COIMBATORE INSTITUTE OF TECHNOLOGY

(Government Aided Autonomous Institution Affiliated to Anna University, Chennai)

COIMBATORE - 641 014, TAMILNADU, INDIA

DIAMOND JUBILEE

(1956 - 2016)

Department of Civil Engineering

M.E. CONSTRUCTION MANAGEMENT

Curriculum and Syllabi

Under Choice Based Credit System

(For the students admitted during 2015 - 2016 and onwards)

CONTENTS

COIMBATORE INSTITUTE OF TECHNOLOGY

(Government Aided Autonomous Institution Affiliated to Anna University, Chennai)

VISION AND MISSION OF THE INSTITUTE

VISION

The Institute strives to inculcate a sound knowledge in engineering along with realized social responsibilities to enable its students to combat the current and impending challenges faced by our country and to extend their expertise to the global arena.

MISSION

The mission of CIT is to impart high quality education and training to its students to make them World-Class Engineers with a foresight to the changes and problems, and pioneers to offer innovative solutions to benefit the nation and the world at large.

DEPARTMENT OF CIVIL ENGINEERING

COIMBATORE INSTITUTE OF TECHNOLOGY

VISION AND MISSION OF THE DEPARTMENT OF CIVIL ENGINEERING

VISION

To provide quality education in Civil Engineering and to become a state-of-the-art source of world-class Civil Engineers and Researchers.

MISSION

To impart quality education with necessary skills to meet the requirements of the industry and to perform with professional ethics and an attitude for innovation in Civil Engineering through state-of-the-art technology.

DEPARTMENT OF CIVIL ENGINEERING

M.E. CONSTRUCTION MANAGEMENT

PROGRAMME EDUCATIONAL OBJECTIVE

1. To equip graduates with knowledge, capable of managing various construction projects with expertise as a team member as well as leader.
2. To encourage graduates to take up continued research and development in the field of construction engineering and management.
3. To practice ethically and with social responsibility.

DEPARTMENT OF CIVIL ENGINEERING

M.E. CONSTRUCTION MANAGEMENT

PROGRAMME OUTCOME

1. To apply principles and modern tools for the effective management of construction projects.
2. To provide feasible solutions to critical construction issues with care towards health, safety and culture of the society and environment.
3. To take research in the chosen field and apply the same in real-time issues.
4. To work with experts from various engineering disciplines involved in construction projects.
5. To work as a team member as well as a leader to manage projects efficiently.
6. To effectively communicate with all participants of the construction project.
7. To engage in lifelong learning for updating the knowledge in the field of construction engineering and management.
8. To perform ethically with an understanding of the impact of their professional practice towards society.
9. To adopt case studies and corrective measures for mistakes from past.

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DEPARTMENT OF CIVIL ENGINEERING

Curriculum for the students admitted during 2015 - 2016 and onwards

M.E. CONSTRUCTION MANAGEMENT

Semester I

Sl. No.	Course Code	Course Name	L	T	P	C	Category
1	15MCM11	Statistical Methods for Construction Engineers	4	0	0	4	FC
2	15MCM12	Construction Project Management	3	0	0	3	PC
3	15MCM13	Construction Personnel Management	3	0	0	3	PC
4	15MCM14	Project Formulation and Appraisal	3	0	0	3	PC
5		Elective I	3	0	0	3	PE
6		Elective II	3	0	0	3	PE
7	15MCM15	Construction Engineering Laboratory	0	0	2	1	PC
		TOTAL	**19**	**0**	**2**	**20**	

Semester II

Sl. No.	Course Code	Course Name	L	T	P	C	Category
1	15MCM21	Quantitative Techniques in Construction Management	3	0	0	3	PC
2	15MCM22	Construction Planning, Scheduling and Control	3	0	0	3	PC
3	15MCM23	Contract Management and Dispute Resolution	3	0	0	3	PC
4	15MCM24	Business Economics and Finance Management	3	0	0	3	PC
5		Elective III	3	0	0	3	PE
6		Elective IV	3	0	0	3	PE
7	15MCM25	Computer Laboratory For Construction Management	0	0	2	1	PC
		TOTAL	**18**	**0**	**2**	**19**	

Semester III

Sl. No.	Course Code	Course Name	L	T	P	C	Category
1		Elective V	3	0	0	3	PE
2		Elective VI	3	0	0	3	PE
3		Elective VII	3	0	0	3	PE
4	15MCM31	Practical Training				2	EEC
		TOTAL	**9**	**0**	**0**	**11**	

Semester IV

Sl. No.	Course Code	Course Name	L	T	P	C	Category
1	15MCM41	Project Work and Viva Voce				18	EEC
		TOTAL	**0**	**0**	**0**	**18**	

GRAND TOTAL CREDITS = 68

FC - Foundation Courses

PC - Professional Core

PE - Professional Electives

EEC - Employment Enhancement Courses

LIST OF ELECTIVES

Sl. No.	Course Code	Course Name	L	T	P	C	Category
1	15MCME01	Construction Materials and Management	3	0	0	3	PE
2	15MCME02	Construction Equipment and Management	3	0	0	3	PE
3	15MCME03	Resource Management and Control in Construction	3	0	0	3	PE
4	15MCME04	Quality Control and Auditing on Construction Projects	3	0	0	3	PE
5	15MCME05	Functional Planning, Building Services and Maintenance Management	3	0	0	3	PE
6	15MCME06	Construction Safety and Health Management	3	0	0	3	PE
7	15MCME07	Disaster Mitigation and Management	3	0	0	3	PE
8	15MCME08	GIS in Construction Management	3	0	0	3	PE
9	15MCME09	Management Information Systems	3	0	0	3	PE
10	15MCME10	Building Information Management	3	0	0	3	PE
11	15MCME11	Total Quality Management in Construction	3	0	0	3	PE
12	15MCME12	Advanced Concrete Technology	3	0	0	3	PE
13	15MCME13	Advanced Construction Techniques	3	0	0	3	PE
14	15MCME14	Shoring, Scaffolding and Formwork	3	0	0	3	PE
15	15MCME15	System Integration in Construction	3	0	0	3	PE
16	15MCME16	Health Monitoring of Structures	3	0	0	3	PE
17	15MCME17	Valuation of Real Properties	3	0	0	3	PE
18	15MCME18	Sustainable Urban and Transport Development	3	0	0	3	PE
19	15MCME19	Urban Transportation Infrastructure - Planning and Design	3	0	0	3	PE

15MCM11 - STATISTICAL METHODS FOR CONSTRUCTION ENGINEERS

L	T	P	C
4	0	0	4

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To study and understand the concepts of Statistical methods and its applications in Engineering.*
- *To study the effect of estimation theory, testing of hypothesis, correlation and regression, randomized design, and multivariate analysis.*

COURSE OUTCOME

CO1 : *The students will able to understand the fundamentals of statistics and their applications to engineering designs.*

CO2 : *The students will able to make use of a variety of statistical methods to model the engineering systems with uncertainty.*

ESTIMATION THEORY

Estimators : Unbiasedness, Consistency, Efficiency and Sufficiency - Maximum Likelihood Estimation - Method of moments. **(12)**

TESTING OF HYPOTHESIS

Tests based on Normal t, X^2 and F distributions for testing of means, variance and proportions - Analysis of r x c tables - Goodness of fit. **(12)**

CORRELATION AND REGRESSION

Multiple and Partial Correlation - Method of Least Squares - Plane of Regression - Properties of Residuals - Coefficient of multiple correlation - Coefficient of partial correlation - Multiple correlation with total and partial correlations - Regression and Partial correlations in terms of lower order co-efficient. **(12)**

DESIGN OF EXPERIMENTS

Analysis of variance - One-way and two-way classifications - Completely randomized design -Randomized block design - Latin square design. **(12)**

MULTIVARIATE ANALYSIS

Random vectors and Matrices - Mean vectors and Covariance matrices - Multivariate Normal density and its properties - Principal components: Population principal components - Principal components from standardized variables. **(12)**

TOTAL : 60

REFERENCES

1. *Gupta.S.C., and Kapoor, V.K., "Fundamentals of Mathematical Statistics", Sultan Chand and Sons, Eleventh Edition, 2002.*

2. *J.E. Freund, "Mathematical Statistical", 5th Edition, Prentice Hall of India, 2001.*
3. *Jay L.Devore, "Probability and statistics for Engineering and the Sciences", 5th Edition,Thomson and Duxbury, Singapore, 2002.*
4. *Murray.R. SpiegelandLarry J.Stephens, "Schaum'sou Tlines- Statistics", Third Edition, Tata McGraw-Hill, 2000.*
5. *R.A.Johnson and C.B.Gupta, "Miller & Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 7th Edition, 2007.*
6. *Richard A.Johnson and Dean W.Wichern, "Applied Multivariate Statistical Analysis", Pearson Education, Asia, 6th Edition, 2007.*

15MCM12 - CONSTRUCTION PROJECT MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the concepts in construction management owners' perspective, organization, design and construction procedures, resource utilization and cost estimation.

COURSE OUTCOME

CO1 : *The student will be able to understand how the owner view a project in consideration with project life cycle, construction agencies legal requirements etc.*

CO2 : *The student will get an idea on various types of organization and their impact and suitability to construction projects, design and construction procedures along with labour, material and equipment utilization.*

CONSTRUCTION PROJECT PERSPECTIVES

Construction Project Life Cycle - Types of Construction - Selection of Professional Services - Stake-holders in Construction Project - Structure of Project Organization - Perspectives of Owners & Builders - Turnkey Operation - Leadership and Motivation for the Project Team - Role of Project Managers - Financing of Constructed Facilities - Evaluation of Alternative Financial Plans - Loans, Bonds, Mortgages, Debentures and Shares. **(9)**

DESIGN AND CONSTRUCTION PROCESS

Design and Construction as an Integrated System - Innovation and Technological Feasibility - Innovation and Economic Feasibility - Functional Design - Engineering Investigations and Design - Industrialized Construction - Prefabrication - Value Engineering and Management in Construction - Construction Site Environment. **(9)**

PROJECT COST ESTIMATION & MANAGEMENT

Various Types of Project Cost - Costs Associated with Constructed Facilities - Method of Structuring Project Cost - Clients' Estimate of Project Cost - Contractors Estimation of Project Cost - Type of Construction Cost Estimates - Methods for Allocation of Joint Costs - Historical Cost Data - Cost Indices - Applications of Cost Indices to Estimating - Estimate Based on Engineer's List of Quantities - Estimation of Operating Costs - Construction Economics - Economic Decision Making - Time Value of Money - Evaluating Alternatives. **(9)**

RESOURCE PLANNING AND MANAGEMENT

Types of Project Plans - Work Breakdown Structure - Resources Levelling - Resource Allocation - Importance of Project Scheduling - Various Types of Project Scheduling - Labour Productivity - Factors Affecting Job-Site Productivity - Labour Relations in Construction - Materials Management - Material Procurement and Delivery - Inventory Control - Tradeoffs of Costs in Materials Management - Construction Equipment - Choice of Equipment and Standard Production Rates - Construction Processes Queues and Resource Bottlenecks - Introduction to Network Analysis and Network Crashing. **(9)**

PROJECT MONITORING AND CONTROL

Project Progress Control - Updating of Project Progress using Bar Chart, PERT/CPM, Precedence Network - Progress Reports - Monthly Progress Report - Measuring Progress at Site - Typical Reports to aid Progress Review - Stage-wise Completion Cost - Standard costing - Earned Value Methods for Schedule Performance and Cost Control - Profit/Loss at Completion - Disputes and Claims - Project Closure - Construction Closure - Financial Closure - Contract Closure - Project Managers' Closure - Lessons Learnt from the Project. **(9)**

TOTAL : 45

REFERENCES

1. *Kumar Neeraj Jha, Construction Project Management - Theory and Practice, Pearson Publications - Dorling Kindersley (India) Pvt. Ltd., 2012.*
2. *Chris Hendrickson and Tung Au, Project Management for Construction - Fundamental Concepts for Owners, Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.*
3. *Chitkara, K.K. Construction Project Management: Planning, Scheduling and Control, Tata McGraw-Hill Publishing Company, New Delhi, 1998.*
3. *Frederick E. Gould, Construction Project Management, Wentworth Institute of Technology, Vary E. Joyce, Massachusetts Institute of Technology, 2000.*
4. *Choudhury, S , Project Management, Tata McGraw-Hill Publishing Company, New Delhi, 1988.*
5. *George J.Ritz , Total Construction Project Management - McGraw-Hill Inc, 1994.*

15MCM13 - CONSTRUCTION PERSONNEL MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the various aspects of manpower management principles and problems related in it, with the organization background.

COURSE OUTCOME

CO1 *: The student is expected to handle manpower resources efficiently.*

CO2 *: The background materials will familiarize the student about organization system and its structure.*

MANPOWER PLANNING

Manpower Planning - Organizing - Staffing - Staffing Plan - directing and controlling - Managerial Staffing - Recruitment - Selection - Personnel Principles. **(9)**

ORGANIZATION

Organization - Span of Control - Organization Charts - Development and Operation of human resources - Placement, Training and Development. **(9)**

HUMAN BEHAVIOUR

Introduction to the field of people management - basic individual psychology; motivation - Job design and performance management - Managing groups at work - self-managing work teams - Intergroup behaviour and conflict in organizations - Leadership - Behavioural aspects of decision-making and communication for people management. **(9)**

MANAGEMENT AND DEVELOPMENT METHODS

Performance appraisal - Employee hand book and personnel manual - Job descriptions and organization structure and human relations - Special Human resource problems - Productivity of Human resources - Discipline and discharge. **(9)**

WELFARE MEASURES

Compensation - Wages and Salary, Employee Benefits, employee appraisal and assessment - Employee services - Safety and health - GPF - EPF - Group Insurance - Housing - Pension - Laws related to welfare measures. **(9)**

TOTAL : 45

REFERENCES

1. *Carleton Counter II and Jill Justice Coutler, The Complete Standard Handbook of Construction Personnel Management, Prentice-Hall, Inc., New Jersey, 1989.*
2. *Memoria,C.B., Personnel Management, Himalaya Publishing Co., 1997.*

3. *Josy.J. Familaro, Handbook of Human Resources Administration, McGraw-Hill International Edition, 1987.*
4. *Charles D Pringle, Justin Gooderi Longenecter, Management, CE Merril Publishing Co. 1981.*
5. *Dwivedi R.S, Human Relations and Organisational Behaviour, Macmillian India Ltd.,2005.*

15MCM14 - PROJECT FORMULATION AND APPRAISAL

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the formulation, costing of construction projects and techniques of project appraisal.

COURSE OUTCOME

CO1 : *The students will able to design and implement an integrated project formulation & business planning framework, defining relevant processes, tools, information needs and stages.*

CO2 : *The students will able to understand the implications of private sector participation in construction projects.*

CO3 : *The students will able to assess the merits of a business model, business plan and whether the minimal viable project fits the objectives.*

PROJECT FORMULATION

Project - Concepts - Capital investments - Generation and Screening of Project Ideas - Project identification - Preliminary Analysis, Market, Technical, Financial, Economic and Ecological - Pre-Feasibility Report and its Clearance, Project Estimates and Techno-Economic Feasibility Report, Detailed Project Report - Different Project Clearances required. **(9)**

PROJECT COSTING

Project Cash Flows - Basic principles of cash flow estimation - Time Value of Money - Time lines and notations - Future value of single amount - Present value of single amount-Future value of an annuity-Present value of an annuity- Concept of average Cost of capital - Cost of debt and preference - cost of equity and depreciation. **(9)**

PROJECT APPRAISAL

NPV - BCR - IRR - ARR - Urgency - Pay Back Period - Assessment of Various Methods - Indian Practice of Investment Appraisal - International Practice of Appraisal - Analysis of Risk - Sensitivity analysis - Scenario analysis - Break even analysis - Hillier Model - Simulation analysis - Decision tree analysis - Project selection under risk. **(9)**

PROJECT FINANCING

Project financing - Public and Private sources of capital - Equity - Equity capital - Preference capital - Internal accruals - Debt - Term loans - Debentures - Working capital advances - Miscellaneous sources - Key financial indicators - ratios. **(9)**

PRIVATE SECTOR PARTICIPATION

Private sector participation in Infrastructure Development Projects - Features of BOT model, BOL model and BOOT model - Key Project parties - Financing of Infrastructure projects with case studies - Technology transfer and Foreign collaboration - Scope of technology transfer. **(9)**

TOTAL : 45

REFERENCES

1. *Prasanna Chandra, Projects - Planning, Analysis, Selection, Implementation Review, Tata McGraw Hill Publishing Company Ltd., Eighth Edition, New Delhi, 2014.*
2. *Joy P.K., Total Project Management - The Indian Context, New Delhi, Macmillan India Ltd., 2006.*
3. *United Nations Industrial Development Organisation (UNIDO) Manual for the Preparation of Industrial Feasibility Studies, (IDBI Reproduction) Bombay., 1987.*
4. *Barcus, S.W. and Wilkinson.J.W., Hand Book of Management Consulting Services, McGraw Hill, New York., 1986.*

15MCM15 - CONSTRUCTION ENGINEERING LABORATORY

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OBJECTIVE

To study the properties of construction materials for their acceptance criteria and to study the usage and applications of non-destructive testing procedure.

COURSE OUTCOME

CO1 *: Students are expected to understand the quality standards and requirement of construction materials.*

CO2 *: Utilization of testing tools and its applications in field.*

LIST OF EXPERIMENTS

1. Tests on Cement (Specific Gravity, Setting Time, Strength, etc.)
2. Tests on Water Quality(Chloride, Sulphate, pH and Hardness)
3. Tests on Aggregates (Crushing Strength, CBR)
4. Tests on fresh and hardened properties of concrete (Workability, Compressive Strength, Modulus of Elasticity)
5. Tests on other materials (Steel, Brick, Tiles)
6. Non Destructive Testing (Rebound hammer and UPV tests)

TOTAL : 30

15MCM21 - QUANTITATIVE TECHNIQUES IN CONSTRUCTION MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the various applications of optimization techniques in management of construction projects.

COURSE OUTCOME

CO1 : *The students will able to understand the elementary concepts and techniques of business research methods, and to appreciate how statistical and mathematical analysis can materially help in business decision-making.*

CO2 : *The students will able to apply the concepts studied to inventory, scheduling and other related problems.*

BASIC PRINCIPLES

Definition - Objective function - Constraints - Design space - local and global optima. **(6)**

LINEAR PROGRAMMING

Formulation of problems - Graphical solutions - Analytical methods - Standard form - Canonical form - Basic feasible solution - Simplex Method - Two phase method - Penalty method - Duality theory - Primal and Dual algorithm. **(6)**

ALLOCATION MODELS IN CONSTRUCTION

Transportation Model - Assignment Models - Sequencing Problems. **(6)**

DYNAMIC PROGRAMMING

Bellman's principle of optimality - Multistage Decision problem - Sub-optimization problems. **(9)**

UNCERTAINITY AND COMPETITION IN CONSTRUCTION

Decision Model and Analysis - Competitive Situation - Games and Gaming Models - Bidding Situation and Bidding Models. **(9)**

SIMULATION OF CONSTRUCTION SYSTEMS

Simulation Approach and Models - Generation of Data - Monte-Carlo Simulation - Decision Making - Planning, Design and Management Construction Games. **(9)**

TOTAL : 45

REFERENCES

1. *Mahesh Varma, "Construction Planning and Management Through System Techniques", Metropolitan Book Co. Pvt. Ltd. Third Edition (1985)*
2. *Rao, S.S., "Optimization Theory and Applications", Wiley Eastern (P) Ltd., 1984.*

15MCM22 - CONSTRUCTION PLANNING, SCHEDULING AND CONTROL

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the concept of scheduling and the techniques necessary for construction project.

COURSE OUTCOME

CO1 : *The students will be able to understand the elements of construction planning and scheduling and to apply appropriate tools and techniques like networks and coding systems, monitoring of projects through cost control.*

CO2 : *The student will be able to understand the concept of gathering and using project information, the elements of quality control and safety of construction projects.*

CONSTRUCTION PLANNING

Basic Concepts in the Development of Construction Plans - Choice of Technology and Construction Method - Defining Work Tasks - Defining Precedence Relationships among Activities - Estimating Activity Durations - Estimating Resource Requirements for Work Activities - Coding Systems. **(9)**

SCHEDULING PROCEDURES AND TECHNIQUES

Construction Schedules - Critical Path Method - Scheduling Calculations - Float - Presenting Project Schedules - Scheduling for Activity-on-Node and with Leads, Lags, and Windows - Scheduling with Resource Constraints and Precedences - Use of Advanced Scheduling Techniques - Scheduling with Uncertain Durations - Calculations for Monte Carlo Schedule Simulation - Crashing and Time/Cost Tradeoffs - Improving the Scheduling Process. **(9)**

COST CONTROL, MONITORING AND ACCOUNTING

The Cost Control Problem - The Project Budget - Forecasting for Activity Cost Control - Financial Accounting Systems and Cost Accounts - Control of Project Cash Flows - Schedule Control - Schedule and Budget Updates - Relating Cost and Schedule Information. **(9)**

QUALITY CONTROL AND SAFETY DURING CONSTRUCTION

Quality and Safety Concerns in Construction - Organizing for Quality and Safety - Work and Material Specifications - Total Quality Control - Quality Control by Statistical Methods - Statistical Quality Control with Sampling by Attributes - Statistical Quality Control with Sampling by Variables - Safety. **(9)**

ORGANIZATION AND USE OF PROJECT INFORMATION

Types of Project Information - Accuracy and Use of Information - Computerized Organization and Use of Information - Organizing Information in Databases - Relational Model of Databases - Other Conceptual Models of Databases - Centralized Database Management Systems - Databases and Applications Programs - Information Transfer and Flow. **(9)**

TOTAL : 45

REFERENCES

1. *Chitkara, K.K. Construction Project Management: Planning, Scheduling and Control, Tata McGraw-Hill Publishing Company, New Delhi, Third Edition,2014.*
2. *Calin M. Popescu, Chotchai Charoenngam, Project Planning, Scheduling and Control in Construction: An Encyclopedia of terms and Applications, Wiley, New York, 1995.*
3. *Chris Hendrickson and Tung Au, Project Management for Construction - Fundamental Concepts for Owners, Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.*
4. *Douglas C. Montgomery ,Statistical Quality Control: A Modern Introduction, Wiley student edition, Sixth edition,2010.*
5. *Willis, E. M., Scheduling Construction Projects, John Wiley & Sons, 1986.*
6. *Halpin, D. W., Financial and Cost Concepts for Construction Management, John Wiley & Sons, New York, 1985.*

15MCM23 - CONTRACT MANAGEMENT AND DISPUTE RESOLUTION

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the various types of construction contracts and their legal aspects and provisions.

COURSE OUTCOME

CO1 : *The students will have an understanding of the various elements of contracts, and administering contracts.*

CO2 : *To achieve awareness on arbitrations and legal procedures.*

CO3 : *Understanding of labor regulations and their impact on managing contracts.*

CONSTRUCTION CONTRACTS

Elements of Contracts - Types of Contracts - Features - Suitability - Salient Features of Indian contract Act 1872 as Relevant to Construction Contracts - Design of Contract Documents - International Contract Document - Standard Contract Document - Law of Torts- Contract for Engineering and Architectural Services- Contract between Owner and Contractor. **(9)**

TENDERS

Types of Tenders - Notice Inviting Tender - Prequalification - Preparation and Submission of -Bid Documents & Tenders - Bidding - Acceptance/Rejection of Tenders - Evaluation of Tender from Technical, Contractual and Commercial Points of View - Contract Formation and Interpretation - Potential Contractual Problems - World Bank Procedures and Guidelines - Tamilnadu Transparency in Tenders Act - Local and International Competitive Bidding - Global Tendering. **(9)**

CONTRACT ADMINISTRATION AND MANAGEMENT

Selection of Project Management Team - Possession of Construction Site - Duties of Employers - Duties of Contractors - Selection of Sub-contractors - Handling of Contract Matters - Settlement of Variations & Clarifications in Construction - Documentation and Maintenance of Construction Progress Records - Field Diary -Maintenance of Feed Back Reports and Documentation - Quality control Inspection Reports and Outcomes. **(9)**

ALTERNATE DISPUTE RESOLUTION

Claims and Disputes in Construction contracts - Various Methods of Settlement of Disputes - Alternate Dispute Resolution - Negotiation, Mediation, Conciliation and Arbitration - Salient Features of The Arbitration and Conciliation Act 1996 - Formation of Arbitration Tribunal - Interim Award - Conduct of Arbitration Proceedings - Award Writing and Setting aside of Award. **(9)**

LEGAL REQUIREMENTS IN CONSTRUCTION INDUSTRY

Insurance and Bonding - Tax Laws - Income Tax, Sales Tax, Excise and Custom Duties and their Influence on Construction Costs - Legal Requirements for Planning - Property Law - Agency Law - Local Government Laws for Approval - Statutory Regulations - Social Security - Welfare Legislation - Laws relating to Wages, Bonus and Industrial Disputes, Labour Administration - Insurance and Safety Regulations - Workmen's Compensation Act - Indian Factory Act - Tamilnadu Factory Act - Child Labour Act - Other Labour Laws. **(9)**

TOTAL : 45

REFERENCES

1. *Gajaria G.T., Laws Relating to Building and Engineering Contracts in India, M.M.Tripathi Private Ltd., Bombay, 1982.*
2. *Jimmie Hinze, Construction Contracts, McGraw Hill, 2001.*
3. *Joseph T. Bockrath, Contracts and the Legal Environment for Engineers and Architects, McGraw Hill, 2000.*
4. *Kwaku, A., Tenah, P.E. Jose M.Guevara, P.E., Fundamentals of Construction Management and Organisation, Printice Hall, 1985.*
5. *Patil. B.S, Civil Engineering Contracts and Estimates, Universities Press (India) Private Limited, 2006.*

15MCM24 - BUSINESS ECONOMICS AND FINANCE MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the basics of economic concept and various ways of financial management. Also to provide the knowledge of accounting methods.

COURSE OUTCOME

CO1 *: The student is expected to govern the financial system of an organization.*

CO2 *: The background of the course will be useful to the student while accounting and lending.*

ECONOMICS

Role of Civil Engineering in Industrial Development - Advances in Civil Engineering - Engineering Economics - Support Matters of Economy related to Engineering - Market demand and supply - Choice of Technology - Quality Control - Quality Production- Audit - Economic law of production. **(10)**

CONSTRCUTION ECONOMICS

Construction development in Housing, Transport Energy and other Infrastructures - Economics of ecology, environment, energy resources - Local material selection - Form and functional designs - Construction workers - Urban Problems - Poverty - Migration - Unemployment - Pollution. **(10)**

FINANCING

The need for financial management - Types of financing - Financing instruments- Short term borrowing - Long term borrowing - Leasing - Equity financing - Internal generation of funds - External commercial borrowings - Assistance from government budgeting support and international finance corporations - Loans to Contractors - Interim construction financing - Security and risk aspects. **(10)**

ANALYSIS OF FINANCIAL STATEMENTS

Balance Sheet - Profit and Loss account - Cash flow and Fund flow analysis - Ratio analysis - Investment and financing decision - Financial Control - Centralized management. **(10)**

ACCOUNTING METHOD

General Overview - Cash basis of a accounting - Accrual basis of accounting - Percentage completion method - Completed contract method - Accounting for tax reporting purposes and financial reporting purposes - Accounting Standards **(5)**

TOTAL : 45

REFERENCES

1. *Prasanna Chandra, Project Selection, Planning, Analysis, Implementation and Review, Tata McGraw Hill Publishing Company, Eighth edition, 2014.*

2. *Halpin, D.W., Financial and Cost Concepts for Construction Management, John Wiley & Sons, New York, 1985.*

3 *Warneer Z Hirsch, Urban Economics, Macmillan, New York, 1993.*

4. *Kwaku A, Tenah and Jose M.Guevara, Fundamental of Construction Management and Organisation, Prentice - Hall of India, 1995.*

5. *Madura, J and Veit, E.T., Introduction to Financial Management, West Publishing Co., St. Paul, 1988.*

15MCM25 - COMPUTER LABORATORY FOR CONSTRUCTION MANAGEMENT

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OBJECTIVE

This course gives an exposure to students in utilizing the sophisticated Spread sheets programs, Estimation Software and other package programs.

COURSE OUTCOME

CO1 *: The students will able to prepare the Schedule and allocate the resource using Management softwares.*

CO2 *: The students will able to prepare Bid for a construction projects.*

CO3 *: The students will able to assess the risk associated with a construction projects.*

LIST OF EXPERIMENTS

1. Quantity takeoff, Preparation and delivery of the bid or proposal of an engineering construction project.
2. Design of a simple equipment information system for a construction project.
3. Scheduling of a small construction project using Primavera scheduling systems including reports and tracking.
4. Scheduling of a small construction project using tools like MS project scheduling systems including reports and tracking.
5. Simulation models for project risk analysis.

TOTAL : 30

15MCME01 - CONSTRUCTION MATERIALS AND MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To understand the properties of construction materials and its application in Civil Engineering.*
- *To provide a knowledge to store and manage construction materials properly.*

COURSE OUTCOME

CO1 : *The student is expected to manage construction materials effectively.*

CO2 : *The background information will also provide ideas to the student about, when and where these materials to be used in the field.*

CONCRETE AND METALS

High Strength Concrete and High Performance Concrete - Applications, Properties of steel - New Alloy Steels - Aluminum and its Products - Applications - Other Alloys - Market forms - Uses - Light Weight Metals - Copper and Zinc Alloys. **(9)**

COMPOSITES AND OTHER MATERIALS

Plastics -Reinforced Polymers - Fibre Reinforced Plastics - Cellular Cores - Types of Polymer Concrete Composites - Properties of Composites - Ferrocement - Applications - Water Proofing Compounds - Non-weathering Materials - Flooring and Façade Materials. **(9)**

SMART AND GREEN MATERIALS

Brief Outline and uses - Smart Materials - Types ofSmart Materials - Usage in Advanced Construction - Green Materials - Green House concept. **(9)**

MATERIALS MANAGEMENT

Materials identification - Classification - Codification of materials - Standardization - Integrated materials management - Organizations for materials management - Conventional and modern approaches. **(9)**

STORES MANAGEMENT

Location - Types of Stores - Method of storing - Safety and security - issues and receipts - Stores accounting - organization - surplus, obsolete and scrap materials - method of disposal - regulations and procedures. **(9)**

TOTAL : 45

REFERENCES

1. *Gambhir, M. L. and Neha Jamwal, " Building Materials - Products, Properties and Systems", Tata McGraw Hill Education Pvt. Ltd. New Delhi, 2011.*

2. *Dutta, A. K. "Materials Management : Procedures, Texts and Cases", Prentice Hall Inc, New Delhi, 2006.*
3. *Shan Somayaji, "Civil Engineering Materials", Prentice Hall Inc., 2nd Edition, 2001.*
4. *Siddique, R "Special Concretes" Galgotia Publications, New Delhi, 1st Edition 2000.*
5. *Mamlouk, M.S. and Zaniewski, J.P., Materials for Civil and Construction Engineers, Prentice Hall Inc., 2000.*

15MCME02 - CONSTRUCTION EQUIPMENT AND MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the various types of equipment and its applications in construction project.

COURSE OUTCOME

CO1 : *The student is expected to manage construction equipment effectively.*

CO2 : *The background information will also provide ideas to the student about, when and where these equipment to be used in the field.*

EQUIPMENT FOR EARTHWORK

Fundamentals of Earth Work Operations - Earth Moving Operations - Types of Earth Work Equipment - Tractors, Motor Graders, Scrapers, Front end loaders, Earth Movers. **(10)**

MATERIALS HANDLING EQUIPMENT

Forklifts and related equipment - Portable Material Bins - Conveyors - Hauling Equipment. **(5)**

EQUIPMENT FOR PRODUCTION OF AGGREGATE AND CONCRETING

Crushers - Feeders - Screening Equipment - Handling Equipment - Batching and Mixing Equipment - Hauling, Pouring and Pumping Equipment - Transporters. **(10)**

OTHER CONSTRUCTION EQUIPMENTS

Equipment for Dredging, Trenching, Tunneling, Drilling, Blasting - Equipment for Compaction - Erection Equipment - Types of pumps used in Construction - Equipment for Dewatering and Grouting - Foundation and Pile Driving Equipment -Equipment for Demolition. **(10)**

CONSTRUCTION EQUIPMENT MANAGEMENT

Identification - Planning - Equipment Management in Projects - Maintenance Management - Replacement - Cost Control of Equipment - Depreciation Analysis - Safety Management. **(10)**

TOTAL : 45

REFERENCES

1. *Peurifoy, R.L., Ledbetter, W.B. and Schexnayder, C., Construction Planning, Equipment and Methods, McGraw Hill, Singapore, 2006.*
2. *Sharma S.C. Construction Equipment and Management, Khanna Publishers, New Delhi, 1988.*
3. *Deodhar, S.V. Construction Equipment and Job Planning, Khanna Publishers, New Delhi, 1988.*
4. *Dr.Mahesh Varma, Construction Equipment and its planning and Application, Metropolitan Book Company, New Delhi, 1983.*

15MCME03 - RESOURCE MANAGEMENT AND CONTROL IN CONSTRUCTION

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

This course intended to provide planning and management of resources such as time, labour, material, equipment.

COURSE OUTCOME

CO1 : *The student is expected to have the necessary skills required for effective resource planning and its management.*

CO2 : *The background materials will also be useful to the student when he/she tries to allocate and level the resources.*

RESOURCE PLANNING

Resource Planning, Procurement, Identification, Personnel, Planning for material, Labour, time schedule and cost control, Types of resources, manpower, Equipment, Material, Money, Time. **(10)**

LABOUR MANAGEMENT

Systems approach, Characteristics of resources, Utilization, measurement of actual resources required, Tools for measurement of resources, Labour, Classes of Labour, Cost of Labour, Labour schedule, optimum use Labour. **(5)**

MATERIALS AND EQUIPMENT

Time of purchase, of materials quantity of material, sources, Transportation, Delivery and Distribution of materials, Planning and selecting equipments by optimistic choice with respect to cost, Time, source and handling. **(10)**

TIME MANAGEMENT

Personnel time, Management and planning, managing time on the project, forecasting the future, Critical path measuring the changes and their effects - Cash flow and cost control. **(10)**

RESOURCE ALLOCATION AND LEVELLING

Time-cost trade off, Computer application - resource leveling, resource list, resource allocation, Resource loading, Cumulative cost - Value Management. **(10)**

TOTAL : 45

REFERENCES

1. *Andrew,D., Szilagg, Hand Book of Engineering Management, 1982.*
2. *James.A., Adrain, Quantitative Methods in Construction Management, American Elsevier Publishing Co., Inc., 1973.*
3. *Harvey, A., Levine, Project Management using Micro Computers, Obsorne-McGraw Hill C.A.Publishing Co., Inc. 1988.*
4. *Oxley Rand Poslcit, Management Techniques applied to the Construction Industry, Granda Publishing Ltd., 1980.*

15MCME04 - QUALITY CONTROL AND AUDITING ON CONSTRUCTION PROJECTS

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the concepts of quality assurance and control techniques in construction.

COURSE OUTCOME

CO1 *: The student will be able to understand the elements of quality planning and the implication, become aware of objectives and advantages of quality assurance.*

CO2 *: The students will able to understand the quality control and procedures for quality auditing.*

QUALITY MANAGEMENT

Introduction - Definitions and objectives - Factors influencing construction quality - Responsibilities and authority - Quality plan - Quality Management Guidelines - Quality circles. **(9)**

QUALITY SYSTEMS

Introduction - Quality system standard - ISO 9000 family of standards - Requirements - Preparing Quality System Documents - Quality related training - Implementing a Quality system - Third party Certification. **(9)**

QUALITY PLANNING

Quality Policy, Objectives and methods in Construction industry - Consumers satisfaction, Ergonomics - Time of Completion - Statistical tolerance - Taguchi's concept of quality - Codes and Standards - Documents - Contract and construction programming - Inspection procedures - Processes and products - Total QA / QC programme and cost implication. **(9)**

QUALITY ASSURANCE AND CONTROL

Objectives - Regularity agent, owner, design, contract and construction oriented objectives, methods - Techniques and needs of QA/QC - Different aspects of quality - Appraisals, factors influencing construction quality - Critical, major failure aspects and failure mode analysis, - Stability methods and tools, optimum design - Reliability testing, reliability coefficient and reliability prediction. **(9)**

QUALITY IMPROVEMENT TECHNIQUES

Selection of new materials - Influence of drawings, detailing, specification, standardization - Bid preparation - Construction activity, environmental safety, social and environmental factors - Natural causes and speed of construction - Life cycle costing - Value engineering and value analysis. **(9)**

TOTAL : 45

REFERENCES

1. *James, J.O' Brian, Construction Inspection Handbook - Quality Assurance and Quality Control, Van Nostrand, New York, 1989.*
2. *Kwaku, A., Tena, Jose, M. Guevara, Fundamentals of Construction Management and Organisation, Reston Publishing Co., Inc., Virginia, 1985.*
3. *Juran Frank, J.M. and Gryna, F.M. Quality Planning and Analysis, Tata McGraw Hill, 1993.*
4. *Hutchins.G, ISO 9000, Viva Books, New Delhi, 2000.*
5. *Clarkson H. Oglesby, Productivity Improvement in Construction, McGraw-Hill, 1989.*
6. *John L. Ashford, The Management of Quality in Construction, E & F.N.Spon, New York, 1989.*
7. *Steven McCabe, Quality Improvement Techniques in Construction, Addison Wesley Longman Ltd, England. 1998.*

15MCME05 - FUNCTIONAL PLANNING, BUILDING SERVICES AND MAINTENANCE MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To introduce basic concepts of building layout and planning.*
- *To familiarise the student with building systems and maintenance services.*

COURSE OUTCOME

CO1 *: The students have knowledge on service requirements of building.*

CO2 *: The students have knowledge on fire resistance systems and requirements of building.*

NEIGHBOURHOOD

Components of urban forms - Planning of urban forms- Concepts-Neighborhood Module - Street system - Layout in a neighbourhood. **(9)**

PLANNING

Development Control Guidelines, Functional planning of buildings, Circulation - Optimization of space - Spatial Synthesis graphical techniques, heuristic procedures - Formulation of linear and non-linear optimization problems. **(9)**

FIRE RESISTANCE

Standard for fire safety - Fire resistance/ Fire fighting and exinguishing systems - Classification of buildings -Means of escape, alarms, etc - Space requirements and relationships for typical buildings like residential, offices, hospitals, etc. **(9)**

ENGINEERING SERVICES

Engineering services in building system- Lighting, Ventilation, Air Conditioning , Lifts, Escalators, Cold and Hot water systems - Waste water systems - Electrical systems. **(9)**

MAINTENANCE MANAGEMENT

Building Maintenance/ Facilities Management - Scheduled and contingency maintenance -Planning - M I S for building maintenance - Maintenance standards and maintenance contracts -Economic maintenance decisions. **(9)**

TOTAL : 45

REFERENCES

1. *Mike Jenks, Colin Jones-Dimensions of the Sustainable City -Springer (2009).*
2. *D. Chapman-Creating Neighbourhoods and Places in the Built Environment (1996).*
3. *Stephen Marshall-Streets and Patterns (2005).*

4. *David. V. Chadderton-Building Services Engineering, 5th edition (2007).*
5. *M. Bhatti-Practical Optimization Methods - With Mathematica Applications-Springer (2000).*
6. *Ruhul Amin Sarker, Charles S. Newton-Optimization Modelling, A Practical Approach (2007).*
7. *Barrie Chanter, Peter Swallow-Building Maintenance Management -Wiley-Blackwell (2007).*
8. *Time Saver Standards for Architectural Design Data(1997).*
9. *NBC 2005 - National Building Code.*
10. *SP 32 (1986) - Lighting and Ventilation.*
11. *SP 30 (2011) - National Electrical Codes.*
12. *SP 35 - Handbook on water supply and Drainage.*
13. *IS 14665 (2000)- Part I, Part II, Part IV- Lifts.*
14. *IS 1172(Reaffirmed 2002) -Code for basic Requirement for Water Supply, Drainage and Sanitation.*
15. *IS 2065(Reaffirmed 1996) - Code of Practice for Water Supply in Buildings.*
16. *IS 1742(Reaffirmed 2002) - Code of practice for building drainage.*
17. *IS 12183(Reaffirmed 2004) - Code of Practice for Plumbing in Multi-Storeyed Buildings.*
18. *IS 13727(Reaffirmed 2004) - Cluster Planning For Housing.*
19. *IS 15105(2002)- Code of Practice for Fire Sprinklers.*
20. *IS 1641 to IS 1646- Code of Practice for Fire Safety in Buildings.*
21. *IRC 73-1980 - Geometric Design For Rural (Non-Urban).*
22. *IRC 86-1983 - Geometric Standards for Urban Roads in Plains.*

15MCME06 - CONSTRUCTION SAFETY AND HEALTH MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the various safety concepts, requirements applied to construction projects.

COURSE OUTCOME

CO1 : *The students will able to understand the importance of managing health and safety in construction and the related key legislation.*

CO2 : *The students will able to know how to plan a safe working environment in construction by implementing safety procedures.*

CONSTRUCTION ACCIDENTS

Accidents and their Causes - Human Factors in Construction Safety - Costs of Construction Injuries - Occupational and Safety Hazard Assessment - Legal Implications. **(9)**

SAFETY PROGRAMMES

Problem Areas in Construction Safety - Elements of an Effective Safety Programme - Job-Site Safety Assessment - Safety Meetings - Safety Incentives - Contractual Obligations - Safety Clausesin Construction Contracts - Substance Abuse - Safety Record Keeping. **(9)**

DESIGNING FOR SAFETY

Safety Culture - Safe Workers - Safety and First Line Supervisors - Safety and Middle Managers - Top Management Practices, Company Activities and Safety - Safety Personnel - Sub contractual Obligation - Project Coordination and Safety Procedures - Workers Compensation. **(9)**

HEALTH MANAGEMENT IN CONSTRUCTION SITES

Occupational Health - Effects of Material Handling on Health - Health Hazards in Construction Site - Disease Prone Environment in Construction Site - Precautionary Measures - Health Monitoring and Treatment - Safety Measures during Material Handling. **(9)**

OWNERS' AND DESIGNERS' OUTLOOK

Responsibilities of owners - Precautions to be taken - Insurance for Workers and Materials - Commitments in case of Accidents - Legal Requirements from Owners' Perspective - Design for Safety in Constructions - Designers Commitments in Design with Safety Perspectives. **(9)**

TOTAL : 45

REFERENCES

1. *Jimmy W. Hinze, Construction Safety, Prentice Hall Inc., 1997.*
2. *Richard J. Coble, Jimmie Hinze and Theo C. Haupt, Construction Safety and Health Management, Prentice Hall Inc., 2001.*
3. *Tamilnadu Factory Act, Department of Inspectorate of factories, Tamil nadu.*
4. *BIS Code of Practice for Safety Management.*

15MCME07 - DISASTER MITIGATION AND MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the various types of disasters, its assessment and habilitation of the community both living standards of people and infrastructure.

COURSE OUTCOME

CO1 *: The student will be aware of all kind of disasters which affects construction projects.*

CO2 *: The background materials will be useful in terms of safety management and mitigation measures.*

NATURAL DISASTERS AND MAN-MADE DISASTERS

Flood - Droughts - Cyclone - Earthquake - Landslide - Avalanches - Volcanic Eruptions - Heat and Cold Waves - Climate Change Global Warming - Climate Change - Sea level Rise - Ozone Depletion - Nuclear Disasters - Chemical Disasters - Biological Disasters - Building Fire - Coal Fire - Forest Fire - Oil Fire - Pollution - Deforestation - Accidents. **(9)**

RISK ASSESSMENT AND VULNERABILITY ANALYSIS

Hazard Evaluation - Risk Assessment - Damage Assessment - Warning System - Post Disaster Review - Vulnerability Analysis of Infrastructure and Settlements - Pre-disaster and Post-disaster Planning for Relief Operations - Disaster Management Plan - Case Studies. **(9)**

SAFETY RATING OF STRUCTURES

Dams, Bridges, Hospitals, Industrial Structures, Ghat Roads - Disaster Resistant Structures - Low Cost Housing for Disaster Prone Areas - Cyclone Shelter Projects and their Implications - Reconstruction after Disasters - Issues of Practices. **(9)**

LONG TERM MITIGATION MEASURES

Needs and Approach towards Prevention - Principles and Components of Mitigation - Disaster Legislation and Policy - Insurance - Cost effective analysis - Utilization of Resources - Training - Education - Public Awareness. **(9)**

DISASTER MANAGEMENT IN INDIA

Disaster Preparedness - Forecasting and Warning of Disasters - Role of News Media in Disaster Management - Rehabilitation of Victims - Community Participation in Disaster Management and Risk Reduction - Role of Union/State Government - Role of Armed Forces - Other Agencies in Disaster Management. **(9)**

TOTAL : 45

REFERENCES

1. *Singh, "DIsater Management: Future" APH Publishers, New Delhi, 2008.*
2. *Saravanakumar, "Disaster Management", Himalaya Publishing House, 2010.*
3. *Goel, S. L., "Encylopedia of Disater Management", Deep and Deep Publications Pvt. Ltd., 2008.*
4. *Sahni, "Disaster Mitigations: Experiences and Reflections", PHI Learning, New Delhoi, 2008.*
5. *Pradeep Sahni and Ariyabander M.M., "Disaster Risk Reduction in South Asia", PHI Pvt. Ltd., New Delhi 2003.*

15MCME08 - GIS IN CONSTRUCTION MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To introduce the elements of GIS as applied to construction management and achieve awareness on application techniques.*
- *To study the various types of data, data analysis methods and data quality requirements.*

COURSE OUTCOME

CO1 : *The student can able to apply GIS techniques in construction management.*

CO2 : *The background materials will be useful in terms of quality management and resource management measures using GIS.*

GIS TECHNIQUES

Map - Types of Maps - Development of GIS - Components of GIS - Hardware, software, organization. **(9)**

GIS DATA ANALYSIS

Types of data - Spatial and non-spatial data - Point, Line and Polygon - Vector and Raster data - Database structures - Files - Vector and Raster data structures. Data Retrieval - Query - Simple Analysis - Spatial Analysis - Overlay - Vector Data Analysis - Raster Data Analysis. **(9)**

GIS MODELING

Modeling using GIS - Digital Elevation Model - Cost and path analysis - Expert Systems - Artificial Intelligence - Integration with GIS Data Output - Types. **(9)**

HARDWARE REQUIREMENT AND ERROR ANALYSIS

Devices used - Raster and Vector Display Devices - Printers - Plotters - Photo write Devices - Sources of Errors - Types of Errors - Elimination - Accuracies. **(9)**

GIS APPLICATIONS IN RESOURCE MANAGEMENT

Fields of Applications - Cadastral Records -- Utility Network Management - Integration with Remote Sensing - Knowledge based techniques - Multicriteria Techniques - Introduction to Object Oriented Data base Models. Output - Case study. **(9)**

TOTAL : 45

REFERENCES

1. *Burrough, P.A., "Principles of GIS for Land Resources Assessment", Oxford Publication, 1998.*
2. *Robert Laurini and Derek Thompson, "Fundamentals of Spatial Information Systems", Academic Press, 1996.*
3. *Reddy, "Remote Sensing and Geographical Information Systems", BS Publications 2001.*

15MCME09 - MANAGEMENT INFORMATION SYSTEMS

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the concepts of information systems and their general applications.

COURSE OUTCOME

CO1 : *The students will able to explain the role and significance of effective management information systems, and describe how they contribute to optimizing organizational performance.*

CO2 : *The students will able to explain fundamental database concepts and apply these concepts to the design and development of relational databases.*

CO3 : *The students will able to demonstrate the technical knowledge of computer networks, information security and information assurance.*

INTRODUCTION

Information Systems - Establishing the Framework - Business Models - Information System Architecture - Evolution of Information Systems - Modern Information System - System Development Life Cycle - Structured Methodologies - Designing Computer Based Methods, Procedures, Control - Designing Structured Programs. **(9)**

INFORMATION SYSTEMS

Integrated Construction Management Information System - Project Management Information System - Functional Areas, Finance, Marketing, Production, Personnel - Levels, DSS, EIS, and ES - Comparison, Concepts and Knowledge Representation - Managing International Information System. **(9)**

IMPLEMENTATION AND CONTROL

Control - Testing Security - Coding Techniques - Detection of Error - Validating - Cost Benefit Analysis - Assessing the value and risk of Information System. **(9)**

SYSTEM AUDIT

Software Engineering qualities - Design, Production, Service, Software specification, Software Metrics, Software quality assurance - Systems Methodology - Objectives - Time and Logic, Knowledge and Human Dimension - Software life cycle models - Verification and Validation. **(9)**

INTERFACE MANAGEMENT

Definition - Background - Requirement - Process - Interface Management System - Interface Matrix Framework - Interface Management Tools - Barriers to Interface Management - Design Interface Management (DIMS) for Construction - Objectives - Terminologies - Methodology - Advantages. **(9)**

TOTAL : 45

REFERENCES

1. *Kenneth C Laudon and Jane Price Laudon, Management Information Systems - Organisation and Technology, Prentice Hall, 1996.*
2. *Gordon B. Davis, Management Information System: Conceptual Foundations, Structure and Development, McGraw Hill, 1974.*
3. *Joyce J Elam, Case series for Management Information Systems, Simon and Schuster, Custom Publishing, 1996.*
4. *Ralph H Sprague and Huge J Watson, Decision Support for Managers, Prentice Hall, 1996.*
5. *Michael W. Evans and John J Marciniah, Software Quality assurance and Management, John Wiley and Sons, 1987.*
6. *Card and Glass, Measuring Software Design quality, Prentice Hall, 1990.*

15MCME10 - BUILDING INFORMATION MANAGEMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study in the various aspects of Building service requirements and its problems related in it.

COURSE OUTCOME

CO1 *: The background materials will familiarize the student about Building services and its structure.*

CO2 *: The student is expected to plan Buildings with respect to system integration.*

STRUCTURAL SYSTEM

Systems for enclosing Buildings, Functional aesthetic system, Materials Selection and specification.**(9)**

ENVIRONMENTAL ASPECTS AND SERVICES

Qualities of enclosure necessary to maintain a specified levelof interior environmental quality - Weather resistance - Thermal infiltration - Acoustic Control -Transmission reduction - Air quality - Illumination.**(9)**

SYSTEM INTEGRATION

Relevant systems integration with structural systems, Plumbing - Electricity -Vertical circulation and their interaction. Technological and methodological demands on constructionmanagement in infrastructure development projects. **(9)**

CONSTRUCTION AND INFRASTRUCTURE

Construction component of various infrastructure sectors - highway - Ports and aviation - Oil and gas - Power - Telecom - Railways - Irrigation. Current scenario - future needs. **(9)**

MAINTENANCE AND SAFETY

Component longevity in terms of operation performance and resistance todeleterious forces - Planning systems for least maintenance materials and construction - Access formaintenance - Feasibility for replacement of damaged components - Maintenance free exposed andfinished surfaces, Ability of systems to protect fire - preventive systems - fire escape system design -planning for pollution free construction-environmental - Hazard free Construction execution. **(9)**

TOTAL : 45

REFERENCES

1. *E.C. Butcher and A.C. Parnell, Designing for Fire Safety, John Wiley and Sons, 1993.*
2. *William T. Mayer, Energy Economics and Build Design, McGraw-Hill Book Company, 1983.*
3. *Peter R. Smith and Warren G. Julian, Building Services, Applied Science Publishers Ltd., London.*

15MCME11 - TOTAL QUALITY MANAGEMENT IN CONSTRUCTION

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the concepts of total quality management and International standards.

COURSE OUTCOME

CO1 : *The students will able to understand the concepts of quality assurance and quality control.*

CO2 : *The students will able to understand the methods and techniques in quality standards.*

CO3 : *The students will able to understand the International standards used in quality management in construction Industry.*

INTRODUCTION

Quality: Necessity for improving Quality in the context of Global Challenges - Concept of Quality Control, Quality Assurance, Quality Management and Total Quality Management (TQM). **(9)**

QUALITY STANDARDS, METHODS & TECHNIQUES

Study of various Quality Standards in Construction Related to building materials and other inputs for construction processes, methods and techniques for construction outputs, products and services. **(9)**

QUALITY MANAGEMENT

Managing Quality in various projects stages from concept to completion by building quality into design of structures, Inspection of incoming material and machinery, in process quality inspections and tests. **(9)**

QUALITY CONTROL & ASSURANCE

Designing of quality manuals, checklists and inspection reports, installing the quality assurance System, monitoring and control - Quality Assurance Department and quality control responsibilities of the line organization. Quality in foundations and piling work, structural work, concreting, electrical system building facilities, waste recycling and maintenance. **(9)**

INTERNATIONAL STANDARDS

Developing quality culture in the organization - Training of people, Bench - marking quality. Quality circles - Study of ISO 9000, ISO 14000 and QS 9000 standards and certification procedures - BIS, BS, Indian standards, British, American, German & Japanese standards. **(9)**

TOTAL : 45

REFERENCES

1. *Quality Planning and Analysis - J M Juran and Frank Gryna, Tata McGraw Hill Book Co. Ltd., Delhi, 2000, 4th Edition.*

2. *Managerial Breakthrough - J M Juran, Tata McGraw Hill Book Co. Ltd., Delhi, 1995, 3rd Edition.*
3. *Total Quality Control - A V Fiegenbaum, Tata McGraw Hill Book Co. Ltd., Delhi, 2004, 4th Edition.*
4. *The Six Sigma Way - Peter Pande and others, Tata McGraw Hill Book Co. Ltd., Delhi, 2000, 3rd Edition.*
5. *Quality is Free - Phil Crosby, Tata McGraw Hill Book Co. Ltd., Delhi, 2001, 4th Edition.*
6. *"The 20 Keys to Workplace Improvement" by Iwao Kobayashi, Pitman's Publishing, 1995, 2nd Edition.*

15MCME12 - ADVANCED CONCRETE TECHNOLOGY

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the properties of concrete and to know the state of the art developments in concrete.

COURSE OUTCOME

CO1 : *The student is expected to design Concrete mix.*

CO2 : *The background information will also provide ideas to the student about, when and where these concrete to be used in the field.*

CONCRETE INGREDIENTS

Composition of OPC - Manufacture - Modified Portland Cements - Hydration Process of Portland Cements - Structure of Hydrated Cement Paste.

Mineral Admixtures - Slags - Pozzolanas and Fillers - Chemical Admixtures - Solutes - Retarders - Air Entraining Agents - Water Proofing Compounds - Plasticizers and Super Plasticizers.

Aggregates - Properties and testing of fine and course aggregates - combining of aggregates - Substitute material for aggregates - recent advancements. **(15)**

SPECIAL CONCRETES

Fibre Reinforced Concrete - Self Compacting Concrete - Polymer Concrete - High performance concrete - Sulphur concrete. **(5)**

CONCRETE MIX DESIGN

Mix Proportioning - Mixes incorporating Fly ash, Silica fume, GGBS - Mixes for High Performance Concrete - High strength concrete - Variations in concrete strength. **(10)**

MECHANICAL PROPERTIES OF CONCRETE

Interfacial Transition Zone - Fracture Strength - Compressive strength - Tensile strength - Impact strength - Bond strength. **(7)**

DURABILITY OF CONCRETE

Factors affecting durability - Chemical Attack - Permeability - Chloride penetration - Water absorption - creep - Shrinkage. **(8)**

TOTAL : 45

REFERENCES

1. *Santhakumar.A.R., Concrete Technology, Oxford University press, New Delhi 2007.*
2. *Gambhir.M.L., Concrete Technology, Tata McGraw Hill Book Co. Ltd., Delhi, 2004.*

3. *Neville. A.M., Properties of Concrete, Longman, 1995.*
4. *Metha P.K.and Montreio P.J.M., Concrete Structure Properties and Materials, Prentice Hall, 1998.*
5. *Gupta. B.L. and Amit Gupta, Concrete Technology, Standard Publishers and Distributers, New Delhi, 2004.*
6. *Shetty M. S. "Concrete Technology", S. Chand and Company 1984.*

15MCME13 - ADVANCED CONSTRUCTION TECHNIQUES

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the latest construction techniques applied to engineering Construction.

COURSE OUTCOME

CO1 : *The student will have necessary knowledge on substructure construction techniques like box jacking, sheet piling etc.*

CO2 : *The student will have an awareness on superstructure construction elements like slipform techniques, launching techniques, erection procedures etc associated with tall, large span and off shore structures and elements of repair construction.*

SUB STRUCTURE CONSTRUCTION

Box jacking - pipe jacking - Under water construction of diaphragm walls and basement - Tunneling techniques - piling techniques - driving well and caisson - sinking cofferdam - cable anchoring and grouting - driving diaphragm walls, sheet piles - laying operations for built up offshore system - shoring for deep cutting - large reservoir construction - well points - dewatering and stand by plant equipment for underground open excavation. **(15)**

SUPER STRUCTURE CONSTRUCTION FOR BUILDINGS

Vacuum dewatering of concrete flooring - concrete paving technology - techniques of construction for continuous concreting operation in tall buildings of various shapes and varying sections - launching techniques - suspended form work - erection techniques of tall structures, large span structures - launching techniques for heavy decks - insitu prestressing in high rise structures, aerial transporting handling erecting lightweight components on tall structures. **(10)**

CONSTRUCTION OF SPECIAL STRUCTURES

Erection of lattice towers and rigging of transmission line structures - construction sequence in cooling towers, silos, chimney, sky scrapers, bow string bridges, cable stayed bridges - launching and pushing of box decks - Advanced construction techniques for offshore structures - construction sequence and methods in domes and prestress domes - support structure for heavy equipment and conveyor and machinery in heavy industries - erection of articulated structures, braced domes and space decks. **(10)**

REHABILITATION TECHNIQUES

Mud jacking grout through slab foundation - micropiling for strengthening floor and shallow profile - pipeline laying - protecting sheet piles, screw anchors - sub grade water proofing, underpinning, crack stabilization techniques. **(6)**

DEMOLITION

Advanced techniques and sequence in demolition and dismantling. **(4)**

TOTAL : 45

REFERENCES

1. *Robertwade Brown, Practical foundation engineering hand book, McGraw Hill Publications, 1995.*
2. *Patrick Powers. J., Construction Dewatering: New Methods and Applications, John Wiley & Sons, 1992.*
3. *Jerry Irvine, Advanced Construction Techniques, CA Rocketr, 1984.*
4. *Peter.H.Emmons, "Concrete repair and maintenance illustrated", Galgotia Publications Pvt. Ltd., 2001.*
5. *Sankar, S.K. and Saraswati, S., Construction Technology, Oxford University Press, New Delhi, 2008.*

15MCME14 - SHORING, SCAFFOLDING AND FORMWORK

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the various types of scaffolding, formworks, shoring methods and techniques.

COURSE OUTCOME

CO1 : *The students will able to recognize the correlation of structural design and construction of temporary structures.*

CO2 : *The students will able to apply design principles for scaffolding, formwork and shoring to projects.*

CO3 : *The students will able to understand how to prevent temporary structure failure having developed insights into the causes of such failures.*

CO4 : *The students will able to effectively design, erect and inspect formwork, scaffolding and shoring in construction projects.*

PLANNING SITE EQUIPMENT & PLANT FOR FORMWORK

Development of basic system - Economical Planning of formwork materials - Detailing the forms - Overall Planning - Formwork Elements and Standards - Schedule for formwork - Site layout plan - Transporting plant - Location of job mill - Storage - Equipment - Formwork for various structural elements - Formwork ties and wales - Vertical transport table formwork. **(9)**

FORMWORK MATERIALS

Types - Lumber - Reconstituted wood - Steel - Aluminum Form lining materials - Hardware and fasteners - Nails in Plywood. **(9)**

DESIGN OF FORMS AND SHORES

Basic simplification - Allowable stresses - Deflection, bending, lateral stability, Shear, Bearing - Examples in wall forms - Slab forms - Beam forms - Ties, Anchors and Hangers - Column forms - Examples in each.

Simple wood stresses - Slenderness ratio - Allowable load - Tubular steel shores patented shores - Steel Tower Frames - Safety practices - Various types of shores. **(9)**

FORMWORK FOR BUILDINGS

Formwork for various structural elements - Prefabricated panel systems - Giant forms - curved wall forms - Column heads - Beam or girder forms - Beam pockets - Suspended forms - Concrete joint construction - Flying system forms - From work for Domes and Tunnels - Slip forms. **(9)**

SAFETY PRACTICES FOR SCAFFOLDS AND FORMWORKS

Causes of failures in shoring and scaffolding - Premature stripping - Errors in design - Failure to follow codes - Finish of exposed concrete design deficiencies - Safety factors - Prevention of rotation - Stripping sequence - Advantages of reshoring -Safety net - General safety requirements - Precautions against particular hazards. **(9)**

TOTAL : 45

REFERENCES

1. *Robert L. Peurifoy and Garold D. Oberlender, Formwork For Concrete Structures, McGraw - Hill , 1996.*
2. *Hurd, M.K., Formwork for Concrete, Special Publication No.4, American Concrete Institute, Detroit, 1996.*
3. *Michael P. Hurst, Construction Press, London & New York, 2003.*
4. *Austin, C.K., Formwork for Concrete, Cleaver - Hume Press Ltd., London, 1996.*

15MCME15 - SYSTEM INTEGRATION IN CONSTRUCTION

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study and understand the construction system integration, environmental factors, services, maintenance and safety systems.

COURSE OUTCOME

CO1 : *The students will able to understand the aesthetic system and materials associated with it.*

CO2 : *The students will be able to know various structural systems, services, safety and maintenance requirements in construction.*

STRUCTURAL INTEGRATION

Structural System, Systems for enclosing Buildings, Functional aesthetic system, Materials Selection and Specification. **(9)**

ENVIRONMENTAL FACTORS

Qualities of enclosure necessary to maintain a specified level of interior environmental quality - Weather resistance - Thermal infiltration - Acoustic Control - Transmission reduction - Air quality - Illumination - Relevant systems integration with structural systems. **(9)**

SERVICES

Plumbing - Electricity - Vertical circulation and their interaction - HVAC. **(9)**

MAINTENANCE

Component longevity in terms of operation performance and resistance to deleterious forces - Planning systems for least maintenance materials and construction - Access for maintenance - Feasibility for replacement of damaged components - Equal life elemental design - Maintenance free exposed and finished surfaces. **(9)**

SAFETY

Ability of systems to protect fire - Preventive systems - Fire escape system design - Planning for pollution free construction environment - Hazard free construction execution. **(9)**

TOTAL : 45

REFERENCES

1. *William T. Mayer, Energy Economics and Building Design, McGraw-Hill Book Company, 1983.*
2. *Peter R. Smith and Warren G. Julian, Building Services, Applied Science Publishers Ltd., London, 1993.*

3. *A.J.Elder and Martiz Vinden Barg, Handbook of Building Enclosure, McGraw-Hill Book Company, 1983.*
4. *Jane Taylor and Gordin Cooke, The Fire Precautions Act in Practices, 1987.*
5. *David V.Chadderton, Building Services Engineering, Taylar and Francis, 2007.*
6. *CPWD Hand Book on Building Maintenance.*

15MCME16 - HEALTH MONITORING OF STRUCTURES

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

To study the damages, repair and rehabilitation of structures.

COURSE OUTCOME

CO1 : *The students will able to understand and be capable of implementing fundamental concepts in structural health monitoring.*

CO2 : *The students will able to develop intuition for instrumentation type and location selection for real life applications.*

MAINTENANCE AND REPAIR STRATEGIES

Maintenance, repair and rehabilitation, Facets of Maintenance, importance of Maintenance, various aspects of Inspection, Assessment procedure for evaluating a damaged structure, causes of deterioration. **(9)**

SERVICE ABILITY AND DURABILITY OF CONCRETE

Quality assurance for concrete construction, concrete properties - Strength, permeability, thermal properties and cracking - Effects due to climate, temperature, chemicals, corrosion - Design and construction errors - Effects of cover thickness and cracking. **(9)**

MATERIALS AND TECHNIQUES FOR REPAIR

Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, Ferro cement and polymers, coating for rebars during repair, foamed concrete, mortar and dry pack, vacuum concrete, Gunite and Shotcrete, Epoxy injection. **(9)**

REPAIRS TO STRUCTURES

Mortar repair for cracks, shoring and underpinning. Methods of corrosion protection, corrosion inhibitors, corrosion resistant steels and cathodic protection.

Repair of structures distressed due to earthquake - Strengthening using FRP- Strengthening and stabilization techniques for repair. **(9)**

SAFETY AND PRECAUTIONS

Safety measures - Dismantling of structures - Safety in finishing works - NDT testing procedures - Engineered demolition techniques for structures. **(9)**

TOTAL : 45

REFERENCES

1. *Denison Campbell, Allen and Harold Roper, "Concrete Structures, Materials, Maintenance and Repair", Longman Scientific and Technical UK, 1991.*

2. *Allen R.T and Edwards S.C, "Repair of Concrete Structures", Blakie and Sons, UK, 1987.*
3. *Raikar, R.N., "Learning from failures - Deficiencies in Design, Construction and Service" - R&D Centre (SDCPL), Raikar Bhavan, Bombay, 1987.*
4. *Santhakumar A.R., "Concrete Technology" Oxford University Press, Printed in India by Radha Press, New Delhi, 2007.*
5. *Peter H.Emmons, "Concrete Repair and Maintenance Illustrated", Galgotia Publications pvt. Ltd., 2001.*

15MCME17 - VALUATION OF REAL PROPERTIES

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To have a clear idea of various techniques of valuation of constructed facilities and cost of construction.*
- *To apply the concepts in valuation of Real Properties for various purposes like taxation, rent, investments etc.*

COURSE OUTCOME

On completion of the course the students will demonstrate an ability to

CO1 : *Value different types of land and buildings.*

CO2 : *Apply appropriate methods of valuation.*

CO3 : *Become an Panel Valuer for Banks and Registered Valuer for Taxation.*

PRINCIPLES OF VALUATION & VALUATION OF LAND & BUILDING

Definition - Cost, Price and Value - Types of Properties under Valuation - Various Purposes of Valuation - Different types of Value - Factors affecting Value - Different Methods of Valuation.

Types of Land - Location of Land and its Value - Belting Method of Valuation - Market Value and Guideline Value of Land - Building FSI - Plot Coverage - Types of Structure - Life of Various types of Building - Methods of Calculating Depreciation - Valuation by Land and Building Method - How to obtain Membership. **(9)**

FREE HOLD AND LEASE HOLD PROPERTIES & FIXATION OF FAIR RENT

Free hold and Lease hold Properties - Lease, Rent and Licence - Different forms of Lease - Lessor - Lessee - Sub-lessee - Reversion - Lessor' Rights - Lessee's Rights - Meaning of Different Rents - Fixation of Fair Rent - Principles of fixation of fair rent - Amenities to be considered - Rent fixation for Residential & Non-Residential purposes, Commercial Buildings, Apartments. **(9)**

VALUATION OF APARTMENTS

FSI - Super Built-up Area - Undivided Share of Land - Different Methods of Valuation - Procedure of Valuation by Composite Rate Method - Valuation by Other Methods - Procedure for Valuation of Flat under Construction - Stage Value of a flat - Valuation of an existing flat - Joint Venture Agreement. **(9)**

VALUATION FOR BANKS

Purposes - Security - Primary and Collateral - Present, Market, Forced Sale and Auction Value - Valuation of Building under Construction - Valuation of Ready Built House - Valuation of Ready built Flats - Valuation of Flats under construction - Valuation of Properties offered as Collateral Security - How to become a Panel Valuer of Banks - Problems involved in Bank Valuation - Precautions to be taken in Bank Valuation - Points to be remembered by a Panel Valuer and Banker. **(9)**

VALUATION FOR TAXATION

Direct and Indirect Taxes - Valuation for Income Tax - Estimation of Cost of Construction by Plinth area rate method - Valuation by CPWD and State PWD Rates - Cost of Construction by accounting method - Valuation for Capital Gains Tax - Fair Market Value as on 1981 Section 50C of Income Tax Act - Valuation for individual Property - Valuation of Apartment. **(9)**

TOTAL : 45

REFERENCES

1. *Kanagasabapathy, B., Practical Valuation, Volumes I - X, No 1, Prestige Flats, Reynolds Road, Trichy.*
2. *Ashok Nain, Principles of Valuation, Tata McGraw Hill Publishing House, July 2010.*
3. *Roshan H. Namavati, Theory and Practice of Valuation, Lakhani Bood Depot, Mumbai, 2009.*
4. *Banerjee, D. N., Principles and Practice of Valuation, J.A. Parks, Eastern Law House, Delhi 5th Edition, 1998.*

15MCME18 - SUSTAINABLE URBAN AND TRANSPORT DEVELOPMENT

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To understand the basic concept of Sustainable Urban and Transport Development.*
- *To Study its influence on region, city and built environment.*

COURSE OUTCOME

Students would have learnt the importance of sustainable urban and transport planning and its benefits to the human community.

SUSTAINABLE URBAN AND TRANSPORT PRINCIPLES

Urban Environmental Sustainability, Urban Development, Urban Sustainable Development, Methods and Tools for Sustainable Appraisal, Sustainable Transportation - Principles, indicators and its implications. **(9)**

URBAN PLANNING AND ENVIRONMENT

Environment and Resources, Sustainability Assessment, Future Scenarios, Form of Urban Region, Managing the change, Integrated Planning, Sustainable Development. **(9)**

THE URBAN BUILT-IN ENVIRONMENT

Urban Form, Land Use, Compact Development, Principles of street design- complete streets, Transport Integrated Urban land use Planning, Guidelines for Environmentally sound Transportation. **(9)**

SUSTAINABLE TRANSPORTATION MODES PLANNING

Pedestrian - Planning Principles, Tools, Designs, Methods to measure success, Cycles- Planning Principles, Cycle Track Network, Crossings and intersections and junctions, Transit Planning, Road Side Infrastructure Planning. **(9)**

TRAVEL AND TRANSPORT

Transport and Environment - Equity Principle, Accessibility, Mobility - Roads, Traffic, Public Transport, Business and Goods Traffic, Relationship to land use, Financing and Pricing - Economic Benefits of Sustainable Transportation. **(9)**

TOTAL : 45

REFERENCES

1. *Joe Ravetz, City Region 2020 - "Integrated Planning for a Sustainable Environment", 2000.*
2. *George Godwin, "Traffic Transportation and Urban Planning", Pitmen Press,Great Britain, 1981.*
3. *"Sustainable Transportation and TDM - Planning the balances, Economic, Social and Ecological objectives", Victoria Transport Policy Institute, 2007.*
4. *UNCHS, Habitat, Cities in a Globalizing world, Global report on Human Settlement, 2001.*
5. *Tumlin Jeffrey, "Sustainable Transportation Planning- Tools for Creating Vibrant", Healthy and Resilient Communities, John Wiley & Sons, 2012.*

15MCME19 - URBAN TRANSPORTATION INFRASTRUCTURE- PLANNING AND DESIGN

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OBJECTIVE

- *To analyze Various Transportation Infrastructure projects.*
- *To design Intersections, Interchanges, Parking and Terminal Facilities to be provided in an urban area.*

COURSE OUTCOME

On completion of the course, the students would have gained knowledge on various urban transport infrastructure facilities and their design.

PRINCIPLES OF INTERSECTION DESIGN

Basic considerations - simplicity - uniformity - Maneouvre Elements - Separation of conflict points - Design Elements - Design Speed - Intersection Curves - Super elevation for curves at Intersection - Intersection Sight Distance. **(9)**

DESIGN OF AT-GRADE INTERSECTIONS

Capacity and LOS, Design of Rotary and Signalised Intersections, Vehicle Actuated Signals, Signal Co-ordination, Area Traffic Control System (ATCS), Pedestrian Planning at Grade Intersections. **(9)**

DESIGN OF GRADE SEPARATED INTERSECTIONS

Design of Grade Separators - Principles , Design Criteria - Layout Design, GAD Preparation - Pedestrian Foot Over-bridge and Subway Design - Pedestrian Planning for Grade Separated Intersections. **(9)**

PARKING FACILITIES

Parking - Demand - Characteristics - Space Inventory - Accumulation - Duration - Turn over - Index - Design of Multi Storeyed and Surface Parking facility. **(9)**

DESIGN OF TERMINAL FACILITIES

Bus Terminus - Design Principles - Design Elements - Design and Case Studies of Inter Modal Transfer Facilities - Design - Case Studies of Bus and Rail Terminals. **(9)**

TOTAL : 45

REFERENCES

1. *Robert F Baker, (Eds) "Hand Book of Highway Engineering, Van Nostrand Reinhold Company, New York, 1975.*
2. *New Jersy, "Transportation and Traffic Engineering Hand Book, Institute of Transportation Engineers, Prentice Hall, INC, 1982.*
3. *Kanna, S.K. and Justo, C.E.G. "Highway Engineering, Nemchand and Brothers, Roorkee, 1998.*