COURSE STRUCTURE
AND
DETAILED SYLLABUS

FOR
B.TECH FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2012-2013)

ANURAG GROUP OF INSTITUTIONS
AUTONOMOUS
VENKATAPUR, GHATKESAR, HYDERABAD – 501 301. A.P.
# III YEAR I SEMESTER

## COURSE STRUCTURE

<table>
<thead>
<tr>
<th>S.No</th>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Lectures</th>
<th>T/P/D</th>
<th>Credits</th>
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**Total**: 19 lectures, 13 tutorials, 25 credits

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# III YEAR II SEMESTER

## COURSE STRUCTURE

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<th>S.No</th>
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**Total**: 19 lectures, 13 tutorials, 25 credits

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**T** – Tutorial  
**P** – Practical  
**D** – Drawing
UNIT I


Water: Quality of mixing water.


UNIT II


UNIT – III


UNIT IV


UNIT V


TEXT BOOKS:

2. Concrete Technology by M.S.Shetty. – S.Chand & Co.; 2004

REFERENCES:

2. Concrete Technology by A.R. Santha Kumar, Oxford university Press, New Delhi
UNIT I


UNIT II

DESIGN DETAILING OF BEAMS: Limit state analysis and design of singly reinforced, doubly reinforced, T and L beam sections.

SHEAR, TORSION AND BOND: Limit state analysis and design of section for shear and torsion – concept of bond, anchorage and development length, IS Code provisions. Design examples in simply supported and continuous beams, detailing.

UNIT III

DESIGN AND DETAILING OF SHORT AND LONG COLUMNS: Subjected to axial loads – Uniaxial and biaxial bending - IS Code provisions.

UNIT IV

DESIGN AND DETAILING OF FOOTINGS: Different types of footings – Design of isolated, square, rectangular and circular footings - Introduction to combined footings.

UNIT V

DESIGN AND DETAILING OF SLABS: Design of one way, two way and continuous slabs using IS Codes.

Limit state of serviceability for deflection and cracking – IS Code provisions.

Introduction to yield line theory.

TEXT BOOKS

1. Limit state design of RC structures by A. K. Jain.
REFERENCE BOOKS


UNIT I


UNIT II

MOMENT DISTRIBUTION METHOD: Introduction - Application to continuous beams with and without settlement of supports - Application to portal frames with and without sway.

UNIT III

SLOPE-DEFLECTION METHOD: Introduction - Derivation of slope deflection equations - Application to continuous beams with and without settlement of supports - Application to portal frames with and without sway (DOF not exceeding 3).

UNIT IV

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 determinate beams trusses using first theorem and unit load method - Castigliano’s second theorem - Analysis of indeterminate trusses and frames whose degree of redundancy is not exceeding two.

UNIT V

INFLUENCE LINES AND MOVING LOADS: Definition of Influence Line (IL) - IL for support reactions, shear force (SF) and bending moment (BM) at a section for ss beams with and without overhang - Load position for maximum reaction, SF and BM at a section due to moving point loads, udl longer than span and shorter than the span- two point loads - Maximum BM under a chosen point load - Absolute maximum BM for a girder - Influence lines for forces in members of Pratt and Warren trusses.

TEXT BOOKS

1. Basic structural Analysis by C.S. Reddy, Tata Mcgrawhill, New Delhi

REFERENCES BOOKS

5. Introduction to structural analysis by B.D. Nautiyal, New age international publishers, New Delhi
7. Analysis of Structures by T.S. Thandavamoorthy, Oxford University Press, New Delhi
ANURAG GROUP OF INSTITUTIONS  
(AUTONOMOUS)  

III Year B.Tech. CIVIL - I Sem  
(L T/P/D C)  
3 1 3  

(A55004) SOIL MECHANICS  

UNIT I  


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

UNIT II  


UNIT III  


UNIT IV  


UNIT V  

TEXT BOOKS


REFERENCES


3. Geotechnical Engineering by Purushotham Raj

UNIT I


Abstraction from rainfall-evaporation, factors affecting evaporation, measurement of evaporation-evapotranspiration-Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices.

UNIT II

Distribution of Runoff-Hydrograph Analysis Flood Hydrograph – effective Rainfall - base flow separation – Direct Runoff Hydrograph- Unit Hydrograph, definition, and limitations of applications of Unit hydrograph, derivation of Unit Hydrograph, from Direct Runoff Hydrograph and vice versa - S-hydrograph, Synthetic Unit Hydrograph.

UNIT III

Ground water Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissibility and storage coefficient, Darcy’s law, radial flow to wells in confined and unconfined aquifers. Types of wells – Well Construction – Well Development

UNIT IV

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.

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- Design discharge for water course. Depth and frequency of Irrigation, irrigation efficiencies – water Logging.

UNIT V

Classification of canals, design of Irrigation canals by Kennedy’s and Lacey’s theories, balancing depth of cutting, IS standards for a canal design canal lining.

Design Discharge, Computation of design discharge-rational formula, SCS curve number method, flood frequency analysis introductory part only – Stream Guaging – measurement and estimation of stream flow.
TEXT BOOKS

2. Irrigation and water power engineering by Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi

REFERENCE BOOKS

1. Elementary hydrology by V.P.Singh, PHI publications.
3. Irrigation Water Management by D.K. Majundar, Printice Hall of India.
UNIT I


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 II


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 III


UNIT IV

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 V


**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 BOOKS**


**REFERENCES BOOKS**

3. Suma Damodaran, Managerial Economics, Oxford University Press.
LIST OF EXPERIMENTS

I. Tests on Cement
1. Fineness and normal consistency of cement
2. Initial setting time and final setting time of cement
3. Specific gravity of cement
4. Compressive strength of cement

II. Tests on Aggregate
1. Fineness modulus of fine and coarse aggregate
2. Specific gravity and bulk density of fine and coarse aggregate
3. Bilking of sand

II. Tests on Concrete
1. Workability tests on concrete by slump and Vee-bee
2. Young’s modulus and compressive strength of concrete
3. Splitting tensile strength of concrete
4. Flexural strength of plain concrete
5. Non-destructive testing on concrete (for demonstration)
LIST OF EXPERIMENTS

1. Attenberg Limits (Liquid Limit, Plastic Limit)
2. (a) Field density by core cutter method and (b) Determination of specific gravity of soil
3. Field density by sand replacement method
4. Grain size distribution by sieve analysis
5. Grain size distribution by hydrometer analysis
6. Permeability of soil by constant and variable head test methods
7. Standard Proctor’s compaction tests
8. Determination of coefficient of consolidation (Square root time fitting method)
9. Unconfined compression tests
10. Triaxial compression test
11. Direct shear test
12. Vane shear test
13. Differential free swell index

Note: Any 10 experiments may be completed
1. Introduction
The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use good English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:
This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

To improve the students’ fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

Further, they would be required to communicate their ideas relevantly and coherently in writing.
3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:


- **Writing Skills** – Structure and presentation of different types of writing - Resume Writing /E-Correspondence/Statement of Purpose.


- **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/Seminars, Written Presentations through Projects/ PPTs/e-mails etc.

- **Interview Skills** – Concept and Process, Pre-Interview Planning, Opening Strategies, Answering Strategies, Interview through Telephone and Video-Conferencing.

4. Minimum Requirement: The English Language Lab shall have two parts:

   i) The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.

   ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

**System Requirement (Hardware component):** Computer network with Lan with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

ii) Headphones of High quality

5. Suggested Software:
The software consisting of the prescribed topics elaborated above should be procured and used.
Suggested Software:

- Clarity Pronunciation Power – part II
- Oxford Advanced Learner’s Compass, 7th Edition
- DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- The following software from train2success.com:
  i. Preparing for being Interviewed,
  ii. Positive Thinking,
  iii. Interviewing Skills,
  iv. Telephone Skills,
  v. Time Management
  vi. Team Building,
  vii. Decision making
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:

UNIT I
Welded connections - Types of welded joints - Specifications - Design requirements.

UNIT II
Design of compress members - Buckling class - Slenderness ratio/Strength design - Design of angle section and rolled steel column sections.
Design of Columns - Laced and battened columns - Splice.
Column Bases: Slab base - Gusseted base.

UNIT III
Design of beams - Plastic moment - Bending and shear strength / buckling - Built-up sections - laterally supported beams.
Beam Connections - Design of eccentric connections – Framed - Stiffened / seated connection.

UNIT IV

UNIT V
Design of roof trusses - Types of roof trusses - Loads on trusses - Estimation of wind loads as per IS 875 - Purling design - Truss design - Design of joints and end bearings.

TEXT BOOKS

REFERENCE BOOKS
1. Design of steel structures by K.S Sairam, person education
2. Design of steel structures Edwin H.gaylord, Jr. charless N.gaylord and jams stallmeyer tata Mc Graw – hill education pvt ltd
3. Design of steel structures by S.S.bhavikatti, I.K Int. Publication House, New Delhi, 2010
UNIT I
Sources of water: Selection of water source based on quality, quantity and other considerations – intakes – infiltration galleries, confined and unconfined aquifers distribution system – requirements – methods and layouts.

UNIT II
Layout and general outline of water treatment units – sedimentation, uniform settling velocity – principles – design factors – surface loading – jar test – optimum dosage of coagulant – coagulation fluctuations clarifier design – coagulants – feeding arrangements


UNIT III
Distribution systems – types of layouts of distribution systems – design of distribution system – Hardy cross and equivalent pipe methods and service reservoirs – joints, valves such as sluice valves, air valves, scour valves and check valves water meter – laying and testing of pipe lines – pump house.

Conservancy and water carriage systems – sewage and storm water estimation – time of concentration – storm water over flows combined flow.
Layouts and general outline of various units in a waste water treatment plant – primary treatment design of screens – grit chambers – skimming tanks – sedimentation tanks – principles and design of biological treatment – tricking filters – standard and high rate.

UNIT IV

UNIT V

TEXT BOOKS

1. Water supply and sanitary engineering by G.S. birdi, dhanpat rai & sons publishers
3. Elements of envrimental engineering by K.N duggal, S.chand publishers

REFERENCE BOOKS

1. Water and waste water technology by mark J hammar and mark J.hammer Jr
2. Water and waste water technology by steel
3. Water and waste water engineering by fair geyer and okun
5. Waste water engineering by Metcalf and eddy
6. Unit operations in environmental engineering by R. elangovan and M.K.saseetharan, new age international
Unit I
(a) **Stone Masonry:** Cutting and dressing, selection of stones, types of stone masonry, principles of construction joints in masonry, lifting heavy stones, common building stones in India.

(b) **Brick Masonry:** Qualities of good bricks, classification of bricks, Tests on bricks as per IS codes, terms used in brickwork, commonly used types of bonds in brickwork such as stretchers and headers in English and Flemish bonds, principles of construction, Reinforced brickwork, brick noggin, parapets, copings, sills and corbels, brief introduction to cavity walls, load bearing and partition walls, Masonry construction using cement concrete blocks and clay blocks, precast construction, Introduction to methods and materials, precast elements like poles, cover, jallies, steps etc.

Unit II
(a) **Arches and lintels:** Terminology in construction, types, chajjas and canopies, precast lintel and arches.

(b) **Damp proofing:** Causes and effects of dampness, various methods of damp proofing, damp proofing in plinth protection, new techniques of damp proofing.

(c) **Floors:** General principles, types and method of construction, upper floors, finishing and testing of floor tiles, Synthetic and ceramic tiles.

(d) **Roofs:** Flat and pitched roofs, roof coverings, types and their construction, features, Thermal insulation.

Unit III
(a) **Stairs:** Types of stairs, functional design of stairs.

(b) **Doors and windows:** Purpose and materials of construction and types.

(c) **Building Services:** **Plumbing services:** Water distribution, Sanitary lines & fittings; **Ventilations:** Functional requirements, system of ventilations; **Air conditioning:** Essentials and types; **Acoustics:** Characteristics, absorption, design; **Fire protection:** Fire hazards, classification of fire resistant materials and construction.

Unit IV
(a) **Plastering and pointing:** Necessity, types and methods.

(b) **Form work:** Centering and formwork, shoring, underpinning and scaffolding.

(c) **Painting:** White washing, colour washing and distempering, new materials and techniques.

Unit V
**Building Planning:** Principles of building planning, Classification of buildings and building by laws.
TEXT BOOKS


REFERENCE BOOKS

5. Building by laws by State and Central Governments and Muncipal Corporations.
UNIT I
STRESS DISTRIBUTION IN SOILS: Boussinesq’s and Wester gaard’s theories for point loads, uniformly loaded circular and rectangular areas, pressure bulb, variation of vertical stress under point load along the vertical and horizontal plane, and newmark’s influence chart for irregular areas.

UNIT II
BEARING CAPACITY OF SOILS: Terzhaghi’s equation for bearing capacity in soils – it’s modification for continuous, square, rectangular and circular footings, general and local shear failure conditions. Plate load test as per IS specification. Allowable bearing capacity. Standard penetration test and use of N values for estimating soil condition and bearing capacity. Proportioning of footings and rafts.

SETTLEMENT ANALYSIS: Computation of pressures before loading and after loading. Estimation of settlement – ultimate and after any given period. Correction for construction period.

UNIT III

UNIT IV
PILE FOUNDATION: Types of piles – load carrying capacity of piles based on static pile formulae – Dynamic pile formula –pile load tests- load carrying capacity of pile groups in sands and clays – settlement of pile groups.

UNIT V
COFFER DAMS: Earth embankments, cantilever sheet piles, braced coffer dams, double wall coffer dams, cellular, coffer dams – circular, diaphragm type, general description and construction methods.
CAISSONS: types of caissons such as open, pneumatic and box caissons (floating caissons), General description and construction methods.
DEWATERING TECHNIQUES: Sumps, ditches, well points, deep wells.
TEXT BOOKS

REFERENCE BOOKS
2. Geotechnical engineering by S.K gulhatti & manoj datta – tata Mc.graw hills publishing company new delhi 2005
3. Teng, W.C – foundation design, prentice hall, new jersy
UNIT I

UNIT II
HIGHWAY GEOMETRIC DESIGN: Importance of geometric design – design controls and criteria – high way cross section elements – sight distance elements – stopping sight distance, over taking sight distance and intermediate sight distance – design of horizontal alignment – design of super elevation and extra widening – design of transmission curve – design of vertical alignments – gradients – vertical curves. Typical cross sections for different types of roads

UNIT III
TRAFFIC ENGINEERING: Basic parameters of traffic – volume , speed and density – traffic volume studies – data collection and presentation – parking studies and parking characteristics – road accidents – causes and preventive measures – accident data recording – condition diagram and collusion diagrams . traffic infrastructures and safety audits

UNIT IV
TRAFFIC REGULATION AND MANAGEMENT: Road traffic signs – types and specifications – road markings – need for road markings – types of road markings – design of traffic signals – Webster method – IRC method intelligent transportation systems typical architectures

UNIT V
TRAFFIC INTERSECTION DESIGN: types of intersections – conflicts at intersections – types of at – grad intersections – canalization: objectives – traffic islands and design criteria – types of grade separated intersections – rotary intersections – concept of rotary and design criteria – impact of geometrics on intersection with reference safety , operational capacity

PAVEMENT DESIGN: Pavement types, factors to be considered for pavement design – Concept of layer theory, design wheel load, ESWL, EALF, vehicle damage factor, design by CBR developed by US corps of Engineers, IRC cumulative standard axiles methods (IRC 37: 2002).

TEXT BOOKS
REFERENCE BOOKS
ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)

III Year B.Tech. CIVIL - II Sem

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(A56006) MANAGEMENT SCIENCE

Objective: To provide students a wonderful opportunity of learning the basics and concepts of management functions like Marketing, HRM, Operations Management and an Organization environment.

Unit-I

Unit-II
A) Operations Management: Principles and Types of Plant Layout-Methods of production(Job, batch and Mass production), Work Study – Basic procedure involved in Method Study and Work measurement-Statistical Quality Control: X chart, R chart, C chart, P chart, (simple problems), Acceptance Sampling, Deming’s contribution to quality.

B) Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records – Supply Chain Management.

Unit –III

B) Marketing: Functions of Marketing, Marketing Mix, Marketing strategies based on Product Life cycle, Channels of distribution.

Unit –IV
Project Management(PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method(CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing.(simple Problem)

Unit –V
Strategic & Contemporary Management Practices: Mission, Goals, objectives, policy, strategy, Programmes, Elements of Corporate Planning process, Environmental Scanning, SWOT analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Basic concepts of Just-In-Time(JIT) system, Total Quality Management(TQM), Six Sigma and Capability Maturity Model(CMM) levels, Value chain Analysis, Enterprise

**Text books:**
1. Aryasri: Management Science, TMH, New Delhi, 2009

**References:**
ANURAG GROUP OF INSTITUTIONS  
(AUTONOMOUS)

III Year B.Tech. CIVIL - II Sem  

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(A56007) CONSTRUCTION TECHNOLOGY AND PROJECT MANAGEMENT

UNIT-I
Construction method – Earthwork – Piling – Concrete and concreting – Form work – Fabrication and erection.

UNIT-II

UNIT-III

UNIT-IV

UNIT-V

TEXT BOOK

REFERENCES:
UNIT-I


Types Of Environmental hazards & Disasters: Natural hazards and Disasters –Man induced hazards &Disasters-Natural Hazards- planetary Hazards/ Disasters- Extra planetary Hazards/disasters-planetary Hazards- Endogenous Hazards –Exogenous Hazards

UNIT-II


UNIT-III:


Floods: Causes of floods- Flood hazards India –Flood control measures( Human adjustment, perception &mitigation), Droughts: Impacts of droughts- Drought hazards in India- Drought control measures – Extra planetary Hazards/ Disasters-Man induced Hazards/Disasters-physical hazards/Disasters

UNIT-VI

Emerging approaches in Disaster Management - Three Stages

1. Pre-disaster stage (preparedness)
2. Emergency Stage
3. Post Disaster stage – Rehabilitation

Natural Disaster Reduction & Management

a) Provision of Immediate relief measures to disaster affected people
b) Predication Hazards & Disasters
c) Measures of adjustment to natural hazards

UNIT-V

Disaster Management - An integrated approach for disaster preparedness, mitigation & awareness.

Mitigation – Institutions – discuss the work of following Institution.

a. Meteorological observatory
b. Seismological observatory
c. Volcanology institution
d. Hydrology Laboratory
e. Industrial Safety inspectorate
f. Industrial Safety inspectorate
g. Chambers of Architects
h. Engineering Council
i. National Standards Committee
   Integrated planning – Contingency management preparedness
a) Education on disasters
b) Community involvement
c) The adjustment of Human Population to Natural hazards & disasters Role of Media Monitoring Management - Discuss the programme of disaster research & mitigation of disaster of following organizations.

a) International Council for Scientific Unions (ICSU)- Scientific committee on problems of the Environment (SCOPE) International Geosphere - Biosphere programme (IGBP)
b) World federation of Engineering Organizations (WFED)
c) National Academy of Sciences
d) World Meteorological organizations (WMO)
e) Geographical Information System (GIS)
f) International Association of Seismology & physics of Earth’s Interior (IASPEI)
g) Various U.N agencies like UNCRD, IDNDR, WHO, UNESCO, UNICEF, UNEP.
Mitigation

a) Regional survey of land Subsidence, coastal disaster, Cyclonic disaster and disaster in hills with particular reference to India

b) Ecological planning for sustainability and sustainable development in India, Sustainable rural development. A remedy to disasters-role of panchayat in disaster mitigations

c) Environmental policies and programs in India-Institutions and National centers for natural disaster reduction, Environmental legislation, Awareness, conversion movement, education and training.

TEXT BOOK:

Disaster Mitigation: Experiences and Reflections by Pardeep Sahni

REFERENCES

1. R.B Singh (Ed) Environmental Geography, Heritage Publishers New Delhi, 1990
2. Savinder Singh Environmental Geography, Prayag pustak Bhawan, 1997
4. R.R Singh (Ed)Disaster Management, Rawat Publiction, New Delhi, 2000
6. R.R. Singh, Space Technology for Disaster Mitigation in India (INCED), University of Tokyo, 1994
7. Dr. Satender, Disaster Management in Hills , Concept publishing co., New Delhi,2003
8. A.S. Arya Action plan For Earthquake, Disaster, Mitigation in V.K. Sharma (Ed) Disaster Management IIPA publication New Delhi, 1994
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TEXT BOOKS:


REFERENCES:

2. Fundamentals of database systems, Elmasri Navrate Pearson Education.
3. Introduction to database systems, C.J.Date Pearson Education.
4. Oracle for Professionals, The X Team, S.Shah and V.Shah, SPD.
5. Database systems using Oracle: A Simplified guide to SQL and PL/SQL Shah, PHI.
LIST OF EXPERIMENTS

1. Determination of pH and turbidity
2. Determination of conductivity and total dissolved solids (Organic and Inorganic)
3. Determination of alkalinity/acidity
4. Determination of chlorides
5. Determination of iron
6. Determination of dissolved oxygen
7. Determination of nitrates
8. Determination of optimum dose of coagulant
9. Determination of chlorine demand
10. Determination of total phosphorous
11. Determination of B. O. D.
12. Determination of C. O. D.
13. Determination of optimum coagulant dose
14. Determination of chlorine demand
15. Presumptive coliform test

Note: Minimum of 10 experiments are to be conducted from the above list.
(A56202) COMPUTER AIDED DRAWING LAB

1. Introduction to computer aided drafting
2. Software for CAD – Introduction to different softwares
3. Practice exercises on AutoCAD software
4. Drawing of plans of buildings for (a) single storied buildings (b) multistoried buildings
5. Developing section and elevations for (a) single storied buildings (b) multistoried buildings
6. Detailing of building components like doors, windows roof trusses etc. using CAD software
7. Exercises on development of working drawings of buildings

TEXT BOOKS

I. TESTS ON ROAD AGGREGATES

1. Aggregate crushing value
2. Aggregate impact value
3. Specific gravity and water absorption
4. Los Angeles abrasion test
5. Shape tests: (a) Elongation index, (b) Flakiness index and (c) Angularity number

II. TESTS ON BITUMEN

1. Penetration tests
2. Softening point tests
3. Ductility tests
4. Viscosity grading
5. Bitumen extraction tests

III. TESTS ON BITUMEN MIXES

1. Marshal stability test
2. Indirect tensile test