



II YEAR II SEMESTER



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY SOLID MECHANICS- II

Course Code: GR22A2017
II Year II Semester

L/T/P/C: 2/1/0/3

Prerequisites: Mathematics, Physics, Engineering Mechanics, and Solid Mechanics I

Course Outcomes:

1. Compute various stresses in thin and thick cylinders under pressure, show stress distribution diagrams and define Lamé's theorems.
2. Analyze the torsional strength of structural members and differentiate between closed and open coiled helical springs.
3. Determine the buckling failure load for axially loaded and eccentrically loaded columns.
4. Evaluate stresses in dams, retaining walls and chimneys, and to check the stability of dams.
5. Evaluate the behaviour of members under unsymmetrical bending and find stresses in circular and semi-circular beams.

UNIT I

Thin Cylinders: Derivation of formula for longitudinal and hoop stress, calculation of longitudinal stress and hoop stress, longitudinal and volumetric strains, changes in diameter and volume of thin cylinders and sphere subjected to internal pressures.

Thick Cylinders: Introduction -Lamé's theory for thick cylinders- derivation of Lamé's formulae, distribution of hoop, radial stresses across thickness due to internal pressure, design of thick cylinders and thick spherical shells.

UNIT II

Torsion of Circular Shafts: Assumptions and derivation of torsion equation, Torsional moment of resistance, polar section modulus, power transmitted by shafts, torsional rigidity, combined bending, torsion, and end thrust of circular shafts, principal stress and maximum shear stresses under combined loading of bending and torsion.

Springs: Introduction, types of spring, analysis of close coiled helical spring, elliptical and open coiled helical spring.

UNIT III

Columns and Struts: Introduction –Types of columns–Short, medium, and long columns. Axially loaded compression members, crushing load. Euler's theorem for long columns, assumptions, derivation of Euler's critical load formulae for various end conditions. Effective length of a column, slenderness ratio, Euler's critical stress, limitations of Euler's theory, Rankine's formula, Gordon formula, Long columns subjected to eccentric loading, Secant formula, Empirical formulae, Johnson's straight line and parabolic formula.

Beam Columns: Laterally loaded struts subjected to uniformly distributed and concentrated loads, Maximum B.M and stress due to transverse and lateral loading.

UNIT IV

Direct and Bending Stresses of Dams, Retaining walls and Chimneys: Stresses under the action of direct loading and bending moment, core of a section. Determination of stresses in the case of chimneys, retaining walls and dams. Conditions for stability of dams. Stresses due to direct loading and bending moment about its axis.



UNIT V

Unsymmetrical Bending of Beams: Introduction–Centroid principal axes of section–Graphical 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. Curved Beams: Introduction – circular beams loaded uniformly and supported on symmetrically placed columns and Semi-circular beams simply supported on three equally spaced supports.

Text Books

1. R.K Bansal, A textbook of Strength of materials, Laxmi Publications (P) Ltd., New Delhi, 6th Edition, 2018.
2. R.K. Rajput, Strength of materials, S. Chand & Co, New Delhi, 6th Edition, 2015.
3. S.S. Bhavikatti, Strength of materials, Vikas Publications, 4th Edition, 2021.

Reference Books

1. Ferdinand Beer and others, Mechanics of solid, Tata Mc. Graw Hill Publications, 7th Edition, 2014.
2. A.R. Basu, Strength of materials, Dhanpat Rai & Co, Nai Sarah, New Delhi, 2nd Edition, 2012.
3. L.S. Srinath, Strength of materials, Macmillian Publishers India Ltd, 2000.
4. B.S. Basavrajiah and P. Mahadevappa, Strength of materials, University Press, Hyderabad, 3rd Edition, 2010.



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SURVEYING AND GEOMATICS**

CourseCode:GR22A2018
II Year II Semester

L/T/P/C: 3/0/0/3

Course Outcomes:

1. Apply the knowledge, techniques, skills, and applicable tools of the discipline to Engineering and surveying activities.
2. To be able to apply the knowledge on levelling and area, volume calculations.
3. Acquire the knowledge on theodolite and traversing methods in surveying.
4. To be able to calculate, design and layout of horizontal and vertical curves and acquire the knowledge on modern surveying methods
5. Acquire knowledge about photogrammetry principles, methods and product generation strategies in both Analytical and digital Photogrammetry system

UNIT I

Introduction to Surveying: Introduction - Objectives, classification and principles of surveying, Scales, Shrinkage of Map, Conventional symbols and Code of Signals, Surveying accessories, phases of surveying.

Measurement of Distances and Directions Linear distances- Approximate methods, Direct Methods- Chains- Tapes, ranging, Tape corrections.

Prismatic Compass - Bearings, included angles, Local Attraction, Magnetic Declination and dip

UNIT II

Leveling

Simple Leveling: Basic definitions; Types of levels and levelling staffs - classification of methods of leveling; Sources of errors in leveling - Curvature and Refraction – Contour: contour interval; Characteristics of contours; Methods of plotting of contours; Uses of contour maps (Surveyor of India toposheets).

Areas and Volumes: Introduction- Simpson's rule - Boundaries with offsets at irregular intervals- coordinate method - planimeter; level section - two level section - trapezoidal and prismoidal rule - volume from contour plan - capacity of a reservoir.

UNIT III

Theodolite Surveying: Types of Theodolites, Fundamental Lines, temporary adjustments, measurement of horizontal angle by repetition method and reiteration method, measurement of vertical Angle, Trigonometric leveling when base is accessible and inaccessible.

Traversing: Methods of traversing, traverse computations, and adjustments, Omitted measurements

UNIT IV

Curves: Types of curves and their necessity, elements of simple, compound, reverse, transition, and vertical curves.

Tacheometric Surveying: Principles of Tacheometry, stadia, and tangential methods of Tachometry.

Modern Surveying Methods: Principle and types of E.D.M. Instruments, Total station- advantages and Applications. Field Procedure for total station survey, Errors in Total Station Survey, Global Positioning System- Principle and Applications.



UNIT V

Photogrammetry Surveying: Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods; photographic mapping-mapping using paper prints, mapping using stereo plotting instruments, mosaics, map substitutes. Digital Photogrammetry – Introduction- List of software related to Digital photogrammetry

Text Books

1. B C Punmia, Surveying, Vol- III, Higher surveying, Laxmi Publications,2016.
2. S K Duggal- Vol- I & II, McGraw-Hill publications, 5th edition, 2019.
3. T P Kanetkar and S V Kulkarni, Surveying and Levelling, PVGP publications,2006.

Reference Books

1. Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson India, first edition 2006.
2. Bhavikatti, S.S., Surveying and Levelling, Vol. I and II, I.K. International publications,2013.
3. Chandra, A.M., Higher Surveying, 2nd Edition, New Age International Publishers, 2006.
4. Anji Reddy, M., Remote sensing and Geographical information system, B.S.Publications, 4th edition, 2012.
5. Arora, K.R., Surveying, Vol-I, II and III, Standard Book House, 17th Edition,2019.
6. Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
STRUCTURAL ANALYSIS - I

Course Code: GR22A2019
II Year II Semester

L/T/P/C: 3/0/0/3

Prerequisites: Engineering Mechanics, Solid mechanics

Course Outcomes:

1. Determine deflections of beams and trusses using energy methods.
2. Analyze three and two hinged circular and parabolic arches.
3. Analyze indeterminate beams using force method for propped cantilever, fixed and Continuous beams (Clapeyrons's three moment theorem).
4. Apply Slope deflection, Moment distribution and Kani's methods to analyse statically indeterminate structures.
5. Analyze statically determinate structures using rolling load and influence line methods.

UNIT I

Energy Theorems: Introduction – strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces – Castiglione's first theorem – Deflections of simple beams and pin jointed trusses (Use Unit load method)

UNIT II

Arches: Classification of arches, advantage of arch, three and two hinged arches – Circular and parabolic arches yielding of supports, Effect of rib shortening, Effect of temperature changes, Tied and linear arch, Eddy's theorem.

UNIT III

Indeterminate Beams (Force Method)

- a. Propped cantilevers
- b. Fixed beams
- c. Continuous Beams (By Clapeyron's theorem of three moments).

UNIT IV

Analysis of Simple and Continuous Beams (Indeterminate Structures)

(up to 2nd degree of Static indeterminacy)

- a. Slope Deflection method.
- b. Moment Distribution method
- c. Kani's Method.

UNIT V

Moving Loads and Influence Line Diagrams: 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 Sloud – focal length.

Definition of influence line for SF, Influence line for B.M- load position for maximum SF at a section – Load positions for maximum BM at a section – Point loads, UDL longer than the span, UDL shorter than the span- Influence lines for forces in members of Pratt and Warren trusses.

Text Books

1. V. N. Vazirani & M. M. Ratwani, Analysis of structures –Vol. & Vol. II, Khanna Publications, New Delhi, 1994.
2. S Ramamrutham, Theory of structures, Dhanpat Rai publications, 9th edition 2014.



3. K U Muthu, Azmi Ibrahim, M Vijayanand, Maganti Janardhana, Basic Structural analysis, I KInternational Publishing House Pvt.Ltd,2017.

Reference Books

1. T.S. Thandavamoorthy, Analysis of structures, Oxford University Press, New Delhi,2005.
2. S.S Bhavikatti, Structural Analysis I, Vikas Publishing House, 4th edition,2010.
3. S.B. Junnakar, Mechanics of structures Vol II, Charotar Publishing House, Anand, Gujarat, 24th edition 2017.
4. Pandit& Gupta, Theory of structures, Vol I, Tata Mc. Graw Hill Publishing Co. Ltd., NewDelhi,1st edition, 2017.
5. R. S. Khurmi, Theoryof structures, S. Chand Publishers, 12th edition, 2020.
6. Dr. B.C. Punmia, Mechanics of Materials, Laxmi publications, 11th edition, 2017.
7. B.D. Nautical, Introduction to structural analysis, new age international publishers, NewDelhi,2001



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ECONOMICS AND ACCOUNTING FOR ENGINEERS**

Course Code: GR22A2004
II Year II Semester

L/T/P/C: 3/0/0/3

Course Outcomes:

1. The student will be able to understand the concepts of economics and Demand concepts, elasticity, and techniques for forecast demand of products.
2. The student will be able to plan the production levels in tune with maximum utilization of organizational resources and with maximum profitability.
3. To understand the types of markets, types of competition and to estimate the cost of products and decide the price of the products and services produced.
4. The student will be able to analyze the profitability of various projects using capital budgeting techniques and
5. The student is able will be able prepare the financial statements and more emphasis on preparation of final accounts.

UNIT I

Introduction & Demand Analysis: Definition and Scope: Introduction to micro, macroeconomics, Nature, and Scope of Managerial Economics. National Income and its Components - GNP, NNP, GDP, NDP **Demand Analysis:** Demand Determinants, Law of Demand, and its exceptions. **Elasticity of Demand:** Definition, Types, Measurement and Significance of Elasticity of Demand. **Demand Forecasting,** Factors governing demand forecasting, methods of demand forecasting.

UNIT II

Production & Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale. **Cost Analysis:** Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

UNIT III

Markets and Forms of Business organizations: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. **Pricing:** Objectives and Policies of Pricing. Methods of Pricing. Business: Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises, and their types.

UNIT IV

Capital Budgeting: Capital and its significance, Types of Capital, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value (NPV) Method and Internal Rate of Return (IRR) (simple problems) and Profitability Index (PI)

UNIT V

Introduction to Financial Accounting: Accounting Concepts and Conventions - Double-Entry Bookkeeping. **Accounting Cycle:** Journal, Ledger, Trial Balance, Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Text Books

1. Managerial Economics – International Edition, 2019, by Christopher Thomas (Author), S.Charles Maurice (Author), McGraw-Hill Education
2. Managerial Economics Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.
3. Managerial Economics: Analysis, Problems and Cases - P. L. Mehta, Edition, 13. Publisher, Sultan



Chand, 2007.

4. Financial Accounting Paperback – 2016 by K.L.Narang S.P.Jain, Kalyani Publishers,2005.

Reference Books

1. Managerial Economics 4th Edition, W. Cris Lewis, Sudhir K. Jain, H. Craig Petersen, Pearson, 2009
2. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2009
3. Financial Accounting, 6/e, Dr S N Maheshwari, CA Sharad K Maheshwari & Dr Suneel K Maheshwari, Vikas Publishing, 2018



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
HYDRAULIC ENGINEERING**

**Course Code: GR22A2020
II Year II Semester**

L/T/P/C: 2/0/0/2

Prerequisite: Fluid Mechanics

Course Outcomes:

1. Describe and predict the most economical Rectangular, Trapezoidal and circular channel sections and critical flow in rectangular channel.
2. Apply dynamic equation in non-Uniform flows and visualize surface properties of channel flow.
3. Analyze model and proto type simulation.
4. Analyze the hydraulic jump in rectangular channel.
5. Evaluate the efficiency of turbines, pumps and hydropower.

UNIT I

Introduction to Open Channel Flow: flow Comparison between open channel flow and pipe flow, geometrical parameters of a channel, classification of open channels, classification of open channel flow, Velocity Distribution of channel section. Characteristics of uniform flow, Computation of Uniform flow, Chezy's formula, Manning's formula. Factors affecting Manning's Roughness Coefficient 'n'. Most economical Rectangular, Trapezoidal and Circular Channel sections. Specific energy, Specific energy curve, critical flow in rectangular channel, discharge curve Specific force Specific depth, and Critical depth.

UNIT II

Non-Uniform Flow: Channel Transitions. Measurement of Discharge and Velocity – Venturi Flume, Parshall Flume, Measurement of Velocity- Current meter, Floats, Hot- wire. Gradually Varied Flow- Dynamic Equation of Gradually Varied Flow, Classification of channel bottom slopes, Classification of surface profile, Characteristics of surface profile, Computation of water surface profile, Direct Step method.

UNIT III

Hydraulic Jump: Theory of hydraulic jump, Elements and characteristics of hydraulic jump in a rectangular Channel, length and height of jump, location of jump, types, applications and location of hydraulic jump. Energy dissipation and other uses, surges a moving hydraulic jump.

Dimensional Analysis and Hydraulic Similitude: Dimensional homogeneity, Rayleigh method, Buckingham's Pi method. Buckingham's π Theorem application of dimensional analysis and model studies to fluid flow problem Dimensionless groups. Similitude, Model studies, Types of models. Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number.

UNIT IV

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, draft tube theory and function efficiency. Angular momentum principle, Applications to radial flow turbines. Governing of turbines, characteristic curves.

Basics of Turbo Machinery: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally, jet striking at tip of the vane.



UNIT V

Centrifugal 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-Cavitations - Reciprocating pumps basics and definition.

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

Text Books

1. Fluid Mechanics and Hydraulic Machines, K. Subramanya, Tata McGraw Hill, 2nd edition, 2018.
2. Modi & Seth, Hydraulic and Fluid mechanics, Standard Book House, 22nd edition, 2018.
3. K. Subramanya, Flow in Open Channel, Tata McGraw Hill, 5th edition, 2019.
4. Dr. R.K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) ltd., New Delhi, 10th Edition, 2019.

Reference Books

1. J.F.Douglas, J.M.Gaserek and J.A.Swaffird Fluid Mechanics, Prentice Hall, 5th edition, 2005.
2. Frank.M. White, Fluid Mechanics, Tata Mc. Graw Hill Pvt. Ltd, 4th Edition, 2013.
3. A.K. Mohanty, Fluid Mehanics, Prentice Hall of India Pvt. Ltd., New Delhi, 2nd Editon 1994.
4. Open Channel Hydraulics, VenTe Chow, Tata McGraw Hill, 2009.



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SURVEYING LAB**

Course Code: GR22A2021
II Year II Semester

L/T/P/C:0/0/4/2

Prerequisite: Surveying

Course Outcomes:

1. Define the characteristics and applications of basic survey instruments.
2. Apply knowledge of mathematics, science and engineering in land measurement Techniques.
3. Calculate distances, inclinations, elevations, areas and volumes.
4. Generate maps of earth surfaces.
5. Analyzing the data and transfer relevant points onto ground.

LIST OF EXPERIMENTS

TASK-1: (i) Measurement of an area by Chain Survey (Open and Closed Traverse).

(ii) Study of Topo sheets

TASK-2: Chaining across obstacles

TASK-3: Simple, fly, Differential Levelling.

TASK-4: Study of Theodolite- Measurement of horizontal and vertical angles- (Repetition and Reiteration method).

TASK-5: Trigonometric Levelling- Heights and distances problems.

TASK-6: Calculation of R.L and distance using tachometric survey.

TASK-7: Setting out Curve.

TASK-8: Determine the area of the field by using Total Station.

TASK-9: Column and foundation marking using Total Station.

TASK-10: (i) Distance, gradient, differential height between two inaccessible points using Total Station.

(ii) GPS Hand Application

Reference Books

1. B C Punmia, Surveying, Vol- III, Higher surveying, Laxmi Publications, 2016.
2. S K Duggal- Vol- I & II, McGraw-Hill publications, 5th edition, 2019.
3. T P Kanetkar and S V Kulkarni, Surveying and Levelling, PVGP publications, 2006.



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
COMPUTER AIDED DESIGN LAB**

Course Code: GR22A2022
II Year II Semester

L/T/P/C:0/0/4/2

Prerequisite: Engineering Graphics

Course Outcomes:

1. Comprehend the fundamentals of building drawings and understand CAD software for drafting.
2. Draw Material, Sanitary, Electrical Symbols and various brick bonds by using drawing commands in CAD.
3. Develop Geometric Plan, Sections and Elevations for single and multi- storeyed building with suitable scale and dimensions.
4. Draft the building components and sectional view of doors, windows and trusses.
5. Create the drawings of various trusses like King post truss, Queen post truss and North light truss.

LIST OF EXPERIMENTS

1. Introduction to Computer Aided Drafting
2. Software and Basic drawing commands for CAD
3. Conventional Symbols used in Building Construction
 - a) Building materials symbols
 - b) Plumbing fixtures and
 - c) Electric fixtures
4. Bonds in brick masonry
5. Drawing Plan, Section and Elevation of Building
 - a) Single room with R.C.C flat roof
 - b) A Residential building with single bedroom
 - c) R.C.C framed structure with R.C.C roof slab
 - d) Library building with R.C.C flat roof.
 - e) Planning of fully tiled gabled house
 - f) Workshop building with north light roof truss.
6. Drawing Plan, Section and Elevation of Multi-storeyed Building
7. Detailing of Building Components
 - a) Doors
 - b) Windows
 - c) Ventilator
 - d) Stairs
 - e) Lintel Cum Shade
8. Drawing of King post truss, Queen post truss and North light Truss.

Reference Books

1. M.N. Shesha Prakash, G.S. Suresh , Reference Book on Computer Aided Design Laboratory, Laxmi Publications; First edition (2016)



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

Course Code: GR22A2023
II Year II Semester

L/T/P/C:0/0/4/2

Prerequisite: Fluid Mechanics and Hydraulic Engineering

Course Outcomes:

1. Predict the discharge through venture meter and orifice meter.
2. Estimate the energy heads. Compute the laminar flow, length of flow.
3. Predict the velocity distribution in pipe flows.
4. Compute the major and minor losses in pipe flow.
5. Evaluate the efficiency of Hydraulic machines.

List of Experiments

1. Calibration of Venturi meter /Orifice meter
2. Calibration of Rectangular notch/ Triangular Notch
3. Major losses
4. Minor losses in pipe (Hydraulic losses due to sudden enlargement of pipe and sudden contraction of pipe)
5. Verification of Bernoulli's Theorem
6. Reynold's experiment Laminar Flow and Turbulent flow through pipes
7. Impacts of jets on vanes
8. Pelton wheel turbine
9. Multi stage centrifugal pump
10. Hydraulic Jump

Text Books

1. Modi & Seth, Hydraulic and Fluid mechanics, Standard Book House, 22nd Edition, 2018
2. S.K.Som & G.Biswas, Introduction to Fluid Machines, Tata Mc.Graw Hill publishers, Pvt.Ltd.,3rd Edition, 2017.
3. Edward J. Shaughnessy, M. Katz and James P. Schaffer, Introduction to Fluid Machines, Oxford University Press, New Delhi, 1st Edition, 2005

Reference Books

1. J.F.Douglas, J.M.Gaserek and J A Swaffird, Fluid Mechanics,5th longman Edition,2005
2. Frank.M. White, Fluid Mechanics, Tata Mc. Graw Hill Pvt. Ltd, 4th Edition, 2013.
3. A.K. Mohanty, Fluid Mechanics, Prentice Hall of India Pvt. Ltd., New Delhi, 2nd Edition,1994.
4. Dr. R.K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) ltd., New Delhi, 10th Edition, 2019.



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENVIRONMENTAL SCIENCE**

**Course Code:GR22A2001
II Year II Semester**

L/T/P/C:2/0/0/0

Prerequisites: Basic knowledge of environmental issues

Course Outcomes:

1. Gain a variety of experiences & acquire a basic knowledge about the environment & its allied problems.
2. Interpret the key components in safe guarding the environment.
3. Evolve an individual vision of harmonious interaction with the natural world.
4. Appraise the quality of the environment to create a healthy atmosphere.
5. Familiarize with the individual responsibilities towards green revolution.

UNIT I

Introduction and Awareness Activities

Environmental Science: Introduction, Definition, scope, and importance.

AWARENESS ACTIVITIES

Small group meetings about:

- Water management
- Waste water treatment.
- Projects Vs Environment
- Zero waste management
- Circular economy
- Impact of Science & Technology on Environment
- E-waste management
- Biodiversity loss
- Renewable Energy

UNIT II

Slogan and Poster Making Event

- Food waste management
- Rain water harvesting
- Climate change
- Green Power
- Water conservation
- Green at work
- Role of IT in environment and human health
- Sustainable development

UNIT III

Expert Lectures on Environmental Science

- Environmental Impact Assessment
- Industrial waste treatment
- Regenerative farming/Organic farming/Vertical gardens/Hydroponics
- Circular Economy



UNIT IV

Cleanliness Drive

- Indoor air pollution
- Vehicular pollution
- Visual pollution
- Waste management at home.
- Composting
- Plastic recycling

UNIT V

Case Studies

- HPCL and LG Polymers disasters in Vizag
- Oleum gas leak in Delhi
- Mathura Refinery & Taj Mahal
- Conservation of Hussain Sagar Lake
- The Cleanliest city of India-Surat
- Green Buildings in India
- KBR park in Hyderabad (Environmental protection Vs Development)
- Fluorosis and remediation
- Evaluation of STP or ETP operation in Hyderabad
- Ecotourism & its impacts
- Positive Impact on Environment due to Lockdown Forced by Corona Pandemic

Text Books

- 1.Environmental Studies for UG Courses, Erach Bharucha, UGC Publications, Delhi, 2004.
- 2.Textbook of Environmental Studies, Deeksha Dave, S. S. Katewa, Cengage Delmar Learning India Pvt., 2012.

Reference Books

1. Introduction to Environmental Science, Y. Anjaneyulu, BS Publications, 2004.
2. Environmental Studies, Anubha Kaushik & C. P. Kaushik, 4th Edition, New Age International Publishers,



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
EFFECTIVE TECHNICAL COMMUNICATION

Course Code: GR22A2108
II Year II Semester

L/T/P/C:2/0/0/0

Course Outcomes:

1. Demonstrate to proficiency in producing well-structured technical documents adhering to standard writing conventions and industry-specific guidelines.
2. Develop critical analysis skills to assess and evaluate technical documents.
3. Develop a habit of lifelong learning in technical communication, recognizing its importance in their personal and professional growth.
4. Exhibit effective oral communication skills by delivering technical presentations with clarity, coherence, and appropriate use of visual aids.
5. Exemplify intercultural competence in technical communication.

UNIT I

Information Design and Development- Different kinds of technical documents, Information development life cycle, Organization structures, Factors affecting information and document design, Strategies for organization, Information design and writing for print and for online media, Artificial Intelligence - Voice of the future, Everyday life, Communicating with Machines.

UNIT II

Technical Writing, Grammar, and Editing- Abstract Writing, Technical writing process, forms of discourse, Collaborative writing, creating indexes, technical writing style and language, Basics of grammar, and study of advanced grammar, Introduction to Digital Humanities, Managing technical communication projects, Time estimation, Single sourcing, Localization.

UNIT III

Self-Development and Assessment- SWOT, Self-assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, Career planning, Self-esteem, Managing Time, Personal memory, Taking notes, Complex problem-solving, Stress Management, Working with Rhythm and Balance, Emotional Intelligence, Six Hats of Thinking.

UNIT IV

Communication and Technical Writing- Group discussion, Oral presentation, Resume writing, Interview skills, Graphic presentation, Personality Development, Technical articles, Official notes, Memos, and Minutes of meetings.

UNIT V

Ethics- Business ethics- Corporate Social Responsibility-importance, need, stories, Engineering Ethics, Role and responsibility of engineer, Work culture in jobs.

Text Books

1. M Ashraf Rizvi, Effective Technical Communication, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2018.

Reference Books

1. Raman Sharma, Technical Communication, Oxford Publication, London, 2013.
2. Meenakshi Raman, Shalini Upadhyay, SOFT SKILLS Key to Success in Workplace and Life, Cengage Learning India Pvt. Ltd., Delhi, 2018.



3. Ron Cowan, The teacher's Grammar of English, CAMBRIDGE UNIVERSITY PRESS, New Delhi,2008.
4. Shiv Khera, You Can Win, Macmillian Books, New York, 2003.
5. Arthur D. Rosenberg, David Hizer, The Resume Handbook, Adams Media, an F+W Publications Company, 57 Little field Street, Avon, MA02322, USA.
6. M. Kay DuPont, Business Etiquette & Professionalism, Viva Books private Limited, Hyd.,2005
7. David F. Beer and David McMurrey, Guide to Writing as an Engineer, John Willey, New York, 2004.



**GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
REAL-TIME RESEARCH PROJECT/ SOCIETAL RELATED PROJECT**

**Course Code: GR22A2109
II Year II Semester**

L/T/P/C:0/0/4/2

Course Outcomes:

1. Predict the Field domain in the specialized area under Engineering discipline.
2. Evaluate and Obtained the category of the solution with help of Real time studies.
3. Analyze and discuss the field problems using software tools /Modes/simulations and experimental investigations.
4. Implementing the solution of problem statement.
5. Prioritize the reports and deliver the final work with presentation.