II YEAR
I SEMESTER

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

BUILDING MATERIALS AND CONSTRUCTION PLANNING

Course Code: GR20A2009 **L/T/P/C: 2/0/0/2**

II Year I Semester

Course Objectives:

1. Identify various building materials and their structural requirements.
2. Explain the significance of cement and lime in construction.
3. Identify the suitable material for construction and various building components.
4. Review different types of masonry construction.
5. Discuss about various building services and planning and their characteristics.

Course Outcomes:

At the end of the course, the student will be able to

1. Distinguish between various types of building stones, bricks and tiles and their structural requirements.
2. Recognize the need and process of manufacture of cement and lime.
3. Identify function of various materials like wood, glass, paints and building components.
4. Find the importance of masonry, finishing and form woks.
5. Assess various building services and principles of building planning.

Unit I

Building Stones, Bricks and Tiles

Stone- Building stones, classification of building stones, quarrying procedures, characteristics of good building stone, dressing, and tools for dressing of stones. Bricks -Composition of brick earth, manufacturing of brick, characteristics of good brick, field and lab test. Tiles - Types of tiles, manufacturing of tiles, structural requirements of tiles.

Unit II

Cement, Lime, Admixtures

Ingredients of cement, manufacturing of cement. Admixtures - physical admixtures, chemical admixtures. Lime -Various ingredients of lime, constituents of limestone and classification of lime, manufacturing of lime.

Unit III

Wood, Glass, Paints

Wood- structure, types of wood, properties of wood, seasoning, defects, alternative material for wood. Glass-types of glasses, manufacturing of glass. Paints -Constituents of paints, types of paints. Introduction to Building Components -Lintel, arches, staircase, floors, roofs, foundation. Joinarys-Doors, windows, materials and types.

Unit IV

Masonry and Finishing, Form Works

Brick Masonry- Types and bonds. Stone Masonry- Types. Finishing- plastering, pointing and cladding- Types of ACP (Aluminum composite panel). Form Works - requirements, standards, Scaffolding, shoring, under pinning.

Unit V

Building Services and Building Planning

Building Services- Plumbing services, water distribution, sanitary lines and fittings, ventilators, functional requirements, air conditioning essentials and types, acoustics. Characteristics- Absorption, fire protections, fire hazards, classification of fire resistance materials and construction. Building Planning - Principles of building planning, classification of building and building by-laws, Typical Building Byelaws as per National Building Code and General Development Control Regulation.

Text/Reference Books:

1. SK Duggal, Building Materials, New Age Publications 4th Edition, April, 2014.
2. B C Punmia, Ashok Kumar Jain and Arun Kumar Jain, Building Construction, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2013.
3. Roy Chudley "Construction Technology" Vol. – 1 & 2,2nd Edition, Longman, UK, 1987.
4. P C Varghese, Building Construction, Prentice Hall of India Private Ltd., New Delhi, 2nd Edition, 2007.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENGINEERING GEOLOGY

Course Code: GR20A2010 **L/T/P/C: 2/0/0/2**
II Year I Semester

Course objectives:

1. Recognize the importance of weathering.
2. Identify the physical properties of minerals and their importance in Civil Engineering
3. Express knowledge on various types of rocks and their study.
4. Analyse various geological structures like faults, folds, joints and unconformity.
5. Identify various consequences of water table, landslides and earthquakes.

Course outcomes:

At the end of the course, the student will be able to

1. Identify the weathering effects and various deposits.
2. Recognize the minerals and its importance from civil engineering point of view.
3. Distinguish features of igneous, sedimentary and metamorphic rocks.
4. Recognize various geological structures and the failures of dams, reservoirs and tunnels due to geological reasons
5. Relate water table and the failures of earthquake and landslides

Unit I

Physical Geology

Branches of geology useful to civil engineering, Scope of geological studies in various Civil Engineering projects. Weathering, Erosion and Denudation. Factors affecting weathering and product of weathering. Engineering consideration. Development of river, River meandering, Alluvial cones and fans, Placer Deposits, Delta deposits and natural levees.

Unit II

Mineralogy

Mineralogy - Mineral, Origin and composition. Physical properties of minerals, Role of study of physical properties of following common rock forming minerals: Feldsper, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Megascopic identification of common primary & secondary minerals.

Unit III

Petrology

Rock forming processes. Specific gravity of rocks. Field Classification chart. Igneous rocks - Various forms of rocks, Structures and Classification of Igneous rocks on the basis of Chemical composition. Texture and its types. Detailed study of Igneous rocks like Granite, Pegmatite, Dolerite and Basalt. Sedimentary rocks - mode of formation, Structures and Textures. Detailed study of Conglomerate, Sandstone, Shale and Limestone. Metamorphic rocks - structures and textures in metamorphic rocks. Important distinguishing features of rocks as Lineation and Foliation. Detailed study of Gneiss, Schist, Slate.

Unit IV

Structural Geology

Outcrop and width of outcrop. Fold - Types and nomenclature, Criteria for their recognition in field Faults: Classification, recognition in field. Types of Joints & Unconformity. Geological structures - Required geological consideration for selecting dam, reservoir and tunnel site.

Unit V

Earthquake and Landslides

Pervious & impervious rocks and ground water. Earthquake - Magnitude and intensity of earthquake. Seismic zone in India. Consequences of failure due to Land sliding and Earthquake.

Text Books

1. N.Chennkesavulu, Mc-Millan, Text book of Engineering Geology, India Ltd. 2005, 2nd edition, 2009, Reprint 2012
2. K.V.G.K. Gokhale, Principles of Engineering Geology, B.S publications, 2005

References Books

1. P.C.Varghes, Engineering Geology for Civil Engineers, PHI learning, New Delhi,2012
2. F.G. Bell, Fundamental of Engineering Geology, Butter worths Publications London, New Delhi, B.S publications-2005
3. Krynine& Judd, Principles of Engineering Geology & Geotechnics, McGraw Hill New york 1956

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SOLID MECHANICS - I

Course Code: GR20A2011 **L/T/P/C: 2/1/0/3**
II Year I Semester

Prerequisite: Mathematics, Engineering Mechanics.

Course Objectives:

1. Knowledge of engineering materials based on first energy principles, deformation and strain, concept of strain energy, momentum balance, stress and stress states, elasticity and elasticity bounds, plasticity and yield design.
2. Skill to determine the Principal stresses and strains under different loading using analytical and Mohr's Circle method.
3. Understanding the shear force and bending moment for different types of beams which allows them to understand, modeling and design of a large range of engineering materials.
4. Utility to evaluate the flexural and shear stress concepts for the different materials and shapes of the structure.
5. Knowledge on deflection of beam for different materials under various loading conditions using moment area, double integration & Macaulay's method.

Course outcomes: At the end of course, the student will be able to

1. Determine the stresses, strains, elastic constants such as modulus of elasticity, modulus of rigidity, Poisson's ratio and bulk density. And also to determine the strain energy for various types of loading.
2. Analyze the principal stresses and strains in different planes by using analytical and graphical methods
3. Determine the shear force, bending moment diagrams and identify the point of contra flexure for different types of beams such as cantilever, simple supports and fixed beams with different loading.
4. Formulate the bending equation and shear equation to calculate the bending stresses and shear stresses for the different sections of the structural members.
5. Evaluate the slope and deflection of different beams for different end conditions and loads by using double integration, Macaulay's and Moment area methods.

Unit I: Simple Stresses and Strains

Concept of stress and strain, St. Venant's principle, stress and strain diagram, 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. Strain Energy – Resilience– Gradual, sudden, impact and shock loadings – simple applications.

Unit II: Compound Stresses and Strains

Two dimensional system, stress at a point on an inclined section of a bar under axial loading-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-Various theories of failures-Maximum Principal stress theory-maximum shear stress theory- Maximum strain energy theory-Maximum shear strain energy theory.

Unit III: Bending Moment and Shear Force Diagrams

Bending moment (BM) and shear force (SF) diagrams.BM and SF diagrams for cantilevers simply supported and fixed beams with or without overhangs. Calculation of maximum BM and SF and the point of contra flexure under concentrated loads, uniformly distributed loads over the whole span or part of span, combination of concentrated loads (two or three) and uniformly distributed loads, uniformly varying loads, application of moments. Relationship between SF, BM and rate of loading at a section of beam.

Unit IV: Flexural Stresses

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

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

Unit V: Slope and Deflection

Relationship between moment, slope and deflection, double integration method, Moment area method, Macaulay's method. Use of these methods to calculate slope and deflection for determinate beams.

Text /Reference Books:

1. Dr.B.C.Punmia, Mechanics of Materials, Laxmi publications, 10thEdition, 2013.
2. B. S. Basavarajaiah, Strength of Materials, University Press, Hyderabad, 3rd Edition, 2010.
3. Dr.R.K.Bansal, Strength of material, Laxmi Publications, New Delhi, 5thEdition, 2012.
4. Ferdinand Beer and others, Mechanics of Solid, Tata Mc. Graw Hill publications, 6th Edition,2000.
5. Schaum' soutline series , Strength of materials, Mc.GrawHillInternationalEditions,6th Edition, 2011.
6. R.K.Rajput, Strength of materials, S.Chand &Co, NewDelhi, 5thEdition, 2010.
7. A.R.Basu, Strength of materials, Dhanpat Rai &Co,NaiSarah,New Delhi, 2nd Edition, 2010.
8. BhaviKatti, Strength of materials, New Age Publications, 3rd Edition, 2008, Re-print 2009.
9. R. Subramanian, Strength of materials Oxford University Press, New Delhi, 2rd Edition, 2010.
10. S. Ramamrutham, Strength of material- Dhanpat Rai Publishing Company, New Delhi, 15thEdition,2007.
11. R.S.Khurmi, Strength of material-S.Chand & CompanyLtd., NewDelhi, 2010 Re-print.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
COMPUTATIONAL MATHEMATICS FOR ENGINEERS

Course code: GR20A2008 **L/T/P/C: 3/0/0/3**
II Year I Semester

Course Objectives:

1. Distinguish between analytical and numerical solutions arising in mathematics.
2. Take part in providing solutions to problems hitherto unsolvable due to their complex nature.
3. Construct a hidden function from given data
4. Interpret concepts like interpolation, numerical differentiation and integration.
5. Utilize the concept of finite differences and its applications in numerical techniques**.**

Course outcomes: At the end of the course, the student will be able to

1. Apply well known techniques to find real roots of an equation and linear algebraic systems by iterative methods.
2. Utilize interpolation techniques for univariate and bivariate data using Gaussian and cubic spline methods.
3. Apply numerical techniques to find eigenvalues and corresponding eigenvectors of a matrix.
4. Make use of numerical techniques in differentiation and integration.
5. Model finite differences method to solve IVP in ODE and PDE.

UNIT-1

Root finding and Numerical solution of linear algebraic systems

Finding the real root of an equation by regula-falsi and Newton Raphson method-Gauss Jacobi and Gauss Seidel iterative methods to solve a linear algebraic system

UNIT-II

Interpolation and Cubic spline

Interpolation with non-uniform data: Newton divided differences formula, Hermite interpolation, Interpolation with uniform data- Newton and Gauss formulas-Newton's bivariate interpolation for uniform data,Fitting natural cubic spline to data

UNIT-III

E**igenvalues and Eigenvectors**

Jacobi iteration method for finding all eigenvalues and eigenvectors of a symmetric matrix-Power method and inverse power method for finding the largest and smallest eigenvalues and eigenvectors of a matrix

UNIT-IV

Numerical differentiation and Numerical integration

Numerical differentiation using the Newton's forward, backward and central difference formulas. Numerical integration by Trapezoidal rule, Simpson's 1/3rd and $3/8^{th}$ rules, Gauss-Legendre one point, two point and three point rules.

UNIT-V

Numerical solution of initial and boundary value problems in ODE and PDE

Euler and R-K fourth order methods to solve initial value problems in ODE- Finite differences method to solve boundary value problems in ODE- Solution of Laplace's equation by Jacobi and Successive over relaxation (SOR) methods

TEXT BOOKS

1. M.K.Jain, S.R.K. Iyengar, R.K.Jain-.Numerical methods for scientific and engineering computation-New Age International publishers-Fourth edition-2—3
2. Robert J.Schilling and Sandra L.Harries- Applied numerical methods for engineers using MATLAB and C-Thomson Brooks/Cole-2002

REFERENCE BOOKS

1, GRIET reference manual

2. S.S.Sastry- Introductory methods of numerical analysis- Prentice Hall (India)- Fourth edition-2010

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

INTRODUCTION TO FLUID MECHANICS

Course Code: GR20A2012 **L/T/P/C: 3/0/0/3**

II Year I Semester

Pre Requisite: Mathematics, Physics.

Course Objectives:

1. To introduce the concepts of fluid mechanics useful in Civil Engineering application
2. Measurement of pressure, computations of hydrostatic forces and the concepts of Buoyancy all final useful applications in many engineering problems.
3. Identifying the nature and behavior of fluid flows and distinguish fluid dynamics and kinematics
4. Describe the boundary layer flows and predict the drag and lift forces
5. Classify the head losses in pipe flows and skill seeing of measurement of flows.

Course Outcomes:

At the end of course, the student will be able to

1. Comprehend the various fluid properties and fluid statics.
2. Understand the broad principles of hydrostatic forces on submerged planes
3. Analyzing fluid dynamics and kinematics.
4. classify concept of boundary layer and predict the laminar and turbulent flows
5. Predict the losses in pipes flows and able to calculate discharge measurement.

Unit-I

Basic Concepts and Definitions Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility. Fluid Statics - Fluid Pressure: Pressure at a point, Pascal law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micro manometers. pressure gauges

Unit-II

Hydrostatic Law, Hydrostatic pressure and force: horizontal, vertical and inclined curved surfaces. Introduction explanatory to Buoyancy and meta centre

Unit-III

Fluid Kinematics- Classification of fluid flow: steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two and three dimensional flows ,Stream line, path line, streak line and stream tube; stream function, velocity potential function. One-, two- and three - dimensional continuity equations in 3D-Cartesiancoordinates

Fluid Dynamics- Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – derivation; Energy Principle; Practical applications of Bernoulli's equation : venturimeter, Momentum principle; Forces exerted by fluid flow on pipe bend;

Unit-IV

Boundary Layer Analysis-Assumption and concept of boundary layer theory. Boundary-layer thickness, displacement, momentum & energy thickness, laminar and Turbulent boundary layers on a flat plate; Laminar sub-layer, smooth and rough boundaries. Local and average friction coefficients. Separation and Controlof boundary layer. N-S equation explanatory.

Laminar Flow- Laminar flow through straight circular pipes.

Turbulent Flow- Reynolds experiment, Transition from laminar to turbulent flow. Definition of turbulence, Causes of turbulence, effect of turbulent flow in pipes. Characteristics of laminar and turbulent flows

Unit-V

Flow through Pipes: Loss of head through pipes, Darcy-Wiesbatch equation, minor losses (explanatory), total energy equation, hydraulic gradient line, Pipes in series, equivalent pipes, pipes in parallel.

Measurement of Discharge and Velocity : Flow over rectangular, triangular and trapezoidal and Stepped notches. Venture meter, orifice meter and pitot tube.

Text Books

1. Modi and Seth, Fluid Mechanics, Standard book house, 19th Edition, 2011.
2. S.K.Som & G.Biswas, Introduction to Fluid Machines, Tata Mc.Graw Hill publishers,Pvt. Ltd., 3rd Edition, 2012.
3. Edward J. Shaughnessy, M. Katz and James P. Schaffer, Introduction to FluidMachines, Oxford University Press, New Delhi, 1st Edition, 2005

References Books

1. J.F.Douglas, J.M. Gaserek and J.A.Swaffirld, Fluid Mechanics, 5th longmanEdition, 2005.
2. Frank.M. White, Fluid Mechanics, Tata Mc. Graw Hill Pvt. Ltd, 4th Edition, 2013.
3. A.K. Mohanty, Fluid Mehanics, Prentice Hall ofIndia Pvt. Ltd., New Delhi, 2nd Edition, 1994.
4. Dr. R.K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi
5. Publications (P) ltd., New Delhi, 9th Edition, 2012.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SURVEYING AND GEOMATICS

Course Code: GR20A2013 **L/T/P/C: 3/0/0/3**
II Year I Semester

Course objectives:

1. Describe the function of surveying in civil engineering construction and work with survey observations, and perform calculations.
2. To introduce basics and concepts of curves which will enable to setup and map the curves on ground with precision.
3. To understand the working of Total Station equipment and solve the surveying problems.
4. To introduce basics and concepts of aerial photography, acquisition and mapping from aerial photographs using different types of stereo plotters.
5. The objective of this course is to familiarize about the principles of remote sensing, data acquisition and analyse of satellite data.

Course Outcomes:

At the end of the course, the student will be able to

1. Apply the knowledge, techniques, skills, and applicable tools of the discipline to Engineering and surveying activities.
2. To be able to calculate, design and layout of horizontal and vertical curves, Understand, interpret, and prepare plan, profile, and cross-section drawings.
3. Understand the advantages of electronic surveying over conventional surveying methods.
4. Acquire knowledge about photogrammetry principles, methods and. product generation strategies in both Analytical and digital Photogrammetry system.
5. Acquire knowledge about the principles and physics of Remote sensing and data acquisition and getting familiarized with various data analysis techniques.

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 staves - 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.
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.

Text/Reference Books:

1. Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: TotalStation, GISand Remote Sensing, Pearson India, 2006.
2. Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011.
3. Bhavikatti, S.S., Surveying and Levelling, Vol. I and II, I.K. International, 2010.
4. Chandra, A.M., Higher Surveying, Third Edition, New Age International (P)Limited, 2002.
5. Anji Reddy, M., Remote sensing and Geographical information system, B.S.Publications, 2001.
6. Arora, K.R., Surveying, Vol-I, II and III, Standard Book House, 2015

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING GEOLOGY LAB

Course Code: GR20A2014 **L/T/P/C: 0/0/4/2**

II Year I Semester

Course Objectives:

1. Identify various Rocks and Minerals, their physical properties and use in industry.
2. Study the macroscopic description of few Rocks and Minerals.
3. Based on topic, usage of different rocks and minerals in commercial aspect.
4. Interpret various Geological maps showing structures like faults, folds, beds and unconformities etc.
5. Solve structural geology problems.

Course Outcomes:

At the end of the course, the student will be able to

1. Identify various minerals and their properties.
2. Identify various rocks and their properties.
3. Understand various rocks and minerals used in the industries.
4. Prepare and interpret various sections of geological maps showing structures like faults, folds and Unconformities etc.
5. Resolve simple structural Geology problems.

CONTENTS:

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, Unconformities etc.
4. Simple Structural Geology problems.

LAB EXAMINATION PATTERN:

1. Description and identification of six minerals.
2. Description and identification of six rocks (including Igneous, Sedimentary and Metamorphic Rocks).
3. Interpretation of a Geological map along with a geological section.
4. Simple strike and Dip problems.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SOLID MECHANICS LAB

Course Code: GR20A2015 **L/T/P/C:0/0/4/2**
II Year I Semester

Prerequisites: Engineering Mechanics, Mathematics and Physics.

Course Objectives:

1. Understanding the effect of tension in mild steel bars under tensile loading.
2. Skill to examine the resistance of various materials using hardness test and impact test
3. Find the modulus of rigidity in springs using spring test.
4. An idea on the compressive stress of concrete, wood etc.
5. Knowledge of pure bending theory and evaluate the Young's modulus of materials and Maxwell's reciprocal Theorem on beams.

Course Outcomes: At the end of course, the student will be able to

1. Determine the important mechanical properties of materials.
2. Identify the stiffness of an elastic isotropic material.
3. Evaluate the Reciprocal theorem.
4. Measure any substance's resistance to uniform compression.
5. Resistance of various materials against abrasion and impact.

Task- 1: Tension test on metals

Task- 2: Torsion test on metals

Task- 3: Hardness test on metals

Task- 4: Spring test on metals

Task-5: Compression test on wood or concrete or brick or block.

Task-6: Impact test on metals.

Task-7: Deflection test on continuous beam.

Task-8: Deflection test on cantilever beam.

Task-9: Deflection test on simply supported beam.

Task-10: Verification of Maxwell's Reciprocal theorem on beams.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

VALUE ETHICS AND GENDER CULTURE

Course Code: GR20A2002 **L/T/P/C:2/0/0/2**

II Year I Semester

Course objectives:

1. To understand about the importance of ethical values
2. To understand the significance of human conduct and self-development
3. To enable students to imbibe and internalize the value and Ethical behaviour in personal and professional lives.
4. To provide a critical perspective on the socialization of men and women.
5. To create an awareness on gender violence and condemn it.

Course Outcomes

1. To enable the student to understand the core values that shapes the ethical behaviour. And Student will be able to realize the significance of ethical human conduct and self-development
2. Students will be able to inculcate positive thinking, dignity of labour and religious tolerance.
3. The students will learn the rights and responsibilities as an employee and a team member.
4. Students will attain a finger grasp of how gender discrimination works in our society and how to counter it.
5. Students will develop a better understanding on issues related to gender and Empowering students to understand and respond to gender violence.

Unit-I: Values and Self-Development–social values and individual attitudes, Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

- A Case study on values and self-development

Unit-II Personality and Behaviour Development-positive thinking, punctuality, avoiding fault finding, Free from anger, Dignity of labour, religious tolerance, Aware of self-destructive habits.

- A Case study on Personality

Unit- III: **Introduction to Professional Ethics**: Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

- A Case study on professional ethics

Unit–IV: Introduction to Gender - Definition of Gender, Basic Gender Concepts and Terminology, Attitudes towards Gender, Social Construction of Gender.

- ❖ A Case study/ video discussion on attitudes towards gender

Unit-V: **Gender-based Violence** -The concept of violence, Types of Gender-based violence, the relationship between gender, development and violence, Gender-based violence from a human rights perspective.

- ❖ A Case study/ video discussion on gender-based violence in view of human rights

Text Books:

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ethics in Engineering Practice & Research, Caroline Whit beck, 2e, Cambridge University Press 2015.
3. A Bilingual Textbook on Gender" written by A. Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, GoguShyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad,Telangana State in the year 2015.

Reference Books:

1. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
2. Abdulali Sohaila. "I Fought For My Life…and Won."Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
3. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e , Cengage learning, 2015.
4. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENVIRONMENTAL SCIENCE

Course Code: GR20A2001 **L/T/P/C:2/0/0/2**

II Year I Semester

Course Objectives:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding the environmental policies and regulations
4. Integrate human ecology and science of environmental problems.
5. The effect of human activities on atmospheric pollution

Course Outcomes:

Based on this course, the Engineering graduate will

1. Understand the harmonious co-existence in between nature and human being
2. Recognize various problems related to environment degradation.
3. Develop relevant research questions for environmental investigation.
4. Generate ideas and solutions to solve environmental problems due to soil, air and water pollution.
5. Evaluate and develop technologies based on ecological principles and environmental regulations which in turn helps in sustainable development.

UNIT-I

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Bio magnification, ecosystem resources and resilience, ecosystem value, services and carrying capacity.

UNIT-II

Natural Resources: Classification of Resources: Living and Non-Living resources, natural capital & Resources water resources: use and over utilization of surface and ground water, conflicts over water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT-III

Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality standards.

Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Waste water Treatment methods: Primary, secondary and Tertiary.
Global Environmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. Anthropogenic activities, influence on the occurrence of COVID-19 Pandemic? How environment benefitted due to global lockdown arising out of corona outbreak.

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Life cycle analysis (LCA), Towards Sustainable Future: Concept of Sustainable Development Goals, Population and its explosion, Resource exploitation, Crazy Consumerism, Environmental Education, Environmental Ethics, Concept of Green Building.

TEXT BOOKS:

1. Environmental Studies by Anubha Kaushik, 4th Edition, New Age International Publishers.
2. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

REFERENCE BOOKS:

1. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications..
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela.2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
5. Introduction to Environmental Science by Y. Anjaneyulu, BS Publications.
6. Environmental Studies by R. Rajagopalan, Oxford University Press.