

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

III Year B.Tech. C.E. I –Sem

L	T/P/D	C
0	-3/-	2

(55601) ENGINEERING GEOLOGY LAB

1. Study of physical properties and identification of minerals referred under theory.
2. Megascopic and microscopic description and identification of rocks referred under theory.
3. Megascopic and microscopic identification of rocks & minerals.
4. Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.
5. 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. Interpretation of a Geological map along with a geological section.
4. Simple strike and Dip problems.

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III Year B.Tech. C.E. II –Sem

L	T/P/D	C
3	-2/-	4

(56001) DESIGN OF STEEL STRUCTURES

UNIT – I

Materials – Making of iron and steel – types of structural steel – mechanical properties of steel – Concepts of plasticity – yield strength. Loads – and combinations local buckling behavior of steel. Concept of limit State Design – Limit States – Design Strengths- deflection limits – serviceability – stability check.

UNIT – II

Bolted connections – Riveted connections – IS – 800 – 2007 - specifications – Design strength – efficiency of joint – prying action. Welded connections – Types of welded joints – specifications - design requirements.

UNIT – III

Design of tension members– Design strength – Design procedure splice - lug angle.

UNIT – IV

Design of compress in members – Buckling class – slenderness ratio / strength design – laced – batted columns – splice – column base – slab /

UNIT – V

Design of Beamss – Plastic moment – Bending and shear strength / buckling – Builtup sections – laterally / supported beams.

UNIT – VI

Design of eccentric connections – Framed – stiffened / seat connection.

UNIT – VII

Design of plate girders – elements – economical depth – design of mairt section – connections between web and flange – design of stiffness bearing – intermediate stiffeners – Design of Websplca & Flange splca.

UNIT – VIII

Design of roof trusses – Types of roof trusses, loads on trusses – purlin design – truss design, Design of joints and end bearings.

TEXT BOOKS :

1. Design of steel structures – N. Subramanian, Oxford University Press – 2009.
2. Limit State Design of steel structures, S.K. Duggal, Tata McGraw-Hill, 2010

REFERENCE BOOKS :

1. Design of Steel structures by K.S. Sai Ram, Person Education.
2. Design of Steel Structures Edwin H. Gaylord, Jr. Charles N. Gaylord and James Stallmeyer Tata McGraw-Hill Education pvt. Ltd.
3. Design of Steel Structures Vol. 1 & 2 – Ramchandra, Standard Publications.
4. Design of steel structures, Structures, S.S. Bhavikatti, IK int Publication House, New Delhi, 2010.

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III Year B.Tech. C.E. II –Sem

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(56002) ENVIRONMENTAL ENGINEERING

UNIT – I

Introduction: Waterborne diseases – protected water supply – Population forecasts, design period – water demand – Types of 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, confined and unconfined aquifers distribution systems. – requirements – methods and layouts.

UNIT III

Layout and general outline of water treatment units – sedimentation, uniform settling velocity – principles – design factors – surface loading – Jar test – optimum dosage of coagulant - 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 – types of disinfection - theory of chlorination - chlorine demand - other disinfection treatment methods.

UNIT - V

Distribution systems – types of layouts of Distribution systems – design of distribution systems - 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 – VI

Layout and general out line 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 – trickling filters – standard and high rate.

UNIT - VIII

Construction and design of oxidation ponds - Sludge digestion tanks – 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 Pvt.Ltd, New Delhi
3. Elements of environmental engineering by K.N. Duggal, S. Chand Publishers

REFERENCES :

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. Waste water treatment- concepts and design approach by G.L. Karia and R.A. Christian, PHI
5. Waste water Engineering by Metcalf and Eddy.
6. Unit operations in Environmental Engineering by R. Elangovan and M.K. Saseetharan, New age International.

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(56003) WATER RESOURCES ENGINEERING-II

UNIT-I

Storage Works-Reservoirs - Types of reservoirs, selection of site for reservoir, zones of storage of a reservoir, reservoir yield, estimation of capacity of reservoir using mass curve- Reservoir Sedimentation – Life of Reservoir.. Types of dams, factors affecting selection of type of dam, factors governing selection of site for a dam.

UNIT-II

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, Factors of Safety - Stability Analysis, Foundation for a Gravity Dam, drainage and inspection galleries.

UNIT-III

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-IV

Spillways: types of spillways, Design principles of Ogee spillways - Spillway gates. Energy Dissipaters and Stilling Basins Significance of Jump Height Curve and Tail Water Rating Curve - USBR and Indian types of Stilling Basins.

UNIT-V

Diversion Head works: Types of Diversion head works- weirs and barrages, layout of diversion head work - components. Causes and failure of Weirs and Barrages on permeable foundations, -Silt Ejectors and Silt Excluders

UNIT-VI

Weirs on Permeable Foundations – Creep Theories - Bligh's, Lane's and Khosla's theories, Determination of uplift pressure- Various Correction Factors – Design principles of weirs on permeable foundations using Creep theories - exit gradient, U/s and D/s Sheet Piles - Launching Apron.

UNIT-VII

Canal Falls - types of falls and their location, Design principles of Notch Fall and Sarada type Fall.

Canal regulation works, principles of design of distributory and head regulators, Canal Cross Regulators -canal outlets, types of canal modules, proportionality, sensitivity and flexibility.

UNIT-VIII

Cross Drainage works: types, selection of site, Design principles of aqueduct, siphon aqueduct and super passage. Design of Type II Aqueduct (Under Tunnel)

TEXT BOOKS:

1. Irrigation engineering and hydraulic structures by S.K Garg, Khanna publishers.
2. Irrigation and water power engineering by Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi

REFERENCES:

1. Irrigation and water resources engineering by G.L. Asawa, New Age International Publishers
2. Theory and Design of Hydraulic structures by Varshney, Gupta & Gupta
3. Irrigation engineering by K.R.Arora
4. Irrigation Engineering by R.K. Sharma and T.K. Sharma, S. Chand Publishers
5. Introduction to hydrology by Warren Viessvann, Jr, Garyl. Lewis, PHI
6. Engineering Hydrology by CS Pojha, R. Berndtsson and P. Bhunya, Oxford University Press.

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(56004) GEOTECHNICAL ENGINEERING-II**UNIT - I**

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

UNIT - II

SLOPE STABILITY: Infinite and finite earth slopes - types of failures - factor of safety of infinite slopes - stability analysis by Swedish arc method, standard method of slices, Bishop's Simplified method - Taylor's Stability Number- Stability of slopes of earth dams under 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 graphical method.

UNIT - IV

RETAINING WALLS: Types of retaining walls - stability of retaining walls against overturning, sliding, bearing capacity and drainage from backfill

UNIT - V

SHALLOW FOUNDATIONS - BEARING CAPACITY CRITERIA - Types - choice of foundation - Location of depth - Safe Bearing Capacity - Terzaghi, Meyerhof, Skempton and IS Methods

UNIT - VI

SHALLOW FOUNDATIONS - SETTLEMENT CRITERIA - Safe bearing pressure based on N- value - allowable bearing pressure; safe bearing capacity - plate load test - allowable settlements of structures.

UNIT -VII

PILE FOUNDATION: Types of piles - Load carrying capacity of piles based on static pile formulae - Dynamic pile formulae - Pile load tests - Load carrying capacity of pile groups in sands and clays - Settlement of pile groups.

UNIT - VIII

WELL FOUNDATIONS: Types – Different shapes of wells – Components of wells – functions and Design Criteria – Sinking of wells – Tilts and shifts.

TEXT BOOKS:

1. Basic and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New Age International Pvt. Ltd, (2004).
2. Das, B.M., - (1999) Principles of Foundation Engineering – 6th edition (Indian edition) Thomson Engineering
3. Geotechnical Engineering : Principles and practices of soil mechanics and foundation Engineering by VNS Murthy, Taylor & Francis Group.

REFERENCES:

1. Analysis and Design of Substructures – Swami Saran, Oxford and IBH Publishing company Pvt Ltd 1998
2. Geotechnical Engineering by S. K. Gulhati & Manoj Datta – Tata Mc.Graw Hill Publishing company New Delhi. 2005.
3. Teng, W.C – Foundation Design, Prentice Hall, New Jersey
4. Bowles, J.E., (1988) Foundation Analysis and Design – 4th Edition, McGraw-Hill Publishing company, New York.

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(56005) TRANSPORTATION ENGINEERING**UNIT I**

HIGHWAY DEVELOPMENT AND PLANNING: Highway development in India – Necessity for Highway Planning- Different Road Development Plans.

UNIT – II

HIGHWAY PLANNING: Classification of Roads- Road Network Patterns – Highway Alignment- Factors affecting Alignment- Engineering Surveys – Drawings and Reports, Road Projects initiation need based planning.

UNIT – III

HIGHWAY GEOMETRIC DESIGN: Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distance Elements- Stopping sight Distance, Overtaking Sight Distance and intermediate Sight Distance- Design of Horizontal Alignment- Design of Super elevation and Extra widening- Design of Transition Curves- Design of Vertical alignment- Gradients- Vertical curves. Typical cross sections for different types of roads.

UNIT – IV

TRAFFIC ENGINEERING: Basic Parameters of Traffic- Volume, Speed and Density- Traffic Volume Studies- Data Collection and Presentation- speed studies- Data Collection and Presentation- Parking Studies and Parking characteristics- Road Accidents- Causes and Preventive measures- Accident Data Recording – Condition Diagram and Collision Diagrams. Traffic, infrastructural and safety audits.

UNIT - V

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.

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**(56007) URBAN DISASTER – INTELLIGENT
CONTROLS SYSTEMS
(OPEN ELECTIVE)**

UNIT – I

Disasters : Types of disaster, Significant aspects of disasters, economic impact of disasters, Risk aspects, Hazards and disasters.

UNIT – II

Urban Disaster and their environmental impacts : Impact of earthquakes, floods, fires, droughts, land slides, Congestion pollution, accident risk on urban environment policies for remedial measures. Technology to forecast their impact.

UNIT – III

Technology to Track Urban Disasters : Monitoring profile – cameras, sensors and communication systems Engineering profiles – total station, terrestrial scanners, and other survey equipment.

UNIT - IV

Planning Profile – Impact on Urban Disasters: Planning profile – GPS, satellite technology and photogrammetric technique.

UNIT – V

Information systems : Geography information systems – different packages and over view, MIS – Architecture, web enabled communication systems – over view.

UNIT – VI

Intelligent control system : Technology enabled online monitoring system, post evaluation multi criteria systems, forecasting approaches through decision supporting systems.

UNIT - VIII

Disasters – case studies on disaster mitigation measures.

REFERENCES & TEXT BOOKS:

1. Disasters – Global challenges and local solutions by Rajib Shaw. R.R. Krishna Murthy, University Press.
2. Sensor Technologies & Date requirement of ITS by Lawrence A. Klein.
3. Disaster mitigation – Experiences and reflections – Pradeep sahni, Alka Dhameja, Uma Medhuri, PHI.

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**(56008) INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE)**

UNIT – I

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

Trade Marks : Purpose and function of trade marks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT – III

Law of copy rights : Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

UNIT – IV

Law of patents : Foundation of patent law, patent searching process, ownership rights and transfer

UNIT – V

Trade Secrets : Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

UNIT – VI

Unfair competition : Misappropriation right of publicity, False advertising.

UNIT – VII

New development of intellectual property: new developments in trade mark law ; copy right law, patent law, intellectual property audits.

UNIT – VIII

International overview on intellectual property, international – trade mark

law, copy right law, international patent law, international development in trade secrets law.

References & Text Books :

1. Intellectual property right, Deborah. E. Bouchoux, cengage learning.
2. Intellectual property right – nleashmy the knowledge economy, prabuddha ganguli, Tate Mc Graw Hill Publishing company ltd.,

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(56600) GEOTECHNICAL ENGINEERING LAB

LIST OF EXPERIMENTS

1. Atterberg's Limits (LL & PL)
2. Field density-core cutter and sand replacement method
3. Grain size analysis (Sieve and Hydrometer analysis)
4. Permeability of soil, constant and variable head test
5. Compaction test
6. CBR Test
7. Consolidation test
8. Unconfined compression test
9. Tri-axial Compression test
10. Direct shear test.
11. Vane shear test

Note: Any eight experiments may be completed.

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**(56601) ADVANCED ENGLISH COMMUNICATION
SKILLS LAB**

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 organise 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:

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.

- Vocabulary Building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Reading Comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, Critical reading.
- Writing Skills – structure and presentation of different types of writing – *Resume writing / e-correspondence/Technical report writing/Portfolio writing* – planning for writing – *research abilities/data collection/organizing data/tools/analysis* – improving one's writing.
- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Presentation Skills – Oral presentations (individual and group) through JAM sessions/seminars and written presentations through posters/projects/reports/PPTs/e-mails/assignments etc.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele 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'
 - Preparing for being Interviewed,
 - Positive Thinking,
 - Interviewing Skills,
 - Telephone Skills,
 - Time Management
 - Team Building,
 - Decision making
 - **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge
- 6. Books Recommended:**
1. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
 2. **Advanced Communication Skills Laboratory Manual** by Sudha Rani, D, Pearson Education 2011.
 3. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
 4. **English Vocabulary in Use series**, Cambridge University Press 2008.
 5. **Management Shapers Series** by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
 6. **Communication Skills** by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
 7. **Handbook for Technical Writing** by David A McMurrey & Joanne Buckley CENGAGE Learning 2008.
 8. **Job Hunting** by Colm Downes, Cambridge University Press 2008.
 9. **Master Public Speaking** by Anne Nicholls, JAICO Publishing House, 2006.
 10. **English for Technical Communication for Engineering Students**, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.

11. **Books on TOEFL/GRE/GMAT/CAT/IELTS** by Barron's/DELTA/ Cambridge University Press.
12. **International English for Call Centres** by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.

DISTRIBUTION AND WEIGHTAGE OF MARKS:*Advanced Communication Skills Lab Practicals:*

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.