ACADEMIC REGULATIONS COURSE STRUCTURE

AND

DETAILED SYLLABUS

For

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2005-2006)

CIVIL ENGINEERING

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

KUKATPALLY, HYDERABAD - 500 072.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

B.TECH. CIVIL ENGINEERING
I Year

COURSE STRUCTURE

S.NO.	CODE.NO.	SUBJECT	T	P	C
	HS05231	ENGLISH	2+1*	0	4
	MA05363	MATHEMATICS – I	3+1*	0	6
	PY05226	ENGINEERING PHYSICS	2+1*	0	4
	CM05044	APPLIED CHEMISTRY	2+1*	0	4
	CE05046	APPLIED MECHANICS	4+1*	0	8
	CS05106	C - PROGRAMMING AND DATA STRUCTURES	3+1*	0	6
	ME05223	ENGINEERING GRAPHICS	0	6	8
	PY05227	ENGINEERING PHYSICS AND APPLIED CHEMISTRY LAB	0	3	4
	CS05144	COMPUTER PROGRAMMING LAB.	0	3	4
	ME05230	ENGINEERING WORKSHOP PRACTICE	0	3	4
	HS05232	ENGLISH LANGUAGE COMMUNICATION SKILLS LABORATORY	0	3	4
	TOTAL		22	18	56

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B.TECH. CIVIL ENGINEERING
COURSE STRUCTURE

II Year — I Semester

CODE.NO.	SUBJECT	T	P	C
MA05364	MATHEMATICS – II	4+1*	0	4
HS05353	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	4+1*	0	4
CE05526	STRENGTH OF MATERIALS - I	4+1*	0	4
CE05104	BUILDING MATERIALS AND CONSTRUCTION	4+1*	0	4
CE05535	SURVEYING	4+1*	0	4
CE05254	FLUID MECHANICS	4+1*	0	4
CE05528	STRENGTH OF MATERIALS LAB.	0	3	2
CE05536	SURVEYING LAB - I	0	3	2
	TOTAL	30	6	28

II Year — II Semester

S.NO. CODE.NO.	SUBJECT	T	P	C
MA05476	PROBABILITY AND STATISTICS	4+1*	0	4
CE05105	BUILDING PLANNING AND CONSTRUCTION MANAGEMENT	4+1*	0	4
CE05527	STRENGTH OF MATERIALS - II	4+1*	0	4
CE05297	HYDRAULICS AND HYDRAULIC MACHINERY	4+1*	0	4
CE05239	ENVIRONMENTAL STUDIES	4+1*	0	4
CE05529	STRUCTURAL ANALYSIS – I	4+1*	0	4
CE05537	SURVEYING LAB - II	0	3	2
CE05257	FLUID MECHANICS AND HYDRAULIC MACHINERY LAB.	0	3	2
	TOTAL	30	6	28

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COURSE STRUCTURE

III Year — I Semester

CODE.NO.	SUBJECT	T	P	C
EE05187	ELECTRICAL AND ELECTRONICS ENGINEERING	4+1*	0	4
CE05072	BASIC REINFORCED CONCRETE DESIGN AND DRAWING	4+1*	0	4
CE05147	CONCRETE TECHNOLOGY	4+1*	0	4
CE05575	WATER RESOURCES ENGINEERING -I	4+1*	0	4
CE05530	STRUCTURAL ANALYSIS - II	4+1*	0	4
CE05221	ENGINEERING GEOLOGY	4+1*	0	4
CE05222	ENGINEERING GEOLOGY LAB.	0	3	2
CE05103	BUILDING DRAWING	0	3	2
	TOTAL	30	6	28

III Year — II Semester

CODE.NO.	SUBJECT	T	P	C
CE05277	GEOTECHNICAL ENGINEERING	4+1*	0	4
CE05235	ENVIRONEMENTAL ENGINEERING-I	4+1*	0	4
CE05073	BASIC STRUCTURAL STEEL DESIGN AND DRAWING	4+1*	0	4
CE05576	WATER RESOURCES ENGINEERING–II	4+1*	0	4
CE05241	ESTIMATING, QUANTITY SURVEY AND VALUATION	4+1*	0	4
CE05561	TRANSPORTATION ENGINEERING	4+1*	0	4
CE05278	GEOTECHNICAL ENGINEERING LAB.	0	3	2
CE05237	ENVIRONMENTAL ENGINEERING LAB.	0	3	2
	TOTAL	30	6	28

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HYDERABAD
B.TECH. CIVIL ENGINEERING
COURSE STRUCTURE

IV Year **I Semester**

CODE.NO.	SUBJECT	T	P	C
CE05264	FOUNDATION ENGINEERING	4+1*	0	4
CE05249	FINITE ELEMENT METHODS IN CIVIL ENGINEERING	4+1*	0	4
EC05506	REMOTE SENSING AND GIS APPLICATIONS	4+1*	0	4
CE05236	ENVIRONMENTAL ENGINEERING – II	4+1*	0	4
	ELECTIVE –I			
CE05034	ANALYSIS AND DESIGN OF STRUCTURES FOR WIND AND EARTHQUAKE EFFECTS	4+1*	0	4
CE05011	ADVANCED FOUNDATION ENGINEERING			
CE05314	INDUSTRIAL WASTE AND WASTE WATER MANAGEMENT			
	ELECTIVE - II			
CE05577	WATER RESOURCES SYSTEM ANALYSIS	4+1*	0	4
CE05025	AIR POLLUTION AND CONTROL			
CE05280	GROUND IMPROVEMENT TECHNIQUES.			
CE05279	GIS AND CAD LAB.	0	3	2
CE05146	CONCRETE AND HIGHWAY ENGINEERING LAB.	0	3	2
	TOTAL	30	6	28

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HYDERABAD
B.TECH. CIVIL ENGINEERING
COURSE STRUCTURE

IV Year **II Semester**

CODE.NO.	SUBJECT	T	P	C
	ELECTIVE – III	4+1*	0	4
CE05015	ADVANCED STRUCTURAL CONCRETE AND STEEL DESIGN			
CE05281	GROUND WATER DEVELOPMENT AND MANAGEMENT			
CE05238	ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT			
	ELECTIVE – IV	4+1*	0	4
CE05578	WATER SHED MANAGEMENT			
CE05469	PRESTRESSED CONCRETE			
CE05445	PAVEMENT ANALYSIS AND DESIGN			
	ELECTIVE – V	4+1*	0	4
HS05002	ADVANCED COMMUNICATION SKILLS			
CE05014	ADVANCED STRUCTURAL ANALYSIS			
CE05162	DESIGN AND DRAWING OF HYDRAULIC STRUCTURES			
CA05315	INDUSTRY ORIENTED MINI PROJECT	-	-	2
CA05515	SEMINAR	-	-	2
CA05495	PROJECT WORK	-	-	12
	TOTAL	15	0	28

* This course may be treated as a core subject in case the Elective III is made as a core course.

NOTE:- All University Examinations (Theory and Practical) are of 3 hours duration.

* : TUTORIAL.
T : Theory periods per week P: Practical /Drawing Periods per week
C : Total Credits for the subject

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. C.E.

(HS 05231) ENGLISH

T	P	C
2+1	0	4

1. INTRODUCTION :

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks, to encourage them to develop their language skills. The two textbooks identified by the Board of Studies serve the purpose of illustrating the conceptual framework with which the syllabus is to be administered in the classroom. When a text book is prescribed content is generally paid attention to. However, the stress in this syllabus is on language acquisition and skill development, calling for both the teacher and the taught to go beyond the prescribed texts and innovate exercises and tasks.

2. OBJECTIVES :

1. To promote the language proficiency of the students with emphasis on improving their LSRW skills.

2. To impart training to the students through the syllabus and its theoretical and practical components.

3. To improve communication skills in formal and informal situations.

3. SYLLABUS :

Listening Skills :

- Listening for general content
- Listening to fill up information gaps
- Intensive listening
- Listening for specific information
- Note-taking - guided and unguided
- Post-listening testing

Speaking Skills :

- Oral practice
- Developing confidence
- Introducing oneself/others
- Asking for/ giving information
- Describing objects/offering solutions
- Describing situations
- Role play
- Expressing agreement/disagreement

Reading Comprehension

- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
- Recognizing coherence/sequencing of sentences

NOTE : **The student, through the training imparted to him/her by means of the text-based approach, will be examined in answering questions on an unseen passage.**

Writing Skills :

- Writing a sentence
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Interpreting data
- Formal and informal letter writing
- Sending e-mails
- Information transfer
- Editing a passage

4. TEXTBOOKS PRESCRIBED :

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Eight Units, are prescribed:

1. **LEARNING ENGLISH:** A Communicative Approach, Hyderabad: Orient Longman, 2005.(Selected Lessons)

2. **WINGS OF FIRE:** An Autobiography – APJ Abdul Kalam, Abridged version with Exercises, Hyderabad: Universities Press (India) Pvt. Ltd., 2004.

The following lessons from the prescribed texts are recommended for study
:

A. STUDY MATERIAL :

Unit – I

1. **Astronomy** from **LEARNING ENGLISH:** *A Communicative Approach,* Orient Longman, 2005.

2. Chapters 1-4 **from** Wings of Fire: An Autobiography – **APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004**

Unit – II

3. Information Technology **from** LEARNING ENGLISH: *A Communicative Approach,* **Orient Longman, 2005.**

4. Chapters 5-8 **from** Wings of Fire: An Autobiography – **APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004**

Unit – III

5. Humour **from** LEARNING ENGLISH: A Communicative Approach, Orient **Longman, 2005.**
6. Chapters 9-12 **from** Wings of Fire: An Autobiography – **APJ Abdul Kalam, an abridged version with Exercises., Universities Press (India) Pvt. Ltd., 2004**

Unit – IV

7. Environment **from** LEARNING ENGLISH: A Communicative Approach, Orient **Longman, 2005.**
8. Chapters 13-16 **from** Wings of Fire: An Autobiography – **APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004**

Unit – V

9. Inspiration **from** LEARNING ENGLISH: A Communicative Approach, Orient **Longman, 2005.**
10. Chapters 17-20 **from** Wings of Fire: An Autobiography – **APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004.**

Unit – VI

11. Human Interest **from** LEARNING ENGLISH : A Communicative Approach, **Orient Longman, 2005.**
12. Chapters 21-24 **from** Wings of Fire: An Autobiography – **APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004.**

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

Unit – VII

Reading and Writing Skills
Reading Comprehension
Situational dialogues
Report writing
Letter writing
Essay writing
Information transfer

Unit – VIII

Remedial English
Common errors
Subject-Verb agreement
Use of Articles and Prepositions
Tense and aspect

Vocabulary – Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.

TEXT BOOKS:

1. **Effective Technical Communication**, M Ashraf Rizvi, Tata McGraw-Hill Publishing Company Ltd.
2. **Everyday Dialogues in English**, Robert J Dixson, Prentice Hall of India Pvt Ltd., New Delhi.

REFERENCES

1. **Strengthen Your English**, Bhaskaran & Horsburgh, Oxford University Press
2. **English for Technical Communication**, K R Lakshminarayana, SCITECH Education Asia.
3. **Strategies for Engineering Communication**, Susan Stevenson & Steve Whitmore (John Wiley and sons).
4. **English for Engineers: With CD**, Sirish Chaudhary, Vikas Publishing House Pvt. Ltd. With CD.
5. **Basic Communication Skills for Technology**, Andrea J Rutherfoord, Pearson Education Asia.
6. **Murphy's English Grammar with CD**, Murphy, Cambridge University Press
7. **A Practical Course in English Pronunciation, (with two Audio cassettes)**, Sethi, Sadanand & Jindal , Prentice –Hall of India Pvt Ltd., New Delhi.
8. **English for Professional Students**, by S S Prabhakara Rao.
9. **The Oxford Guide to Writing and Speaking**, John Seely, Oxford.
10. **Grammar Games**, Renvolucri Mario, Cambridge University Press.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. C.E.

(MA05363) MATHEMATICS – I

T P C
3+1 0 6

UNIT – I

Sequences – series – Convergences and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence. Rolle's theorem – Lagrange's Mean Value Theorem – Cauchy's Mean value Theorem – Generalized Mean Value theorem (Taylor's Theorem).

UNIT – II

Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints or without constraints- Radius, Centre and Circle of Curvature – Evolutes and Envelopes.

UNIT – III

Curve tracing – Cartesian , polar and Parametric curves - Applications of integration to lengths , volumes and surface areas in Cartesian and polar coordinates.

UNIT – IV

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-Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, Sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, $xV(x)$, method of variation of parameters.

UNIT – V

Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms-Application of Laplace transforms to ordinary differential equations.

UNIT – VI

Multiple integrals - double and triple integrals – change of variables – change of order of integration.

UNIT – VII

Vector Calculus: 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.

UNIT – VII

Vector Calculus: 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.

UNIT – VIII

Vector integral theorems: Green's theorem- Stoke's and Gauss's Divergence Theorem. Verification of Green's - Stoke's and Gauss's Theorems – Cylindrical, Spherical coordinates-Expressions Grad, div, curl in spherical and cylindrical coordinates.

TEXT BOOKS:

1. A text book of Engineering Mathematics Volume – 1, 2005 T.K.V.Iyengar, B.Krishna Gandhi, S.Chand and Company.

2. Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill 2003.

REFERENCES:

1. Engineering Mathematics–I, 2002, P.Nageswara Rao, Y.Narsimhulu, Prabhakara Rao

2. Engineering Mathematics- I, 2004, Dr.Shahnaz Bathul, Right Publishers.

3. Engineering Mathematics, S.K.V.S. Sri Rama Chary, M.Bhujanga Rao, Shankar, B.S.Publications 2000.

4. Engineering Mathiematics-I Rukmangadhachary, Pearson Education.

5. Engineering Mathematics – I, Sankaraiah, VGS Book Links, Hyderabad.

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HYDERABAD

I YEAR B.TECH. C.E.

T	P	C
2+1	0	4

(PY05226) ENGINEERING PHYSICS

UNIT - I
INTERFERENCE:

Introduction - Superposition of waves - Young's double slit experiment - Coherence
- Interference in thin films by reflection - Newton's rings.

DIFFRACTION:

Introduction - Fresnel and Fraunhofer diffraction - Fraunhofer diffraction at a single slit & at a double slit - Circular aperture - Diffraction grating - Grating spectrum - Resolving power of a grating - Rayleigh's criterion for resolving power.

UNIT - II
POLARIZATION:

Introduction - Representation of polarized and unpolarized light - Polarization by reflection - Malus law - Double refraction - Nicol prism - Circular and Elliptical polarization -Quarter wave plate - Half wave plate.

ULTRASONICS:

Introduction - Production of Ultrasonic waves - Magnetostriction method – Piezo-electric method - Detection of Ultrasonics - Properties of Ultrasonics - Use of Ultrasonics for non-destructive testing - Applications of Ultrasonics.

UNIT - III
ACOUSTICS OF BUILDINGS:

Basic requirement of acoustically good hall - Reverberation and time of reverberation
– Sabine's formula for reverberation time - Measurement of absorption coefficient of a material - Factors affecting the architectural acoustics and their remedy.

SUPERCONDUCTIVITY:

General properties - Meissner effect - Penetration depth - Type I and Type II superconductors - Flux quantization - Josephson Effect - BCS Theory - Applications of superconductors.

UNIT - IV
LASERS:

Introduction - Characteristics of Lasers - Spontaneous and Stimulated Emission of radiation - Einstein's coefficients - Population inversion - Ruby Laser - Helium-Neon Laser - Semiconductor Laser - Applications of Lasers in Industry, Scientific and Medical fields.

UNIT - V
FIBER OPTICS:

Introduction - Principle of optical fiber - Acceptance angle and Acceptance cone - Numerical aperture - Step-Index fiber and transmission of signal in SI fiber - Graded-Index fiber and transmission of signal in GI fiber - Attenuation in optical fibers - Advantages of optical fibers in communication - Application of optical fibers in Medicine and Sensors.

UNIT - VI
MAGNETIC PROPERTIES:

Permeability - Magnetization - Origin of magnetic moment - Classification of magnetic materials - Dia, Para and Ferro magnetism - Hysteresis curve - Soft and Hard magnetic materials - anti-Ferro and Ferri magnetism - Ferrites and their applications.

CRYSTAL STRUCTURES:

Introduction - Space lattice - Basis - Unit cell - Lattice parameter - Crystal systems - Bravais lattices - Structure and Packing fractions of Simple cubic - Body Centred Cubic - Face Centred Cubic crystals - Structures of Diamond, ZnS, NaCl, CsCl.

UNIT - VII
CRYSTAL PLANES & X-RAY DIFFRACTION:

Directions and Planes in crystals - Miller Indices - Separation between successive [h k l] planes - Diffraction of X-rays by Crystal planes - Bragg's Law - Laue method -Powder method.

UNIT - VIII
DEFECTS IN SOLIDS:

Imperfections in Crystals - Point defects - Schottky and Frenkel defects - Energy for formation of a Vacancy - Equilibrium concentration of Schottky and Frenkel defects -Line defects - Edge and Screw dislocations - Burger's Vectors.

TEXT BOOKS:

1. Engineering Physics by R.K.Gaur - S.L. Gupta; Dhanpat Rai and Sons.
2. Applied Physics by Dr. M.Chandra Shekar & Dr.P.Appala Naidu; V.G.S. Book links.

REFERENCES:

1. Engineering Physics by Dr.M. Arumugam; Anuradha Agencies
2. Physics Volume 2, by Halliday, Resnick and Krane; John Wiley & Sons
3. Engineering Physics by M.N.Avadhanulu & P.G. Kshirasagar; S.Chand &Company Ltd.
4. Engineering Physics by P.V.Naik; Pearson Education
5. Materials Science and Engineering by V. Raghavan; Prentice-Hall India
6. Engineering Physics (Vol.1) by M.D. Khanna and V. Balaswamy; Vikas Publishing House Pvt. Ltd., New Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I YEAR B.TECH. C.E.

(CM05044) APPLIED CHEMISTRY

T	P	C
2+1	0	4

UNIT I: Water Technology-I:
Introduction, Sources of Water, Effect of Water on Rocks and Minerals, Types of impurities in Water, Hardness of Water – Temporary and Permanent hardness. Units and inter conversions of Units. Estimation of hardness by Soap Solution and EDTA Methods. Problems on Temporary and Permanent hardnesses. Analysis of Water - Alkalinity; Chlorides and Dissolved Oxygen. Disadvantages of Hard Water. Methods of Treatment of Water for Domestic Purpose - Sedimentation, Coagulation, Filtration, Disinfection - Sterilization, Chlorination, Ozonization, Mineral Water.

UNIT II: Water Technology-II:
Water for Industrial purpose - Water for Steam Making, Boiler Troubles – Carry Over - Priming and Foaming, Boiler Corrosion, Scales and Sludges, Caustic Embrittlement. Water Treatment- Internal Treatment – Colloidal, Phosphate, Calgon, Carbonate, Sodium aluminate Conditioning of Water. External Treatment - Lime-Soda Process, Zeolite Process, Ion-Exchange Process; - Numerical Problems. Demineralization of Brakish Water - Reverse Osmosis.

UNIT III: Science of Corrosion:
Definition, Examples - Underground, Soil Corrosion, Pitting Corrosion, Stress Corrosion, Season Cracking, Caustic Embrittlement. Types of Corrosion: Theories of Corrosion and Mechanism – Dry Corrosion, (Direct Chemical attack), Wet Corrosion, (Electro Chemical Theory) Principles of Corrosion, Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion, Mechanism of Wet Corrosion – Hydrogen evolution type, Oxygen absorption type. Atmospheric 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, use of Inhibitors.

UNIT IV: Protective Coatings and their applications:
Surface Preparation: (1) Solvent Cleaning (2) Alkali Cleaning (3) Pickling and Etching (4) Sand Blasting (5) Mechanical Cleaning.

Types of Protective Coatings: Metallic Coatings – Anodic Coating Galvanization, Cathodic Coating – Tinning. Metal Cladding, Electroplating Ex: Chromium Plating, Metal Spraying, Cementation–Sheradizing, Colourizing, Chromizing
Chemical Conversion Coatings: (1) Phosphate (2) Chromate (3) Chemical Oxide (4) Anodized Coatings.
Ceramic Protective Materials: (1) Vitreous Enamels (2) Ceramics.
Organic Coatings: (1) Paints – Constituents and their functions (2) Varnishes (3) Lacquers (4) Enamels (5) Emulsion Paints (6) Distempers.

UNIT V: Polymer Science and Technology:
Polymerization Reactions – Basic concepts. Types of Polymerization – Addition and Condensation Polymerizations. Plastics –Thermosetting and Thermoplastics – Differences. Compounding. Casting and Spining. Molding of Plastics – Compression, Injection, Transfer, and Extrusion molding methods. Composition, Properties and Engineering Uses of the Following: Polyethylene, PVC, Teflon, Bakelite, Nylon, Polymethyl Methacrylate, Urea-Formaldehyde and Silicone Resins. Rubber – Processing of Natural Rubber, Vulcanization and Compounding, Elastomers – Buna S, Buna N, Thiokol, Polyurethane Rubber, Silicone Rubber.

UNIT VI: Refractories and Insulators:
Refractories – 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.

UNIT VII: Lubricants:
Principles- Metallic friction – Surface Energy, Surface Attraction, Adsorption, Surface Roughness. Types of Lubrication and Mechanism – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure and Temperature Lubrication. Classification of lubricants-Liquid lubricants-Petroleum Oils-Fixed Oils-Additives-Synthetic Lubricants-semisolid lubricants-Calcium base, soda base and Lithium base greases-Solid lubricants-Graphite-Molybdenum disulphide. Properties of Lubricants – Viscosity – Flash and Fire points – Cloud and Pour points – Emulsification – Volatility – Gravity – Colour – Carbon Residue – Oxidation Stability- Aniline-Point-Neutralization number-Saponification number-Mechanical Stability - Selection of lubricants- Cutting tools-Internal combustion engines-Steam engine cylinder-Steam turbines-Gears- Food Industry.

UNIT VIII: Inorganic Cementing Materials:
Lime: Classification of Limes, Manufacturing of Lime, Properties of Lime. Cement: Important Parameters for Manufacturing Cement Clinkers. Chemical Constituents and Composition of Cement. Methods of Manufacture of Cement – Wet and Dry Processes. Additives for Cement. Properties of Cement - Setting and Hardening. Types of Portland Cement - Analysis of Cement.

TEXT BOOKS:
1. Text book of Engineering Chemistry by Jain & Jain, Dhanpat Rai Publishing Company, 15th edition New Delhi (2004).
2. Chemistry of Engineering Materials by C.V. Agarwal, Tara Publication, Varanasi.

REFERENCE:
1. A text book of Engineering Chemistry by S.S. Dara, S.Chand & Co., New Delhi (2004)
2. Engineering Chemistry by J C Kuriacose and J. Rajaram, Tata McGraw-Hill Co., New Delhi (2004)
3. A text book of Engineering Chemistry by Balaram Pani, Galgotia Publications. New Delhi (2004).
4. A text book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company, New Delhi (2004).
5. Industrial Chemistry by O.P.Veeramani and A.K.Narula, Galgotia Publications, New Delhi (2004).
6. Advanced Engineering Chemistry by Senapati and Mohanty, Laxmi Publications New Delhi (2002).
7. Engineering Chemistry by Daniel Yesudian, Hi-Tech Publications, Coimbatore (2002).
8. Laboratory Manual on Engineering Chemistry by S.K. Bhasin and Sudha Rani, Dhanpat Rai Publishing Company, New Delhi (2004).
9. Engineering Chemistry by R. Gopalan, D. Venkappaya and S.Nagarajan, Vikas Publishing House, New Delhi (2004).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I YEAR B.TECH. C.E.

(CE05046) APPLIED MECHANICS

	T	P	C
	4+1	0	8

UNIT – I

Introduction of Engineering. Mechanics – Basic concepts System of Forces- Coplanar Concurrent Forces – Components in Space – Resultant- Moment of Forces and its Application – Couples and Resultant of Force System - Equilibrium of System of Forces- Free body diagrams- Equations of Equilibrium of Coplanar Systems and Spatial Systems.

UNIT – II

Friction: Types of friction – Limiting friction – Laws of Friction – static and Dynamic Frictions – Motion of Bodies – Wedge, Screw jack and differential Screw jack.

UNIT – III

Transmission of Power: Belt Drivers – Open, Crossed and compound belt drives –length of belt – tensions - tight side - slack side - Power transmitted and condition for maximum power.

UNIT – IV

Centroid and Center of Gravity: Centrods – Theorem of Pappus- Centroids of Composite figures – Centre of Gravity of Bodies - Area moment of Inertia: – polar Moment of Inertia – Transfer – Theorems - Moments of Inertia of Composite Figures - product of Inertia - Transfer Formula for product of Inertia.

UNIT – V

Mass Moment of Inertia: Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia - Mass moment of inertia of composite bodies.

UNIT – VI

Kinematics: Rectilinear and Curve linear motion – Velocity and Acceleration – Motion of a Rigid Body – Types and their Analysis in Planar Motion.

UNIT – VII

Kinetics: Analysis as a particles and Analysis as a Rigid Body in Translation – Central Forces of motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies - Work–Energy Method - Equation for Translation – Work–Energy application to Particle Motion, Connected System- Fixed axis Rotation and Plane Motion.

UNTI – VIII

Mechanical Vibrations: Definitions, Concepts – Simple Harmonic motion – free vibrations - Simple and compound pendulums – torsional vibrations.

TEXT BOOKS:

(1) Engineering Mechanics, by Ferdinand L.Singer Published by Harper Collins Publishers, Singapore.

(2) Engineering Mechanics by Dr. M.V.Seshagiri Rao & D.Rama Durgaiah – University Press 2005.

REFERENCES:

1. Engineering Mechanics (Statics and Dynamics) by Arthur P.Boresi & Ridhard J.Schmidt – Thomson publications 2001.
2. Engineering Mechanics by A.K.Tayal, Umesh Publications
3. Engineering Mechanics – Schaum's series – Mc.Grawhill Publications.
4. Engineering Mechanics by R.C.Hibbeler; Pearson education.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I YEAR B.TECH. C.E.

T	P	C
3+1	0	6

(CS05106)C - PROGRAMMING AND DATA STRUCTURES

UNIT – I

(Computer Awareness – Qualitative Treatment only)

Algorithm, flowchart, program development steps, basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values, arithmetic, relational and logical operator, increment and decrement operators, conditional operator, bit-wise operators, type conversions, expressions, evaluation, input-output statements, blocks, if and switch statement, while, do-while and for statements, C programs covering all the above aspects.

UNIT – II

One dimensional & Two dimensional arrays, initialization, string variables-declaration, reading, writing, Basics of functions, String handling function, user-defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, example C programs.

UNIT – III : Computer Programming -I

Pointer and Arrays: Pointers and addresses, Pointers and Arrays, Pointers And function arguments, Address arithmetic, character pointers and functions, pointers to pointers, multi-dimensional arrays, initialization of pointer arrays, command line arguments, pointers to functions statements.

UNIT – IV : Computer Programming - II

Structures: Definition, initializing, assigning values, passing of structures as arguments, Arrays of structures, pointers to structures, self referential structures. Unions, typedef, bit fields, C program examples.

UNIT – V :

Console & File I/O: Standard I/O, Formatted I/O, opening & closing of files, I/O operations on files.

UNIT - VI

Linear Data Structures: Introduction to Data Structures, representing stacks and queues in C using arrays, Infix, Postfix & Prefix programs, circular queues.

UNIT – VII :

Linked Lists: Singly linked list, Doubly linked list, Circular List, representing stacks and Queues in C using linked lists Binary trees: Representation, tree traversals, graph representation, graph traversal, Spanning trees.

UNIT – VIII :

Sorting & Searching: Searching Methods- Linear and binary search methods, Sorting methods- Ex: Bubble sort, Selection sort, Insertion sort, heap sort, quick sort.

TEXT BOOKS:

1. C and Data structures – P.Padmanabham, BS Publications
2. C & Data Structures, Ashok N.Kamthane, Pearson Education

REFERENCES:

1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/ Pearson Education
2. C &Data Structures – Prof. P.S.DeshPande, Prof O.G.Kakde, Wiley Dreamtech Pvt. Ltd., NewDelhi.
3. DataStructures Using C – A.S.Tanenbaum, PHI/Pearson education
4. C & Data Structures, E.Balaguruswamy, TMH.

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I YEAR B.TECH. C.E.

(ME05223) ENGINEERING GRAPHICS

T	P	C
0	6	8

UNIT – I
INTRODUCTION TO ENGINEERING DRAWING :

Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions. Scales used in Engineering Practice and Representative Fraction – Construction of Plain, Diagonal and Vernier Scales.

UNIT – II
PLANE GEOMETRIC DRAWING :

Construction of Polygons – Inscription and Superscription of Polygon given the diameter of the Circles.

Curves used in Engineering Practice and their Constructions

a) Conic Sections including the Rectangular Hyperbola – General method only.

b) Cycloid, Epicycloid and Hypocycloid

c) Involute.

UNIT – III
DRAWING OF PROJECTIONS OR VIEWS
ORTHOGRAPHIC PROJECTION IN FIRST ANGLE PROJECTION ONLY :

Principles of Orthographic Projections – Conventions – First and Third Angle Projections Projections of Points and Lines inclined to both planes, True lengths, traces -Projections of Planes regular auxiliary planes and Auxiliary projection inclined to both planes.

UNIT – IV
PROJECTIONS OF SOLIDS

Projections of Regular Solids inclined to both planes – Auxiliary Views. Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

UNIT – V
DEVELOPMENT AND INTERPENETRATION OF SOLIDS

Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid Cone and their parts.

Interpenetration of Right Regular Solids – Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – VI
ISOMETRIC PORJECTIONS :

Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts.

UNIT – VII
TRANSFORMATION OF PROJECTIONS :

Conversion of Isometric Views to Orthographic Views – Conventions :

UNIT – VIII
PERSPECTIVE PROJECTIONS :

Perspective View : Points, Lines, Plane Figures and Simple Solids ,Vanishing Point Methods(General Method only)

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhat, Charotar

REFERENCES:

1. Engineering Drawing, Narayana and Kannaiah, Scietech publishers.
2. Engineering Drawing and Graphics, Venugopal, New age.

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I YEAR B.TECH. C.E.

	T	P	C
	0	3	4

(PY05227) ENGINEERING PHYSICS AND APPLIED CHEMISTRY LAB

Any ten of the following experiments are to be performed during the Academic year.

Sl. No.	Name of the Experiment
1.	Determination of Refractive Index of the material of a Prism - Spectrometer.
2.	Dispersive power of the material of a Prism - Spectrometer.
3.	Cauchy's constants - Spectrometer.
4.	Determination of wavelength of a source - Diffraction Grating.
5.	Determination of thickness of a thin object using parallel fringes.
6.	Newton's Rings.
7.	Determination of Rigidity modulus of a material in the form of a wire - Torsional pendulum
8.	Melde's Experiment - Transverse and Longitudinal modes.
9.	Determination of velocity of sound - Volume resonator.
10.	Single slit diffraction using Sodium lamp.
11.	Double slit diffraction using Sodium lamp.
12.	Single slit diffraction using Lasers.
13.	Double slit diffraction using Lasers.
14.	Time constant of R-C Circuit.
15.	L-C-R Circuit.
16.	Verification of laws of stretched string - Sonometer.
17.	Calculation of Frequency of A.C. mains - Sonometer.
18.	Study of Characteristics of LED and LASER sources.
19.	Study of Characteristics of p-i-n and avalanche photo diode detectors.
20.	Bending losses of fibers.
21.	Evaluation of Numerical Aperture of a given fiber.
22.	Magnetic field along the axis of a current carrying coil - Stewart and Gee's method.
23.	Hall effect.
24.	B-H curve.
25.	Energy gap of a material of p-n junction.
26.	Determination of Young's modulus and Poisson's ratio by Cornu's method
27.	Thermo Electric effect – Seebeck effect and Peltier effect.

REDOX TITRATIONS:

1. Preparation of Standard Potassium Dichromate and Estimation of Ferrous Iron.
2. Preparation of Standard Potassium Dichromate and Estimation of Ferric Iron.
3. Preparation of Standard Potassium Dichromate and Estimation of Copper, by Iodometry.

IODOMETRY:

5. Preparation of Standard EDTA and Estimation of Copper

COMPLEXOMETRY:

4. Preparation of Standard EDTA solution and Estimation of Calcium/Hardness of Water.

PRECIPITATION TITRATION:

6. Preparation of Standard solution of Zinc and Estimation of Ferrocyanide.

ANALYSIS OF MINERALS:

7. Percentage Purity of Pyrolusite.
8. Percentage Purity of Lime Stone.

COLORIMETRIC ESTIMATIONS:

9. Manganese in Steel
10. Iron in Cement

TEXT BOOKS:

1. Chemistry Pre-lab manual by Dr K.N.Jayaveera and K.B. Chandra Sekhar, S.M. Enterprizes Ltd.
2. Vogel's Book of Quantitative Inorganic Analysis, ELBS Edition.

(CS05144) COMPUTER PROGRAMMING LAB.

T	P	C
0	3	4

1. Write a C program that evaluates the following algebraic expressions after reading necessary values from the user:

   a) ax+b/ax-b

   b) $2.5 \log x + \cos 32^0 + |x^2 - y^2| + v\,2xy$

   c) $1/\alpha\sqrt{2\pi}\ e- (x-m/\sqrt{2}\sigma)^2$

2. Write a C program for the following

   a) Printing three given integers in ascending order

   b) Sum of $1 + 2 + 3 + ----- n$

   c) $1 + \frac{x^2}{2!} + \frac{x^4}{4!} + ------$ upto ten terms

   d) $x + \frac{x^3}{3!} + \frac{x^5}{5!} + ------$ upto 7th digit accuracy

   e) Read x and compute Y =1 for x > 0

   Y=0 for x = 0

   Y = -1 for x<0

3. Write C program using FOR statement to find the following from a given set of 20 integers.

   i) Total number of even integers. ii) Total number of odd integers.

   iii) Sum of all even integers. iv) Sum of all odd integers.

4. Write a C program to obtain the product of two matrices A of size (3X3) and B of size (3X2). The resultant matrix C is to be printed out along with A and B. Assume suitable values for A & B.

5. Using Switch-Case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +,-,/,* and %).

6. Write C procedures to add, subtract, multiply and divide two complex numbers (x+iy) and (a+ib). Also write the main program that uses these procedures.

7. The total distance travelled by vehicle in 't' seconds is given by distance = ut+1/2at² where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec²). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a.'

8. A cloth show room has announced the following seasonal discounts on purchase of items.

PURCHASE Amount	Discount (Percentage)	
	Mill Cloth	Handloom items
1-100	-	5.0
101-200	5.0	7.5
201-300	7.5	10.0
Above 300	10.0	15.0

Write a C program using Switch and If statements to complete the net amount to be paid by a customer.

9. Given a number, write a C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.

10. The Fibonacci sequence of numbers is 1,1,2,3,5,8... based on the recurrence relation

    f(n) = f (n-1) + f (n-2) for n>2.

    Write a C program using do-while to calculate and print the first n fibonacci numbers.

11. Write C programs to print the following outputs using For loop.

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

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

12. Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.

13. A Maruthi Car dealer maintains a record of sales of various vehicles in the following form:

Vehicle type	Month of Sales	Price (Rs).
Maruthi – 800	02/87	75,000
Maruthi – DX	07/87	95,000
Gypsy	04/88	1,10,000
Maruthi Van	08/88	85,000

14. Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

15. Implement the following data structures using Arrays

   i) Stacks   ii) Linear Queuesiii) Circular queues   iv) Dequeue.

16. Implement polynomial addition and multiplication with linked list sparse matrix.

17. Implement binary search tree using linked list and perform the following operations.

   i) Insertion   ii) Deletion   iii) Inorder Traversal iv)Preorder Traversal

   v) Post Order Traversal.

18. Singly linked list and doubly linked lists

   i) Insertion   ii) Deletion   iii) Lookup

19. i) Implement stack using singly linked list.

   ii) Implement queue using singly linked list.

20. Implement the following sorting techniques.

   i) Bubble sort   ii) Insertion Sort iii) Quick Sort   iv) Heap Sort.

21. Implement the following searching method.

22. i) Sequential Search ii) Binary Search iii) Fibonacci

23. i) Conversion of Infix expression to Postfix notation.

   ii) Simple expression evaluator, that can handle +,-,/ and $*$.

   Implement the algorithms for the following iterative methods using C to find one root of the equation

$x_1 + 10x_2 + 4x_3 = 6$

$x_1 + 10x_2 + 4x_3 = 6$

$2x_1 - 4x_2 + 10x_3 = -15.$

25. Write Computer programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.

26. Implement in 'C' the linear regression and polynomial regression algorithms.

27. Implement Trapezoidal and Simpson methods.

28. Practice of exercises (in text book 2 of theory) related to:

   a) Word 2000 Chapter 7, 8, 9.   b) Excel 2000 Chapter 12, 13.

   c) Power point- 2000 Chapter 15, 16.   d) Access 2000 Chapter 18,19.

   e) Outlook 2000 Chapter 21,22,23.   f) FrontPage 2000 Chapter 25

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HYDERABAD

I YEAR B.TECH. C.E.

T	P	C
0	3	4

(ME05230) ENGINEERING WORKSHOP PRACTICE

1. TRADES FOR EXERCISES:

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Black Smithy
5. House-wiring
6. Foundry
7. IT Workshop-I : Computer hardware , identification of parts , Disassembly, Assembly of computer to working condition, Simple diagnostic exercises.
8. IT workshop-II: Installation of Operating system windows and Linux , simple diagnostic exercises.

II TRADES FOR DEMONSTRATION & EXPOSURE:

1. Plumbing
2. Welding
3. Machine Shop
4. Power tools in construction, Wood working, Electrical Engg. & Mechanical Engg.
5. Metal Cutting (water plasma)

Text Books: Work shop Manual / P.Kannaiah/ K.L.Narayana/ Scitech publishers

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. C.E.

T	P	C
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(HS 05232) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The language Lab focuses computer-aided multi-media instruction and language acquisition to achieve the following targets :

The Language Lab focuses computer-aided multi-media instruction and language acquisition to achieve the following targets :

The language Lab focuses computer-aided multi-media instruction and language acquisition to achieve the following targets :

- To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
- To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such GRE, TOEFL, GMAT etc.
- To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
- To train them to use language effectively to face interviews, group discussions, public speaking.
- To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

However, depending upon the available infrastructure and budget, the above targets can also be achieved by procuring the minimum required equipment suggested for the establishment of a Conventional Lab the details of which are given below. The lab should cater to the needs of the students to build up their confidence to help them develop leadership qualities through their communicative competence.

SYLLABUS :

The following course content is prescribed for the English Language Laboratory Practice :

1. Introduction to Phonetics.
2. Introduction to Vowels and Consonants and associated Phonetic symbols.
3. Introduction to Accent, Intonation and Rhythm.
4. Situational Dialogues / Role Play.
5. Public Speaking.
6. Debate
7. Group discussions
8. Facing Interviews
9. Resume preparation
10. e-correspondence

Minimum Requirement :

- Computer aided multi media language lab with 30 systems with LAN facility.
- Conventional Language Lab. with audio and video systems, speakers, head phones and a teacher console to accommodate 30 students.

Suggested Software :

- Cambridge Advanced Learners' Dictionary with exercises
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd
- Learning to Speak English - 4 CDs
- Microsoft Encarta
- Murphy's English Grammar, Cambridge
- Time series of IQ Test, Brain-teasers, Aptitude Test etc.
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy,Cambridge.

BOOKS SUGGESTED FOR ENGLISH LAB :

1. Developing Communication Skills by Krishna Mohan & Meera Banerji (Macmillan)
2. Speaking English Effectively by Krishna Mohan & NP Singh (Macmillan)
3. Better English Pronunciation by JDO Connor (UBS – Cambridge)
4. Oxford Practice Grammar with Answers, John Eastwood, Oxford
5. Handbook of English Grammar and Usage, Mark Lester and Larry Beason, Tata McGraw-Hill
6. A text book of English Phonetics for Indian Students by T.Balasubramanian (Macmillan)
7. Lingua TOEFL CBT Insider, by Dreamtech
8. TOEFL & GRE(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
9. English Skills for Technical Students, WBSCTE with British Council, OL
10. A Handbook of English for Competitive Examinations, by B Shyamala Rao, Blakie Books, Chennai.

DISTRIBUTION AND WEIGHTAGE OF MARKS :

ENGLISH LANGUAGE LABORATORY PRACTICE

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD
II YEAR B.TECH. C.E. I-SEMESTER

(MA05364) MATHEMATICS – II

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4+1  0  4
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UNIT – I

Matrices : Elementary row transformations – Rank – Normal form - Echelon form – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.

UNIT – II

Eigen values, eigen vectors – properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonolization of matrix. Calculation of powers of matrix – Modal and spectral matrices. Real matrices – Symmetric, skew - symmetric, orthogonal, Linear Transformation - Orthogonal Transformation. Complex matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and eigen vectors of complex matrices and their properties.

UNIT-III

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index - signature - Sylvester law.

UNIT –IV

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

UNIT-V

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type)equations. Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation, wave equation and two-dimensional Laplace's equation under initial and boundary conditions.

UNIT –VI

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

UNIT-VII

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

UNIT-VIII

Wave lets – The Haar wavelets – A wavelet expansion - Multiresolution analysis with Haar Wavelets - General construction of wavelets and multiresolution analysis - Shannon wavelets.

TEXT BOOKS:

1. A Text book of Engineering Mathematics Volume – II, 2005
T.K.V.Iyengar, B.Krishna Gandhi and others, S.Chand and Company.
2. Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill 2003.

REFERENCES:

1. Engineering Mathematics–II, 2002, P.Nageswara Rao, Y.Narsimhulu, Prabhakara Rao
2. Engineering Mathematics, S.K.V.S. Sri Rama Chary, M.Bhujanga Rao, Shankar, B.S.Publications 2000.
3. Advanced Engineering Mathematics (eighth edition), Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt. Ltd. 2001.
4. Advanced Engineering Mathematics Peter V.O'Neil Thomson Brooks/Cole.
5. Advanced Engineering Mathematics, Merle C.Potter, J.L.Goldberg, E.F.Abrufadel, Oxford University Press. Third Edition 2005.
6. Engineering Mathematics – II, 2005, Sankaraiah, VGS Book Links, Hyderabad.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II YEAR B.TECH. C.E. I –SEMESTER

T P C
4+1 0 4

(HS05353)MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Unit I

Introduction to Managerial Economics

Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Unit II

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

Unit III

Theory of Production and Cost Analysis Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts, Opportunity cost, Fixed Vs.Variable costs, Explicit costs Vs.Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)-Managerial Significance and limitations of BEA.

Unit IV

Introduction to Markets & Pricing strategies Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies

Unit V

Business & New Economic Environment Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

Unit VI

Capital and Capital Budgeting Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

Unit VII

Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Unit VIII

Financial Analysis through ratios: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt-Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOK:

1. Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2004.
2. Shim &Siegel: Financial Accounting (Schaum's Outlines), 2/e, TMH,2004
3. Chary: Production and Operations Management, 3/e, TMH, 2004.
4. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson, 2003.
5. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI, 2005
6. Peterson & Lewis: Managerial Economics, 4th Edition, Pearson Education, 2004
7. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech, 2005.
8. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2005.
9. Truet and Truet: Managerial Economics:Analysis, Problems and Cases, Wiley, 2004.
10. Dwivedi:Managerial Economics, 6th Ed., Vikas, 2002
11. Yogesh Maheswari:Managerial Economics, 2nd Ed.,PHI, 2005.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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II YEAR B.TECH. C.E. I-SEMESTER

(CE05526)STRENGTH OF MATERIALS – I

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UNIT – I
SIMPLE STRESSES AND STRAINS :

Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

UNIT - II
STRAIN ENERGY – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

UNIT – III
SHEAR FORCE AND BENDING MOMENT :

Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, u.d.l., uniformly varying loads and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – IV
FLEXURAL STRESSES :

Theory of simple bending – Assumptions – Derivation of bending equation: M/I = f/y = E/R Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I,T,Angle and Channel sections – Design of simple beam sections.

UNIT – V
SHEAR STRESSES :

Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

UNIT – VI
DEFLECTION OF BEAMS :

Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L. Uniformly varying load.-Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – VII
THIN CYLINDERS :

Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Thin spherical shells.

UNIT – VIII
THICK CYLINDERS :

Introduction Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

TEXT BOOKS:

1. Introduction to text book of Strength of materials by R.K.Bansal – Laxhmi publications 2004.

2. Introduction to text book of Strength of Material by U.C. Jindal, Galgotia publications.

REFERENCES :

1. Mechanics of Solid, by Ferdinandp Beer and others – Tata Mc.Grawhill Publications 2000.

2. Strength of Materials by Schaumis out line series – Mc. Grawhill International Editions.

3. Strength of Materials by S. Ramakrishna and R.Narayan – Dhanpat Rai publications.

4. Strength of materials by R.K.Rajput, S.Chand & Co, New Delhi.

5. Strength of Materials by A.R.Basu, Dhanpat Rai & Co, Nai Sarah, New Delhi.

6. Strength of Materials by L.S.Srinath et al, Macmillan India Ltd., Delhi.

7. Mechanics of Structures, by S.B.Junnarkar, Charotar Publishing House, Anand, Gujrat.

8. Strength of Materials by D.S. Prakash Rao, Universities Press, Hyderabad.

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HYDERABAD

II YEAR B.TECH. C.E. I-SEMESTER

T	P	C
4+1	0	4

(CE05104) BUILDING MATERIALS AND CONSTRUCTION

UNIT – I

STONES, BRICKS AND TILES:

Properties of building stones – relation to their structural requirements. Classification of stones – Stone quarrying – precautions in blasting, Dressing of stone, Composition of good brick earth, various methods of manufacture of bricks. Comparison between clamp burning and kiln burning.

UNIT-II

Qualities of a good brick. Characteristics of good tile – manufacturing methods, Types of tiles. Use of Materials like aluminium, gypsum, glass and bituminous materials – their quality.

UNIT – III

LIME AND CEMENT:

Various ingredients of lime – Constituents of lime stone – classification of lime – various methods of manufacture of lime. Various types of cement and their properties. Various file and laboratory tests for Cement.

Various ingredients of Cement concrete and their importance – various test for concrete.

UNIT-IV

WOOD: Structure – properties – Seasoning of timber. Classification of various types of woods used in buildings – Defects in timber. Alternative materials for wood, Galvanized Iron, Fiber-reinforced plastics, steel, Aluminum.

UNIT – VI

FOUNDATIONS:

Foundations : Shallow foundations – Spread, combined strap and mat footings.

MASONARY :

Types of masonry, English and Flemish bonds ∆ Rubble and Ashlar masonry, cavity and partition walls.

UNIT –VII

BUILDING COMPONENTS: Lintels, Arches, Vaults-stair cases – Types. Different types of floors-Concrete, Mosaic, Terrazo floors, Pitched, flat and curved Roofs, Lean-to-Roof, Coupled Roofs, Trussed roofs- King and Queen Post Trusses, RCC Roofs, Madras Terrace/Shell Roofs.

UNIT- VIII

FINISHINGS : Proofing Damp and water proofing- materials used. Plastering, pointing, white washing and distempering – Painting – Constituents of a paint – Types of paints – Painting of new/old Wood – Varnish – Form work and scaffolding.

TEXT BOOKS:

1. Building material by S K Duggal – New Age International Publishers; Second Edition
2. Building Construction by B.C.Punmia- Laxmi Publications (P) ltd.2003

REFERENCES:

1. R.Chudly "Construction Technology – Volumes I and II" 2nd Edition, Longman, UK, 1987.

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II YEAR B.TECH. C.E. I-SEMESTER

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(CE05535) SURVEYING

SYLLABUS:

UNIT – I

INTRODUCTION: Overview of plane surveying (chain, compass and plane table), Objectives, Principles and classifications.

UNIT – II:

DISTANCES AND DIRECTION: Distance measurement conventions and methods; use of chain and tape, Electronic distance measurements, Meridians, Azimuths and Bearings, declination, computation of angle.

UNIT – III

LEVELING AND CONTOURING: Concept and Terminology, Temporary and permanent adjustments- method of leveling.

Characteristics and Uses of contours- methods of conducting contour surveys and their plotting.

UNIT – IV

COMPUTATION OF AREAS AND VOLUMES: Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

UNIT - V

THEODOLITE: Theodolite, description, uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite. Trigonometrical leveling, Traversing.

UNIT – VI

TACHEOMETRIC SURVEYING:
Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

UNIT – VII
Curves: Types of curves, design and setting out – simple and compound curves.

UNIT - VIIIG
Introduction to geodetic surveying, Total Station and Global positioning system, Introduction to Geographic information system (GIS).

TEXT BOOKS:

1. Punmmia B.C., "Surveying (Vol – 1, 2 & 3), Laxmi Publications Pvt. Ltd. 2004.

2. Duggal S K, "Surveying (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. New Delhi, 2004.

REFERENCES:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surying, McGraw Hill – 2000

2. Arror K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004

3. Chandra A M, "Plane Surveying", Image International Pvt. Ltd., Publishers, New Delhi, 2002.

4. Chandra A M, "Higher Surveying" Image International Pvt. Ltd., Publishers, New Delhi, 2002.

5. Venkataramaiah "Surveying", New-Age publications.

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(CE05254) FLUID MECHANICS

UNIT I
INTRODUCTION : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion- pressure at a point, Pascal's law, Hydrostatic law - atmospheric, gauge and vacuum pressure- measurement of pressure. Pressure gauges, Manometers: differential and Micro Manometers.

UNTI – II
Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure. Derivations and problems.

UNTI – III
FLUID KINEMATICS : Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows – stream and velocity potential functions, flownet analysis.

UNIT – IV
FLUID DYNAMICS : Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow. (Navier – stokes equations (Explanationary) Momentum equation and its application – forces on pipe bend.

UNIT – V
Approximate Solutions of Navier Stoke's Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen momentum integral equation, laminar and turbulent Boundary layers no deviations BL in transition, separation of BL, control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

UNIT – VI

Reynold's experiment – Characteristics of Laminar & Turbulent flows. Flow between parallel plates, Flow through long tubes, flow through inclined tubes.

UNIT - VII

CLOSED CONDUIT FLOW: Laws of Fluid friction – Darcy's equation, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line. Pipe network problems, variation of friction factor with Reynold's number – Moody's Chart.

UNIT – VIII

MEASUREMENT OF FLOW : Pitot tube, Venturi meter and orifice meter – classification of orifices, flow over rectangular, triangular and trapezoidal and Stepped notches - –Broad crested weirs.

TEXT BOOKS:

1. Fluid Mechanics by Modi and Seth, Standard book house.

2. Introduction to fluid Mechanics & Fluid Machines by S.K.Som & G.Biswas (Tata Mc.Grawhill publishers Pvt. Ltd.)

REFERENCES:

1. Fluid Mechanics by J.F.Douglas, J.M. Gaserek and J.A.Swaffirld (Longman)
2. Fluid Mechanics and Machinery by D. Rama Durgaiah.
3. Fluid Mechanics by Frank.M. White (Tata Mc.Grawhill Pvt. Ltd.)

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II YEAR B.TECH. C.E. I-SEMESTER

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(CE05528) STRENGTH OF MATERIALS LAB

1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

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II YEAR B.TECH. C.E. I-SEMESTER

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(CE05536) SURVEYING LAB – I

LIST OF EXERCISES :

1. Survey of an area by chain survey (closed traverse) & Plotting
2. Chaining across obstacles
3. Determination of distance between two inaccessible points with compass.
4. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
5. Radiation method, intersection methods by plane Table survey
6. Traversing by plane table survey
7. Fly leveling (differential leveling)
8. An exercise of L.S and C.S and plotting
9. An exercise on contouring.

TEXT BOOKS:

1. Punmia B.C., "Surveying (Vol – 1,), Laxmi Publications Pvt. Ltd. 2004.
2. Duggal S K, "Surveying (Vol – 1), Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.

REFERENCES:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surying, McGraw Hill – 2000
2. Arror K R "Surveying Vol 1,), Standard Book House, Delhi, 2004
3. Chandra A M, "Plane Surveying", Image International Pvt. Ltd., Publishers, New Delhi, 2002.

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II YEAR B.TECH. C.E. II-SEMESTER

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(MA05476) PROBABILITY AND STATISTICS

UNIT-I
Probability: Sample space and events – Probability – The axioms of probability - Some elementary theorems - Conditional probability – Baye's theorem.

UNIT-II
Random variables – Discrete and continuous – Distribution – Distribution function.

UNIT-III
Distribution - Binomial, poisson and normal distribution – related properties.

UNIT-IV
Sampling distribution: Populations and samples - Sampling distributions of mean (known and unknown) proportions, sums and differences.

UNIT-V
Estimation: Point estimation – interval estimation - Bayesian estimation.

UNIT-VI
Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests.

UNIT-VII
Tests of significance – Student's t-test, F-test, test. Estimation of proportions.

UNIT –VIII
Curve fitting: The method of least squares – Inferences based on the least squares estimations - Curvilinear regression – multiple regressions – correlation for univariate and bivariate distributions.

TEXT BOOKS:

1. Probability and statistics for Engineers: Erwin Miller And John E.Freund. Prentice-Hall of India Pvt. Ltd., Sixth edition.
2. Text book of Probability and Statistics by Dr. Shahnaz Bathul, V.G.S. Publishers 2003.

REFERENCES:

1. Probability, Statistics and Random Processes Dr.K.Murugesan & P.Gurusamy by Anuradha Agencies.
2. Advanced Engineering Mathematics (Eighth edition), Erwin Kreyszig, John Wiley and Sons (ASIA) Pvt. Ltd., 2001.
3. Probability and Statistics for Engineers: G.S.S.Bhishma Rao,sitech., Second edition 2005.

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II YEAR B.TECH. C.E. II-SEMESTER

(CE05105) BUILDING PLANNING AND CONSTRUCTION MANAGEMENT

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UNIT – I

Building Byelaws and Regulations:

Introduction – Terminology – Objectives of building byelaws – Floor area ratio (FAR) – Floor space Index (FSI) – Principles underlying building byelaws – classification of bye buildings – Open space requirements – built up area limitations – Height of Buildings – Wall thickness – lighting and ventilation requirement.

UNIT – II

Residential Buildings: Minimum standards for various parts of buildings – requirements of different rooms and their grouping – characteristics of various types of residential buildings.

UNIT – III

Public Buildings: Planning of Educational institutions, hospitals, dispensaries, Office buildings, banks, industrial buildings, hotels and motels, buildings for recreation.

UNIT – IV

Planning of construction projects – scheduling and monitoring Bar chart – CPM and PERT Network planning – computation of times and floats – their significance.

UNIT – V

Network Analysis: Updating of Network – Crashing for optimum cost – Resources leveling and Resources allocation.

UNIT – VI

Construction Equipment: Cost of owning and operation – Estimation of outputs of power showels, Bulldozers, Trucks and other earth – moving equipment - Belt Conveyors – functioning.

UNIT – VII

Geotechnical materials, compaction, stabilization – dozers, scrappers, power showels, bull dozers earth moving equipment – earth compaction equipment.

UNIT – VIII

Concrete equipment – equipment for pumping of water – draglines and clean shells – cranes.

TEXT BOOKS:

1. Construction Planning, Equipment and methods by R.L. Peurifoy etal. – Tata Mc. Graw Hill Publications.
2. PERT and CPM – Project planning and control with by Dr.B.C.Punmia & Khandelwal – Laxmi publications.

REFERENCE:

1. Building by laws bye state and Central Governments and Municipal corporations.

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II YEAR B.TECH. C.E. II-SEMESTER

(CE05527) STRENGTH OF MATERIALS - II

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UNIT I

PRINCIPAL STRESSES AND STRAINS :

Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains – Analytical and graphical solutions.

THEORIES OF FAILURES :

Introduction – Various Theories of failures like Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

UNIT – II

TORSION OF CIRCULAR SHAFTS :

Theory of pure torsion – Derivation of Torsion equations : T/J = q/r = N?/L – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

SPRINGS

Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel – Carriage or leaf springs.

UNIT – III

COLUMNS AND STRUTS :

Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler's theorm for long columns- assumptions-derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Long columns subjected to eccentric loading – Secant formula – Empirical formulae – Straight line formula – Prof. Perry's formula.

UNIT - IV

Laterally loaded struts – subjected to uniformly distributed and concentrated loads – Maximum B.M. and stress due to transverse and lateral loading.

UNIT – V
DIRECT AND BENDING STRESSES :

Stresses under the combined action of direct loading and B.M., core of a section – determination of stresses in the case of chimneys, retaining walls and dams – conditions for stability – stresses due to direct loading and B.M. about both axis.

UNIT – VI
UNSYMETRICAL BENDING :

Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis Deflection of beams under unsymmetrical bending.

UNIT – VII
BEAMS CURVED IN PLAN:

Introduction – circular beams loaded uniformly and supported on symmetrically placed Columns – Semi-circular beam simply-supported on three equally spaced supports.

UNIT - VIII
ANALYSIS OF PIN-JOINTED PLANE FRAMES :

Determination of Forces in members of plane, pin-jointed, perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever and simply – supported trusses.- by method of joints, method of sections.

TEXT BOOKS:

1. Introduction to Strength of materials by R.K.Bansal – Laxhmi publications 2004.
2. Introduction to Strength of Materials by U.C. Jindal, Galgotia publications.

REFERENCES:

1. Mechanics of Solid, by Ferdinandp Beer and others – Tata Mc.Grawhill Publications 2000.
2. Strength of Materials by Schaum's out line series – Mc. Graw hill International Editions.
3. Strength of Materials by S. Ramakrishna and R.Narayan – Dhanpat Rai publications.
4. Strength of materials by R.K.Rajput, S.Chand & Co, New Delhi.
5. Strength of Materials by A.R.Basu, Dhanpat Rai & Co, Nai Sarah, New Delhi.
6. Strength of Materials by L.S.Srinath et al., Macmillan India Ltd., Delhi.
7. Mechanics of Structures, by S.B. Junnarkar, Charotar Publishing House, Anand, Gujrat.
8. Strength of Materials by D.S. Prakash Rao, Universities Press, Hyderabad.

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II YEAR B.TECH. C.E. II-SEMESTER

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(CE05297) HYDRAULIC AND HYRAULIC MACHINERY

UNIT – I
OPEN CHANNEL FLOW:

Types of flows - Type of channels – Velocity distribution – Energy and momentum correction factors – Chezy's, Manning's; and Bazin formulae for uniform flow – Most Economical sections. Critical flow: Specific energy-critical depth – computation of critical depth – critical sub-critical and super critical flows.

UNIT II
OPEN CHANNEL FLOW II:

Non uniform flow-Dynamic equation for G.V.F., Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method-Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT - III
HYDRAULIC SIMILITUDE :

Dimensional analysis-Rayleigh's method and Buckingham's pi theorem-study of Hydraulic models – Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations.

UNIT – IV
BASICS OF TURBO MACHINERY :

Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle, Applications to radial flow turbines.

UNIT - V
HYDRAULIC TURBINES – I:

Layout of a typical Hydropower installation – Heads and efficiencies-classification of turbines-pelton wheel-Francis turbine-Kaplan turbine-working, working proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and function efficiency.

UNIT – VI

HYDRAULIC TURBINES – II : Governing of turbines-surge tanks-unit and specific turbines-unit speed-unit quantity-unit power-specific speed performance characteristics-geometric similarity-cavitation.

UNIT – VII

CENTRAIFUGAL-PUMPS : Pump installation details-classification-work done-Manometric head-minimum starting speed-losses and efficiencies-specific speed-multistage pumps-pumps in parallel- performance of pumps-characteristic curves-NPSH-cavitation.

UNIT – VIII

Hydropower Engineering: Classification of Hydropower plants – Definition of terms – load factor, utilization factor, capacity factor, estimation of hydropower potential.

TEXT BOOKS:

1. Open Channel flow by K.Subramanya . Tata Mc.Grawhill Publishers
2. Fluid Mechanics & Fluid Power Engineering by D.S. Kumar Kataria & Sons.

REFERENCES :

1. Fluid Mechanics, Hydraulic and Hydraulic Machines by Modi & Seth, Standard book house.
2. Elements of Open channel flow by Ranga Raju, Tata Mc.Graw Hill, Publications.
3. Fluid mechanics and fluid machines by Rajput, S.Chand &Co.
4. Open Channel flow by V.T.Chow, Mc.Graw Hill book company.
5. Hydraulic Machines by Banga & Sharma Khanna Publishers.

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II YEAR B.TECH. C.E. II-SEMESTER

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(CE 05239) ENVIRONMENTAL STUDIES

UNIT – I

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

UNIT – II

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. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - III

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. - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV

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 - . Biodiversity at global, National and local levels. - . India as a mega-diversity nation - .Hot-sports 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.

UNIT - V

Environmental Pollution : Definition, 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.

UNIT - VI

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. -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.

UNIT - VII

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.

UNIT - VIII

Field work : Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems-pond, river, hill slopes, etc.

TEXT BOOK :

Text Book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

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(CE05529) STRUCTURAL ANALYSIS – I

UNIT – I

PROPPED CANTILEVERS : Analysis of propped cantilevers-shear force and Bending moment diagrams-Deflection of propped cantilevers.

UNIT – II

FIXED BEAMS – Introduction to statically indeterminate beams with U.D.load central point load, eccentric point load. Number of point loads, uniformly varying load, couple and combination of loads shear force and Bending moment diagrams-Deflection of fixed beams effect of sinking of support, effect of rotation of a support.

UNIT – III

CONTINUOUS BEAMS : Introduction-Clapeyron's theorem of three moments-Analysis of continuous beams with constant moment of inertia with one or both ends fixed-continuous beams with overhang, continuous beams with different moment of inertia for different spans-Effects of sinking of supports-shear force and Bending moment diagrams.

UNIT-IV

Slope-Deflection Method: Introduction, derivation of slope deflection equation, application to continuous beams with and without settlement of supports.

UNIT – V

ENERGY THEOREMS : Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces -Castigliano's first theorem-Deflections of simple beams and pin jointed trusses.

UNIT – VI

MOVING LOADS : Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load U.D load longer than the span, U.D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length.

UNIT – VII

INFLUENCE LINES : Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a section- single point load, U.D.load longer than the span, U.D.load shorter than the span- Influence lines for forces in members of Pratt and Warren trusses.

UNIT -VIII

INDETERMINATE STRUCTURAL ANALYSIS : Indeterminate Structural Analysis –Determination of static and kinematic indeterminacies –Solution of trusses with upto two degrees of internal and external indeterminacies –Castigliano's theorem

TEXT BOOKS:

1. Analysis of Structures-Vol I & Vol II by V.N. Vazirani & M.M.Ratwani, Khanna Publications, New Delhi.
2. Structural Analysis by V.D.Prasad Galgotia publications, 2nd Editions.

REFERENCES:

1. Mechanics of Structures by S.B.Junnarkar, Charotar Publishing House, Anand, Gujrat
2. Theory of Structures by Gupta, Pandit & Gupta; Tat Mc.Graw – Hill Publishing Co.Ltd., New Delhi.
3. Advanced Theory of Structures by N.C.Sinha & Gayen Dhanpat Rai Publications, Daryaguni, New Delhi.
4. Strength of Materials and Mechanics of Structures- by B.C.Punmia, Khanna Publications, New Delhi.

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II YEAR B.TECH. C.E. II- SEMESTER

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(CE05537) SURVEYING LAB – II

LIST OF EXERCISES :

1. Study of theodolite in detail - practice for measurement of horizontal and vertical angles.
2. Measurement of horizontal angles by method of repetition and reiteration.
3. Trigonometric Leveling - Heights and distance problem (Two Exercises)
4. Heights and distance using Principles of tacheometric surveying (Two Exercises)
5. Curve setting – different methods. (Two Exercises)
6. Setting out works for buildings & pipe lines.
7. Determine of area using total station
8. Traversing using total station
9. contouring using total station
10. Det of remote height using total station
11. State-out using total station
12. Distance, gradient, Diff, height between tow inaccessible points using total stations

TEXT BOOKS:

1. Punmmia B.C., "Surveying (Vol – II & III), Laxmi Publications Pvt. Ltd. 2004.
2. Duggal S K, "Surveying (Vol – II), Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.

REFERENCES:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surying, McGraw Hill – 2000.
2. Arora K R "Surveying Vol II & III), Standard Book House, Delhi, 2004
3. Chandra A M, "Higher Surveying", Image International Pvt. Ltd., Publishers, New Delhi, 2002.
4. Vernkataramaiah "Surveying New age publications.

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II YEAR B.TECH. C.E. II-SEMESTAR

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(CE05257) FLUID MECHANICS AND HYDRAULIC MACHINERY LAB.

SYLLABUS

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice by a constant head method.
3. Determination of Coefficient of discharge for an external mouth piece by variable head method.
4. Calibration of contracted Rectangular Notch and /or Triangular Notch
5. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.

Any ten of the above experiments are to be covered.

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III YEAR B.TECH. C.E. I-SEMESTER

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(EE05187) ELECTRICAL AND ELECTRONICS ENGINEERING

UNIT-I ELECTRICAL CIRCUITS
Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchoff's Laws, Inductive networks, Capacitive networks, Series, Parallel circuits and Star-delta and delta-star transformations.

UNIT II DC MACHINES
Principle of operation of DC Generator – emf equation - types – DC motor types – torque equation – applications – three point starter.

UNIT III TRANSFORMERS
Principle of operation of single phase transformers – emf equation – losses – efficiency and regulation

UNIT IV AC MACHINES
Principle of operation of alternators – regulation by synchronous impedance method – Principle of operation of induction motor – slip – torque characteristics – applications.

UNIT VINSTRUMENTS
Basic Principle of indicating instruments – permanent magnet moving coil and moving iron instruments.

UNIT VI DIODE AND IT'S CHARACTERISTICS
P-N junction diode, symbol, V-I Characteristics, Diode Applications, Rectifiers – Half wave, Full wave and Bridge rectifiers (simple Problems)

UNIT VII TRANSISTORS
P-N-P and N-P-N Junction transistor, Transistor as an amplifier, SCR characteristics and applications

UNIT VIII: CATHODE RAY OSCILLOSCOPE
Principles of CRT (Cathode Ray Tube), Deflection, Sensitivity, Electrostatic and Magnetic deflection, Applications of CRO - Voltage, Current and frequency measurements.

TEXT BOOKS:
1. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin
2. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand & Co.

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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD
III YEAR B.TECH. C.E. I-SEMESTER

(CE05072) BASIC REINFORCED CONCRETE
DESIGN AND DRAWING

T P C
4+1 0 4

UNIT –I

Introduction Materials, Constituents of concrete, recommendation of IS 456 – 2000, grades of concrete, elastic theory, design constants; singly reinforced beam.

UNIT –II

Introduction of Limit State Design : Concepts of limit state design – Basic statistical principles – Characteristic loads – Characteristic strength – Partial load and safety factors – representative stress-strain curves for cold worked deformed bars and mild steel bars.

Assumptions in limit state design – stress - block parameters – limiting moment of resistance

UNIT –III

Beams : Limit state analysis and design of singly reinforced, doubly reinforced, T and L beam sections.

UNIT –IV

Shear, Torsion and Bond : Limit state analysis and design of section for shear and torsion – concept of bond, anchorage and development length, I.S. code provisions.

Design examples in simply supported and continuous beams, detailing.

UNIT – V

Short and Long columns – under axial loads ,uniaxial bending and biaxial bending – Braced and un-braced columns – I S Code provisions.

UNIT –VI

Footings : Different types of footings – Design of isolated, square, rectangular and circular footings.

UNIT – VII

Design of Two-way slabs, one way slab, continuous slab Using I S Coefficients .

UNIT –VIII

Limit state design for serviceability for deflection, cracking and codal provision.

NOTE : All the designs to taught in Limit State Method

TEXT BOOKS:

1. Reinforced concrete design by S.Unnikrishna Pillai & Devdas Menon, Tata Mc.Graw Hill, 2nd Edition, 2004.

2. Limit state theory and design of reinforced concrete by Dr.S.R.Karve and Dr.V.L.Shah, Standard publishers, Pune, 3rd Edition, 1994.

REFERENCES :

1. Reinforced concrete design by Kennath Leet, Tata Mc.Graw-Hill International, editions, 2nd edition, 1991.

2. Reinforced concrete structural elements – behaviour, Analysis and design by P.Purushotham, Tata Mc.Graw-Hill, 1994.

3. Design of concrete structures – Arthus H.Nilson, David Darwin, and Chorles W. Dolar, Tata Mc.Graw-Hill, 3rd Edition, 2005.

4. Reinforced concrete structures, Vol.1, by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, publications, 2004.

5. Reinforced concrete structures – I.C. Syal & A.K.Goel, S.Chand, 2004.

6. Limit state designed reinforced concrete – P.C.Varghese, Practice Hall, 1994.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR B.TECH. C.E. I-SEMESTER

	T	P	C
	4+1	0	4

(CE 05147) CONCRTE TECHNOLOGY

UNIT I

CEMENTS & ADMIXTURES: Portland cement – chemical composition – Hydration, Setting of cement – Structure of hydrate cement – Test on physical properties – Different grades of cement – Admixtures – Mineral and chemical admixtures.

UNIT – II

AGGREGATES: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregate – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand – Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded aggregate – Maximum aggregate size.

UNIT – III

FRESH CONCRETE: Workability – Factors affecting workability – Measurement of workability by different tests – Setting times of concrete – Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete – Steps in manufacture of concrete – Quality of mixing water.

UNIT – IV

HARDENED CONCRETE : Water / Cement ratio – Abram's Law – Gelspaoe ratio – Nature of strength of concrete – Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength - Curing.

UNIT – V

TESTING OF HARDENED CONCRETE: Compression tests – Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Non-destructive testing methods – codal provisions for NDT.

UNIT – VI

ELASTICITY, CREEP & SHRINKAGE – Modulus of elasticity – Dynamic modulus of elasticity – Posisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage – types of shrinkage.

UNIT – VII

MIX DESIGN : Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design.

UNIT – VIII

SPECIAL CONCRETES: Light weight aggregates – Light weight aggregate concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Different types of fibres – Factors affecting properties of F.R.C – Applications – Polymer concrete – Types of Polymer concrete – Properties of polymer concrete – Applications – High performance concrete – Self consolidating concrete.

TEXT BOOKS:

1. Properties of Concrete by A.M.Neville – Low priced Edition – 4th edition
2. Concrete Technology by M.S.Shetty – S.Chand & Co. ; 2004

REFERENCES:

1. Concrete Technology by Gambir. – Tata Mc. Graw Hill Company; 2004
2. Special Structural Concrete by Rafat Siddiqu – Galgotia Publications – 2000

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III YEAR B.TECH. C.E. I-SEMESTER

T	P	C
4+1	0	4

(CE05575) WATER RESOURCE ENGINEERING-I

UNIT I
Introduction to engineering hydrology and its applications, Hydrologic cycle, types and forms of precipitation, rainfall measurement, types of rain gauges, computation of average rainfall over a basin, processing of rainfall data.

UNIT-II
Abstraction from rainfall-evaporation, factors affecting evaporation, measurement of evaporation-evapotranspiration-Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices.
Runoff-components of runoff, factors affecting runoff, stream gauging, effective rainfall, seperation of base flow.

UNIT-III
Unit Hydrograph, definition, and limitations of applications of Unit hydrograph, derivation of Unit Hydrograph, S-hydrograph, IUH, Synthetic Unit Hydrograph.

UNIT-IV
Design Discharge, Computation of design discharge-rational formula, SCS method, flood frequency analysis-Gumbel's method, log pearson III method, basic concepts of flood routing-hydraulic and hydrologic routing, channel and reservoir routing.

UNIT-V
Groound water Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient, types of wells, Darcy's law, radial flow to wells in confined and unconfined aquifers.

UNIT-VI
Necessity and Importance of Irrigation, advantages and ill effects of Irrigation, types of Irrigation, methods of application of Irrigation water, Indian agricultural soils, methods of improving soil fertility, preparation of land for Irrigation, standards of quality for Irrigation water.

UNIT-VII
Soil-water-plant relationship, vertical distribution of soil moisture, soil moisture constants, soil moisture tension, consumptive use, estimation of consumptive use, Duty and delta, factors affecting duty, depth and frequency of Irrigation, irrigation efficiencies.

UNIT-VIII
Classification of canals, design of Irrigation canals by Kennedy's and Lacey's theories, balancing depth of cutting, canal lining.

TEXT BOOKS:
1. Engineering Hydrology by Jayaram Reddy, Laxmi publications.
2. Irrigation and water power engineering by Punmia & Lal, Laxmi publications.

REFERENCES:
1. Elementary hydrology by V.P.Singh, PHI publications.
2. Irrigation and Water Resources & Water Power by P.N.Modi, Standard Book House.
3. Irrigation Water Management by D.K. Majundar Printice Hall of India.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD
III YEAR B.TECH. C.E. I-SEMESTER

(CE05530) STRUCTURAL ANALYSIS – II

T	P	C
4+1	0	4

UNIT I

ARCHES : Three hinged arches, Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature.

UNIT – II

TWO HINGED ARCHES: Determination of horizontal thrust bending moment, normal thrust and radial shear – Rib shortening and temperature stresses, tied arches – fixed arches – (No analytical question).

UNIT-III

Approximate method of structural analysis , application to building frames. (i) Portal method (ii) Cantilever method.

UNIT – IV

Slope deflection method : Derivation of slope deflection equation of supports application to continuous beams including settlement of supports single bay, single sway, portal frame including side sway.

UNIT – V

Moment Distribution method – Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – storey portal frames – including Sway-Substitute frame analysis by two cycle.

UNIT – VI

Analysis of continuous beams – including settlement of supports and single bay portal frames with side sway by Kani's method.

UNI – VII

Flexibility methods, Introduction, application to continuous beams including support settlements.

UNIT – VIII

Stiffness method: Introduction, application to continuous beams including support settlements.

TEXT BOOKS:

1. Analysis of Structures – Vol. I & 2 by Bhavikathi, Vikas publications, 3rd Edition 2005.
2. Theory of Structures Analysis of structures by Vazrani & Ratwani – Khanna Publications.

REFERENCES :

1. Structural Analysis (Matrix Approach) by Pundit and Gupta – Tata Mc.Graw Hill publishers.
2. Theory of structures by Ramamuratam
3. Structural Analysis by C.S. Reddy

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD
III YEAR B.TECH. C.E. I-SEMESTER

(CE05221) ENGINEERING GEOLOGY

T	P	C
4+1	0	4

UNIT - I

INTRODUCTION: Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological draw backs. Importance of Physical geology, Petrology and Structural geology.

WEATHERING OF ROCKS : Its effect over the properties of rocks importance of weathering with REFERENCE to dams, reservoirs and tunnels weathering of common rock like "Granite"

UNIT - II

MINERALOGY : Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldsper , Quartiz , Flint , Jasper ,Olivine , Augite , Hornblende , Muscovite , Biotite , Asbestos , Chlorite , Kyanite , Garnet , Talc , Calcite. Study of other common economics minerals such as Pyrite, Hematite, Magnetite, Chorite, Galena, Pyrolusite, Graphite , Magnesite, and Bauxite.

UNIT - III

PETROLOGY : Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of igneous. Sedimentary and metamorphic rocks. Their distinguishing features. Megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laerite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT - IV

STRUCTURAL GEOLOGY : Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults uncomformities, and joints - their important types. Their importance Insitu and drift soils, common types of soils, their origin and occurrence in India, Stabilisation of soils.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR B.TECH. C.E. I-SEMESTER

T P C
0 3 2

(CE05222) ENGINEERING GEOLOGY LAB.

1. Study of physical properties and identification of minerals referred under theory.

2. Megascopic description and identification of rocks referred under theory.

3. Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.

4. Simple Structural Geology problems.

LAB EXAMINATION PATTERN:

1. Description and identification of SIX minerals

2. Description and identification of Six (including igneous, sedimentary and metamorphic rocks)

3. Inter pretation of a Geological map along with a geological section.

4. Simple strike and Dip problems.

UNIT - V

Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration. Earth quakes, their causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Land slides, their causes and effect; measures to be taken to prevent their occurrence. Importance of study of ground water, earth quakes and land slides.

UNIT – VI

Importance of Geophysical studies Principles of geophysical study by Gravity methods. Magnetic methods. Electrical methods. Seismic methods. Radio metric methods and Geothermal method. Special importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc. Fundamental aspects of Rock mechanics and Environmental Geology.

UNIT - VII

GEOLOGY OF DAMS AND RESERVOIRS : Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factor's Contributing to the success of a reservoir. Geological factors influencing water Lightness and life of reservoirs.

UNIT - VIII

TUNNELS : Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (ie. Trithological, structural and ground water) in tunneling over break and lining in tunnels.

TEXT BOOKS:

1) Principals of Engineering Geology by KVGK Gokhale – B.S publications - 2005

2) Engineering Geology by N.Chennkesavulu, Mc-Millan, India Ltd. 2005.

REFERENCES:

1. F.G. Bell, Fundamental of Engineering Geology Butterworths, Publications, 198 Aditya Books Pvt. Ltd., New Delhi, 1992.

2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution, First Edition, 1998.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR B.TECH. C.E. I-SEMESTER

(CE05103) BUILDING DRAWING

T	P	C
0	3	2

UNIT – I
SIGN CONVENTIONS OF THE FOLLOWING: Brick, Stone, Plaster, Sand filling, Concrete, Glass, Steel, Cast iron, Copper alloys, Aluminium alloys etc., Lead, Zinc, tin, white lead etc., Earth, Rock, Timber and Marble. (PLATE 1)

UNIT – II
BONDS: English bond & Flemish bond odd & even courses for one, one and half, two and two and half brick walls in thickness at the junction of a corner (PLATE No.2)

UNIT – III
DOORS WINDOWS & VENTILATORS: Panelled Door – paneled and glazed door, glazed windows – paneled windows – Swing ventilator – Fixed ventilator (PLATE. No. 3)

UNIT – IV
TYPES OF ROOFS: Couple roof – Collar roof – Kind Post truss – Queen post truss. (PLATE.No.4)

UNIT – V
SLOPED ROOF BUILDINGS (PLATES.No.5)
mk

UNIT - VI
FLAT ROOF BUILDING (PLATE.No.6)

UNIT - VII
TWOSTOREYED BUILDINGS (PLATE.No.7)
COLUMN TYPE BUILDING (PLATE.No.8)

UNIT - VIII
Given line diagram with specification to draw, plan, sections section andelevation (PLATE.No.9,10)

TEXT BOOK :
1. 'A' Series & 'B' Series of JNTU Engineering College, Anantapur,

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR B.TECH. C.E. II-SEMESTER

(CE05277) GEOTECHNICAL ENGINEERING

T	P	C
4+1	0	4

UNIT – I
INTRODUCTION: Soil formation – soil structure and clay mineralogy – Adsorbed water – Mass, volume ratio and inter-relationship – Relative density.

UNIT – II
INDEX PROPERTIES OF SOILS: Grain size analysis – Sieve and Hydrometer methods – consistency limits and indices – I.S. Classification of soils

UNIT –III
PERMEABILITY: Soil water – capillary rise – flow of water through soils – Darcy's law – permeability – Factors effecting – laboratory determination of coefficient of permeability

UNIT –IV
SEEPAGE THROUGH SOILS: Total, neutral and effective stresses – critical void ratio – dilatancy – quick sand condition – Seepage through soils including Flownets – Characteristics and Uses.

UNIT – V
STRESS DISTRIBUTION IN SOILS: Boussinesq's and Wester gaard's theories for point loads and areas of different shapes – Newmark's influence chart .

UNIT – VI
COMPACTION: Mechanism of compaction – factors effecting – effects of compaction on soil properties. – compaction control.

UNIT –VII
CONSOLIDATION : stress history of clay; e-p and e-logp curves – magnitude and rate of 1-D consolidation – Terzaghi's Theory.

UNIT - VIII
SHEAR STRENGTH OF SOILS : Morh's – Coloumb Failure theories – Types of laboratory strength tests – strength tests based on drainage conditions – Shear strength of sands – bulking of sand – shear strength of clays.

TEXT BOOKS:
1. Geotechnical Engineering by C. Venkataramiah, New age International Pvt . Ltd, Publishers (2002).
2. Soil Mechanics and Foundation Engg. By Arora, Standard Publishers and Distributors, Delhi 2002).

REFERENCES:
1. Basics and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New age International Pvt . Ltd, Publishers (2004).
2. Soil Mechanics – T.W. Lambe and Whitman, Mc-Grawhills Publishing Company.
3. Geotechnical Engineering by Purushotham Raj
4. Geotechnical Engineering by Manoj Dutta & Gulatisk – Tata Mc.Grawhill Publishers New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

III YEAR B.TECH. C.E. II-SEMESTER

(CE05235) ENVIRONMENTAL ENGINEERING –I

	T	P	C
	4+1	0	4

UNIT – I

Introduction : Waterborne diseases – protected water supply – Population forecasts, design period – water demand – factors affecting – fluctuations – fire demand – storage capacity – water quality and testing – drinking water standards.

UNIT-II

SOURCES OF WATER : Comparison from quality and quantity and other considerations – intakes – infiltration galleries distribution systems. – requirements – methods and layouts.

UNIT III

Layout and general outline of water treatment units – sedimentation – principles – design factors – coagulation-flocculation clarifier design – coagulants - feeding arrangements.

UNIT –IV

Filtration – theory – working of slow and rapid gravity filters – multimedia filters – design of filters – troubles in operation comparison of filters – disinfection – theory of chlorination, chlorine demand, other disinfection practices- Miscellaneous treatment methods.

UNIT-V

Distribution systems -Design procedures- Hardy Cross and equivalent pipe methods service reservoirs – joints, valves such as sluice valves, air valves, scour valves and check valves water meters – laying and testing of pipe lines – pump house.

UNIT VI

Conservancy and water carriage systems – sewage and storm water estimation – time of concentration – storm water overflows combined flow – characteristics of sewage – cycles of decay – decomposition of sewage, examination of sewage – B.O.D. – C.O.D. equations.

Design of sewers – shapes and materials – sewer appurtenances manholes – inverted siphon – catch basins – flushing tanks – ejectors, pumps and pumphouses – house drainage – components requirements – sanitary fittings-traps – one pipe and two pipe systems of plumbing – ultimate disposal of sewage – sewage farming – dilution.

UNIT – VII

Layout and general out line of various units in a waste water treatment plant – primary treatment design of screens – merit chambers – skimming tanks – sedimentation tanks – principles of design – biological treatment – trickling filters – standard and high rate.

UNIT-VIII

Construction and design of oxidation ponds - Sludge digestion – factors effecting – design of Digestion tank – Sludge disposal by drying – septic tanks working principles and design – soak pits.

TEXT BOOKS:

1. Water supply and sanitary Engineering by G.S. Birdi, Dhanpat Rai & Sons Publishers.

2. Water Supply Engineering, Vol. 1, waste water Engineering, Vol. II, B.C.Punmia, Ashok Jain & Arun Jain, Laxmi publications, (2002).

REFERENCS :

1. Water and Waste Water Technology by Mark J Hammar and Mark J. Hammar Jr.

2. Water and Waste Water Technology by Steel

3. Water and Waste Water Engineering by Fair Geyer and Okun

4. Text book of Environemental Engineering by P. Venugopal Rao (PHI)

5. Waste water Engineering by Metcalf and Eddy.

6. Unit operations in Environmental Engineering by R. Elangovan and M.K. Sasutharam (Newage)

7. Waste Water Management by KVSG Murali Krishna

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III YEAR B.TECH. C.E. I-SEMESTER

T	P	C
4+1	0	4

(CE05073) BASIC STRUCTURAL STEEL DESIGN AND DRAWING

UNIT - I

Welded connections: Introduction, Advantages and disadvantages of welding- Strength of welds-Butt and fillet welds: Permissible stresses – IS Code requirements. Design of welds fillet weld subjected to moment acting in the plane and at right angles to the plane of the joints, beam to beam and beam to Column connections.

UNIT – II

Beams: Allowable stresses, design requirements as per IS Code-Design of simple and compound beams-Curtailment of flange plates, Beam to beam connection, check for deflection, shear, buckling, check for bearing, laterally unsupported beams.

UNIT –III

Tension members and compression members : General Design of members subjected to direct tension and bending – effective length of columns. Slenderness ratio – permissible stresses. Design of compression members, struts etc.

UNIT – IV

Design of Built up compression members – Design of lacings and batten. Design Principles of Eccentrically loaded columns splicing of columns.

UNIT – V

Design of Column Foundations: Design of sign of slab base and gusseted bases. Column bases subjected moment.

UNIT - VI

Roof Trusses: Different types of trusses – Design loads – Load combinations IS Code recommendations, structural details – Design of simple roof trusses involving the design of purlins, members and joints – tubular trusses.

UNIT – VII

Plate Girder: Design consideration – I S Code recommendations Design of plate girder-Welded – Curtailment of flange plates stiffeners – splicings and connections.

UNIT - VIII

Gantry girder impact factors - longitudinal forces, Design of Gantry girders.

TEXT BOOKS

1. Design of Steel Structures by Ramachandra. Vol – 1, Universities Press, 2nd Edition 2004.

2. Structural Design and Drawing by N.Krishna Raju; University Press, Hyderabad.

REFERENCES

1. Design of Steel structures, by Edmin H.Gaylord, Jr., Charles. N.Gaylord & James E.Stallmeyer, Mc.Graw – Hill Inaternationl 3rd Edition, 1992.

2. Steel Structures Design and Behaviour by charles G. Soloman and J.E. Johnson

3. Design of Steel Structures by P.Dayaratnam; Whatever publications.

4. Design of Steel Structures by M.Raghupathi, Tata Mc. Graw-Hill, 1995..

IS Codes:
    1) IS -800 – 1984
    2) IS – 875 – Part III
    3) Steel Tables.

These codes and steel tables are permitted in the examinations.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR B.TECH. C.E. II-SEMESTER

(CE05576) WATER RESOURCES ENGINEERING-II

T	P	C
4+1	0	4

UNIT-I
Diversion Head works: Types of Diversion head works-diversion and storage head works, weirs and barrages, layout of diversion head works, components, Causes and failure of hydraulic structures on permeable foundations, Bligh's creep theory, Khosla's theory, determination of uplift pressure, impervious floors using Bligh's and Khosla's theory, exit gradient, functions of U/s and d/s sheet piles.

UNIT-II
Canal structures I: types of falls and their location, design principles of Sarda type fall, trapezoidal notch fall and straight glacis fall.

UNIT-III
Canal structures II: canal regulation works, principles of design of distributory and head regulators, canal outlets, types of canal modules, proportionality, sensitivity and flexibility.

UNIT-IV
Cross Drainage works: types, selection of site, design principles of aqueduct, siphon aqueduct and super passage.

UNIT-V
Types of dams, merits and demerits, factors affecting selection of type of dam, factors governing selecting site for dam, types of reservoirs, selection of site for reservoir, zones of storage of a reservoir, reservoir yield, estimation of capacity of reservoir using mass curve.

UNIT-VI
Gravity dams: Forces acting on a gravity dam, causes of failure of a gravity dam, elementary profile and practical profile of a gravity dam, limiting height of a low gravity dam, stability analysis, drainage galleries.

UNIT-VII
Earth dams: types of Earth dams, causes of failure of earth dam, criteria for safe design of earth dam, seepage through earth dam-graphical method, measures for control of seepage.

UNIT-VIII
Spillways: types of spillways, design principles of Ogee spillways, types of spillway gates.

TEXT BOOKS:
1. Irrigation engineering and hydraulic structures by SK Garg, Khanna publishers.
2. Irrigation engineering by K.R.Arora

REFERENCES:
1. Concrete dams by Varshney.
2. Theory and Design of Hydraulic structures by Varshney, Gupta & Gupta

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III YEAR B.TECH. C.E. II-SEMESTER

(CE05241) ESTIMATING, QUANTITY SURVEY AND VALUATION

T	P	C
4+1	0	4

UNIT – I
General items of work in Building – Standard Units Principles of working out quantities for detailed and abstract estimates – Approximate method of Estimating.

UNIT – II
Detailed Estimates of Buildings.

UNIT – III
Earthwork for roads and canals.

UNIT – IV
Rate Analysis – Working out data for various items of work over head and contigent charges.

UNIT – V
Reinforcement bar bending and bar requirement schedules.

UNIT – VI
Contracts – Types of contracts – Contract Documents – Conditions of contract, Valuation of buildings.

UNIT – VII
Valuation of buildings.

UNIT – VIII
Standard specifications for different items of building construction.

TEXT BOOKS
1. Estimating and Costing by B.N. Dutta, UBS publishers, 2000.
2. Estimating and Costing by G.S. Birdie.

REFERENCES :
1. Standard Schedule of rates and standard data book by public works department.
2. I. S. 1200 (Parts I to XXV – 1974/ method of measurement of building and Civil Engineering works – B.I.S.)
3. Estimation, Costing and Specifications by M. Chakraborthi; Laxmi publications.

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HYDERABAD

III YEAR B.TECH. C.E. II-SEMESTER

(CE05561)TRANSPORTATION ENGINEERING

T	P	C
4+1	0	4

UNIT

HIGHWAY ENGINEERING: Highway development in India – Road pattern - Engineering Surveys – Alignment – Requirement – Controlling factors.

UNIT – II

HIGHWAY GEOMETIC DESIGN:

- Elements of cross section.
- Sight distances
- Horizontal & vertical alignment gradient.

UNIT – III

Traffic Engineering:

Traffic studies – volume, speed, O&D, accidental studies.

UNIT – IV

Traffic Management:

- Traffic signs
- Traffic signals – Design – Webstar method.

UNIT – V

Traffic Islands: - characterization – Intersection design – At grade & grade separated intersection – Rotary.

UNIT – VI

Railway Engineering.

Permanent way components – Rails - types – defects creep – welding of rails –sleepers, ballast – fastenigs – rigid & elastic.

UNIT – VII

GEOMETRIC DESIGN: Gradient, grade compensation, degree of curvature super elevation – negative super elevation speed on curves – signalling.

UNIT – VIII

AIRPORT ENGINEERING: Selection of site Airport – Runway length – Correction for runway length – orientation of runway – wind rose diagram – lighting system.

TEXT BOOKS:

1. Highway Engineering – S.K.Khana & C.J.Justo, Nemchand & Bros., 7th edition (2000).
2. Railway Engineering – A text book of Transportation Engineering – S.P.chadula – S.Chand & Co. Ltd.– (2001).

REFERENCES:

1. Highway Engineering – S.P.Bindira – Dhanpat – Raj & Sons. – 4th Edition (1981)
2. Traffic Engineering & Transportation Planning – Dr.L.R.Kadyali Khanna publications – 6th Edition – 1997.
3. Railway Engineering – August – Prabha & Co., 15th Edition – 1994.
4. Air Transportation Planning & design – Virendhra Kumar & Statish Chandhra – Gal Gotia Publishers (1999).
5. Airport planning and design – S.K.Khanna & M.G.Arora Nem Chand & Bros., 3rd Edition (1979).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR B.TECH. C.E. II-SEMESTER

(CE05278) GEOTECHNICAL ENGINEERING LAB

T	P	C
0	3	2

LIST OF EXPERIMENTS

1. Atterberg's Limits.
2. Field density-core cutter and sand replacement method
3. Grain size analysis
4. Permeability of soil, constant and variable head test
5. Vane shear test
6. Compaction test
7. Unconfined compression test
8. Consolidation test
9. Triaxial Compression test
10. Direct shear test.

Any eight experiments may be completed.

REFERENCE BOOK

1. Measurement of Engineering Properties of Soils by. E. Saibaba Reddy & K. Rama Sastri, JNTU.

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III YEAR B.TECH. C.E. II-SEMESTER

T	P	C
0	3	2

(CE05237) ENVIRONMENTAL ENGINEERING LAB.

LIST OF EXPERIMENTS

1. Determination of pH and Turbidity
2. Determination of Conductivity and Total dissolved solids.
3. Determination of Alkalinity/Acidity.
4. Determination of Chlorides.
5. Determination and Estimation of total solids, organic solids and inorganic solids.
6. Determination of iron.
7. Determination of Dissolved Oxygen.
8. Determination of Nitrogen.
9. Determination of total Phosphorous.
10. Determination of B.O.D
11. Determination of C.O.D
12. Determination of Optimum coagulant dose.
13. Determination of Chlorine demand.
14. Presumptive coliform test.

NOTE : At least 8 of the above experiments are to be conducted.

TEXT BOOKS:

1. Chemistry for Environmental Engineering by Sawyer and Mc. Carty
2. Standard Methods for Analysis of water and Waste Water – APHA

REFERENCE

1. Relevant IS Codes.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05264) FOUNDATION ENGINEERING

UNIT – I

SOIL EXPLORATION: Need – Methods of soil exploration – Boring and Sampling methods – Field tests – Penetration Tests – Plate load test – Pressure meter – planning of programme and preparation of soil investigation report.

UNIT – II

EARTH SLOPE STABILITY: Infinite and finite earth slopes – types of failures – factor of safety of infinite slopes – types of failure of finite slopes – stability analysis by Swedish arc method, standard method of slices – Stability of earth dams for different conditions.

UNIT – III

EARTH PRESSURE THEORIES: Rankine's theory of earth pressure – earth pressures in layered soils – Coulomb's earth pressure theory – Culmann's and trial wedge graphical methods –

UNIT-IV

RETAINING WALLS: Types of retaining walls – stability of retaining walls.

UNIT – V

SHALLOW FOUNDATIONS: Types - choice of foundation – Location of depth – Safe Bearing Capacity – Terzaghi's and Meyerhof's theories

UNIT-VI

Safe bearing pressure based on N- value – allowable bearing pressure; safe bearing capacity and settlement from plate load test – allowable settlements of structures.

UNIT -VII

PILE FOUNDATION: Types of piles – Load carrying capacity of piles based on static pile formulae – a and ß methods – Dynamic pile formulae – Pile load testing

UNIT-VIII

PILE GROUPS: Load carrying capacity of pile groups in sands and clays.

TEXT BOOKS:

1. Geotechnical Engineering by C. Venkataramah, New Age International Pvt.Ltd, Publishers (2002).

REFERENCES:

1. Das, B.M., - (1999) Principles of Foundation Engineering –4th edition PWS Publishing, Singapore.
2. Bowles, J.E., (1988) Foundation Analysis and Design – 4th Edition, McGraw-Hill International.
3. Analysis and Design of Substructures – Swami Saran, Oxford and IBH Publishing company Pvt Ltd (1998).
4. Basics and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New Age International Pvt.Ltd, Publishers (2004).
5. Geotecnical Engineering by Shashi, K.Gulhati & Manoj Datta – Tata Mc.Graw – Hill Publishing company New Delhi. 2005.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05249) FINITE ELEMENT METHODS IN CIVIL ENGINEERING

UNIT -I

Introduction: Concepts of FEM – Steps involved – merits & demerits – energy principles – Discretization – Rayleigh –Ritz method of functional approximation.

UNIT -II

Principles of Elasticity: Stress equations –strain displacement relationships in matrix from –plane stress, plane strain and Axi-symmetric bodies of revolution with axi-symmetric loading.

UNIT -III

One Dimensional FEM : Stiffness matrix for beam and bar element - shape functions for one dimensional elements – one dimensional problems.

UNIT-IV

Analysis of two-dimensional framed structures (trusses, frames) for loads and displacements.

UNIT -V

Two Dimensional FEM : Different types of elements for plane stress and plane strain analysis – Displacement models – generalized coordinates – shape functions – convergent and compatibility requirements – Geometric invariance – Natural coordinate system – area and volume coordinates – generation of element stiffness and nodal load matrices.

UNIT -VI

Isoparametric formulation – Concepts of, isoparametric elements for 2D analysis formulation of CST elements, 4 –noded and 8-noded isoparametric quadrilateral elements –Lagrangian and Serendipity elements.

UNIT-VII

Solution of plane stress, plane strain and Axisymmetric problems using FEM.

UNIT-VIII

Solution Techniques: Numerical Integration, Static condensation, assembly of elements and solution techniques for static loads.

TEXT BOOK:

1. Finite Elements Methods in Engineering by Tirupati.R. Chandrepatla and Ashok D. Belegundu - Pearson Education Publications.

REFERENCES:

1. Concepts and Applications of Finite Element Analysis by Robert D.Cook, David S. Malkus and Michael E.Plesha. Jhon Wiley & Sons.
2. Finite Element analysis – Theory & Programming by C.S.Krishna Murthy- Tata Mc.Graw Hill Publishers.
3. Text book of Finite Element analysis by P.Seshu – Prentice – Hall India 2003.

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IV YEAR B.TECH. C.E. I SEMESTER

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(EC05506) REMOTE SENSING AND GIS APPLICATIONS

UNIT – I

Introduction to Photogrammetry: Principle and types of aerial photographs, stereoscopy, Map Vs Mosaic, ground control, Parallax measurements for height, determinations.

UNIT – II

Remote Sensing – I: Basic concepts and foundation of remote sensing – elements involved in remote sensing, electromagnetic spectrum, remote sensing terminology and units.

UNIT – III

Remote Sensing – II: Energy resources, energy interactions with earth surface features and atmosphere, resolution, sensors and satellite visual interpretation techniques, basic elements, converging evidence, interpretation for terrain evaluation, spectral properties of water bodies, introduction to digital data analysis.

UNIT – IV

Geographic Information System: Introduction, GIS definition and terminology, GIS categories, components of GIS, fundamental operations of GIS, A theoretical framework for GIS.

UNIT – V

Types of data representation: Data collection and input overview, data input and output. Keyboard entry and coordinate geometry procedure, manual digitizing and scanning, Raster GIS, Vector GIS – File management, Spatial data – Layer based GIS, Feature based GIS mapping.

UNIT – VI

GIS Spatial Analysis: Computational Analysis Methods(CAM), Visual Analysis Methods (VAM), Data storage-vector data storage, attribute data storage, overview of the data manipulation and analysis. Integrated analysis of the spatial and attribute data.

UNIT – VII

Water Resources Applications-I: Land use/Land cover in water resources, Surface water mapping and inventory, Rainfall – Runoff relations and runoff potential indices of watersheds, Flood and Drought impact assessment and monitoring, Watershed management for sustainable development and Watershed characteristics.

UNIT – VIII

Water Resources Applications – II: Reservoir sedimentation, Fluvial Geomorphology, water resources management and monitoring, Ground Water Targeting, Identification of sites for artificial Recharge structures, Drainage Morphometry, Inland water quality survey and management, water depth estimation and bathymetry.

TEXT BOOKS:

1. Remote Sensing and its applications by LRA Narayana University Press 1999.
2. Principals of Geo physical Information Systems – Peter A Burragh and Rachael A. Mc Donnell, Oxford Publishers 2004.

REFERENCES:

1. Concepts & Techniques of GIS by C.P.Lo Albert, K.W. Yonng, Prentice Hall (India) Publications.
2. Remote Sensing and Geographical Information systems by M.Anji Reddy JNTU Hyderabad 2001, B.S.Publications.
3. GIS by Kang – tsung chang, TMH Publications & Co.,
4. Basics of Remote sensing & GIS by S.Kumar, Laxmi Publications.
5. Fundamental of GIS by Mechanical designs John Wiley & Sons.

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IV YEAR B.TECH. I-SEMESTER

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(CE05236) ENVIRONMENTAL ENGINEERING – II

UNIT – I
Air Pollution – sources of pollution – Classification – effects on human beings – Global effects of Air pollution.

UNIT – II
Air pollution Control Methods – Particulate control devices – General Methods of Controlling Gaseous Emission.

UNIT – III
Special Treatment Methods – Adsorption – Reverse Osmosis – Defluoridation – Ion exchange – Ultra Filtration.

UNIT –IV
Theories industrial waste treatment – Volume reduction – strength reduction – Neutralization – Equalization – Proportioning – Nitrification and Denitrification – Removal of Phosphates.

UNIT – V
Solid waste Management – sources, composition and properties of solid waste – collection and handling – separation and processing.

UNIT – VI
Solid waste disposal methods – Land filling – Incineration composting.

UNIT – VII
Hazardous Waste – Nuclear waste – Biomedical wastes – chemical wastes – Effluent – disposal and Control methods.

UNIT – VIII
Noise Pollution – effects of noise and control methods – Effluent standards – Air emission standards – Water Act – Air Act – Environment Protection Act.

TEXT BOOKS:
1. Environmental Science and Engineering by J.G.Henry and G.W.Heinke – Person Education.
2. Environmental Engineering and Management – Dr.Suresh K.Dhameja – S.K.Kartarai & Sons 2nd Edition 2005.

REFERENCES:
1. Physico – Chemical process for water quality control by Weber
2. Air Pollution and Control by MN Rao & H.N.Rao

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05279) GIS & CAD LAB.

GIS :

SOFTWARE :
1. Arc GIS 9.0
2. ERDAS 8.7
3. Mapinfo 6.5

Any one or Equivalent.

EXCERCISES:
1. Digitization of Map/Toposheet
2. Creation of thematic maps.
3. Study of features estimation
4. Developing Digital Elevation model
5. Simple applications of GIS in water Resources Engineering & Transportation Engineering.

CAD:

SOFTWARE:
1. STAAD PRO or Equivalent

EXCERCISIES:
1. 2-D Frame Analysis and Design
2. Steel Tabular Truss Analysis and Design
3. 3-D Frame Analysis and Design
4. Retaining Wall Analysis and Design
5. Simple tower Analysis and Design

TEXT BOOK:
1. Concept and Techniques of GIS by C.P.L.O. Albert, K.W. Yong, Printice Hall Publishers.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05146) CONCRETE AND HIGHWAY ENGINEERING LAB.

I. ROAD AGGREGATES:

1. Aggregate Crushing value
2. Aggregate Impact Test.
3. Specific Gravity and Water Absorption.
4. Attrition Test
5. Abrasion Test.

II. BITUMINOUS MATERIALS :

1. Penetration Test.
2. Ductility Test.
3. Softening Point Test.

III. CEMENT AND CONCRETES :
TESTS ON CEMENTS :

1. Normal Consistency of fineness of cement.
2. Initial setting time and final setting time of cement.
3. Specific gravity and soundness of cement.
4. Compressive strength of cement.
5. Workability test on concrete by compaction factor, slump and Vee-bee.
6. Young's modulus and compressive strength of concrete.
7. Bulking of sand.
8. Non-Destructive testing on concrete (for demonstration)

TEXT BOOKS:

1. Concrete Technology by M.S. Shetty – S.Chand & Co.
2. Laboratory Manual in Highway Engineering by Ajay K. Duggal and Vijay P. Puri - Newage Publishers.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05034) ANALYSIS AND DESIGN OF STRUCTURES FOR WIND AND EARTHQUAKE EFFECTS
(Elective-I)

UNIT – I

Causes of earthquakes, Review of damages to Buildings due to wind and Earthquakes.

UNIT – II

Single degree of freedom systems – Equations of motion, free vibrations, damping, response to harmonic excitation – response to general dynamic loading – Duhamel Integral, concept of response spectrum.

UNIT – III

Multi degree of freedom systems – Equations of motion. Free vibration, natural frequencies and modes. Response spectrum Analysis ground excited systems.

UNIT – IV

Earthquake and wind design philosophy, ductility.

UNIT – V

Concepts of seismic design, lateral strength and structural configuration – Design spectrum.

UNIT – VI

Codal Provisions: provisions of IS: 1893 for buildings – Seismic design of masonry structures, provisions of IS: 4326. IS: 875 Part III wind loads.

UNIT – VII

Seismic design and detailing of RC buildings, provisions of IS: 13920, IS:4326, IS: 800.

UNIT – VIII

Shear walls and design.

TEXT BOOKS:

1. Dynamic of Structures Theory and Application to Earthquake Engineering-A.K.Chopra – Pearson Education (Singapore) Indian Branch, Delhi 2004.
2. Wind effects on Structures: An Introduction to Wind Engineering", Simiu, E., Scanlan, R.H., 2nd Edition, John Wiley & Sons, Newyork, 1986.

REFERENCES :

1. Dynamic of Structures – Clough & Penzien, Mc.Graw -Hill – International Edition.
2. "Vibration of buildings to wind and earthquake loads", Springer Verlag, Germany, 1993.
3. "Wind and earthquake resistant building: Structural analysis and design", Marcel Dekker Inc. USA 2005.

IS Codes: IS 1893, IS 4326, IS 13827, IS 13828, IS 13920 and IS 13935.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05314) INDUSTRIAL WASTE AND WASTE WATER MANAGEMENT
(ELECTIVE –I)

UNIT – I

Quality requirements of boiler and cooling waters – Quality requirements of process water for Textiles – Food processing and Brewery Industries – Boler and Cooling water treatment methods.

UNIT – II

Basic Theories of Industrial Waste water Management – Volume reduction – Strength reduction – Neutralization – Equalization and proportioning. Joint treatment of industrial wastes and domestic sewage – consequent problems.

UNIT – III

Industrial waste water discharges into streams. Lakes and oceans and problems.

UNIT – IV

Recirculation of Industrial Wastes – Use of Municipal Waste Water in Industries.

UNIT – V

Manufacturing Process and design origin of liquid waste from Textiles, Paper and Pulp industries, Thermal Power Plants and Tanneries, Special Characteristics, Effects and treatment methods.

UNIT – VI

Manufacturing Process and design origin of liquid waste from Fertilizers, Distillers, and Dairy, Special Characteristics, Effects and treatment methods.

UNIT – VII

Manufacturing Process and design origin of liquid waste from Suger Mills, Steel Plants, Oil Refineries, and Pharmaceutical Plants, Special Characteristics, Effects and treatment methods.

UNIT – VIII

Common Effluent Treatment Plants – Advantages and Suitability, Limitations, Effluent Disposal Methods.

TEXT BOOK:

1. Waste Water Treatment by M.N. Rao and Dutta, Oxford & IBH, New Delhi.

REFERENCES:

1. Liquid waste of Industry by Newmerow.
2. Water and Waste Water technology by Mark J. Hammer and Mark J. Hammer (Jr).

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05011) ADVANCED FOUNDATION ENGINEERING
(ELECTIVE –I)

UNIT I

Introduction-Bearing capacity of Footings subjected to Eccentric and Inclined loading – Meyerhoff's, Hansen's, Vesic theories – Foundations on layered soils.

UNIT – II

Elastic settlement of Footings embedded in sands and clays of Infinite thickness – Footings on soils of Finite thickness-Schmertamaunn's method, Janbu method.

UNIT – III

Pile Foundations – static and dynamic methods-pile groups-negative skin friction-under reamed piles.

UNIT – IV

Settlement of Pile groups resting in sands and clays –laterally loaded piles-ultimate capacity of laterally loaded piles.

UNIT – V

Lateral Earth pressures-Rankine's - Coloumb's and graphical methods-cantilever and counter - fort retaining wall design.

UNIT – VI

Caissons and well foundations: Types of caissons – well foundation Different shapes of wells – Components of wells – functions and Design – Design Criteria – Sinking of wells – lateral stability by Terzaghi's analysis.

UNIT – VII

Cantilever sheet piles and anchored bulkheads, Earth pressure diagram Determination of Depth of embedment in sands and clays – Timbering of trenches- Earth pressure diagrams – Forces in struts.

UNIT – VIII

Foundations in Expansive soils – Problems in Expansive soils – Mechanism of swelling – Swell Pressure and Swelling potential – Heave – foundation practices – Sand cushion – CNS technique – under – reamed pile Foundations – Granular pile – anchor technique, stabilization of expansive soils.

TEXT BOOKS:

1) Das, B.M., - (1999) Principles of Foundation Engineering –4th edition PWS Publishing, Singapore.

2) Bowles, J.E., (1988) Foundation Analysis and Design – 4th Edition, McGraw-Hill International.

REFERENCES :

1) Geotechnical Engineering by C. Venkataramah, NewAge International Pvt.Ltd, Publishers (2002).

2) Analysis and Design of Substructures – Swami Saran, Oxford & IBH Publishing Company Pvt.Ltd (1998).

3) Basics and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New Age International Pvt.Ltd, Publishers (2002).

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05577) WATER RESOURCES SYSTEMS ANALYSIS
(ELECTIVE –II)

UNIT – I
Introduction: concepts of systems analysis, definition, systems approach to water resources planning and management, role of optimization models, objective function and constraints, types of optimization techniques.

UNIT – II
Linear programming –I: Formulation linear programming models, graphical method, simplex method, application of Linear programming in water resources.

UNIT – III
Linear programming – II: Revised simplex method, duality in linear programming, sensitivity and past optimality analysis.

UNIT – IV
SDynamics programming: Belman's of principles of optimality forward and backward recursive dynamic programming, case of dimensionality, application of dynamic for resource allocation.

UNIT – V
Non-linear optimatization techniques: Clerical of method optimization, Kuch-Tucleer, gradential based research techniques for simple unconstrained optimization.

UNIT – VI
Simulation: application of simulation techniques in water resources.

UNIT – VII
Water –resources economics: Principles of Economics analysis, benefit cost analysis socio economic intuitional and pricing of water resources.

UNIT – VIII
Water resources management: Planning of reservoir system, optimal operation of single reservoir system, allocation of water resources, optimal cropping pattern, conjunctive use of surface and sub-surface water resources.

TEXT BOOKS:
1. Water Resources System Analysis – Vedula & Mujumdar – Tata Mc.Graw Hill Company Ltd. 2005.
2. Water Resources Economics - James & Lee. Oxford Publishers 2005.
REFERENCES:
1. Optimal design of water distribution networks P.R.Bhave, Narosa Publishing house 2003.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(AE05025) AIR POLUTION AND CONTROL
(ELECTIVE –II)

UNIT – I
Air Pollution – Definitions, Scope, Significance and Episodes, Air Pollutants – Classifications – Natural and Artificial – Primary and Secondary, point and Non-Point, Line and Areal Sources of air pollution- stationary and mobile sources.

UNIT – II
Effects of Airpollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

UNIT-III
Thermodynamics and Kinetics of Air-pollution – Applications in the removal of gases like SO_x, NO_x, CO, HC etc., air-fuel ratio. Computation and Control of products of combustion. x, y

UNIT – IV
Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

UNIT-V
Lapse Rates, Pressure Systems, Winds and moisture plume behaviour and plume Rise Models; Gaussian Model for Plume Dispersion.

UNIT-VI
Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT – VII
General Methods of Control of NO_x and SO_x emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

UNIT – VIII
Air Quality Management – Monitoring of SPM, SO_2 NO and CO Emission Standards.

TEXT BOOKS:
1. Air pollution By M.N.Rao and H.V.N.Rao – Tata Mc.Graw Hill Company.
2. Air pollution by Wark and Warner.- Harper & Row, New York.

REFERENCE:
1. Air pollution and control By K.V.S.G. Murali Krishna, Kaushal Publishers. Kakinada.

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IV YEAR B.TECH. C.E. I-SEMESTER

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(CE05280) GROUND IMPROVEMENT TECHNIQUES
(ELECTIVE –II)

UNIT – I
In – situ densification methods in granular Soils:– Introduction, Vibration at the ground surface, Impact at the Ground Surface, Vibration at depth, Impact at depth.

UNIT – II
In – situ densification methods in Cohesive soils:– Introduction, preloading or dewatering, Drain walls – Sand Drains, Sandwick geodrains – Stone and lime columns – thermal methods.

UNIT – III
Reinforced Earth: Principles – Components of reinforced earth – factors – governing design of reinforced earth walls – design principles of reinforced earth walls.

UNIT – IV
Geotextiles: Introduction – Types of geotextiles, Functions and their applications, tests for geotextiles materials – geogrids – functions.

UNIT - V
Expansive soils : Problems of expansive soils – tests for identification – I.S. Test methods of determination of swelling pressure. Improvement of expansive soils – Foundation techniques in expansive soils – under reamed piles – I.S.Code practice – Remedial measures.

UNIT – VI
Mechanical stabilization: Soil aggregate mixtures-properties and proportioning techniques – soft aggregate stabilization – compaction – field compaction control.

UNIT - VII
Cement stabilization : Mechanism – factors affecting and properties – Use of additives – design of soils cement mixtures – construction techniques.

UNIT – VIII
Lime and Bituminous stabilization : Type of admixtures – mechanism – factors affecting – design of mixtures – construction methods.

TEXT BOOKS:
1. Hausmann M.R. (1990), Engineering Principles of Ground Modification, McGraw-Hill International Edition.

REFERENCES:
1. Moseley M.P. (1993) Ground Improvement, Blackie Academic and Professional, Boca Taton, Florida, USA.
2. Xanthakos P.P, Abramson, L.W and Brucwe, D.A (1994) Ground Control and Improvement, John Wiley and Sons, New York, USA.
3. Robert M. Koerner, Designing with Geosynthatics, Prentice Hall New Jercy, USA

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IV YEAR B.TECH. C.E. II-SEMESTER

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(CE05015) ADVANCED STRUCTURAL CONCRETE AND STEEL DESIGN
(ELECTIVE –III)

UNIT – I
Design of flat slabs

UNIT – II
Design of Combined footings, Raft foundation and pile cap.

UNIT – III
Design of Retaining walls, cantilever and counter fort

UNIT – IV
Design of water tanks, RCC and Steel, circular rectangular and Intz. Tanks.

UNIT – V
Introduction to bunkers, silos and Chimney, concepts of loading and Design.

UNIT – VI
Introduction to concrete bridges, IRC loading, slab bridges and T - beam bridges design concepts.

UNIT – VII
Design of plate girder bridges and gantry girders.

UNIT – VIII
Multistory building system – detailing for Ductility, Design for earthquake and wind forces.

TEXT BOOKS:
1. Advanced Reinforced concrete structures by Vargheesh, Pranties Hall of India Pvt. Ltd.
2. Design drawing of concrete and steel structures by N.Krishna Raju University Press 2005.

REFERENCES:
1. Essentials of Bridge Engineering by D.John son Victor, Oxford and IBM publication Co., Pvt. Ltd.
2. Reinforced concrete design by S.U.Pillai and D.Menon, Tata Mc.Ghrawhill Publishing company
3. Advanced Reinforced Concrete Design by P.C. Varghese, Prentice Hall India.

Codes: Relevant IS: codes.

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IV YEAR B.TECH. C.E. II-SEMESTER

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(CE05281) GROUND WATER DEVELOPMENT AND MANAGEMENT
(ELECTIVE –III)

UNIT – I
Ground Water Occurrence: Ground water hydrologic cycle, origin of ground water, rock properties effecting ground water, vertical distribution of ground water, zone of aeration and zone of saturation, geologic formation as Aquifers, types of aquifers, porosity, Specific yield and Specific retention.

UNIT – II
Ground Water Movement: Permeability, Darcy's law, storage coefficient. Transmissivity, differential equation governing ground water flow in three dimensions derivation, ground water flow equation in polar coordinate system. Ground water flow contours their applications.

UNIT – III
Analysis of Pumping Test Data – I: Steady flow groundwater flow towards a well in confined and unconfined aquifers – Dupit's and Theism's equations, Assumptions, Formation constants, yield of an open well interface and well tests.

UNIT – IV
Analysis of Pumping Test Data – II: Unsteady flow towards a well – Non equilibrium equations – Thesis solution – Jocob and Chow's simplifications, Leak aquifers.

UNIT – V
Surface and Subsurface Investigation: Surface methods of exploration – Electrical resistivity and Seismic refraction methods. Subsurface methods – Geophysical logging and resistivity logging. Aerial Photogrammetry applications along with Case Studies in Subsurface Investigation.

UNIT – VI
Artificial Recharge of Ground Water: Concept of artificial recharge – recharge methods, relative merits, Applications of GIS and Remote Sensing in Artificial Recharge of Ground water along with Case studies.

UNIT – VII
Saline Water Intrusion in aquifer: Occurrence of saline water intrusions, Ghyben-Herzberg relation, Shape of interface, control of seawater intrusion.

UNIT – VIII
Groundwater Basin Management: Concepts of conjunction use, Case studies.

TEXT BOOKS:
1. Ground water Hydrology by David Keith Todd, John Wiley & Son, New York.
2. Groundwater by H.M.Raghunath, Wiley Eastern Ltd.

REFERENCES :
1. Groundwater by Bawwwr, John Wiley & sons.
2. Groundwater System Planning & Managemnet – R.Willes & W.W.G.Yeh, Printice Hall.
3. Applied Hydrogeology by C.W.Fetta, CBS Publishers & Distributers.

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IV YEAR B.TECH. C.E. II-SEMESTER

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(CE05238) ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(ELECTIVE –III)

UNIT – I

Basic concept of EIA : Initial environmental Examination, Elements of EIA, - factors affecting E-I-A Impact evaluation and analysis, preparation of Environmental Base map, Classification of environmental parameters.

UNIT – II

E I A Methodologies: introduction, Criteria for the selection of EIA Methodology, E I A methods, Ad-hoc methods, matrix methods, Network method Environmental Media Quality Index method, overlay methods, cost/benefit Analysis.

UNIT – III

Impact of Developmental Activities and Land use: Introduction and Methodology for the assessment of soil and ground water, Delineation of study area, Identification of actives

UNIT-IV

Procurement of relevant soil quality, Impact prediction, Assessment of Impact significance, Identification and Incorporation of mitigation measures.
E I A in surface water, Air and Biological environment:
Methodology for the assessment of Impacts on surface water environment, Air pollution sources, Generalized approach for assessment of Air pollution Impact.

UNIT – V

Assessment of Impact of development Activities on Vegetation and wildlife, environmental Impact of Deforestation – Causes and effects of deforestation.

UNIT – VI

Environmental Audit & Environmental legislation objectives of Environmental Audit, Types of environmental Audit, Audit protocel, stages of Environmental Audit, on-site activities, evaluation of Audit data and preparation of Audit report.

UNIT-VII

Post Audit activities, The Environmental pollution Act, The water Act, The Air (Prevention & Control of pollution Act.), Mota Act, Wild life Act.

UNIT-VIII

Case studies and preparation of Environmental Impact assessment statement for various Industries.

TEXT BOOKS:

1. Environmental Impact Assessment Methodologies, by Y. Anjaneyulu, B.S. Publication, Sultan Bazar, Hyderabad.

2. Environmental Science and Engineering, by J. Glynn and Gary W. Hein Ke – Prentice Hall Publishers

REFERENCES:

1. Environmental Science and Engineering, by Suresh K. Dhaneja – S.K.Katania & Sons Publication., New Delhi.

2. Environmental Pollution and Control, by Dr H.S. Bhatia – Galgotia Publication (P) Ltd, Delhi

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IV YEAR B.TECH. C.E. II-SEMESTER

(CE05578) WATERSHED MANAGEMENT
(ELECTIVE –IV)

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UNIT-I
INTRODUCTION: Concept of watershed development, objectives of watershed development, need for watershed development in India, Integrated and multi-disciplinary approach for watershed management.

UNIT-II
CHARACTERISTICS OF WATERSHED: size, shape, physiography, slope, climate, drainage, land use, vegetation, geology and soils, hydrology and hydrogeology, socio-economic characteristics, basic data on watersheds.

UNIT-III
PRINCIPLES OF EROSION: Types of erosion, factors affecting erosion, effects of erosion on land fertility and land capability, estimation of soil loss due to erosion, Universal soil loss equation.

UNIT-IV
MEASURES TO CONTROL EROSION: Contour techniques, ploughing, furrowing, trenching, bunding, terracing, gully control, rockfill dams, brushwood dam, Gabion.

UNIT-V
WATER HARVESTING: Rainwater Harvesting, catchment harvesting, harvesting structures, soil moisture conservation, check dams, artificial recharge, farm ponds, percolation tanks.

UNIT-VI
LAND MANAGEMENT: Land use and Land capability classification, management of forest, agricultural, grassland and wild land. Reclamation of saline and alkaline soils.

UNIT-VII
ECOSYSTEM MANAGEMENT: Role of Ecosystem, crop husbandry, soil enrichment, inter, mixed and strip cropping, cropping pattern, sustainable agriculture, bio-mass management, dry land agriculture, Silvi pasture, horticulture, social forestry and afforestation.

UNIT-VIII
Planning of watershed management activities, peoples participation, preparation of action plan, administrative requirements.

TEXT BOOKS:
1. Watershed Management by JVS Murthy, - New Age International Publishers.
2. Water Resource Engineering by R.Awurbs and WP James, - Prentice Hall Publishers.

REFERENCE:
1. Land and Water Management by VVN Murthy, - Kalyani Publications.
2. Irrigation and Water Management by D.K.Majumdar, Printice Hall of India.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD
IV YEAR B.TECH. C.E. II-SEMESTER

(CE05469) PRESTRESSED CONCRETE
(ELECTIVE –IV)

T	P	C
4+1	0	4

UNIT – I
INTRODUCTION: Historic development – General principles of prestressing pretensioning and post tensioning – Advantages and limitations of prestressed concrete – Materials – High strength concrete and high tensile steel their characteristics.

UNIT – II
I.S.Code provisions, Methods and Systems of Prestressing; Pre-tensioning and post tensioning methods – Analysis of post tensioning - Different systems of prestressing like Hoyer System, Magnel System Freyssinet system and Gifford – Udall System.

UNIT – III
LOSSES OF PRESTRESS: Loss of prestress in pre-tensioned and post-tensioned members due to various causes like elastic shortage of concrete, shrinkage of concrete, creep of concrete, Relaxation of steel, slip in anchorage bending of member and frictional losses.

UNIT – IV
Analysis of sections for flexure; Elastic analysis of concrete beams prestressed with straight, concentric, eccentric, bent and parabolic tendons.

UNIT – V
DESIGN OF SECTIONS FOR FLEXURE AND SHEAR: Allowable stress, Design criteria as per I.S.Code – Elastic design of simple rectangular and I-section for flexure, shear, and principal stresses – design for shear in beams – Kern – lines, cable profile.

UNIT – VI
ANALYSIS OF END BLOCKS: by Guyon's method and Mugnel method, Anchorage zone strusses – Approximate method of design – Anchorage zone reinforcement – Transfer of prestress pre-tensioned members.

UNIT – VII
Composite section: Introduction – Analysis of stress – Differential shrinkage – General designs considerations.

UNIT – VIII
DEFLECTIONS OF PRESTRESSED CONCRETE BEAMS: Importance of control of deflections – factors influencing deflections – short term deflections of uncracked members prediction of long term deflections.

TEXT BOOKS:
1. Prestressed Concrete by Krishna Raju; - Tata Mc.Graw Hill Publications.
2. Prestressed Concrete by N.Rajasekharan; - Narosa publications.

REFERENCE:
1. Prestressed Concrete by Ramamrutham; Dhanpatrai Publications.
2. Design of Prestressed concrete structures (Third Edition) by T.Y. Lin & Ned H.Burns, John Wiley & Sons.

Codes: BIS code on prestressed concrete, IS 1343.

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IV YEAR B.TECH. C.E. II-SEMESTER

T	P	C
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(CE05445) PAVEMENT ANALYSIS AND DESIGN
(ELECTIVE –IV)

UNIT – I
Types of pavement – factors affecting design of pavements – wheel loads – type pressure – contact pressure, Material characteristics – Environmental and other factors.

UNIT – II
Stresses in flexible pavement – layered systems concept – one layer system – Boussinesq Two layer system – Burmister.

UNIT – III
Stress in rigid pavement – relative stiffness of slab, modulus of sub-grade reaction – stresses due to warping, stresses due to loads, stresses due to friction.

UNIT – IV
Pavement design: IRC method of flexible pavement design.

UNIT – V
IRC method of Rigid pavement design.

UNIT – VI
Highway material tests- Bitumen's material tests

UNIT – VII
Highway construction – Gravel, WBM, Bituminous pavements types – cement concrete roads.

UNIT – VIII
Failure in Rigid & flexible pavements, Highway maintenance – Routine - periodic – special repairs.

TEXT BOOKS:
1. Highway Engineering – S.K.Khanna & C.J.Justo, Nemchand & Bros., 7th Edition (2000).
2. Principles and practices of highway Engineering – Dr.L.R.Kadiyali & Dr.N.B.Lal – Khanna publishers – (2003).

REFERENCES:
1. Principles of pavement design – Yoder & wit zorac – Jhonwilley & Sons.

CODES:
1. IRC Code for flexible pavement – IRC – 37 -2001.
2. IRC Code for Rigid pavement – IRC – 58 – 2002.

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IV YEAR B.TECH. II-SEMESTER

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(HS05002) ADVANCED COMMUNICATION SKILLS
(ELECTIVE –V)

UNIT–I:
Fundamentals of interpersonal communication - Internal operational communication, External - operational communication - Informal conversation Vs Formal expression Verbal and non-verbal communication, barriers to effective communication - kinesics

UNIT - II:
Types of Communication - Horizontal, Vertical (Upward downward), Grape-vine, Consensus - Oral, aural, Writing and reading - Word-Power- Vocabulary- Jargon - rate of speech, pitch, tone - Clarity of voice

UNIT - III:
Technical presentations - types of presentation – teleconferencing / video conferencing-participation in meetings - chairing sessions.

UNIT - IV:
Formal and informal interviews - polemics - interviewing in different settings and for different purposes e.g., eliciting and giving information, recruiting, performance appraisal.

UNIT - V:
Written communication - differences between spoken and written communication - features of effective writing such "as clarity, brevity, appropriate tone clarity, balance etc.- GRE. TOEFL models

UNIT – VI: Features of Indian English - Correction of sentences - Structures - Tenses - ambiguity - idiomatic distortions.

UNIT – VII: Letter-writing - business letters – Proforma culture - format - style – effectiveness, promptness - Analysis of sample letters collected from industry - email, fax.

UNIT – VIII: Technical Report writing - Business and Technical Reports – Types of reports - progress reports, routine reports - Annual reports - format - Analysis of sample reports from industry - Synopsis and thesis writing

2005-2006

REFERENCES:

1. Essentials of Business Communication, Rajendra Pal, J S KorlahaHi : Sultan Chand & Sons, New Delhi.

2. Basic Communication Skills for Technology, Andrea J. Rutherford: Pearson Education Asia, Patparganj, New Delhi-92.

3. Advanced Communication Skills, V. Prasad, Atma Ram Publications, New Delhi.

4. Raymond V. Lesikav: John D. Pettit Jr.: Business Communication; Teory & Application, All India Traveller Bookseller, New Delhi-51.

5. Business Communication, RK Madhukar, Vikas Publishing House Pvt Ltd

6. K.R. Lakshminarayana : English. for Technical Communication – vols. 1 and 2, SCITECH Publications (India) Pvt. Ltd., T. Nagar, Chennai-600 017.

7. Edmond H Weiss: Writing Remedies: Practical Exercises for Technical Writing, Universities Press, Hyderabad.

8. Cliffs Test Prep for GRE and TOEFL: Computer Based Test, IDG Books. India (P) Ltd. New Delhi-002.

9. GRE and TOEFL: Kaplan and Baron's

10. English in Mind, Herbert Puchta and Jeff Stranks, Cambridge

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IV YEAR B.TECH. C.E. II-SEMESTER

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(CE05014) ADVANCED STRUCTURAL ANALYSIS
(ELECTIVE –V)

UNIT – I
Moment Distribution method: Application to the analysis of portal frames with inclined legs, gable frames

UNIT – II
Strain energy method: Application to the analysis of continuous beams and simple portal frames.

UNIT – III
Influence lines: Influence line diagrams for Reaction, Shearing force and Bending moment in case of determinate beams and Influence line diagrams for member forces in determinate trusses – application of influence line diagrams.

UNIT – IV
Analysis Two hinged and Three hinged arches using influence lines.

UNIT – V
Flexibility Method: Introduction to the structural analysis by flexibility concept using Matrix approach and application to frames simple grids and trusses.

UNIT – VI
Stiffness method: Introduction to the structural analysis by stiffness concept using Matrix approach and application to frames simple grids and trusses.

UNIT – VII
Beams on elastic foundation: Introduction – Sub grade modulus and stiffness – Analysis of simple beams resting on semi infinite elastic medium and estimation of shear force and Bending moment.

UNIT – VIII
Plastic Analysis: Introduction – Idealized stress – Strain diagram – shape factors for various sections – Moment curvature relationship – ultimate moment – Plastic hinge – lower and upper bound theorems – ultimate strength of fixed and continuous beams.

TEXT BOOKS:
1. Matrix methods of Structural Analysis by Pandit and Gupta – Tata Mc.Graw Hill
2. Analysis of structures Vol. I & II by Vazrani and Ratwani. Khanna publications.

REFERENCES:
1. Structural Analysis by D.S.Prakash Rao Sagar books
2. Structural Analysis Vol. I & II by Bhavi Katti Vikas Publications.
3. Matrix structural analysis by T.N.Gayi; Tata Mc.Graw Hill company

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IV YEAR B.TECH. C.E. II-SEMESTER

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(CE05162) DESIGN AND DRAWING OF HYDRAULIC STRUCTURES

(ELECTIVE –V)

Design and drawing of the following hydraulic structures.

1. Sloping glacis weir.
2. Tank sluice with tower head
3. Type III Syphon aqueduct.
4. Surplus weir.
5. Trapezoidal notch fall.
6. Canal regulator.

Examination: Any two questions of the above six may be asked of which the candidate has to answer one question.

TEXT BOOKS:

1. Design of minor irrigation and canal structures by C.Satyanarayana Murthy, Wiley eastern Ltd.

2. Irrigation engineering and Hydraulic structures by S.K.Garg, Standard Book House.