B.Tech. IV - I Sem.	Th	Tu	C
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(13A52501) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS (MEFA)

Course Objective:
The objectives of this course are to equip the student with the basic inputs of Managerial Economics and Economic Environment of business and to enrich analytical skills in helping them take sound financial decisions for achieving higher productivity.

Learning Outcome:
The thorough understanding of Managerial Economics and Analysis of Financial Statements facilitates the Technocrats – cum – Entrepreneurs to take-up decisions effectively and efficiently in the challenging Business Environment.

UNIT I
INTRODUCTION TO MANAGERIAL ECONOMICS
Managerial Economics - Definition, nature and scope – contemporary importance of Managerial Economics - Demand Analysis: Determinants- Law of Demand - Elasticity of Demand. Significance – types – measurement of elasticity of demand - Demand forecasting- factors governing demand forecasting- methods of demand forecasting –Relationship of Managerial Economics with Financial Accounting and Management.

UNIT II
THEORY OF PRODUCTION AND COST ANALYSIS
Production Function – Short-run and long- run production - 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 - Break-Even Analysis (BEA) - Managerial significance and limitations of BEA - Determination of Break Even Point (Simple Problems)

UNIT III
INTRODUCTION TO MARKETS AND NEW ECONOMIC ENVIRONMENT
Market structures: Types of Markets - Perfect and Imperfect Competition - Features, Oligopoly - Monopolistic competition. Price-Output determination - Pricing Methods and Strategies. Forms of Business Organization – Sole Proprietorship- Partnership – Joint Stock Companies – Public Sector Enterprises – New Economic Environment- Economic systems – Economic Liberalization – Privatization and Globalization

UNIT IV
CAPITAL AND CAPITAL BUDGETING
Concept of Capital - Over and Under capitalization – Remedial measures - Sources of Short term and Long term capital - Estimating Working Capital requirement – Capital budgeting – Features of Capital budgeting proposals – Methods and Evaluation of Capital budgeting – Pay Back Method – Accounting Rate of Return (ARR) – Net Present Value (NPV) – Internal Rate Return (IRR) Method (simple problems)

UNIT V
INTRODUCTION TO FINANCIAL ACCOUNTING AND ANALYSIS
Financial Accounting – Concept - emerging need and importance - Double-Entry Book Keeping- Journal - Ledger – Trial Balance - Financial Statements - - Trading Account – Profit & Loss Account – Balance Sheet (with simple adjustments). Financial Analysis – Ratios – Techniques – Liquidity, Leverage, Profitability, and Activity Ratios (simple problems).

Text Books:

1. *Aryasri: Managerial Economics and Financial Analysis, 4/e, TMH, 2009.*
2. *Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.*

Reference Books:

1. *Premchand Babu, Madan Mohan: Financial Accounting and Analysis, Himalaya, 2009*
2. *S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International,. 2009.*
3. *Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.*
4. *Domnick Salvatore: Managerial Economics in a Global Economy, Cengage, 2009.*
5. *H.L.Ahuja: Managerial* Economics, S.Chand, 3/e, 2009

B.Tech. IV - I Sem.	Th	Tu	C
	3	1	3

(13A01701) BRIDGE ENGINEERING

Course Objective:

It deal with different types of Bridges like deck slab bridge, T – Beam Bridge etc and gives a good knowledge on different components of bridges.

UNIT I

INTRODUCTION:

Importance of site investigation in Bridge design. Highway Bridge loading standards. Impact factor. Railway Bridge loading standards (B.G. ML Bridge) various loads in bridges.

BOX CULVERT: General aspects. Design loads, Design of Box culvert subjected to RC class AA tracked vehicle only.

BRIDGE BEARINGS:

General features – Types of Bearings – Design principles of steel Rocker & Roller Bearings – Design of a steel Rocker Bearing – Design of Elastometric pad Bearing.

UNIT II

DECK SLAB BRIDGE:

Introduction – Effective width method of Analysis Design of deck slab bridge (Simply supported) subjected to class AA Tracked Vehicle only.

UNIT III

BEAM & SLAB BRIDGE (T-BEAM BRIDGE)

General features – Design of interior panel of slab – Pigeauds method – Design of a T-beam bridge subjected to class AA tracked vehicle only.

UNIT IV

PLATE GIRDER BRIDGE:

Introduction – elements of a plate girder and their design. Design of a Deck type welded plate girder – Bridge of single line B.G.

COMPOSITE BRIDGES:

Introduction – Advantages – Design of Composite Bridges consisting of RCC slabs over steel girders' including shear connectors

UNIT V

PIERS & ABUTMENTS:

General features – Bed Block – Materials piers & Abutments Types of piers – Forces acting on piers – Stability analysis of piers – General features of Abutments – forces acting on abutments – Stability analysis of abutments – Types of wing walls – Approaches – Types of Bridge foundations (excluding Design).

Text Books:

1. *Bridge Engineering by Ponnu Swamy, TATA Mcgraw Hill Company, New Delhi.*
2. *Design of Bridges by N.Krishnam Raju, Oxford & IBH, Publishing Company Pvt.ltd., Delhi.*
3. *Relevant – IRC & Railway bridge Codes.*

Reference Books:

1. *Design of Steel structures, by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi Publications, New Delhi.*
2. *Design of Bridges Structure by D.J.Victor*
3. *Design of Steel structures by Ramachandra.*
4. *Design of R.C.C. structures B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi Publications, New Delhi.*
5. *Design of Bridges Structure by T.R.Jagadish & M.A.Jayaram Prentice Hall of India Pvt., Delhi.*

B.Tech. IV - I Sem.	Th	Tu	C
	3	1	3

(13A01702) GEOTECHNICAL ENGINEERING – II

Course Objective:

To use the principles of Soil mechanics to design the foundations, Earth retaining structures and slope stability safely and economically knowledge of the subject is essential.

UNIT I

SOIL EXPLORATION: Need – Methods of soil exploration – Boring and Sampling methods – Field tests – Penetration Tests – Plate load test – Pressure meter – planning of Programme and preparation of soil investigation report.

UNIT II

EARTH SLOPE STABILITY: Infinite and finite earth slopes – types of failures – factor of safety of infinite slopes – stability analysis by Swedish arc method, standard method of slices, Bishop's Simplified method – Taylor's Stability Number- Stability of slopes of earth dams under different conditions.

UNIT III

EARTH PRESSURE THEORIES: Rankine's theory of earth pressure – earth pressures in layered soils – Coulomb's earth pressure theory – Rebhann's and Culmann's graphical method

RETAINING WALLS: Types of retaining walls – stability of retaining walls.

UNIT IV

SHALLOW FOUNDATIONS: Types – choice of foundation – Location of depth – Safe Bearing Capacity – Terzaghi`s, Meyerhoff's and Skempton`s Methods

ALLOWABLE BEARING PRESSURE : Safe bearing pressure based on N- value – allowable bearing pressure; safe bearing capacity and settlement from plate load test – allowable settlements of structures – Settlement Analysis

UNIT V

PILE FOUNDATION: Types of piles – Load carrying capacity of piles based on static pile formulae – Dynamic pile formulae – Pile load tests – Load carrying capacity of pile groups in sands and clays – Settlement of pile groups.

WELL FOUNDATIONS: Types – Different shapes of wells – Components of wells – functions and Design Criteria – Sinking of wells – Tilts and shifts.

Text Books:

1. *Geotechnical Engineering by C.Venkataramaiah, New Age Pubilications.*
2. *Soil Mechanics and Foundation Engineering by Arora, Standard Publishers and Distributors, Delhi*
3. *Soil Mechanics and Foundations by – by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, publications Pvt. Ltd., New Delhi*

Reference Books:

1. *Soil Mechanics and Foundation Engineering by Purushtoma Raj, Pearson Pubilications*
2. *Das, B.M., - (1999) Principles of Foundation Engineering –6th edition (Indian edition) Thomson Engineering*
3. *Foundation Engineering by Varghese,P.C., Prentice Hall of India., New Delhi.*
4. *Foundation Engineering by V.N.S.Murthy, CRC Press, New Delhi.*
5. *Bowles, J.E., (1988) Foundation Analysis and Design – 4th Edition, McGraw-Hill Publishing company, New York.*
6. *Geotechnical Engineering by Manoj Dutta & Gulati S.K – Tata Mc.Grawhill Publishers New Delhi.*

B.Tech. IV - I Sem.	Th	Tu	C
	3	1	3

(13A01703) TRANSPORTATION ENGINEERING – II

Course Objective:

It deals with different components of Transportation Engineering like Railway, Airport Engineering & harbours. Sound knowledge can aquire on components of airports, docks and harbours.

UNIT I

Railway Engineering:

Introduction – permanent way components – cross section of permanent way – functions and requirements of rails, sleepers and ballast – types of gauges – creep of rails – theories related to creep – coning of wheels – adzing of sleepers – rail fastenings.

UNIT II

Geometric design of railway track

Gradients – grade compensation – cant and negative super elevation – cant deficiency – degree of curves – safe speed on railway track – points and crossings – layout and functioning of left hand turn out and right hand turn outs – station yards – signaling and interlocking.

UNIT III

Airport Engineering

Airport site selection – factors affecting site selection and surveys- runway orientation – wind rose diagram – basic runway length – correction for runway length – terminal area – layout and functions – concepts of terminal building – simple building , linear concept, pier concept and satellite concept – typical layouts .

UNIT IV

Geometric design of runways and taxiways

Aircraft characteristics – influence of characteristics on airport planning and design – geometric design elements of runway – standards and specifications as per - functions of taxiways – taxiway geometric design – geometric elements and standard specifications – runway and taxiway lighting.

UNIT V

Ports and Harbours

Requirements of ports and harbours – types of ports – classification of harbours – docks and types of docks – dry docks, wharves and jetties – breakwaters: layouts of different types of harbours and docks – dredging operations – navigation aids.

Text Books:

1. *A Text Book of Railway Engineering-S.C.Saxena and S.Arora, Dhanpatrai and Sons, New Delhi.*
2. *Satish Chandra and Agarwal, M.M. (2007) "Railway Engineering" Oxford Higher Education, University Press New Delhi.*
3. *Airport Planning and Design- S.K. Khanna and M.G Arora, Nemchand Bros.*
4. *A Text book of Transportation Engineering – S.P.Chandola – S.Chand & Co. Ltd. – (2001).*
5. *Railway Track Engineering by J.S.Mundrey*

Reference Books:

1. *Highway, railway, Airport and Harbour Engineering – K.P. Subramanian, Scitech pubilishers.*
2. *Harbour, Dock and Tunnel Engineering – R. Srinivasan, Charotar Publishing House Pvt. Limited, 2009*
3. *Dock and Harbour Engineering – Hasmukh P Oza, Gutam H Oza, Chartor Publishers pvt ltd.*

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B.Tech. IV - I Sem.	**Th**	**Tu**	**C**
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(13A01704) GROUND IMPROVEMENT TECHNIQUES (ELECTIVE –II)

Course Objective:

The knowledge on the problems posed by the problematic soils and the remedies to build the various structures in problematic soils.

UNIT I

DEWATERING: Methods of de-watering- sumps and interceptor ditches- single, multi stage well points - vacuum well points- Horizontal wells-foundation drains-blanket drains- criteria for selection of fill material around drains –Electro-osmosis .

GROUTING: Objectives of grouting- grouts and their properties- grouting methods- ascending, descending and stage grouting- hydraulic fracturing in soils and rocks- post grout test.

UNIT II

DENSIFICATION METHODS IN GRANULAR SOILS:-

In – situ densification methods in granular Soils:– Vibration at the ground surface, Impact at the Ground Surface, Vibration at depth, Impact at depth.

DENSIFICATION METHODS IN COHESIVE SOILS:–

In – situ densification methods in Cohesive soils:– preloading or dewatering, Vertical drains – Sand Drains, Sand wick geodrains – Stone and lime columns – thermal methods.

UNIT III

STABILISATION: Methods of stabilization-mechanical-cement- lime-bituminous-chemical stabilization with calcium chloride,sodium silicate and gypsum

UNIT IV

REINFORCED EARTH: Principles – Components of reinforced earth – factors governing design of reinforced earth walls – design principles of reinforced earth walls.

GEOSYNTHETICS : Geotextiles- Types, Functions and applications – geogrids and geomembranes – functions and applications.

UNIT V

EXPANSIVE SOILS: Problems of expansive soils – tests for identification – methods of determination of swell pressure. Improvement of expansive soils – Foundation techniques in expansive soils – under reamed piles.

Text Books:

1. *Haussmann M.R. (1990), Engineering Principles of Ground Modification, McGraw-Hill International Edition.*
2. *Dr.P.Purushotham Raj. Ground Improvement Techniques, Laxmi Publications, New Delhi / University science press, New Delhi*
3. *Nihar Ranajan Patra. Ground Improvement Techniques, Vikas Publications, New Delhi*

Reference Books:

1. *Moseley M.P. (1993) Ground Improvement, Blackie Academic and Professional, Boca Taton, Florida, USA.*
2. *Xanthakos P.P, Abramson, L.W and Brucwe, D.A (1994) Ground Control and Improvement, John Wiley and Sons, New York, USA.*
3. *Robert M. Koerner, Designing with Geosynthetics, Prentice Hall New Jersey, USA*

B.Tech. IV - I Sem.	Th	Tu	C
	3	1	3

(13A01705) AIR POLLUTION AND QUALITY CONTROL (ELECTIVE –II)

UNIT I

INTRODUCTION: Air Pollution – Definitions, Scope, Significance and Episodes, Air Pollutants – Classifications – Natural and Artificial – Primary and Secondary, point and Non- Point, Line and Areal Sources of air pollution- stationary and mobile sources.

EFFECTS OF AIR POLLUTION: Effects of Air pollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

UNIT II

THERMODYNAMIC OF AIR POLLUTION:

Thermodynamics and Kinetics of Air-pollution – Applications in the removal of gases like Sox, Nox, CO, HC etc., air-fuel ratio. Computation and Control of products of combustion.

PLUME BEHAVIOUR: Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

UNIT III

POLLUTANT DISPERSION MODELS: Lapse Rates, Pressure Systems, Winds and moisture plume behaviour and plume Rise Models; Gaussian Model for Plume Dispersion.

CONTROL OF PARTICULATES : Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control, Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT IV

CONTROL OF GASEOUS POLLUTANTS: General Methods of Control of Nox and Sox emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

UNIT V

AUR QUALITY MANAGEMENT: Air Quality Management – Monitoring of SPM, SOx; NOx and CO Emission Standards– Air sampling – Sampling Techniques – High volume air sampler – Stack sampling - Analysis of Air pollutants – Air quality standards – Air pollution control act.

Text Books:

1. Air pollution By M.N.Rao and H.V.N.Rao – Tata Mc.Graw Hill Company.
2. Air Quality by Thod godish, Levis Publishers, Special India Edition, New Delhi
3. Air pollution by Wark and Warner.- Harper & Row, New York.

Reference Books:

1. An introduction to Air pollution by R.K. Trivedy and P.K. Goel, B.S. Publications.
2. Air Pollution and Control by K.V.S.G.Murali Krishna, Kousal & Co. Publications, New Delhi.
3. Enivronmental meteorology by S.Padmanabham murthy , I.K.Internationals Pvt Ltd,New Delhi.

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B.Tech. IV - I Sem.	**Th**	**Tu**	**C**
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(13A01706) CONSTRUCTION TECHNOLOGY AND PROJECT MANAGEMENT (ELECTIVE –II)

UNIT I

FUNDAMENTALS OF CONSTRUCTION TECHNOLOGY :

Definitions and Discussion – Construction Activities – Construction Processes - Construction Works – Construction Estimating – Construction Schedule – Productivity and Mechanized Construction – Construction Documents – Construction Records – Quality – Safety – Codes and Regulations.

PREPARATORY WORK AND IMPLEMENTATION

Site layout – Infrastructure Development – Construction Methods – Construction Materials – Deployment of Construction Equipment – Prefabrication in Construction – Falsework and Temporary Works.

UNIT II

EARTHWORK :

Classification of Soils – Project Site – Development – Setting Out - Mechanized Excavation – Groundwater Control – Trenchless (No-dig) Technology – Grading – Dredging.Rock Excavation – Basic Mechanics of Breakage – Blasting Theory – Drillability of Rocks – Kinds of Drilling – Selection of the Drilling Method and Equipment – Explosives – Blasting Patterns and Firing Sequence – Smooth Blasting – Environmental Effect of Blasting.

UNIT III

PROJECT MANAGEMENT AND BAR CHARTS AND MILESTONE CHARTS:

Introduction – Project planning – Scheduling – Controlling – Role of decision in project management – Techniques for analyzing alternatives Operation research – Methods of planning and programming problems – Development of bar chart – Illustrative examples – Shortcomings of bar charts and remedial measures – Milestone charts – Development of PERT net work problems.

UNIT IV

ELEMENTS OF NETWORK AND DEVELOPMENT OF NETWORK :

Introduction – Event – Activity – Dummy – Network rules – Graphical guidelines for network – Common partial situations in network – Numbering the events – Cycles Problems – Planning for network construction – Modes of network construction – Steps in development of network – Work breakdown structure –Hierarchies – Illustrative examples – Problems.

UNIT V

PERT AND CPM: TIME COMPUTATIONS & NETWORK ANALYSIS

Introduction – Uncertainties : Use of PERT – Time estimates – Frequency distribution – Mean, variance and standard deviation – Probability distribution – Beta distribution – Expected time Problems -Earliest expected time – Formulation for T_E - Latest allowable occurrence time – Formulation for T_L - Combined tabular computations for T_E and T_L problems.Introduction - Slack – Critical path – Illustrative examples – Probability of meeting scheduled date Problems – CPM : process – CPM : Networks – Activity time estimate – Earliest event time – Latest allowable occurrence time – Combined tabular computations for T_E and T_L - Start and f inish times of activity – Float – Critical activities and critical path – Illustrative examples Problems.

Text Books:

1. Construction project management by Jha ,Pearson pubilications,New Delhi.

2. *Construction Technology by Subir K.Sarkar and Subhajit Saraswati – Oxford Higher Education-Univ.Press, Delhi.*
3. *Project Planning and Control with PERT and CPM by Dr.B.C.Punmia, K.K.Khandelwal, Lakshmi Publications New Delhi.*

Reference Books:

1. *Optimal design of water distribution networks P.R.Bhave, Narosa Publishing house 2003.*
2. *Total Project management , the Indian context- by : P.K.JOY- Mac Millan Publishers India Limited.*

B.Tech. IV - I Sem.

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(13A01707) CAD LAB

CAD:
SOFTWARE:
1. STAAD PRO or Equivalent

EXERCISES:
1. 2-D Frame Analysis and Design
2. Steel Tabular Truss Analysis and Design
3. 3-D Frame Analysis and Design
4. Retaining Wall Analysis and Design
5. Simple tower Analysis and Design
6. One Way Slab Analysis & Design
7. Two Way Slab Analysis & Design
8. Column Analysis & Design

References:
Computer Aided Design Lab Manual by Dr.M.N.Sesha Prakash and Dr.C.S.Suresh

B.Tech. IV - I Sem. **L** **C**
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(13A01708) HIGHWAY MATERIALS LAB

LIST OF EXPERIMENTS:

I. ROAD AGGREGATES:
1. Aggregate Crushing value
2. Aggregate Impact Test.
3. Specific Gravity and Water Absorption.
4. Attrition Test
5. Abrasion Test.
6. Shape tests

II. BITUMINOUS MATERIALS:
1. Penetration Test.
2. Ductility Test.
3. Softening Point Test.
4. Flash and fire point tests.

LIST OF EQUIPMENT:
1. Apparatus for aggregate crushing test.
2. Aggregate Impact testing machine
3. Pycnometers.
4. Los angles Abrasion test machine
5. Deval's Attrition test machine
6. Length and elongation gauges
7. Bitumen penetration test setup.
8. Bitumen Ductility test setup.
9. Ring and ball apparatus
10. Penskey – Morten's apparatus
11. Relevant IS Codes

References:
Lab manual in High way Engineering by Ajay.K.Duggal & Vijay .P.Puri, New Age pubilications,New Delhi.