III YEAR
II SEMESTER

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
DESIGN OF STEEL STRUCTURES

Course Code: GR22A3079 **L/T/P/C: 2/1/0/3**
III Year II Semester

Prerequisite: Mathematics**,** Engineering Mechanics, Engineering Drawing, Solid Mechanics.

Course Outcomes:
1. Identify various types of structural steel and its properties. Also able to define concepts ofLSD.
2. Classify and compute various types of connections.
3. Design tension and compression members.
4. Design steel beams and purlins.
5. Design various eccentric connections.

UNIT I
Materials: Properties of materials. Concepts of limit state method, loads and stresses. Types of structural steel- making of iron and steel. Deflection limits, serviceability and stability check as per IS 800-2007.

UNIT II
Bolted Connections: IS – 800 – 2007 specifications, Design strength and efficiency of joint.
Welded connections: Types of welded joints, specifications and design requirements.

UNIT III
Design of tension member: Design of tension members subjected to axial tension and bending, splicing of tension member and lug angle.
Design of compression members: Design of columns, laced and battened columns, column- splice,column slab base and gusset base.

UNIT IV
Design of Beams: Design of flexural members, lateral stability of beams, lateral torsional buckling, shear strength of beams; web buckling, web crippling, built-up beams, lintels and purlins.

UNIT V
Eccentric and Moment connections: Introduction, beam-column connections; connections subjected to eccentric shear, bolted framed connections, bolted seat connections, bolted bracket connections, welded framed connections, welded seat connections, welded bracket connection, moment resistant connection; bolted moment connections and welded moment connections.

Text Books
1. Design of steel structures – N. Subramanian, Oxford University Press – 2018.
2. Limit State Design of steel structures, S.K.Duggal, Tata McGraw – Hill, 2019
3. Design of Steel Structures Vol. 1 & 2 – Ramchandra, Standard Publications. 2010.

Reference Books
1. Design of steel structures, S. S. Bhavikatti, IK int Publication House, New Delhi, 2019
2. Design of steel structures, BC Punmia A. K. Jain , Ashok Kumar Jain, LaxmiPublications, 2015.
3. Limit State Design of Steel Structures, by S. Kanthimathinathan, Dreamtech Press, 2019.
4. Design of steel structures, by Elias G. Abu-Saba, cbspd publisher, 2000.
5. Design of steel structures, by R. R. Gadpal, Nirali Prakashan publisher, 2000.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

FOUNDATION ENGINEERING

Course Code: GR22A3080 **L/T/P/C: 3/0/0/3**
III Year II Semester

Prerequisites: Geotechnical Engineering
Course Outcomes:
1. Identify various soil exploration methods and interpret the results.
2. Assess the stability of slopes.
3. Compute earth pressures and stability of retaining wls.
4. Apply bearing capacity equations for shallow foundations and analyze settlement.
5. Estimate pile and pile group capacity and recognize the shapes and components of wellfoundations.

UNIT I
Soil Exploration: Introduction, methods of site exploration and soil investigation, methods of boring, soil samplers, penetrometer tests, analysis of borehole logs, preparation of soil investigationreport.

UNIIT II
Stability of Slopes: Introduction, types of slopes and their failure mechanisms, factor of safety, analysis of finite and infinite slopes, stability analysis by standard method of slices, Taylor's stabilityNumber. Stability of earth dam slopes under different conditions.

UNIT III
Earth pressure and retaining walls: Introduction, Rankine's theory of earth pressure, active and passive earth pressures, Coulomb's earth pressure theory, Culmann's graphical method, types of retaining walls, stability of cantilever retaining walls.

UNIT IV
Bearing capacity and settlement analysis of shallow foundations: Types and choice of foundation, location of depth, modes of soil failure, safe bearing capacity by Terzaghi, Meyerhof, Skempton and IS methods. Effect of water table on bearing capacity, safe bearing pressure based on N value, settlement analysis, contact pressure, settlement from plate load test.

UNIT V
Deep foundations: Types of piles, static pile formulae, dynamic pile formulae, pile load tests, loadcarrying capacity of pile groups in sands and clays, negative skin friction, types and different shapes of well foundations, components of well foundations.

Text Books
1. Gopal Ranjan and ASR Rao, Basic and Applied Soil Mechanics, New Age International Pvt. Ltd, New Delhi, 3rd edition (2016).
2. Braja M. Das, Principles of Foundation Engineering, Cengage Learning, New Delhi, 8th edition(2017).
3. K.R. Arora, Soil Mechanics and Foundation Engineering, Standard Publishers Distributors, Delhi, 5th edition (2000), Reprint (2020).

Reference Books
1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Soil Mechanics and Foundations, Laxmi publications Pvt. Ltd., New Delhi, 16th edition, Reprint (2017).

2. VNS Murthy, Soil Mechanics and Foundation Engineering, CBS Publishers, and Distributors.
3. Bowles, J.E., Foundation Analysis and Design, McGraw-Hill Publishing Company, New York, 5th edition 2001.
4. Singh.A, Modern Geotechnical Engineering, 3 rd Ed., CBS Publishers, New Delhi, 2006.
5. N. Som, Theory and Practice of Foundation Design, Prentice Hall, New Delhi, 2003.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENVIRONMENTAL ENGINEERING

Course Code: GR22A3081 **L/T/P/C: 2/0/0/2**

III Year II Semester

Pre-Requisites: Engineering Chemistry, Environmental Science.

Course Outcomes:

1. Analyze characteristics of water and wastewater.
2. Assess water demand and design components of water distribution systems.
3. Design conveyance elements of wastewater collection systems.
4. Assess sources of water and wastewater.
5. Plan and design water treatment units and wastewater treatment systems.

UNIT I

Sources, Quality and Quantity Perspectives of Water: Surface sources, subsurface sources, physical, chemical and biological characteristics, BIS standards for potable water, Estimation of water demand, water consumption rate, fluctuations in rate of demand, design period, population forecasting methods. Collection and Conveyance of Water, Intakes, types of Intakes.

UNIT II

Water Pollution: Types of pollutants, their sources, and impacts.

Water Treatment: Layout and general outline of water treatment units, screening, plain sedimentation, sedimentation aided with coagulation, filtration, disinfection, water softening, miscellaneous treatments. Design of Clarifiers, working of slow and rapid gravity filters, multimedia filters.

UNIT III

Distribution Systems: Requirements of a good distribution system, methods of distribution, systems of supply of water, Distribution reservoirs, layout of distribution system, design of distribution system, analysis of pipe networks, appurtenances in distribution system- Joints, Valves and Water Meters.

UNIT IV

Quality and Quantity Perspectives of wastewater: Physical, chemical, and biological characteristics of wastewater, analysis of wastewater, Importance of BOD and COD, Effluent standards, BIS for disposal of Industrial Waste water, impacts of disposal, Wastewater Collection, Estimation of dry weather flow and stormwater flow.

UNIT V

Primary Treatment of wastewater: Preliminary & primary treatment of wastewater: screening, grit removal basins, removal of oil and grease, sedimentation, sedimentation aided with coagulation.

Secondary Treatment of wastewater: Principles and classification of secondary treatment, activated sludge process, trickling filters, miscellaneous methods such as oxidation ditch, oxidation ponds, aerated lagoons, rotating biological contractors. Disposal of wastewater, self- purification of streams, sewage irrigation, BIS standards for waste water irrigation, Treatment and disposal of sludge, On-site disposal methods.

Tertiary Treatment of wastewater: Principles and classification of Tertiary treatment

Text Books

1. Water Supply Engineering, Vol. 1, Waste Water Engineering, Vol. II, B.C.Punmia, Ashok Jain & Arun Jain, Laxmi Publications Pvt. Ltd, New Delhi.,2nd edition, 2016.

2. Elements of environmental engineering by K.N. Duggal, S. Chand Publishers, Revised edition, 2018.
3. Sewage treatment & Disposal and waste water Engineering-Environmental Engineering (Vol.II) by
4. P.N. Modi, Standard Book House, 17th edition, 2020.

Reference Books

1. Environmental Engineering Vol. I and II by S.K. Garg, Khanna Publishers, 35th Edition, 2022.
2. Water and Waste Water Technology by Mark J Hammer and Mark J. Hammer Jr., Pearson 7th Edition, 2011.
3. Water and Waste Water Engineering by Fair, Geyer and Okun- Wiley, 3rd Edition, 2010.
4. Waste water treatment- concepts and design approach by G.L. Karia and R.A. Christian, Prentice Hall of India., 2nd Edition, 2013.
5. Wastewater Engineering by Metcalf and Eddy., 5th Edition-2013.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
MASONRY STRUCTURES
(PROFESSIONAL ELECTIVE-II)

Course Code: GR22A3082 **L/T/P/C: 3/0/0/3**
III Year II Semester

Pre-Requisites: Structural Analysis, Design of Reinforced Concrete Structures.

Course Outcomes:
1. Identify the types of masonry units and Strength and stability of concentrically loaded masonry walls and factors affecting them.
2. Analyze the emerging permissible compressive, tensile and shear stress and factors influencing them for masonry elements.
3. Identify the concept of effective height of walls and columns, effective length, effective thickness of wall and factors affecting them.
4. Analyze how to design load bearing masonry walls for buildings up to three stories using IS:1905 and SP-20.
5. Explain the concept of reinforced masonry and its applications, and how to bring flexural and compression elements (beams and columns) of reinforced masonry shear walls.

UNIT I
Introduction: Brick stone, and block masonry units - Strength, modulus of elasticity and water absorption of masonry materials - classification and properties of mortars, selection of mortars. Defects and errors in masonry construction, cracks in masonry, types, reasons for cracking and remedial methods.
Strength and stability of concentrically loaded masonry walls, effect of unit strength, mortar strength, joint thickness, rate of absorption, effect of ageing, workmanship, strength formulae and mechanism of failure of masonry subjected to direct compression.

UNIT II
Load Analysis: Permissible compressive stresses- stress reduction and shape reduction factors, increase in permissible stresses for eccentric vertical and lateral loads, permissible tensile and shear stresses. Load considerations for masonry: walls carrying axial load, eccentric load with different eccentric ratios— walls with openings and free-standing wall.

UNIT III
Design considerations: Effective height of walls and columns, opening in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action and Lintels.

UNIT IV
Masonry Design: Design of load bearing masonry walls for building up to 3storeys using IS 1905-1987 and SP20 Procedure.

UNIT V
Masonry Types: Reinforced masonry and its application, flexural and compression elements of reinforced masonry, shear walls. Composite masonry walls, composite wall beam elements, infilled frames.

Text Books
1. Henry, A.W(1990), “Structural masonry”, published by Macmillan Education Ltd. 3rd Edition.
2. Dayarathnam.P (1987), “Brick and reinforced brick structures”, Oxford & IBH Publication, 2nd Edition-2017.

3. Masonry Structures: Behaviour & Design by Drysdale, R. G. Hamid, A. H. and Baker, L.R, Prentice Hall. 3rd Edition.

Reference Books

1. Reinforced Masonry Design by R.S. Schneider and W.L. Dickey, Prentice Hall
2. Sinha, B.P and Davies, S.R(1997), "Design of Masonry Structures", E &FN spon.
3. Design of Masonry Structures by A.W. Hendry, B.P. Sinha and Davis, S.R, E&FN Spon, UK
4. Design of Reinforced and Prestressed Masonry by Curtin, Thomas Telford
5. Structural Masonry by Sahlin, S, Prentice Hall

CODES:

1. IS 1905-1987 (3rd revision), "Code of practice for structural use of unreinforced masonry", BIS, New Delhi.
2. SP 20 (S& T) 1991, "Hand book on Masonry Design and Construction (1strevision)", BIS New Delhi.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ROCK MECHANICS
(PROFESSIONAL ELECTIVE-II)

Course Code: GR22A3083 **L/T/P/C: 3/0/0/3**
III Year II Semester

Pre-Requisites: Engineering Geology

Course Outcomes:

1. Identify the objectives of geotechnical data collection and rock mass classification methods, and successfully collect and analyze a range of geotechnical datasets for design purposes.
2. Annotate on impact of geological features on civil engineering projects.
3. Analyze the problems associated with different geological features on civil engineering structures and suggest alternatives.
4. Demonstrate various methods to improving the properties of rock masses.
5. Describe the theory and analysis of in situ and induced stresses in a rock mass and structurallycontrolled failure.

UNIT-I

Importance and application of rock mechanics to engineering problems, Rock mass classification, Lithological classification of rocks, Engineering classification of intact and fissured rocks, Classification of fissures, Physical-mechanical properties of rocks.

UNIT-II

Joints and faults, Engineering properties of rocks, Stability of rock slope, Modes of failure in rock mass, Definition of stress in rock, Simple methods of determining in-situ stresses and stress distribution around openings.

UNIT-III

Causes and impacts of subsidence, Mechanics of surface subsidence, discontinuous and continuous subsidence. Monitoring, prediction, control and management of subsidence.

UNIT-IV

Analysis by simple field Bishop's method and use of Hoek's chart, Foundations on rocks, Consideration of uplift pressures; Methods of improving the properties of rock masses.

UNIT-V

Mechanics of rock burst and bumps, Stability of slopes. Instrumentation and measurement of in- situ stresses and rock strength, Photoelasticity.

Text Books

1. Jager. J C & Cook NGW Fundamentals of Rock Mechanics, Wiley India Pvt.Ltd,4th edition2012.
2. Jumikis Alfred's. R, Rock Mechanics, CRC Press, 2nd edition,1988.
3. Goodman, R.E. (1989), 'Introduction to Rock Mechanics', John Wiley, Chichester, 2nd edition.

Reference Books

1. Hudson, J.A. and Harrison, J.P. (2000), 'Engineering Rock Mechanics', Pergamon Press, Amsterdam.

2. Peng. Syd. S. Coal Mining Ground Control West Virginia University.
3. Brady, BHG& Brown.ET, Rock mechanics for underground mining, George Allen &Unwin Ltd, 1992.
4. Hudson, J.A. and Harrison, J.P. (2000), 'Engineering Rock Mechanics', Pergamon Press, Amsterdam.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
OPEN CHANNEL FLOW
(PROFESSIONAL ELECTIVE-II)

Course Code:GR22A3084 **L/T/P/C: 3/0/0/3**
III Year II Semester

Pre-requisites: Hydraulics and Water Resource Engineering

Course outcomes:
1. Explain properties and the type of channel flows.
2. Design the different shapes channel section.
3. Compute the energy loss due to hydraulic jump.
4. Apply the dynamic equations and different method for energy loss in the Gradually Varied Flow
5. Apply the dynamic equation in Rapidly Varied Flow.

UNIT I
Introduction: Basic Concepts, types of channels, types of flows in open channels Geometric properties of various sections, Velocity, and pressure distribution. Velocity distribution coefficients. Effects of slope on pressure distribution.

UNIT II
Uniform Flow: Chezy's equation, Darey - Weisbach friction factor. Manning's formula, Factors effecting Manning's roughness coefficient, Equivalent Channels of compound section. Conveyance of a channel section. Section factor for uniform flow, Channels of first and second kind - Hydraulically efficient channel sections - rectangular, trapezoidal, triangular and circular: Hydraulic exponent N, Compound sections, composite roughness.

UNIT III
Critical Flow in Open Channel: Energy in open channel flow: Specific energy – features, Criterion for critical state of flow - Critical depth in Rectangular, Triangular, Trapezoidal and circular channels; section factor - specific force.

UNIT IV
Gradually Varied Flow: Types of non-uniform flow, Dynamic equation: Governing equation for wide rectangular channels - Surface Profiles - classification. Characteristics-Control sections- Transitional depth - Length of surface profiles - Standard step method - Direct integration methods - Brasses' method Tolmkit method, Bekhmeteff's method. Chow's method.

UNIT V
Rapidly Varied Flow: Hydraulic jump application of momentum equation Types of jump, Location of jump, Characteristics of jump in rectangular channels Dimensionless method; Jump on sloping floor; Oblique jump. Spatially Varied Flow: Basic Principles and assumptions. Dynamic equation for flow with increasing and decreasing discharges; Analysis of flow profiles. Flow In Non — Prismatic Channels: Transitions — humps, flumes, gradual and sudden transitions.

Text Books
1. Flow in open channels — K. Subramanya TMH Publishing Co. Ltd '7th edition, 2022.
2. Flow through open channels — K.G. Ranga Raju. THM Publishing Co. Ltd.8st edition,2021.
3. Elements of Water Resources Engineering by K.N.Duggal and J.P.Soni (New Age International)

Reference Books

1. Open Channel Hydraulics — French R.H. McGraw Hill book Company, 8th Edition,2021.
2. Open Channel Flow -Hanif Chaudhary. M. Printice — Hall of India Pvt. Ltd., 2022.
3. Open Channel Hydraulics — V.T. Chow, McGraw Hill book company, new edition 2021.
4. Open Channel Flow by Das, Madan Mohan PHI Learning Pvt Ltd.2011 third print.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREEN BUILDING TECHNOLOGY
(PROFESSIONAL ELECTIVE -II)

Course Code: GR22A3085 **L/T/P/C: 3/0/0/3**

III Year II Semester

Prerequisite: Environmental Science, Building materials and construction planning, Concrete Technology.

Course Outcomes:

1. Correlate the underlying principles, history, and the impacts of green building technology and to identify the criteria for rating systems along with the established Indian codes and guidelines.
2. Identify various Renewable and Non-renewable sources of energy along with their carbon footprints and building modeling and energy analysis, monitoring and metering.
3. Recognize the energy efficient green building materials and the cost-effective Building Technologies and materials with low embodied energy and incorporate them into design.
4. Explain broad perspective in thinking for sustainable practices by utilizing the engineering knowledge and principles gained from this course.
5. Explain the application of design guidelines of Green Building considering the Energy Conservation Measures and to Perform cost/benefit and life-cycle analysis of green buildings.

UNIT I

Concept of Green Buildings: Definition of Green Buildings, typical features of green buildings, Necessity, Initiatives, environmental benefits economic benefits, health and social benefits, Major energy efficiency areas for building, Contribution of buildings towards Global Warming, Green buildings in India
Green building Assessment: Green Building Rating Systems (BREEAM, USGBC, LEED, IGBC, TERI-GRIHA, GREEN STAR), Criteria for rating, Energy efficient criteria, Codes and Certification Programs.

UNIT II

Sources of Energy: Renewable and Non-renewable sources of energy; Coal, Petroleum, Nuclear, Wind, Solar, Hydro, Geothermal sources; potential of these sources, hazards, pollution; Global scenario with reference to demand and supply in India, Global efforts to reduce carbon emissions, Building modeling , Energy analysis, Commissioning, Metering, Monitoring.

Carbon emission: Forecasting, Control of carbon emission, Air quality and its monitoring carbon footprint; Environmental issues, Minimizing carbon emission, Energy retrofits.

UNIT III

Green Building Materials: Sustainably managed Materials, renewable and recyclable resources; energy efficient materials; Embodied Energy of Materials, Green cement, Biodegradable materials, Smart materials, Volatile Organic Compounds (VOC's), Natural Non-Petroleum Based Materials, Recycled materials, Renewable and Indigenous Building Materials, Engineering evaluation of these materials.
Green Building Planning and Specifications: Environment friendly and cost-effective Building Technologies, Integrated Life cycle design of Materials and Structures, Green Strategies for Building Systems, Energy Conservation Measures in Buildings, Waste &Water management and Recycling in Sustainable Facilities, Heating, Ventilation and Air Conditioning, Passive Solar & Daylight.

UNIT IV

Design of Green Buildings: Sustainable sites, Impact of building on environment, Life cycle assessment,

Principles of sustainable development in Building Design, Design on Bioclimatic and solar passive architecture, Considerations of energy consumption, water use, and system reliability, indoor air quality, noise level, comfort, cost efficiency in building design, Advanced Green building technologies and innovations.

UNIT V

Construction of Green Buildings: Energy efficient construction, Practices for thermal efficiency and natural lighting. Eco- friendly water proofing; ECB codes building rating, Maintenance of green buildings, Cost and Performance Comparisons and Benchmarking, Green Project Management Methods and Best Practices, Cost/benefit analysis of green buildings, Life-cycle analysis of green buildings, Case studies of rated buildings (new and existing)

Text Books

1. Alternative Building Materials and Technologies – By K S Jagadeesh, B V Venkata Rama Reddy&K S Nanjunda Rao – 2nd Edition, New Age International Publishers (2017)
2. Integrated Life Cycle Design of Structures – By AskoSarja – SPON Press, first edition 2019.
3. Non-conventional Energy Resources – By D S Chauhan and S K Sreevasthava – New AgeInternational Publishers, 3rd edition 2017.

Reference Books

1. Sustainable Energy Systems Engineering: The Complete Green Building Design Resource(McGraw hill publication): by Gevorkian-2007
2. Understanding Green Building Guidelines: For Students and Young Professionals, Traci RoseRider, W. W. Norton & Company Publisher, 2010.
3. Abe Kruger and Carl," Green Building, Principles and practices in Residential Construction", In2012, Seville Publication
4. Ross Spiegel, Dru Meadows, "Green Building Materials: A Guide to product selection
5. andSpecification",3rd Edition, October 2010
6. IGBC Rating systems Reference guide
7. Free abridged versions of LEED reference guides
8. ECBC latest version
9. US GBC's Reference Material:
10. http://www.ncrec.gov/pdfs/bicar/Greenbuilding.pdf

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENVIRONMENTAL ENGINEERING LAB

Course Code: GR22A3087 **L/T/P/C: 0/0/4/2**
III Year II Semester

Pre-Requisites: Engineering Chemistry

Course Outcomes:

1. Describe the knowledge of physical, chemical, and biological parameters of water and their importance.
2. Develop the social responsibility to eradicate water borne diseases.
3. Recognize the methods to control environmental pollution.
4. Express water quality parameters in written reports
5. Generalize the various quality control aspects of industrial effluents by performing the different lab tests.

List of Experiments:

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

Reference Books

1. Standard Methods for Analysis of water and Wastewater – APHA.
2. Sawyer and Mc. Carty , Chemistry for Environmental Engineering, Mc Graw- Hill publications,2017.
3. IS 10500 (2012): Drinking water; http://cgwb.gov.in/documents/wq-standards.pdf
4. IS 3025 Methods of sampling and test physical and chemical for water and wastewater: by Indianstandard burro kindle Edition, 2020.
5. https://ee1-nitk.vlabs.ac.in/
6. https://ee2-nitk.vlabs.ac.in/
7. S.K. Garg, Environmental Engineering (Vol. I) Water Supply Engineering, Khanna Publishers,35th Edition, 2022.
8. S.K. Garg, Environmental Engineering (Vol. II) Sewage Waste Disposal and Air PollutionEngineering, Khanna Publishers, 41st Edition, 2022.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
GIS LAB

Course Code:GR22A3088 **L/T/P/C: 0/0/4/2**
III Year II Semester

Pre- Requisites: Surveying and Geomatics

Course Outcomes:

1. Inculcate hands on experience on fundamental commands.
2. Demonstrate proficiency in the basic functions of geospatial software.
3. Create awareness on raster layer to vector layer conversion
4. Analyze proficiency in the creation and acquisition of spatial data.
5. Recognize conversion of DEM to contour map and Contour to DEM map

SOFTWARE: Q GIS (Open Source)

EXCERCISES:

1. Demonstrating the concept of Labeling in GIS using Quantum GIS
2. Demonstrating the concept of Symbolism in GIS using Quantum GIS.
3. Creation of point features Maps using Toposheets (Ex- Trees, Post office, Wells etc.,)
4. Creation of Line features Maps using Toposheets (Ex – Road Networks, RailwayTracks etc.)
5. Creation of polygon features Maps using Toposheets (Ex – Waterbodies,Forest areas, buildings etc.,)
6. Creation of thematic maps for a region of interest.
7. Identify the demographic study using attribute tool.
8. Creation of buffer zones for given maps.
9. Preparation of contour maps, flow accumulation maps from Digital Elevation model maps
10. GIS applications in various civil engineering aspects- Network Analysis, Watershed Analysis.
11. Performing SQL queries on created Thematic maps (Pre-Requisites: 6,8,9 exercises)

Reference Books

1. Introduction to Geographic Information Systems by Kang-tsung Chang, Tata McGraw-Hill Publishing Company Limited- 2008.
2. Concept and Techniques of GIS by C.P.L.O Albert, K.W.Yong,Prentice Hall Publishers(2010).
3. Concept and Techniques of GIS by C.P.L.O. Albert, K.W. Yong, Prentice HallPublishers (2002).

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
MINI PROJECT WITH SEMINAR

Course Code:GR22A3089 **L/T/P/C: 0/0/4/2**
III Year II Semester

Pre-Requisite: Civil Engineering courses

Course Outcomes:
1. Make use of fundamental knowledge and practical knowledge to implement towards industries.
2. Utilizing software and design, analyze the engineering Knowledge in accordance with applicable standards.
3. Analyze project management skills and scheduling of work in stipulated time.
4. Evaluate and demonstrate the problem finding ability in Engineering Technologies.
5. Develop technical information by means of written and oral reports.