CURRICULUM OF CIVIL ENGINEERING
RGUKT BASAR

IV YEAR
I SEMESTER

Subject Code	Course Name	(L-T)-P	Credits
BM3001/4001	Managerial Economics and Financial Analysis	4-0-0	3
CE4101	Structural Design (Concrete)	4-0-0	4
CE4102	Advanced Water Resource Engineering	4-0-0	4
CE4532	Elective-I Remote Sensing and GIS	4-0-0	3
CE4700	Project		4
Total		16-0-0	18

CM3001/4001 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Externals: 60Marks **L-T-P-C**

Internals: 40Marks **4-0-0-3**

Objectives:

UNIT I: Introduction to Managerial Economics:

Definition, Nature and Scope of Managerial Economics-Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

UNIT II: Theory of Production and Cost Analysis:

Production Function - Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs. Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts, Opportunity cost. Fixed vs. Variable costs, Explicit costs Vs. Implicit costs. Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

UNIT III: Markets & Pricing Policies:

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Objectives and Policies of Pricing- Methods of Pricing: Cost Plus Pricing. Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing.

UNIT IV: Introduction to Financial Accounting: Introduction to Financial Accounting: Double entry Book Keeping, Journal, Ledger, Trail Balance and Final Accounts (Trading account, Profit and Loss Account and Balance sheet with simple adjustments).

UNIT V: Capital and Capital Budgeting:

Capital and Capital Budgeting: Capital and its significance. Types of Capital. Estimation of Fixed and Working capital requirements. Methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals. Methods of Capital Budgeting: Payback Method. Accounting Rate of Return (ARR) and Net Present Value Method, Internal Rate of Return (IRR).

Reference Books:

1. Aryasri: Managerial Economics and Financial Analysis, TMH,2009.
2. Varshney & Maheswari : Managerial Economics, Sulthan Chand,2009.
3. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech. 2009.
4. V.Rajasekarn & R.Lalitha. Financial Accounting, Pearson Education. New Delhi. 2010
5. Suma Damodaran, Managerial Economics, Oxford University Press. 2009.

CE4101 **STRUCTURAL DESIGN (CONCRETE)**

Externals: 60Marks **L-T-P-C**

Internals: 40Marks **4-0-0-4**

Objectives:

- To understand the design procedures for columns and footings.
- To know the design of different types of water tanks.
- To learn the various types of bridges and their functional advantages.
- To be able to understand the IRC Loadings for bridge design
- To determine the various parameters of slab bridges.

UNIT-I

Introduction to columns and footings, Definition, IS codes. Elastic design and detailing of combined rectangular footings. Elastic design and detailing of retailing of walls-cantilever and counter fort types.

UNIT-II

Types of water tanks, Definition, IS codes. Elastic design and detailing of rectangular and circular, ground and over head tanks including Intze tanks. Design of staging.

UNIT-III

Bridges: Introduction to Bridges, Classification of Bridges, Recent advantages in Bridges Engineering, IRC loading -impact factor -effective width method and Pigeaud's method. Elastic design and detailing of (I) R.C, Slab bridges and (ii) T-beam bridges for IRC loadings.

Suggested Reading:

1. Krishna Raju, N. (2009), "Structural Design and Drawing (Third Edition)", Universities Press.
2. Punmia, B.C. And Jain, A.K.(2006), "RCC designs (Reinforced Concrete Structures)", Laxmi Publications (10th Edition).
3. Phatak (1990), "Bridge Engineering", SatyaPrakashan Publishers.
4. Johnson, D. Victor (2006), "Essentials of Bridge Engineering", Oxford & IBH Publicashers Pvt. Ltd., New Delhi.

CE4102 ADVANCED WATER RESOURCE ENGINEERING

Externals: 60Marks **L-T-P-C**

Internals: 40Marks **4-0-0-4**

Objectives:

- To describe design aspects of different types of weirs and regulatory systems.
- To impart knowledge regarding the different types of cross drainage structures.
- To introduce the concepts of planning for hydro power projects.

UNIT- I

Weirs: Components of diversion head works, types of weirs -fixation of still level of head sluice, scouring sluice and crest level of weir, afflux and top level of flood banks, design of vertical drop and slopping glacis weir, design for surface flow and sub – surface flow, lengths, level and thickness of downstream apron, upstream and downstream and downstream cutoffs, protection works.

UNIT-II

Seepage Forces: Causes of failures of structures on permeable foundations, piping, rupture of floor, undermining, remedial measures, and computation of uplift forces by Bligh's theory, Khoshla's theory, analytical method, and significance of exit gradient.

UNIT-III

Canals: Alignment, classification of alluvium canals and their functions, regime concept of kennedy's andlacey's theories, design of canals based on kennedy's and lacey's method. Use of gattett's diagrams for the design of canals, lining of canals, methods of lining and design of line canals.

UNIT-IV

Canal Falls: Definition, location, types of falls, design principles of trapezoidal notch fall, vertical drop fall, glacis fall.

Regulators and Modules: Head regulator and cross regulators, canal escapes, canal outlets and modulus-proportionality, sensibility and flexibility.

UNIT-V

Hydro-Power: Comparison of hydro power with thermal power classification of hydro power plants. Definition of various terms, principal components of hydro-electric power plants (Forebay, intake structure, penstock & surge tank), economical diameter of penstocks.

Power House: Sub-structure and super structure of a power house, merits and demerits and demerits of an underground power house, fixation of dimensions of a power house.

Suggested Reading:

- Punmia, B.C., Pande, B. and Lal, B. (1991), “Irrigation and Water Power Engineering”, Standard Book House.
- Garg, S.K. (1993), “Irrigation and Hydraulic Structures”, Khanna Publishers.
- Modi, P.N. (1993), “Irrigation Water Resources and Water Power”, Standard Book of House.

Arora, K.R. (1993), “Irrigation, Water Power and Water Resources Engineering”, Standard Publishers Distributors, New Delhi

CE4532 ELECTIVE – REMOTE SENSING AND GIS

Externals: 60Marks **L-T-P-C**

Internals: 40Marks **4-0-0-3**

Unit-I

Modern Surveying Techniques: Electronic distance measuring instruments, Total station, Electronic Theodolite,

Unit-II

Triangulation: Concepts, Introduction to Global Positioning System(GPS), GPS errors and accuracy, Diffrential GPS techniques, Photogrammetry, Geometry of vertical aerial photographs, Photo scale, Stereoscopy and parallax.

Unit-III

Geographic Information System (GIS): What is GIS? components of GIS, Raster and vector data models, Scale, Projection, Datum and coordinate system, ata acquisition and conversion techniques, Database management System, Query development, Spatial querying, Geoprocessing, Elements of map making (Cartography), GIS Applications: Case studies.

Unit-IV

Remote Sensing: Physical basis of Remote sensing, Electromagnetic Radiation (EMR), Remote sensing platforms and sensor characteristics, image interpretation, Multi-spectral remote sensing systems, Digital Image Processing and classification, Active and Passive microwave remote sensing,

Remote sensing Appliations: Case studies.

Lab: During the lab section the students will get hands on training in applying the concepts learned during the Lecture using GIS and remote sensing software.

CE4700 PROJECT

External panel: 60 Marks **L-T-P-C**

Internal advisor: 40 Marks **0-0-4-4**

Student has to do literature review on the chosen/allotted area of project work and must submit a report.

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