddi, Remote Sensing and Geographical Information Systems, BS Publications, 2001.
4. Srinivas.M.G (Edited by), Remote Sensing Applications, Narosa Publishing House, 2001.

REFERENCES

1. Lillesand,T.M and Kiefer.W, "**Remote Sensing and Image Interpretations**", John Wiley & Sons, New York, 1987
2. Burrough, P.A., "**Principles of Geographical Information Systems for Land Resources Assessment**," Clarandone Press, Oxford, 1986.

P887 COMPUTER AIDED ANALYSIS AND DESIGN IN	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of twelve (12No) shall be done and recorded
Students are required to analyze and design the following structures using software package like BUILD MASTER/STAAD Pro/STRUDS/GTSTRUDL/STRAP etc.

CYCLE-1
(At least SIX of the following)

1. Analysis and design of continuous beam with simple supports on either ends.
2. Analysis and design of continuous beam with a fixed end support.
3. Analysis of single storey unsymmetrical portal frame
4. Analysis and design of plane frame subjected to gravity loading.
5. Analysis and design of plane frame subjected to gravity loads and lateral load (wind load)
6. Analysis and design of plane roof truss (DL+LL).
7. Analysis and design of plane roof truss (DL+WL).

CYCLE-2
(At least FIVE of the following)

1. Design of one-way slab
2. Design of two way slab
3. Design of Cantilever Retaining wall
4. Design of Counterfort Retaining wall
5. Design of Isolated footing.
6. Design of Pile foundation.

CYCLE-3
(At least one of the following)

1. Analysis and design of two-storied R.C.C.Framed building.
2. Analysis and design of Industrial steel building.

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P897	L	T	P	Credits	Internal	External	TOTAL
TRANSPORTATION ENGINEERING LABORATORY	0	0		2	25	75	100

Note: A minimum of twelve (12No) shall be done and recorded

B. Tests On Aggregates

1. Aggregate Crushing value test.
2. Aggregate impact value test.
3. Los Angele's abrasion test.
4. Deval's attrition value test.
5. Shape test
   a) Flakiness index test
   b) Elongation index test
   c) Angularity number test. .
6. Specific gravity Test.

C. Tests On Bituminous Materials

7. Penetration test.
8. Softening point test.
9. Flash and fire point test.
10. Ductility test.
11. Viscosity test.
12. Bitumen Extractions Test.
13. Specific gravity of Bitumen.
D. Test On Bituminous Mixes

14. Marshall stability test.

E. Test On Soil Subgrade

15. California bearing ratio test.

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P892 ENVIRONMENTAL ENGINEERING LABORATORY	L	T	P	Credits	Internal	External	TOTAL
	0	0	3	2	25	75	100

Note: A minimum of twelve (12No) shall be done and recorded

1. Determination of total, suspended and dissolved solids in water / sewage sample.

2. Determination of fixed and volatile solids in water / sewage sample.

3. Determination of Settleable Solids.

4. Determination of turbidity of water / sewage sample.

5. Determination of pH value of water / sewage sample.

6. Determination of optimum dose of coagulant.

7. Determination of residual chlorine.

8. Determination of temporary and permanent hardness of water sample.

9. Determination of chloride concentration of water / sewage sample.

10. Determination of acidity of water sample.

11. Determination of alkalinity of water sample.

12. Determination of fluorides in water sample.

13. Determination of Dissolved Oxygen of water / sewage sample.

14. Determination of Biochemical Oxygen Demand (BOD) of waste water.

15. Determination of Chemical Oxygen Demand (COD) of waste water.

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VIII -SEMESTER

T375 CONSTRUCTION MANAGEMENT	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I
CONSTRUCTION PROJECT MANAGEMENT

Introduction – Project Life Cycle – Major Types of construction – Selection of professional services – Construction contractors – Financing of constructed facilities – Legal & Regulatory requirements – Role of project managers

UNIT - II
PROJECT PLANNING & ORGANIZATION

Development of project plan, objective and conception– Programming – Scheduling – Project Organization – Project budget fund flow statement – Controlling system

UNIT - III
LABOUR, MATERIAL & EQUIPEMENT UTILIZATION

Introduction – Labour Productivity – Factors affecting job site productivity – Materials Management – Material procurement & Delivery – Inventory control – Plant & Equipment management

UNIT - IV
CONTRACTS

Introduction – Types of Contract – Contract document – Specifications – Important conditions of contract – Tender and tender document – Deposits by the contractor – Arbitration – M. Book, R.A Bills & Advances – Muster Roll – Stores

UNIT - V
NETWORK ANALYSIS

Introduction – Basic concepts of network analysis – CPM and PERT – Use of CPM & PERT Techniques – Problems, and prospects and applications of CPM & PERT – Introduction to software applications in project Management

TEXT BOOKS

1. S. Sanga Reddy & Meyyappan, "Construction Management", Kumaran Publications, 2009.
2. Gahlot, P.S & Dhir, D.M., "Construction Planning and Management", Wiley Eastern Limited, 1992.
3. Chitkara, K.K., "Construction Project Management", Tata McGraw Hill Publishing Co, Ltd., New Delhi, 1992.
4. Punmia B.C., "Project Planning and Control with PERT and CPM", Laxmi Publications, New Delhi, 1987.

REFERENCES

1. Jerome D. Wiest & K. Levy, "Management Guide to PERT/CPM",
2. Clough R.H. & Sears. G.A, "Construction Project Management" 2008

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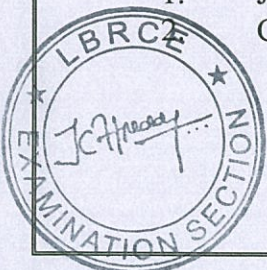
T404 **REPAIR AND** **REHABILITATION OF** **STRUCTURES**	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT – I

Durability of Concrete Structures

Permeability of concrete- Sulphate attack- Methods of control- Durability of concrete in seawater- Action of sewage- Thermal properties of concrete- Fire resistance- Resistance to freezing and thawing- resistance to abrasion, erosion and cavitation.

UNIT – II

Distress in Concrete Structures- Causes, Effects and Remedial measures

Effects due to climate, temperature, chemicals, wear and erosion, design and construction errors, corrosion mechanism, effects of cover thickness and cracking, methods of corrosion protection, inhibitors, resistant steels, coatings, cathodic protection.

UNIT – III

Maintenance and Repair Strategies

Inspection, structural appraisal, economic appraisal- Diagnosis of distress-Procedure. Quality assurance- Need- components - Conceptual bases for quality assurance schemes

UNIT – IV

Materials for Repair

Special concretes and mortars, special cements for accelerated strength gain, expansive cement, polymer concrete, sulphur infiltrated concrete, ferro-cement, fibre reinforced concrete.

UNIT – V

Techniques of Repair

Rust eliminators and polymer coating for rebars during repair, foamed concrete, mortar and dry pack, vacuum concrete, Gunite and Shotcrete epoxy injection, mortar repair for cracks.Trench less Technology for underground pipe laying.

TEXT BOOKS

1. Shetty. M.S, "**Concrete Technology Theory and Practice**", S. Chand Company, New Delhi. (Units I, IV& V), 1992
2. Gambhir,M.L., "**Concrete Technology**", Tata McGraw Hill Publishing Co. New Delhi 1998.
3. Dension Campbell, Allen and Harold Roper, "**Concrete Structures, Materials, Maintenance andRepair**", Longman Scientific and Technical Publications, UK. (Units II to V), 1991.
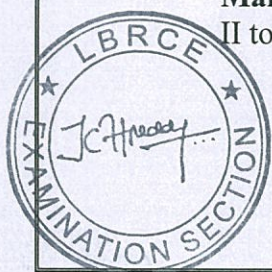
REFERENCES

1. ACCE (I), Madurai Centre, "**Workshop on Cracks, Corrosion and Leaks**", July, 2003
2. Allen.R.T and Edwards.S.C, "**Repair of Concrete Structures**", Blakie and Sons, UK, 1997
3. Peter H. Emmons, "**Concrete Repair and Maintenance illustrated problem analysis, RepairStrategy, Techniques**", Galgotia Publication, 2001.

Web sites

1. www.fix concrete.org
2. www.structurescan.com
3. www.4specs.com
4. www.trenchlessonline.com
5. www.nodig-construction.com
6. www.tunneling.com

T398 MODERN CONSTRUCTION SYSTEMS AND TECHNIQUES	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I
LOW COST HOUSING
Introduction – Building Materials - Foundations - Walls - Roofs - Prefabrication - Case Study

UNIT - II
FOUNDATION SYSTEM
Introduction – Piling – Pier Construction – Caisson – Well Foundations – Footings Underpinning – Dewatering – Trenchless Techniques.

UNIT - III
PRESTRESSING SYSTEMS
Introduction – Principles and applications – Tensioning Devices – Pretensioning Systems – Hoyer's Long line system – Post Tensioning systems – Freyssinet, Gifford-Udall, Anderson and Magnel-blaton – Lee-McCall System – Thermo electric Pretensioning – Chemical Pretensioning – Ground anchors.

UNIT - IV
CONSTRUCTION EQUIPMENT PLANNING
Introduction – Earth moving equipments – Lifting equipments – Hauling Equipments – Paving Equipments – Productivity calculations.

UNIT - V
BRIDGE LAUNCHING TECHNIQUES
Introduction – Temporary and Enabling structures – Setting out of Bridges – Girder Erection – Balanced Cantilever Segmental construction – Cable Stayed Bridges – Fixing of Bearings – Case Study.

TEXT BOOKS

1. Krishnaraju N., "Prestressed Concrete", Tata McGraw Hill Publication, 2000.
2. Chudley R., "Construction Technology", [Vol. 3 and 4], ELBS Publisher, 2006
3. Madhava Rao A.G. and Ramachandra Murthy D.S.," Appropriate Low Cost Housing", Oxford & IBH Publication, 1997.
4. Johnson Victor, "Essentials of Bridge Engineering", Oxford & IBH Publication, 1995

REFERENCES

1. Horrison, "Construction Equipments Planning", Longman Publication.
2. Peurifoy, "Construction Methods and Planning", McGraw Hill Publication, 2000
3. Nainan P. Kurian, "Foundation Systems", Narosa Publication, 2005
4. Rakshit K.S., "Design and Construction of Highway Bridges", New Central Book Agency(P) Ltd, 2009
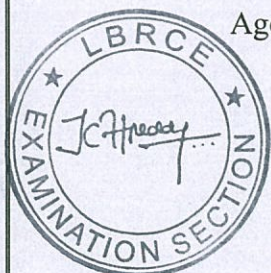
T406 SHORING, SCAFFOLDING AND FORM WORK	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I
PLANNING, SITE EQUIPMENT AND PLANT FOR FRAMEWORK
Lumber – Types – Finish – Sheathing ratio – Working stresses – Repetitive member stress – Plywood – Types and grades – Textured surfaces and strength – Reconstituted wood -Steel – Aluminium – Form lining materials – Hardware and fasteners – Nails in Plywood – Bolts, lag screws and connectors.

UNIT - II
FORM MATERIALS AND PRESSURES ON FORMWORK
Design considerations – Live loads and Wind pressure – Concrete pressure on form work- Concrete density – Height of discharge -Temperature -Rate of Placing – Consistency of concrete – Vibration – Hydrostatic pressure and pressure distribution. Beam forms – Slab forms – Column forms -Wall forms – Allowable stresses – Check for deflection, bending and lateral stability – Examples.

UNIT - III
SHORES AND FORM DESIGN
Simple wood stresses – Slenderness ratio -Allowable load -Tubular steel shores -Patented shores – Site Preparation, Size and spacing – Steel Tower Frames -Safety practices – Horizontal shores – llis shores -Dayton sure grip and Baker Roos shores – Safway Symons shores-Dead shore – Raking and Flying shores. Overall Planning -Detailed planning – Standard units – Corner units – schedule – Planning at Tender stage – Development of basic system – Planning for maximum reuse – Planning examples – Site layout plan – Crane arrangements – Recheck plan details – Planning for safety – Transporting plant -Wales and ties – Vertical transportable form work.

UNIT - IV
FORM WORK FOR BUILDINGS AND FAILURES
Location of job mill – Storage – Equipment. Prefabricated panel systems – Giant forms -Curved wall forms -Erections Practices – Column heads – Beam or girder forms – Suspended forms – Suggested Tolerances – Concrete Joint construction – Flying system forms. Causes of failures – Case studies – Safety factors – Stripping sequence –
Reshore installation – Advantages of reshoring.

UNIT - V

TUNNEL FORMS, SLIP FORMS AND SAFETY PRACTICES FOR SCAFFOLDS
Shell forms – Design considerations – Loads – Building forms – Strength requirements -Tunnel forming components – Curb and gutter forms – Invert forms – Arch forms – Concrete placement methods – Cut and cover construction -Tolerances – Slip forms – Principles -Types – Advantages – Functions of various components – Planning -Safety in slip forms -Special structures built with slip form technique – Codal provisions -Types of scaffolds – Putlog and Independent scaffold – Single pole scaffolds – Fixing ties- Spacing of ties – bracing – knots safety net – General safety requirements – Gantry and system scaffolds – Shuttering for Precast members and continuous casting forms.

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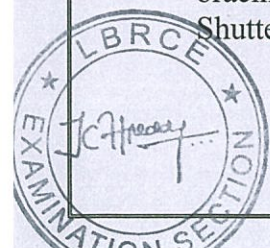
TEXT BOOKS

1. Robert L.Peurifoy and Garold D.Oberlender, "Formwork for Concrete Structures", McGraw- Hill, 1996
2. Hurd M.K., "Formwork for Concrete", 5th Edition, Special Publication Vol.4, American   Concrete Institute, Detroit, 1983
3. Michael P. Hurst, "Construction Press", London & New York, 2003.
4. Austin. C.K., "Formwork for Concrete", Cleaver- Hume Press ltd., London 1986.
5. Tudor Dinescu and Constantin Radulescu, "Slip Form Techniques", Abacus Press Tum Bridge Wells, Kent, 1982.

REFERENCES

1. "Guide for Concrete Formwork", American Concrete Institute, Box No. 9150, Michigan 48219
2. "Safety Requirements for Scaffolding", American National Standards Institute. Broadway, New York, 10018

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T394 MACHINE FOUNDATIONS	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Introduction, nature of dynamic loads free vibrations of spring mass systems, forced vibrations viscous damping, principles of vibration measuring equipments.

UNIT - II

Dynamic properties of soils: Elastic properties of soils, coefficient of elastic uniform and non uniform compression and shear, effect of vibration on the dissipative properties of soils , determination of dynamic properties of soils , Codal provisions.

UNIT - III

Analysis and design of block type machine foundations: Review of methods for dynamic analysis- modes of vibration, foundations for machines inducing periodical forces and impact type forces.

UNIT - IV

Design of framed foundations for high speed machinery: Special consideration in planning, principles design criteria, structural design- foundations for miscellaneous machines.

UNIT - V

Vibration isolation, passive and active isolation, use of springs and springs and damping materials, construction aspects of machine foundations.

TEXT BOOKS

1. Barkon,D.D., Dynamics of basis of foundation, MGH,1974.
2. Bowle's.J.E., Foundation Analysis and design,4th edition,MGL,1998.

REFERENCES
Arora.K.R., Soil mechanics and foundation Engineering,SPD,2001

ELECTIVE-IV

T368 ARCHITECTURE AND TOWN PLANNING	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Introduction to Architecture: Origin and definition – Influence of nature – Climate – Topography – material – Social condition – Economic condition on architecture. Architectural science - factors influencing architecture, aesthetic responses: Colour and aesthetic responses- formal and informal organization of solids and voids.

UNIT - II

Basic Principles: Concepts of beauty, unity, balance, composition, rhythm, harmony, style, character, integration, scale, proposition, contrast, shape and structure.

UNIT - III

Urbanization: Urbanization trends in India- Classification of towns - humans settlements development policy - National approach. Urban growth: planning of towns in ancient India - Greek and Roman towns - Garden city concept - New towns & satellite towns –Urban Renewal- Planning standards for neighborhood

UNIT - IV

Evolution of planning legislation in India – Organisation and administration of planning agencies at national, state, regional level and metropolitan level – building bye law – Function of local Authority – Provision of Building regulations.

UNIT - V

Planning of Land uses: Residential area planning - Site & service programmes - Commercial areas - Industrial sites - rectangular areas, Principles of planning for traffic and transportation facilities - transport
terminals pedestrian path and bikeways.

TEXT BOOKS

1. Gallion,D., et.al, The Urban pattern city planning & design, Affiliated East West Press Pvt. Ltd., NewDelhi.
2. Lewis Keeble, Town Planning Made Plain & Town & Country Planning Association, London, 1983.

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REFERENCES

1. Rangwala, K.S., Town Planning, Charotar Publishing House, Anand, India.
2. Hiraqskar, G.K., Fundamentals of Town Planning, Dhanpat Rai &Sons., Delhi 2001.
3. Pickering,E., Architectural Design, John Wiley and Sons , London.

T392 INDUSTRIAL STRUCTURES	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

Classification of Industrial Structures - Layout requirements - lighting and Ventilation - protection against noise and vibration - fire safety - factories act.

UNIT - II

Roofing configuration – types of trusses - Beams and lattice trusses - Type of roof covering materials - purlins - detailed design.

UNIT - III

Silos and Bunkers - Shape of hopper for different materials - design of vertical sides - hopper bottom - stiffening girder - staging -design - Conveyors and supporting structures.

UNIT - IV

Gable frames of uniform cross sections - varying depth – pin-jointed knee bracings - design of joints - analysis by various methods.

UNIT - V

Load Analysis and design of Transmission line Towers - Substation structures - Foundation analysis – Design Principle only.

REFERENCES

1 Punmia .B.C.,. Jain A.K, Arun Kumar Jain ,"Comprehensive R C C Designs", LaxmiPublications (P) Ltd., New Delhi, 1998
2. Lother, "Advance Design in Steel Structure", Prentice Hall, USA, 1980
3. Salmon. C.G. and Johnson J.E. "Steel Structure - Design and Behaviour", Harper and Row - 1980
4. Wiliam McGuire - "Steel Structures", Prentice Hall of India New Jersey, 1968
5. Arya and Ajmani, "Design of Steel Structures" Nem Chand Bros, Roorkee, 1990
6. Dayaratnam. P. "Design of -Steel Structures", Wheeler & Co., New Delhi, 1999.
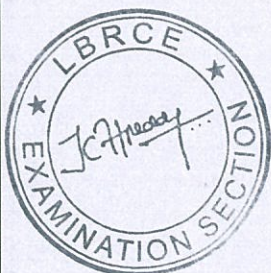
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T399 PAVEMENT ANALYSIS AND DESIGN	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

OBJECTIVE

Student gains knowledge on various IRC guidelines for designing rigid and fl exible pavements. Further, he/she will be in a position to assess quality and serviceability conditions of roads.

UNIT- I

TYPE OF PAVEMENT AND STRESS DISTRIBUTION ON LAYERED SYSTEM

Introduction - Pavement as layered structure - Pavement types - rigid and fl exible -Stress and deflections in pavements under repeated loading.

UNIT – II

DESIGN OF FLEXIBLE PAVEMENTS

Flexible pavement design - Empirical - Semi empirical and theoretical Methods – Design procedure as per latest IRC guidelines – Design and specifi cation of rural roads.

UNIT – III

DESIGN OF RIGID PAVEMENTS

Cement concrete pavements - Modified Westergaurd approach - Design procedure as per latest IRC guidelines - Concrete roads and their scope in India.

UNIT – IV

PERFORMANCE EVALUATION AND MAINTENANCE

Pavement Evaluation [Condition and evaluation surveys (Surface Appearance, Cracks, Patches And Pot Holes, Undulations, Ravelling, Roughness, Skid Resistance), Structural Evaluation By Deflection Measurements, Present Serviceability Index], Pavement maintenance. [IRC Recommendations Only]

UNIT – V

STABILISATION OF PAVEMENTS 8

Stabilisation with special reference to highway pavements - Choice of stabilisers -Testing and field control –Stabilisation for rural roads in India -use of Geo-synthetics (geo-textiles & geo-grids)in roads.
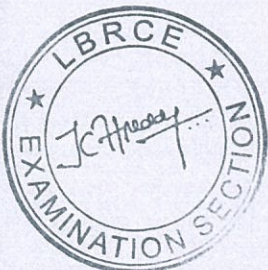
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TEXT BOOKS

1. Kadiyali, L.R., "Principles and Practice of Highway Engineering", Khanna tech. Publications,New Delhi, 2000.
2. Croney, D., Design and Performance of Road Pavements, HMO Stationary Offi ce, 1979.
3. Wright, P.H., "Highway Engineers", John Wiley & Sons, Inc., New York, 1996.
4. Design and Specifi cation of Rural Roads (Manual), Ministry of rural roads, Government ofIndia, New Delhi, 2001

REFERENCES

1. Yoder R.J and Witczak M.W., "Principles of Pavement Design", John Wiley, 1975.
2. Guidelines for the Design of Flexible Pavements, IRC:37 - 2001, The Indian roads Congress,New Delhi.
3. Guideline for the Design of Rigid Pavements for Highways, IRC:58-1998, The Indian RoadsCongress, New Delhi.

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~~T388~~ T 410 TOTAL QUALITY MANAGEMENT	L	T	P	Credits	Internal	External	TOTAL
	4	0	0	3	25	75	100

UNIT - I

INTRODUCTION
Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs – Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers toTQM Implementation.

UNIT - II

TQM PRINCIPLES
Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection,Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, strategy, Performance Measure.

UNIT - III

STATISTICAL PROCESS CONTROL (SPC)
The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

UNIT - IV

TQM TOOLS
Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

UNIT - V

QUALITY SYSTEMS
Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, QS 9000, ISO 14000 – Concept, Requirements and Benefits.

TEXT BOOK
Dale H.Besterfiled, et at., Total Quality Management, Pearson Education Asia, 1999. (Indian reprint 2002).
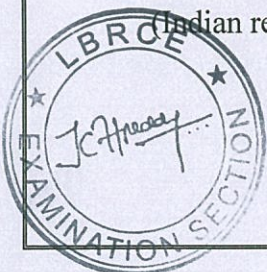
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REFERENCES

1. James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning),2002 (ISBN 0-324-06680-5).
2. A.V. Feigenbaum. "Total Quality Management, McGraw-Hill, 1991.
3. Oakland.J.S. "Total Quality Management Butterworth – Hcinemann Ltd., Oxford.1989.
4. V. Narayana and N.S. Sreenivasan, Quality Management – Concepts and Tasks, New Age International 1996.
5. Zeiri. "Total Quality Management for Engineers Wood Head Publishers, 1991.

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P894 QUANTITY ESTIMATION AND PROJECT MANAGEMENT	L	T	P	Credits	Internal	External	TOTAL
	0	0		2	25	75	100

Note: A minimum of twelve (12No) shall be done and recorded

CYCLE-1
Quantity Surveying
*(At least **SIX** of the following using softwares like MS Excel/ Qty./Road Estimate/Super Rate analysis etc.)*

1. Quantity estimation of a single storey residential building (different items).
2. Cost estimation of a single storey residential building.
3. Quantity estimation of a B.T.Road (different items).
4. Cost estimation of a B.T.Road.
5. Quantity estimation of a Canal (different items).
6. Cost estimation of a Canal.
7. Find out the labour requirement and preparing the Rate Analysis for different items of work.

   a) C.C b) R.C.C c) Brick work d) Flooring
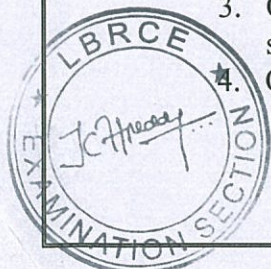
CYCLE-2
Project Management
*(Any **THREE** of the following using softwares like MS Project / Primavera etc.)*

1. Preparing the Project management report for a single storey residential building/Road/Canal by using the Bar Chart/Mile stone chart.
2. Preparing the Project management report for a single storey residential building by using the network technique (PERT/CPM).
3. Preparing the Project management report for a B.T.Road by using the network technique (PERT/CPM).
4. Preparing the Project management report for a Canal by using the network technique (PERT/CPM).

CYCLE-3
*(At least **THREE** of the following by using softwares like MS Excel)*
1. Quantity estimation of RCC roof slab and preparing schedule of bars
2. Quantity estimation of RCC beam and preparing schedule of bars
3. Quantity estimation of RCC Column with foundation footing and preparing schedule of bars
4. Quantity estimation of RCC retaining wall and preparing schedule of bars