GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Economics and Accounting for Engineers

Course Code: GR18A2004	**L**	**T**	**P**	**C**
III Year. II Semester	**3**	**0**	**0**	**3**

Course Objectives: The students will be able to

1. Provide the student with a clear understanding of demand analysis, elasticity of demand and demand forecasting;
2. Provide the insight on theory of production and cost analysis.
3. Describe different types of markets and competition, forms of organization and methods of pricing.
4. Make the students understand various capital budgeting techniques.
5. Describe fundamentals of accounting.

Course Outcomes: After studying this course, students will be in a position to:

1. Scan the economic environment and forecast demand of products through demand forecasting techniques.
2. Plan the production levels in tune with maximum utilization of organizational resources and with maximum profitability and list out various costs associated with production and able to compute breakeven point.
3. Outline the different types markets and competition, forms of business organization and methods of pricing.
4. Analyze the profitability of various projects using capital budgeting techniques
5. Prepare the financial statements.

Unit-1: Introduction & Demand Analysis: ***Definition and Scope:*** Introduction to Economics, Nature and Scope of Managerial Economics. ***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-2: 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-3: 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 Organisation: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types.

Unit-4: 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-5: Introduction to Financial Accounting: ***Accounting Concepts and Conventions*** - Double-Entry Book Keeping. ***Accounting Cycle:*** Journal, Ledger, Trial Balance, Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Text Books

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.
2. Managerial Economics: Analysis, Problems and Cases - P. L. Mehta, Edition, 13. Publisher, Sultan Chand, 2007.
3. Financial Accounting -1: S P Jain and K. L. Narang, Kalyani Publishers,2005.

Reference Books

1. Peterson, Lewis and Jain: Managerial Economics, Pearson, 2009
2. Mithani : Managerial Economics , HPH, 2009
3. Lipsey&Chrystel, Economics, Oxford University Press, 2009
4. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2009
5. Horngren : Financial Accounting, Pearson, 2009.
6. Dr. S. N. Maheswari and Dr. S.K. Maheshwari: Financial Accounting, Vikas, 2009.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

TRANSPORTATION ENGINEERING

Course Code: GR18A3065 **L T P C**
III Year. II Semester **3 0 0 3**

Course Objectives: The objectives of this course is to make the student to

1. Gain a solid understanding of the principles of highway engineering and traffic analysis
2. Develop and interpret design standards for horizontal and vertical geometry.
3. Have a strong analytical and practical knowledge of Planning, Designing and solving transportation problems
4. Understand the type of conflicts that occur at intersection and design the intersection accordingly
5. Gain the knowledge in Railway Engineering and Airport Engineering.

Course Outcomes: After completion of this course, students will be able to

1. Apply basic principles of physics in estimating stopping and overtaking sight distance requirements
2. Compute the geometric features of road like horizontal and vertical alignment
3. Analyze the factors influencing road vehicle performance, characteristics and design.
4. Illustrate the basic traffic stream parameters and perform basic traffic signal phasing and timing plan.
5. Demonstrate the role of intersections and other modes of transportation

UNIT I

Highway Development and Planning: Highway development in India – Necessity for Highway Planning- Different Road Development Plans- Classification of Roads- Road Network Patterns – Highway Alignment- Factors affecting Alignment- Engineering Surveys – Drawings and Reports.

UNIT II

Highway Geometric Design: Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements – Sight Distances – Stopping sight Distance, Overtaking Sight Distance, intermediate Sight Distance and Head light sight distance- Design of Horizontal Alignment- Design of Super elevation and Extra widening- Design of Transition Curves- Design of Vertical Alignment-Gradients- Vertical curves.

UNITIII

Traffic Engineering: Traffic flow parameters-Volume, Speed, Density and headway- Traffic Volume Studies- Data Collection and Presentation-speed studies- Data Collection and Presentation- Parking Studies, Parking types and Parking characteristics- Road Accidents- Causes and Preventive measures – Accident Data Recording – Condition Diagram and Collision Diagrams.

Traffic Regulation and Management: Road Traffic Signs – Types and Specifications–Road Markings-Need for Road Markings-Types of Road Markings- Design of Traffic Signals – Webster Method –IRC Method.

UNIT IV

Intersections: Types of Intersections – Conflicts at Intersections- Types of At-Grade Intersections- Channelization: Objectives –Traffic Islands and Design Criteria-Types of Grade Separated Intersections- Rotary Intersection – Concept of Rotary and Design Criteria- Advantages and Disadvantages of Rotary Intersection.

UNIT V

Introduction to Railway and Airport Engineering: Gradients- Grade Compensation-Cant and Negative Super elevation- Cant Deficiency – Degree of Curve – Crossings and Turnouts. Factors affecting Selection of site for Airport – Aircraft Characteristics- Geometric Design of Runway- Computation of Runway length – Correction for runway length – Orientation of Runway – Wind Rose Diagram – Runway Lighting system

TEXT BOOKS:

1. Highway Engineering – S.K.Khanna &C.E.G.Justo, Nemch and& Bros., 9th edition (2011).
2. Highway Engineering Design – L.R.Kadiyali and Lal- Khanna Publications.
3. Airport Planning and Design- S.K.Khanna and Arora,Nemch and Bros.
4. Railway engineering- A Textbook of Railway Engineering- SubhashC.Saxena,SatyapalArora – DhanpatRai& Sons – (2012)

REFERENCES:

1. Highway Engineering – S. P. Bindra, Dhanpat Rai& Sons. – 4th Edition(1981)
2. Traffic Engineering & Transportation Planning –Dr.L.R.Kadyali, Khanna Publications – 8th Edition –2011.
3. Railway Engineering – A text book of Transportation Engineering –S.P.Chandola
4. Air Transportation Planning & design – Virendhra Kumar &StatishChandhra – Gal GotiaPublishers(1999).

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

FOUNDATION ENGINEERING

Course Code: GR18A3066	**L**	**T**	**P**	**C**
III Year II Semester	**3**	**0**	**0**	**3**

Course Objectives: The objectives of this course is to make the student to

1. Learn about various soil exploration methods.
2. Estimate the factors of safety against slope stability.
3. Utilize the knowledge of earth pressure theories and retaining walls.
4. Interpret and analyze bearing capacity of shallow foundations.
5. Analyze bearing capacity deep foundations.

Course Outcomes: After completion of this course, students will be able to

1. Identify the various soil exploration techniques and interpret the resulting soil profiles.
2. Assess the stability of slopes.
3. Compute earth pressures and stability of retaining walls.
4. Apply bearing capacity equations for shallow foundations and analyze settlement.
5. Estimate pile and pile group capacity for soils and recognize the shapes and components of well foundations.

UNIT I

Soil Exploration: Introduction, methods of site exploration and soil investigation, methods of boring, soil samplers, sampling procedures, penetrometer tests, analysis of borehole logs, preparation of soil investigation report.

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 stability Number. 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, and settlement from penetration tests.

UNIT V

Deep foundations: Types of piles, static pile formulae, dynamic pile formulae, pile load tests, load carrying 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. GopalRanjan and ASR Rao, Basic and Applied Soil Mechanics, New Age International Pvt. Ltd, New Delhi, 2nd edition (2000), Reprint (2014).
2. Braja M. Das, Principles of Foundation Engineering, Cengage Learning, New Delhi, 6th edition (2007), Reprint (2012).
3. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Soil Mechanics and Foundations, Laxmi publications Pvt. Ltd., New Delhi, 16th edition, Reprint (2012).

REFERENCES

1. VNS Murthy, Soil Mechanics and Foundation Engineering, CBS Publsihers and Distributors.
2. Bowles, J.E., Foundation Analysis and Design, McGraw-Hill Publishing Company, Newyork, 5th edition (1997).
3. A. Singh, Modern Geotechnical Engineering, 3rd Ed., CBS Publishers, New Delhi, 1999.
4. N. Som, Theory and Practice of Foundation Design, Prentice Hall, New Delhi, 2003.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DESIGN OF STEEL STRUCTURES

	L	T	P	C
Course Code: GR18A3067				
III Year. II Semester	**3**	**0**	**0**	**3**

Prerequisite: Engineering Mechanics, Strength of Materials and Structural Analysis.

Course Objectives: The objectives of this course is to make the student to

1. Identify various types of structural steel and its properties. Also able to define concepts of LSD.
2. Classify and design various types of connections.
3. Design tension and compression members for the given loads and moments.
4. Design steel beams for the given loads and moments.
5. Design eccentric connections for the given loads and moments.

Course Outcomes: After completion of this course, students will be able to

1. Identify various types of structural steel and its properties. Also able to define concepts of LSD.
2. Classify and design various types of connections.
3. Design tension and compression members for the given loads and moments.
4. Design steel beams for the given loads and moments.
5. Design eccentric connections for the given loads and moments.

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/Reference Books:

1. Design of steel structures – N. Subramanian, Oxford University Press –2009.
2. Limit State Design of steel structures, S.K.Duggal, Tata McGraw – Hill, 2010
3. Design of Steel Structures Vol. 1 & 2 – Ramchandra, Standard Publications.
4. Design of steel structures , S. S. Bhavikatti, IK int Publication House, New Delhi, 2010
5. Design of steel structures, BC Punmia A. K. Jain , Ashok Kumar Jain, Laxmi Publications

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

REINFORCED CONCRETE
(PROFESSIONAL ELECTIVE-II)

Course Code: GR18A3068	**L**	**T**	**P**	**C**
III Year II Semester	**3**	**0**	**0**	**3**

Course Objectives: The objectives of this course is to make the student to

1. Understand basics of reinforced concrete
2. Understand basic design concepts of reinforced concrete
3. Understand behaviour of flexure, shear and torsion of reinforced concrete
4. Understand the limit state of design
5. Understand the limit state of design for compression members

Course Outcomes: After completion of this course, students will be able to

1. Optimise the reinforced concrete member based on its properties
2. Design of reinforced concrete members using different methods
3. Design of beams and slabs
4. Design of two way slabs
5. Design of columns subjected to uniaxial and biaxial loadings

UNIT-I

Introduction- plain and reinforced concrete- objectives of structural design – structural systems – Basic material properties- cement, aggregate, water, grade of concrete, concrete mix design- Behavior of concrete under uniaxial compression, tension, combined stress, creep, shrinkage and temperature, durability, reinforcing steel.

UNIT-II

Basic design concepts- Working stress method, Ultimate load method, Probability Analysis and design, Limit State method; Behaviour in flexure, analysis at service loads, ultimate limit state,

UNIT-III

Design of beams and slabs for flexure, Design for shear, Torsion, bond

UNIT-IV

Serviceability Limit state: Deflection and cracking; Design of two way slab systems

UNIT-V

Design of compression members – uniaxial and biaxial bending

TEXT BOOKS:

1. Reinforced concrete design, S Unnikrishna Pillai and Devdas Menon,

REFERENCES:

1. IS 456 – 2000 Plain and Reinforced concrete – code of practice
2. Reynolds, C.E.; Reinforced Concrete Design Handbook; 9th Edition; Rupa & Company; Calcutta; 1981
3. Park and Paulay; Reinforced Concrete Structures, John Wiley and Sons

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ROCK MECHANICS
(PROFESSIONAL ELECTIVE-II)

Course Code: GR18A3069	**L**	**T**	**P**	**C**
III Year II Semeter	**3**	**0**	**0**	**3**

Course Objectives: The objectives of this course is to make the student to

1. Introduced to basics of characteristics of rocks.
2. Provide a basic understanding of geology its effect on civil engineering structures.
3. Apply rock mechanics principles in the design of foundations.
4. Study the subsidence and slopes in rocks.
5. Compute and measure state of stress in rock mass.

Course Outcomes: After completion of this course, students will be able to

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. Develop understanding on impact of geological features on civil engineering projects
3. Identify the problems associated with different geological features on civil engineering structures and suggest alternatives.
4. Describe the theory and analysis of in situ and induced stresses in a rock mass and structurally controlled failure.
5. Introduced various methods to improving the properties of rock masses.

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, Physico-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 mine 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 insitu stresses and rock strength, Photo elasticity

TEXT BOOKS:

- Jager. J C & Cook NGW Fundamentals of Rock Mechanics, Blackwell Publishers.
- JumikisAlfreds. R, Rock Mechanics, Trans Tech Publishers.
- Goodman, R.E. (1989), 'Introduction to Rock Mechanics', John Wiley, Chichester.
- Hudson, J.A. and Harrison, J.P. (2000), 'Engineering Rock Mechanics', Pergamon Press, Amsterdam.

REFERENCE BOOKS:

- Peng. Syd. S. Coal Mining Ground Control West Virginia University.
- Brady, BHG& Brown.ET, Rock mechanics for underground mining, George Allen &Unwio Ltd, 1992

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

OPEN CHANNEL FLOW
(PROFESSIONAL ELECTIVE-II)

Course Code: GR18A3070	**L**	**T**	**P**	**C**
III Year II Semester	**3**	**0**	**0**	**3**

`

Course Objectives: The objectives of this course is to make the student to

1. Introduction to types of open channels and flows
2. Skill of designing type of channel flows and types of channel sections
3. Visualization uniform flows of channel
4. Knowledge about the gradual varied flow and surface profiles
5. Knowledge about the rapid varied flow and surface profiles

Course Outcomes: After completion of this course, students will be able to

1. Express 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 G.V.F
5. Apply the knowledge of dynamic equation in R.V.F

UNIT I

Basic Concepts introduction 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, Hydraulic exponent M. morrient in open channel flow — 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' metchod 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. Open Channel Hydraulics — V.T. Chow, McGraw Hill book company
2. Flow in open channels — K. Subramanya TMH Publishing Co. Ltd '

REFERENCES:

1. Flow through open channels — K.G. RangaRaju. THM Publishing Co. Ltd.
2. Qpen Channel Hydraulics — French R.H. McGraw Hill book Company
3. Open Channel Flow –Hanif Chaudhary. M. Printice — Hall of India Pvt. Ltd. , 46.4

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

CONCRETE TECHNOLOGY
(PROFESSIONAL ELECTIVE-II)

Course Code: GR18A3071	**L**	**T**	**P**	**C**
III Year II Semester	**3**	**0**	**0**	**3**

Course Objectives: The objectives of this course is to make the student to

1. Identify the physical and chemical properties of concrete ingredients and able to conduct tests on cement and aggregates.
2. Comprehend the workability of concrete, manufacturing processes of concrete and the behavior of fresh, hardened concrete.
3. Gain the knowledge about NDT methods, quality control of concrete and how to conduct the tests on hardened concrete.
4. Identify the properties like elasticity, creep, shrinkage; special concretes and their applications in the diverse construction field.
5. Acquire the practical knowledge on mix design principles, concepts and methods

Course Outcomes: After completion of this course, students will be able to

1. Illustrate the physical and chemical properties of concrete ingredients and able to conduct tests on cement and aggregates.
2. Clarify the physical properties of fresh and hardened concrete and also about the manufacturing of concrete.
3. Estimate the creep and shrinkage of concrete and how to conduct the different tests such as compression and tension on hardened concrete and also summarize the quality control of concrete under different conditions.
4. Distinguish the special concretes like Self compacting concrete, Fibre reinforced concrete, Polymer concrete and light weight concrete etc.
5. Design the mix proportions for the specific work for required strength and workability with available materials at workplace.

UNIT I
Concrete Ingredients and its Properties:

Cements & Admixtures: Portland cement – Chemical composition – Hydration, setting of cement – Structure of hydrated cement – Tests on physical properties – Different grades of cement – Admixtures – Mineral and chemical admixtures.

Aggregates: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregate – Specific gravity, bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand – Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded aggregate – Maximum size of aggregate.

UNIT II

Fresh Concrete: Production of concrete, mixing, compaction curing, Properties of fresh concrete. Workability – Factors affecting workability – Measurement of workability bydifferenttests–Settingtimesofconcrete–Effectoftimeandtemperatureonworkability– Segregation & bleeding.

Hardened Concrete : Water / Cement ratio – Abram's Law – Gel Space ratio – Nature of strengthofconcrete–Maturityconcept–Strengthintension&compression–Factorsaffecting strength – Relation between compression & tensile strength -Curing.

UNIT III

Testing of Hardened Concrete: Compression tests–Tension tests–Factors affecting strength –Flexure tests–Splitting tests–Non-destructive testing methods–codal provisions for NDT.

Quality control of Concrete: Behavior of concrete in extreme environment; temperature problem in concreting, hot weather, cold weather and under water conditions, Resistance to freezing, sulphate and acid attack, efflorescence, fire resistance; Inspection and testing of concrete-Concrete cracking, types of cracks, causes and remedies.

UNIT IV

Elasticity, Creep & Shrinkage: Modulus of elasticity – Dynamic modulus of elasticity – Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage – Types of shrinkage.

Special concretes: Light weight aggregates – Lightweight aggregate concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Different types of fibres– Factors affecting properties & Applications of F.R.C – Polymer concrete – Types of Polymer concrete – Properties of polymer concrete & Applications – High performance concrete – Self consolidating concrete – SIFCON.

UNIT V

Mix Design: Factors in the choice of mix proportions – Durability of concrete– Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design.

TEXT/REFERENCE BOOKS :

1. Concrete Technology by M. S. Shetty – S. Chand & Co. ;2004
2. Properties of Concrete by A. M. Neville – Low priced Edition – 4thedition
3. Concrete Technology by M.L. Gambhir – Tata Mc. Graw Hill Publishers,NewDelhi.
4. Concrete Technology by A.R. Santha Kumar, Oxford University Press, NewDelhi.
5. Concrete: Microstructure, Properties and materials by P Kumar Mehta, P J M Monteiro, MC Graw Hill Education Publisher, New Delhi.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREEN BUILDING TECHNOLOGY
(OPEN ELECTIVE)

Course Code: GR18A3128	L	T	P	C
III Year II Semester	3	0	0	3

COURSE OBJECTIVES: The objectives of this course is to make the student to

- Create awareness about the principles of green building technology and to have insight about the criteria for rating systems along with the established Indian codes and guidelines.
- Get a clear understanding of various renewable and non-renewable sources of energy along with their carbon foot prints and also enumerate the process of performance testing including building modeling and energy analysis.
- Discuss about the energy efficient green building materials and to have understanding on the cost effective Building Technologies, Strategies for Green Building Systems and Energy Conservation Measures.
- Describe the principles of sustainable development in green building design.
- Explain the best green building practices adopted along with cost/benefit and life-cycle analysis of green buildings.

COURSE OUTCOMES: After completion of the course the student will be able to -

- Know the underlying principles, history, environmental and economic impacts of green building technology and to identify the criteria for rating systems along with the established Indian codes and guidelines.
- Identify various Renewable and Non-renewable sources of energy along with their carbon foot prints and also comprehend the techniques and benefits of building performance testing such as building modeling and energy analysis, monitoring and metering.
- Recognize the energy efficient green building materials and explain the cost effective Building Technologies, Strategies for Green Building Systems and Energy Conservation Measures and compare cost and performance of building materials with recycled components, non-petroleum based materials, materials with low volatile organic compounds, materials with low embodied energy and salvaged materials and incorporate them into design.
- Explain the application of design guidelines of Green Building considering the Energy Conservation Measures.Perform cost/benefit analysis and life-cycle analysis of green buildings.
- Summarize on the building codes, relevant legislation governing the consumption of resources and emission of environmental pollutants by buildings and be familiar with IGBC green building certification procedure.

UNIT-1

Concept of Green Buildings:

Definition of Green Buildings, typical features of green buildings, Necessity, Initiatives, 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 ,environmental benefits economic benefits, health and social benefits , ,Contribution of buildings towards Global Warming. Life cycle cost of buildings, 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 foot print; Environmental issues, Minimizing carbon emission, Energy retrofits and Green Remodels.

UNIT-III

Green Building Materials: Sustainably managed Materials, Depleting natural resources of building materials; renewable and recyclable resources; energy efficient materials; Embodied Energy of Materials , Green cement, Biodegradable materials, Smart materials, Manufactured 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, Green Strategies for Building Systems, Alternative Construction Methods, Energy Conservation Measures in Buildings, Waste &Water management and Recycling in Sustainable Facilities, Heating, Ventilation and Air Conditioning, Passive Solar & Daylight, Plumbing and its Effect on Energy Consumption

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, , Case studies of rated buildings (new and existing)

REFERENCE BOOKS:

1. Alternative Building Materials and Technologies – By K S Jagadeesh, B V Venkata Rama Reddy & K S Nanjunda Rao – New Age International Publishers
2. Integrated Life Cycle Design of Structures – By AskoSarja – SPON Press
3. Non-conventional Energy Resources – By D S Chauhan and S K Sreevasthava – New Age International Publishers
4. Green Buildings (McGraw hill publication): by Gevorkian
5. Emerald Architecture: case studies in green buildings, The Magazine of Sustainable Design
6. Understanding Green Building Guidelines: For Students and Young Professionals, Traci Rose Rider ,W. W. Norton & Company Publisher.
7. Understanding Green Building Materials,Traci Rose Rider, W. W. Norton & Company Publisher.

List of free reference guides/resources available on the net:

1. IGBC reference guide/Rating systems
2. Free abridged versions of LEED reference guides
3. ECBC latest version
4. US GBC's Reference Material:

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECCHNOLOGY

Soft Skills and Interpersonal Skills

Course code:GR18A3117 (Open Elective)

III B.Tech II Semester

L	T	P	C
2	1	0	3

Course Objectives: The learner will be able to:

- Know the importance of soft skills
- Identify good leadership skills /qualities
- Recognize the importance of interpersonal skills
- Demonstrate the significance of confidence building
- Define and differentiate between a report and a proposal

Course Outcomes:

After the end of the course the learners will be able to:

- Develop soft skills communication skills, leadership skills etc
- Implement goal setting techniques to build a promising career
- Design formal report and proposals with appropriate formal expressions
- Analyse their own experiences of leading and participating in teams with suitable examples
- Describe team dynamics and exchange ideas about the elements of positive teamwork
- Create healthy workplace environment by treating others with respect and dignity
- Evaluate the power of confidence building and self-esteem with examples

Unit 1: Soft Skills

- Introduction to soft skills, Definition of Soft skills, Importance of soft skills
- Communication skills, Usage of English in Business/Corporate scenario
- Nonverbal communication
- Presentation skills

Unit 2: Leadership development

- Qualities of a good leader
- Decision making and problem solving skills
- Strategic management
- Crisis management

Unit3: Confidence building

- Motivation
- Goal setting
- Self-esteem
- Team skills

Unit 4: Developing reports and proposals

- Understanding reports and proposals
- Planning reports and proposals
- Writing beginning, body and ending
- Formats of reports and proposals

Unit 5: Interpersonal skills

- Understanding professional relationships
- Networking professionally
- Showing basic office courtesies
- Interview skills

Text Books:

1. Soft Skills-Key to success in workplace and life Meenakshi Raman, Raman Upadhyay, CENAGE

Reference books:

2. Soft skills for Everyone Jeff Butterfield, CENAGE Learning

3. Soft skills for Interpersonal Communication S. Bala Subramaniam, ORIENT BLACKSWAN

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

HUMAN RESOURCE DEVELOPMENT AND ORGANIZATIONAL BEHAVIOUR

(**Open Elective**)

Course Code: GR18A3118 **L/T/P/C: 3/0/0/3**

III Year II Semester

Course Objectives

- To make student aware of the concepts, techniques and practices of human resource development.
- This course is intended to make students capable of applying the principles and techniques as professionals for developing human resources in an organization.
- OB provides perspectives and skills that enhance understanding of our own behaviour and our ability to influence the behaviour of others in organizational settings
- OB and HRM together can instill sustainability deep within an organizations' culture.
- To equip them with behavioural skills in managing people at work.

Course Outcomes:

- To familiarize the concepts, techniques and practices of human resource development in the current organizational view and to impart and apprise the capable of applying the principles and techniques as professionals for developing human resources in an organization.
- Develop, implement, and evaluate organizational human resource development strategies aimed at promoting organizational effectiveness in different organizational environments.
- To acquaint the student with the determinants of intra -individual, inter-personnel and inter-group behaviour in organizational setting.
- To understand individual behavior in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality, values, perception, decision making, and motivational theories and apply in the organizational context.
- To assess the group behavior in organizations, including communication, leadership, power and politics, conflict, and negotiations in the frame work of organization.

Unit I -Introduction to Human Resource Development:

Concept; Relationship between human resource management and human resource development; HRD mechanisms, processes and outcomes; HRD matrix; Roles and competencies of HRD professionals; Challenges in HRD, steps in HRD Process.

Unit II-HRD Applications and Trends:

Coaching and mentoring; Career management and development; Competency mapping; Balanced Score Card. HRD in Organisations: Selected cases covering HRD practices in government organisations, manufacturing and service industries and MNCs.

Unit III - Introduction to OB:

Organisational Behaviour- Concept and Emergence of OB Concept; Nature and Theoretical frameworks; Models of Organisational Behaviour, Challenges and Opportunities for Organisational Behavior;

Unit IV- Individual Behaviour:
Individual Behaviour: Personality, Learning, Values and Attitudes, Perception, Stress at work. Management's assumptions about people- McGregor's Theory X and Theory Y. Motivation - Maslow's Need Hierarchy, Herzberg's Two Factors Theory, Vroom's Expectancy Theory.

Unit V-Inter-personal and Group Behaviour:
Interpersonal communication and Feedback; Transactional Analysis (TA); Johari Window, Group Behaviour: Group Dynamics, Cohesiveness and Productivity; Management of Dysfunctional groups; Group Decision Making. Leadership- Concept and Styles.

Text Books:

1. Robbins, Stephen P. and Timothy A. Judge, Organisational Behaviour, Prentice -Hall, New Delhi.
2. Werner J. M., DeSimone, R.L., Human resource development, South Western.

Reference Books:

1. Luthans, Fred, Organizational Behaviour, McGraw-Hill, New York.
2. Gregory, Moorhead and Ricky W. Griffin, Managing Organizational Behaviour, Thomson South Western Publication.
3. Pareek, Udai and V. Sisodia, "HRD in the New Millennium, Tata McGraw - Hill Publishing Co. Ltd., New Delhi, 1999.
4. Haldar, U. K., Human resource development, Oxford University Press India.
5. Rao, T.V., Future of HRD, Macmillan Publishers India.
6. Rao, T.V., HRD Score Card 2500: Based on HRD audit, Response Books, SAGE Publications.
7. Mankin, D., Human resource development, Oxford University Press India.