KUMARAGURU college of technology
character is life

DEPARTMENT OF CIVIL ENGINEERING

VISION

To develop industrial partnerships by integrated project management and inculcate unmatched knowledge and experience for students' global marketability.

MISSION

- Developing organizational and leadership capabilities with the potential to manage complex infrastructure projects and organizations globally.
- Developing industrial connect and promoting industrial collaborative projects with PMC.
- Providing training on technological trends in construction management as an integral part of the program.
- Promotion of R & D activities to develop advanced technologies and management approaches.
- Forging sound interdisciplinary techniques and collaborative partnership with national and international community.

PROGRAMME EDUCATION OBJECTIVES (PEOs)

PEO1:. Provide to construction students the technical knowledge and problem solving skills for a career in construction.

PEO2: Provide employers with a well-educated workforce that is ready and able to perform valuable construction management services immediately after graduation

PEO3: Provide to construction students necessary communication skills for the successful practice of the construction profession.

PROGRAMME OUTCOMES (POs)

PO1: An ability to independently carry out research /investigation and work to solve practical problems.

PO2: An ability to write and present a substantial technical report/document.

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

PO4: Evaluate how the legal, economic, and social relationships between contracting, the building trades, and the regulatory environment inform construction management.

PO5: Analyze how issues of cost, safety, and design impact project development and implementation.

PO6: Apply global, ethical, and sustainability perspectives to construction management knowledge.

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Coimbatore - 49.
DEPARTMENT OF CIVIL ENGINEERING
Regulation 2018
M.E Construction Management – Curriculum

Semester I										Pre-requisite
S. No	Course code	Course Title	Course Mode	CT	L	T	P	J	C	
1	P18MAT1001	Statistical Methods for Management	Theory	BS	3	0	0	0	3	Nil
2	P18CMT1001	Project Management in Construction	Theory	PC	3	0	0	0	3	Nil
3	P18CMT1002	Construction Economics and Finance	Theory	PC	3	0	0	0	3	Nil
4	P18CMT1003	Resource Planning and Management	Theory	PC	3	0	0	0	3	Nil
5	P18CMT1004	Construction Equipment and Methods	Theory	PC	3	0	0	0	3	Nil
6	P18CMP1505	Construction Engineering Laboratory	Lab	PC	0	0	2	0	1	Nil
								Total Credits	16	
								Total Contact Hours/week	17	

Semester II										Pre-requisite
S. No	Course code	Course Title	Course Mode	CT	L	T	P	J	C	
1	P18CMT2001	Building Information Management	Theory	PC	3	0	0	0	3	Nil
2	P18CMI2302	Project Formulation and Appraisal	Embedded	PC	2	0	0	2	3	Nil
3	P18CMT2003	Construction Contracts and Legal disputation	Theory	PC	3	0	0	0	3	Nil
4	P18CME	Elective 1	Theory	PE	3	0	0	0	3	Nil
5	P18CME	Elective 2	Theory	PE	3	0	0	0	3	Nil
6	P18CMP2504	Managerial Skills Workshop	Lab	PC	0	0	2	0	1	Nil
7	P18CMP2505	Construction Management Lab	Lab	PC	0	0	2	0	1	Nil
8.	P18___	Audit Course	Theory	HS	3	0	0	0	0	Nil
								Total Credits	17	
								Total Contact Hours/week	23	

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Semester III										Pre-requisite
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C	
1	P18CMT3001	Construction Quality and Safety Management	Theory	PC	3	0	0	0	3	Nil
2	P18CME	Elective 3	Theory	PC	3	0	0	0	3	Nil
3	P18CMP3702	In-Plant Training *	Project	PW	0	0	0	0	1	Nil
4	P18CMP3703	Project Phase-I	Project	PW	0	0	0	24	12	Nil
								Total Credits	19	
								Total Contact Hours/week	30	

*2 weeks duration in the second semester vacation.

Semester IV									
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C
1.	P18CMP 4701	Project Phase-II	Project	PW	0	0	0	36	18
								Total Credits	18
								Total Contact Hours/week	36

Total Credits	**70**

Professional Electives									
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C
Elective List -1 (Core)									
1	P18CME0001	Integrated Building Service Management	Theory	PE	3	0	0	0	3
2	P18CME0002	Risk and Due Diligence	Theory	PE	3	0	0	0	3
3	P18CME0003	Energy Efficient Buildings	Theory	PE	3	0	0	0	3
4	P18CME0004	Value Engineering	Theory	PE	3	0	0	0	3
5	P18CME0005	Human Resources Management in Construction	Theory	PE	3	0	0	0	3
6	P18CME0006	Prefabricated Techniques and Management	Theory	PE	3	0	0	0	3
7	P18CME0007	Lean Construction Concepts, Tools & Practices	Theory	PE	3	0	0	0	3
8	P18CME0008	Neural Fuzzy and Expert Systems	Theory	PE	3	0	0	0	3
9	P18CME0009	Quantitative Techniques for Management	Theory	PE	3	0	0	0	3
Elective List - 2(Industry Driven)									
1	P18CME0010	Automation in Construction Industry	Theory	PE	3	0	0	0	3

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2	P18CME0011	Construction Site Administration and Control	Theory	PE	3	0	0	0	3
3	P18CME0012	Real Estate Practices and Management	Theory	PE	3	0	0	0	3

List of Mandatory Audit Course									
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**
1.	P18CMO0001	Disaster Management and Mitigation	Theory	OE	3	0	0	0	0

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SEMESTER I

P18MAT1001

STATISTICAL METHODS FOR MANAGEMENT

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Consistency, efficiency and unbiasedness of estimators, method of maximum likelihood. estimation and Central Limit Theorem.

CO2: Use statistical tests in testing hypotheses on data.

CO3: Concept of linear regression, correlation, and its applications.

CO4: List the guidelines for designing experiments and recognize the key historical figures in Design of Experiments.

CO5: Perform exploratory analysis of multivariate data, such as multivariate normal density, calculating descriptive statistics, testing for multivariate normality.

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S		M	S	M	S
CO2	S		M	S	M	S
CO3	S		M	S	M	S
CO4	S		M	S	M	S
CO5	S		M	S	M	S

ESTIMATION THEORY **9 Hours**

Estimators: Unbiasedness, Consistency, Efficiency and Sufficiency – Maximum Likelihood Estimation – Method of moments

TESTING OF HYPOTHESIS **9 Hours**

Sampling distributions - Large and small samples -Tests based on Normal, t, Chi square, and F-distributions for testing of means, variance and proportions – Analysis of r x c tables – Goodness of fit.

CORRELATION AND REGRESSION **9 Hours**

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.

DESIGN OF EXPERIMENTS **9 Hours**

Analysis of variance – One way and two way classifications – Completely randomized design – Randomized block design – Latin square design – 2^2 Factorial design.

MULTIVARIATE ANALYSIS **9 Hours**

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.

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Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Gupta S.C., and Kapoor V.K., “Fundamentals of Mathematical Statistics”, Sultan Chand and Sons, 11th Edition, 2002.
2. Jay L. Devore, “Probability and statistics for Engineering and the Sciences”, 8th Edition, Cengage Learning, 2014.
3. Johnson R.A. and Wichern D. W. “Applied Multivariate Statistical Analysis”, Pearson Education, Asia, 6th Edition, 2007.
4. Johnson R.A., Miller I and Freund J., "Miller and Freund’s Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.
5. Rice J.A. "Mathematical Statistics and Data Analysis", 3rd Edition, Cengage Learning, 2015.

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P18CMT1001 **PROJECT MANAGEMENT IN CONSTRUCTION**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Understand the project phases and various stakeholders of construction projects.
CO2: Design construction as an integrated project system.
CO3: Estimate the costs induced in construction.
CO4: Monitor the progress of the construction project
CO5: Understand the importance of management information systems.

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	S	S		M	M
CO2	M	S	S		M	M
CO3	M	S	S		M	M
CO4	M	S	S		M	M
CO5	M	S	S		M	M

STAKEHOLDER PERSPECTIVES 9 Hours

Project Management-Objectives and scope-Need for project management-PMBOK-Construction Project Life Cycle - Types of Construction -– Stakeholders in Construction Project – Structure of Project Organization – Perspectives of Owners & Builders – Turnkey Operation - Leadership and Motivation for the Project Team - Role of Project Managers

DESIGN AND CONSTRUCTION PROCESS 9 Hours

Design and Construction as an Integrated System – Innovation and Technological Feasibility – Innovation and Economic Feasibility – Functional Design - Engineering Investigations and Design – Industrialized Construction – Prefabrication

PROJECT COST ESTIMATION 9 Hours

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-Cost estimation software's.

PROJECT MONITORING AND CONTROL 9 Hours

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 – EVM– Profit/Loss at Completion – Disputes and Claims – Project Closure – Construction Closure – Financial Closure – Contract Closure – Project Managers' Closure.

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PROJECT INFORMATION **9 Hours**

Types of Project Information - Accuracy and Use of Information -Computerized Organization and Use of Information - Other Conceptual Models of Databases - Centralized - Database Management Systems - Databases and Applications Programs –Information - Transfer and Flow.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

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

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P18CMT1002 **CONSTRUCTION ECONOMICS AND FINANCE**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

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

CO2: To estimate the economic life of an assert with inflation effect.

CO3: To understand various methods of depreciation, tax and cost analysis of construction equipments followed by cost estimating.

CO4: To estimate the economic life of an assert with inflation effect.

CO5: To study the growth of MNC's in relation to construction industry.

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S		S	M	
CO2	S	S		S	M	
CO3	S	S		S	M	
CO4	S	S		S	M	
CO5	S	S		S	M	

ECONOMICS **9 Hours**

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

CONSTRCUTION ECONOMICS **9 Hours**

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

FINANCING **9 Hours**

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

ANALYSIS OF FINANCIAL STATEMENTS **9 Hours**

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

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INFLATION **9 Hours**

Inflation – procedure to adjust inflation – economic life determination without inflation effect – economic life determination with inflation effect – measurement of inflation – impact of inflation on economic evaluations – growth of multinational construction companies.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

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, 2017.
3. Warneer Z Hirsch, Urban Economics, Macmillan, New York, 2013.
4. Kwaku A, Tenah and Jose M.Guevara, Fundamental of Construction Management and Organisation, Prentice – Hall of India, 2015.
5. Madura, J and Veit, E.T., Introduction to Financial Management, West Publishing Co., St. Paul, 2014

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P18CMT1003 RESOURCE PLANNING AND MANAGEMENT

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students will be able to:

CO1: understand the various concepts of resource planning.

CO2: understand the various approaches of labour management.

CO3: analyze the planning and selection of various materials and equipment's for construction.

CO4: apply the techniques of time management.

CO5: allocate the resources for the construction projects.

Pre-requisites : Nil

	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak					
COs	Programme Outcomes(POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		S	M	S		M
CO2		S	M	S		M
CO3		S	M	S		M
CO4		S	M	S		M
CO5		S	M	S		M

RESOURCE PLANNING 9 Hours

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

LABOUR MANAGEMENT 9 Hours

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.

MATERIAL AND EQUIPMENT MANAGEMENT 9 Hours

Material: Time of purchase, quantity of material, sources, Transportation, Delivery and Distribution. Equipment: Planning and selecting by optimistic choice with respect to cost, Time, Source and handling.

TIME AND COST MANAGEMENT 9 Hours

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

RESOURCE ALLOCATION 9 Hours

Time-cost trade off, Computer application - resource leveling, resource smoothing, resource list, resource allocation, Resource loading, Cumulative cost - Value Management.

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45Hours

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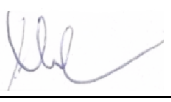
REFERENCES

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.



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P18CMT1004 **CONSTRUCTION EQUIPMENT & METHODS**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: understand the functions of various earthwork equipment

CO2: understand the functions of forklifts and screening equipment

CO3: understand the construction methods involved in sub structure and super structure construction

CO4: understand the functions of various methods of strengthening and rehabilitation of structures.

CO5: understand the various equipment management techniques

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M			S	
CO2	S	M		M	S	
CO3	S	M		M	S	
CO4	S	M		M	S	
CO5	S	M		M		M

EARTHWORK EQUIPMENT **9 Hours**

Fundamentals of Earth Work Operations- Types of earth work equipment- Tractors, Motor Graders, Scrapers, Loaders, Earth Movers.

FORKLIFTS & SCREENING EQUIPMENT **9 Hours**

Forklifts and related equipment -Portable Material Bins –Material Handling Conveyors – Crushers – Feeders - Screening Equipment - Handling Equipment - Batching and Mixing Equipment - Hauling, Pouring and Pumping Equipment – Transporters.

TUNNELING & DEMOLITION **9 Hours**

Equipment for Dredging, Trenching, Tunnelling, 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.

REHABILITATION AND STRENGTHENING METHODS **9 Hours**

Seismic retrofitting-Strengthening of beams -Strengthening of columns -Strengthening of slab - Strengthening of masonry wall, Protection methods of structures, Mud jacking and grouting for foundation – underpinning for strengthening floor and shallow profile -Sub grade water proofing.

CONSTRUCTION EQUIPMENT MANAGEMENT **9 Hours**

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Identification – Planning - Equipment Management in Projects - Maintenance Management – Replacement – Equipment Productivity Analysis-Cost Control of Equipment - Depreciation Analysis – Safety Management.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Peurifoy, R.L., Ledbetter, W.B. and Schexnayder, C., Construction Planning, Equipment and Methods, McGraw Hill, Singapore, 2006.
2. Constuction Equipment and its Planning and Applications, Mahesh Varma, Metropolitan Book Co. (P) Ltd., New Delhi, India.
3. Construction Macinery and Equipment in India, (A compilation of articles Published in Civil Engineering and Construction Review), Publish by Civil Engineering and Construction Review New Delhi,1991
4. Construction Equipment and Job Planning. Deodhar, S.V. "Khanna Publishers, New Delhi, 1988.
5. Construction Planning, Equipment and Methods , Peurifoy, R.L., Ledbetter, W.B. and Schexnayder, C,McGraw Hill, Singapore, 2006.
6. Construction Equipment and Management, Sharma S.C,Khanna Publishers, New Delhi, 1988.

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P18CMP1505	CONSTRUCTION ENGINEERING LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Objectives

The objective of the course is :

- To study the properties of various construction materials and quality of the material for their acceptance criteria and study the application of various testing tools.

Course Outcomes

After successful completion of this course, the students will be able to:

CO1: Understand the quality standards and requirement of construction materials.

CO2: Utilize various testing tools and its applications in the field.

Pre-requisites : NIL

	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak					
COs	Programme Outcomes(POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	M	S	S	M
CO2	S	M	M	S	S	M

LIST OF EXPERIMENTS **30 Hours**

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)

Theory: 0 Tutorial: 0 Practical: 0 Project: 30 Total: 30 Hours

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SEMESTER II

P18CMT2001	BUILDING INFORMATION MANAGEMENT	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

After successful completion of this course, the students will be able to:

CO1: Understand the concept of structural system of a building.
CO2: Identify the environmental aspects required for a building.
CO3: Plan Buildings with respect to system integration.
CO4: Analyze the various construction components required in infrastructure sector.
CO5: Understand the safety and maintenance systems in construction.

Pre-requisites : Nil

	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak					
COs	Programme Outcomes(POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M		M	M	S	M
CO2	M		M	M	S	M
CO3	M		M	M	S	M
CO4	M		M	M	S	M
CO5	M		M	M	S	M

STRUCTURAL SYSTEM 9 Hours

Systems for enclosing Buildings, Functional aesthetic system, Materials Selection and specification .

ENVIRONMENTAL ASPECTS AND SERVICES 9 Hours

Qualities of enclosure necessary to maintain a specified level of interior environmental quality – Weather resistance – Thermal infiltration – Acoustic Control –Transmission reduction – Air quality – Illumination.

SYSTEM INTEGRATION 9 Hours

Relevant systems integration with structural systems, Plumbing – Electricity –Vertical circulation and their interaction. Technological and methodological demands on construction management in infrastructure development projects.

INFRASTRUCTURE COMPONENTS 9 Hours

Construction component of various infrastructure sectors - highway - Ports and aviation - Oil and gas - Power – Telecom - Railways - Irrigation. Smart Systems (Case Study)

SAFETY AND MAINTENANCE 9 Hours

Planning systems for least maintenance materials and construction – Access for maintenance – Feasibility for replacement of damaged components – Maintenance free exposed and finished surfaces, Ability of systems to protect fire – preventive systems – fire escape system design –planning for pollution free construction- Hazard free Construction execution.

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45Hours

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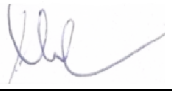
REFERENCES

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.



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P18CMI2302	PROJECT FORMULATION AND APPRAISAL	L	T	P	J	C
		2	0	0	2	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Screen project ideas and select the project.
CO2: Identify and analyse the feasibility of projects.
CO3: Assess the various methods of project appraisal.
CO4: Understand the sources of project financing.
CO5: Understand the importance of private sector participation in infrastructure development projects.

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M			M	M
CO2	S	M			M	M
CO3	S	M			M	M
CO4	S	M			M	M
CO5	S	M			M	M

PROJECT FORMULATION **6+3 Hours**

Generation and Screening of Project Ideas - Project identification – Project evaluation an overview-Project planning, project selection and appraisal-Project quality factors and the basic needs-measurement of project performance-project formulation exercise.

PROJECT INITIATION **6+3 Hours**

Feasibility study-Market and Demand Analysis-Detailed technical analysis-Time value of money-feasibility study exercise.

PROJECT APPRAISAL **6+3 Hours**

NPV – BCR – IRR – ARR – Urgency – Pay Back Period – Assessment of Various Methods – Indian and International Practice of Investment-investment analysis in practice.

PROJECT FINANCING **6+3 Hours**

Project financing – Means of finance-Financial Institutions-Special schemes-Key financial indicators-Ratios-project finance report preparation exercise.

PRIVATE SECTOR PARTICIPATION **6+3 Hours**

Private sector participation in Infrastructure Development Projects – Features of BOT model, BOLT model and BOOT model – Case study.

Theory: 30	Tutorial: 0	Practical: 0	Project: 15	Total: 45 Hours

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REFERENCES

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

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P18CMT2003 **CONSTRUCTION CONTRACTS AND LEGAL DISPUTATION**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: understand the various elements of contracts
CO2: understand various clauses and conditions of contract documents
CO3: understand the concepts of tendering
CO4: understand the arbitration process and procedures
CO5: Understand various laws & labour regulations and their impact on managing contracts

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S		M	S		M
CO2	S		M	S		M
CO3	S		M	S		M
CO4	S		M	S		M
CO5	S		M	S		M

CONSTRUCTION CONTRACTS **9 Hours**

Definition of Contract Legal issues in contract – Standard forms of contracts- General and special conditions of contracts- Contract pricing by the client, project management consultants and the contractor, Contract correspondence and contract closure.

CONTRACT DOCUMENTS **9 Hours**

Types of contracts - Documents forming a contract - General conditions and clauses of Indian contracts - International contracts - Contract administration, Law of Torts - FIDIC conditions of contract-Concession agreement

TENDERS **9 Hours**

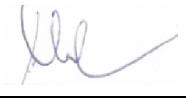
Prequalification – Bidding – Accepting – Evaluation of Tender from Technical, Contractual and Commercial Points of View – Contract Formation and Interpretation – Potential Contractual Problems - World Bank Procedures and Guidelines – Tamilnadu Transparency in Tenders Act.

ARBITRATION **9 Hours**

Comparison of Actions and Laws – Agreements –Appointment of Arbitrators – Conditions of Arbitration – Arbitration Tribunals - Powers and Duties of Arbitrator –Enforcement of Award – Arbitration and Conciliation Act 1996 - Arbitration case study.

TAX LAWS AND LABOUR REGULATIONS **9 Hours**

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,



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Bonus and Industrial Disputes – Workmen's Compensation Act 1923 – Indian Factory Act 1948 – Tamil Nadu Factory Rules 1950 – Child Labour (Prohibition and Regulation) Act, 1986 - Other Labour Laws and Regulations.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. L.S. Ranaga Rao Contract Management and Dispute Resolutions Engineering staff College of India January 2008.
2. C. J. Schexnayder and R. E. Mayo, Construction Management Fundamentals, McGraw Hill, New Delhi.2003
3. General Conditions of Contract, Central Public Works Department, New Delhi,2010
4. S. Ranaga Rao, Contract Management & Dispute Resolutions, Engineering staff College of India,January 2008
5. D.S. Berrie and B.c. Paulson, Professional construction management including C.M.,Design construct and general contracting ,McGraw Hill InternationaL, Third Edition 1992..
6. V. K. Raina, Construction & Contract Management Practices ,SPD, New Delhi
7. Gajaria G.T., Laws Relating to Building and Engineering Contracts in India, M.M.Tripathi Private Ltd., Bombay, 1982
8. Jimmie Hinze, Construction Contracts, McGraw Hill, 2001
9. Joseph T. Bockrath, Contracts and the Legal Environment for Engineers and Architects, McGraw Hill, 2000.
10. Kwaku, A., Tenah, P.E. Jose M.Guevara, P.E., Fundamentals of Construction Management and Organisation, Printice Hall, 1985.
11. Patil. B.S, Civil Engineering Contracts and Estimates, Universities Press (India) Private Limited, 2006

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P18CMP2504

MANAGERIAL SKILLS WORKSHOP

L	T	P	J	C
0	0	2	0	1

Course Outcome

After successful completion of this course, the students should be able to

CO1: Equip student with managerial and soft skills.
CO2: Develop leadership and team management skills.
CO3: Prepare students in career management in respective areas.

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	S	M		
CO2	S	M	S	M	S	
CO3	S	M	S	M		M

Career management - interview skills, group discussion, carrier development and setbacks: Overcoming adversity in your career, Personal effectiveness skills - time management, stress management, problem solving, positive attitude and confidence, learning and self- development; Team management skills - team building, leadership skills, motivation, conflict management skills, decision-making, change management, art of delegation and feedback; Understanding personality - types of personality, personality assessment questionnaire, understanding self-behaviour.

Theory: 0	**Tutorial: 0**	**Practical: 30**	**Project: 0**	**Total: 30 Hours**

References

1. Mcgrath E (2006) Basic manager skill for all, Prentice Hall of India

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P18CMP2505	CONSTRUCTION MANAGEMENT LABORATORY	L	T	P	J	C
		0	0	2	0	1

Course Outcome

After successful completion of this course, the students should be able to

CO1: To prepare estimates using CostX software

CO2: To prepare schedule using Priamavera P6 Professional software

CO3: To update and monitor the progress of the project

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	S	S		M	M
CO2	M	S	S		M	M
CO3	M	S	S		M	M

Estimation

Quantity take-off for residential buildings and commercial buildings-Manual design-Introduction to CostX software-Reports

Schedule Preparation

Primavera P6 Professional – EPS and OBS – Calendars – WBS- Projects – Activities, duration and assigning relationships – Scheduling – Baseline creation – Earned Value Management - Reports

Theory: 0	**Tutorial: 0**	**Practical: 30**	**Project: 0**	**Total: 30 Hours**

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SEMESTER III

P18CMT3001 **CONSTRUCTION QUALITY AND SAFETY MANAGEMENT**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: apply quality control aspects in planning and management.

CO2: learning concepts of quality assurance and control techniques in construction

CO3: understand the various safety concepts and requirements applied to construction projects.

CO4: applying design for safety in construction industry.

CO5: learn to avoid construction accidents, suggest safety programmes.

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1			M			
CO2	M				M	
CO3	S				M	
CO4	M		M			
CO5	M				S	

QUALITY MANAGEMENT 9 Hours

Introduction –Definitions and objectives –Factors influencing construction quality – Responsibilities and authority –Quality plan –Quality Management Guidelines –Quality circles-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

QUALITY ASSURANCE AND CONTROL 9 Hours

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.

SAFETY PROGRAMMES 9 Hours

Problem Areas in Construction Safety –Elements of an Effective Safety Programme –Job-Site Safety Assessment –Safety Meetings –Safety Incentives

DESIGNING FOR SAFETY 9 Hours

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

CONSTRUCTION ACCIDENTS 9 Hours

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Accidents and their Causes –Human Factors in Construction Safety –Costs of Construction Injuries –Occupational and Safety Hazard Assessment –Legal Implications.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Jimmy W. Hinze, "Construction Safety", Prentice Hall Inc., 1997.
2. Hutchins.G, ISO 9000 : A Comprehensive Guide to Registration, Audit Guidelines and Successful Certification, Viva Books Pvt. Ltd., 1994.
3. James, J.O' Brian, "Construction Inspection Handbook"–Total Quality Management, Van Nostrand, 1997
4. John L. Ashford, "The Management of Quality in Construction", E & F.N.Spon, 1989.
5. Juran Frank, J.M. and Gryna, F.M. "Quality Planning and Analysis", McGraw Hill, 2001.
6. Kwaku.A., Tena, Jose, M. Guevara, "Fundamentals of Construction Management and Organisation", Reston Publishing Co., Inc., 1985.
7. Steven McCabe, "Quality Improvement Techniques in Construction", Addison Wesley Longman Ltd, 1998

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P18CMP3702 **INPLANT TRAINING**

L	T	P	J	C
0	0	0	0	1

After successful completion of this course, the students should be able to

CO1: have a first-hand knowledge of practical problems related to Construction Management in carrying out engineering tasks.

CO2: develop skills in facing and solving the problems experiencing in the field.

CO3: prepare the technical document report efficiently

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S					
CO2	M		M			
CO3		S				

SYLLABUS: The students individually undertake training in reputed engineering companies doing construction during the summer vacation for a specified duration of two weeks. At the end of training, a detailed report on the work done should be submitted within ten days from the commencement of the semester. The students will be evaluated through a viva-voce examination by a team of internal staff.

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P18CMP3703 **PROJECT PHASE I**

L	T	P	J	C
0	0	0	24	12

Course outcome
After successful completion of this course, the students should be able to
CO1: formulate a clear idea of his/her area of work
CO2: apply suitable guidelines/software/methodology for the projects
CO3: present the project efficiently
CO4: prepare the technical document report efficiently

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S					
CO2	M			S		M
CO3			M			
CO4	M	S			M	

OBJECTIVES:

- To identify a specific problem for the current need of the society and collecting information related to the same through detailed review of literature.
- To develop the methodology to solve the identified problem.
- To train the students in preparing project reports and to face reviews and viva-voce examination.

SYLLABUS: The student individually works on a specific topic approved by the head of the department under the guidance of a faculty member who is familiar in this area of interest. The student can select any topic which is relevant to the area of construction engineering and management. The topic may be theoretical or case studies. At the end of the semester, a detailed report on the work done should be submitted which contains clear definition of the identified problem, detailed literature review related to the area of work and methodology for carrying out the work. The students will be evaluated through a viva-voce examination by a panel of examiners including one external examiner.

Total : 120Hrs

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SEMESTER IV

P18CMP4701 **PROJECT PHASE II**

L	T	P	J	C
0	0	0	36	18

Course outcome

After successful completion of this course, the students should be able to

CO1: carry out research work to solve practical problems independently

CO2: utilize advanced software/methodology/for the projects

CO3: prepare the substantial technical report efficiently

CO4: demonstrate the project efficiently

CO5: analyze the impact of issues in project development

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S					
CO2	M					W
CO3	M	S	M			
CO4	M	S		S		
CO5	M				S	

OBJECTIVES:

- To solve the identified problem based on the formulated methodology.
- To develop skills to analyze and discuss the test results, and make conclusions.

SYLLABUS: The student should continue the phase I work on the selected topic as per the formulated methodology under the same supervisor. At the end of the semester, after completing the work to the satisfaction of the supervisor and review committee, a detailed report should be prepared and submitted to the head of the department. The students will be evaluated through based on the report and the viva-voce examination by a panel of examiners including one external examiner.

Total : 300Hrs

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PROFESSIONAL ELECTIVE

P18CME0001 **INTEGRATED BUILDING SERVICE MANAGEMENT**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Plan layout in a neighbourhood
CO2: Prepare functional planning of buildings.
CO3: Plan for fire safety requirements.
CO4: Understand the engineering services in building system.
CO5: Manage the facilities by MIS.

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M		M		M
CO2	M	M		M		M
CO3	M	M		M		M
CO4	M	M		M		M
CO5	M	M		M		M

URBAN FORMS **9 Hours**

Components of urban forms — Planning of urban forms- Concepts-Neighbourhood Module - Street system - Layout in a neighbourhood

FUNCTIONAL PLANNING **9 Hours**

Development Control Guidelines, Functional planning of buildings, Circulation - Optimization of space - Spatial Synthesis graphical techniques, heuristic procedures

FIRE RESISTANCE **9 Hours**

Standard for fire safety - Fire resistance/ Firefighting and extinguishing systems - Classification of buildings -Means of escape, alarms, etc - Space requirements and relationships for typical buildings like residential, offices, hospitals, etc.

ENGINEERING SERVICES **9 Hours**

Plumbing – Electricity – Vertical circulation and their interaction - HVAC .

MAINTENANCE MANAGEMENT **9 Hours**

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

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45Hours

REFERENCES

1. Mike Jenks, Colin Jones-Dimensions of the Sustainable City –Springer.

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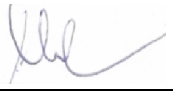
2. D. Chapman-Creating Neighbourhoods and Places in the Built Environment.
3. Stephen Marshall-Streets and Patterns .
4. David. V. Chadderton-Building Services Engineering, 5th edition.
5. M. Bhatti-Practical Optimization Methods - With Mathematica Applications-Springer .
6. Ruhul Amin Sarker, Charles S. Newton-Optimization Modelling, A Practical Approach.
7. Barrie Chanter, Peter Swallow-Building Maintenance Management -Wiley-Blackwell.
8. Time Saver Standards for Architectural Design Data.
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.



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P18CME0002 RISK AND DUE DILIGENCE

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: broad knowledge of risk concepts, principles and terminology

CO2: good comprehension of how major project risks are identified and assessed

CO3: understanding of specific risk analysis methodologies and the ability to apply them in practice

CO4: understanding of capital project program and pre-construction strategies and approaches

CO5: up-to-date knowledge of risk management best practices in the construction industry

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1		M		S		M
CO2		M		S		M
CO3		M		S	S	
CO4		M		S	S	
CO5		M		S	S	

INTRODUCTION **9 Hours**

Definitions of risk – Elements of risk management – causes of risk – Corporate Governance – Finance & Market Risk –Risks associated with infrastructure and other complex projects

RISK MANAGEMENT **9 Hours**

Components of risk management Planning for risk management – project – charter – risk management policies – roles and responsibilities – examining stakeholder tolerance – risk management plan template – revisiting the work breakdown structure. Risk management plan – creating the risk management plan – risk analysis – tracking

IDENTIFICATION OF RISK **9 Hours**

Identifying risk – preparing for risk identification – risk categories – referring to historical information. Identifying the project risk – reviewing project documents – brainstorming – The Delphi technique - analysing SWOT – diagrammatic techniques - Analysing project risk through qualitative and quantitative measures

RISK RESPONSE AND COMMUNICATION **9 Hours**

Preparing for risk response – creating risk response – result of risk response planning. Risk monitoring and control. Risk communication – informing public about risk and responding to expresses concerns – education.

PROJECT DUE DILIGENCE **9 Hours**

Objectives – Scope – Types – factors to be kept in mind while conducting due diligence – risk minimisation – the concept of data room – virtual or physical – preparing a risk analysis matrix – due diligence vs audit

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Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. PMP Project Management Professional Study Guide, Joseph Phillips, McGraw –Hill
2. Bruce Barkley, Project Risk Management (Project Management)
3. John R. Schuyler, Risk and Decision analysis in Projects (Cases in project and program management series)
4. Chris Chapman and Stephen Ward, Project Risk Management: Processes, Techniques and Insights.
5. Dale F. Cooper, Stephen Grey, Geoffrey Raymond, and Phil Walker, Project Risk Management Guidelines : Managing Risk in Large projects and Complex Procurements.
6. William G. Ramroth, Risk Management for Design Professionals.
7. James B. Atkins and Grant A. Simpson, Managing Project Risk : Best Practices for Architects and Related Professionals.

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P18CME0003 **ENERGY EFFICIENT BUILDINGS**

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students will be able to:

CO1: understand the concepts of energy efficiency.
CO2: understand the principles of passive solar heating and cooling
CO3: analyze the components and techniques used in day lighting and electrical lighting
CO4: analyze the various systems involved in heat control and ventilation
CO5: design various energy efficient buildings.

Pre-requisites : Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M		M	M	M
CO2	M	M		M	M	M
CO3	M	M		M	M	M
CO4	M	M		M	M	M
CO5	M	M		M	M	M

INTRODUCTION 9 Hours

Climate adapted and climate rejecting buildings – Heat Transfer – Measuring Conduction – Thermal Storage – Measurement of Radiation – The Green house Effect – Convection – Measuring latent and sensible heat – Psychrometry Chart – Thermal Comfort – Microclimate, Site Planning and Development – Temperature – Humidity – Wind – Optimum Site Locations – Sun Path Diagrams – Sun Protection – Types of Shading Devices – Design responses to energy conservation strategies.

PASSIVE SOLAR HEATING AND COOLING 9 Hours

General Principles of passive Solar Heating – Key Design Elements – Sunspace – Direct gain – Trombe Walls, Water Walls – Convective Air loops – Concepts – Case Studies – General Principles of Passive Cooling – Ventilation – Principles – Case studies – Courtyards – Roof Ponds – Cool Pools – Predicting ventilation in buildings – Window Ventilation Calculations – Room Organization Strategies for Cross and Stack Ventilation – Radiation – Evaporation and dehumidification – Wind Catchers – Mass Effect – Zoning – Load Control – Air Filtration and odor removal.

DAYLIGHTING AND ELECTRICAL LIGHTING 9 Hours

Materials, components and details – Insulation – Optical materials – Radiant Barriers – Glazing materials – Glazing Spectral Response – Day lighting – Sources and concepts –Building Design Strategies – Case Studies – Daylight apertures – Light Shelves – Codal requirements – Day lighting design – Electric Lighting – Light Distribution – Electric Lighting control for day lighted buildings – Switching controls – Coefficient of utilization – Electric Task Lighting – Electric Light Zones – Power Adjustment Factors.

HEAT CONTROL AND VENTILATION 9 Hours

Hourly Solar radiation – Heat insulation – Terminology – Requirements – Heat transmission through building sections – Thermal performance of Building sections – Orientation of buildings – Building

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characteristics for various climates – Thermal Design of buildings – Influence of Design Parameters – Mechanical controls – Examples. Ventilation – Requirements – Minimum standards for ventilation – Ventilation Design – Energy Conservation in Ventilating systems – Design for Natural Ventilation – Calculation of probable indoor wind speed.

DESIGN FOR CLIMATIC ZONES 9 Hours

Energy efficiency – An Overview of Design Concepts and Architectural Interventions – Embodied Energy – Low Embodied Energy Materials – Passive Downdraft Evaporative Cooling – Design of Energy Efficient Buildings for Various Zones – Cold and cloudy – Cold and sunny – Composite – Hot and dry – Moderate – Warm and humid – Case studies of residences, office buildings and other buildings in each zones – Commonly used software packages in energy efficient building analysis and design - Energy Audit – Certification.

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45Hours

REFERENCES

1. Brown, G.Z. and DeKay, M., Sun, Wind and Light - Architectural Design Strategies, John Wiley and Sons Inc, 2001
2. Energy Conservation Building Code, Bureau of Energy Efficiency, New Delhi,2007.
3. Handbook on Functional Requirements of Buildings Part 1 to 4 SP : 41 (S and T) 1995
4. Majumdar, M (Ed), Energy - Efficient Buildings in India, Tata Energy Research Institute, Ministry of Non Conventional Energy Sources, 2002.
5. Moore, F., Environmental Control System, McGraw Hill Inc. 2002.
6. Tyagi, A.K. (Ed). Handbook on Energy Audits and Management Tata Energy Research Institute, 2000.

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P18CME0004 VALUE ENGINEERING

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: understand value engineering methods and its methodology

CO2: apply it to various stages of a construction project

CO3: conduct valuation for different types of assets

CO4: prepare report on valuation

CO5: perform life cycle cost analysis of projects

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M					
CO2			S		S	
CO3			M		M	
CO4		S				
CO5					M	

VALUE ENGINEERING	**9 Hours**
Value Engineering-Definition-Importance to Contractors-Potential VE Applications-Value- basic and secondary functions-factor contributing to value such as aesthetic-ergonomic-technical-economic-identify ingreasons or unnecessary costs- Different methods of performing value engineering-Methodology	
APPLICATION OF VALUE ENGINEERING	**9 Hours**
VE during the Planning Phase of a Construction Project - VE during the Design Phase of a Construction Project-VE during the Construction Phase of a Construction Project	
VALUATION	**9 Hours**
Types of value-purposes of valuation factors affecting value-Different methods of valuation for different types of assets such as land and building-horticulture-historical places	
VALUATION REPORT	**9 Hours**
Valuation Report-contents-standard formats-Case study of any one Report	
VALUE ANALYSIS & LIFE CYCLE COSTING	**9 Hours**
10 Commandments of value analysis-value analysis team- principles-elements of job plan-Forecasting of Capital as well as operating & maintenance costs-time value-present worth analysis-DCF methods-ROR analysis-sensitivity analysis	
Theory: 45 Tutorial: 0 Practical: 0 Project: 0	**Total: 45 Hours**

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REFERENCES

1. Value Engineering: Analysis And Methodology By Del Younke
2. Industrial Engg. & Mgt., O.P.Khanna, DhanpatRai Publ.
3. Industrial Organization & Engg. Economics, T.R.Banga, S.C.Sharma, Khanna Publ.
4. Estimating and Costing in Civil Engineering: Theory and Practice B.N Dutta Published S. Dutta & Company, Lucknow
5. Estimating, Costing Specifications & valuation in Civil Engineering By : M. Chakraborty Published By : Author
6. Estimating and Costing By : G.S.Birdie
7. EstimatingandCostingBy:RangwalaPublishedBy:CharotarPublishingHouse,8. PracticalInformationforQuantitySurveyors,Propertyvaluers,ArchitectsEngineersand Builders,P.T.Joglekar,PuneVidyarthiGrihaPrakashan,2008reprint.

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P18CME0005 **HUMAN RESOURCES MANAGEMENT IN CONSTRUCTION**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Implement practices and techniques for evaluating performance, structuring teams, coaching and mentoring people,

CO2: Understand the role of the leader and leadership principles and attitudes

CO3: Demonstrate an understanding of professional and ethical responsibilities.

CO4: Demonstrate commitment to quality, timeliness, and continuous improvement.

CO5: Clearly understand their future managerial role, with emphasis on the management of the human resources and with a multi-cultural perspective

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S			S		
CO2	S			M		
CO3	S			M		M
CO4		M		M		S
CO5		M				S

MANPOWER PLANNING **9 Hours**

Manpower planning and forecasting–Recruitment, selection process-Sources-Induction-Orientation and Training-Manpower Planning process-Organising, Staffing, directing, and controlling—Factors influencing supply and demand of human resources–Role of HR manager–Personnel Principles

ORGANISATION **9 Hours**

Elements of an organisation-Management process in organisations-Planning-Organising-Staffing-Directing-Controlling–Delegation of authority–responsibility–accountability–lines and staff organisation Workforce diversity-international dimensions of Organisation-Organisational structure-determinants of organisational design

HUMAN RELATIONS AND ORGANISATIONAL BEHAVIOUR **9 Hours**

Basic individual psychology–Approaches to job design and job redesign–Self managing work teams–Intergroup–Conflict in organizations–Leadership-Engineer as Manager–aspects of decision making–Significance of human relation and organizational–Individual in organization–Motivation–Personality and creativity–Group dynamics, Team working–Communication and negotiation skills.

WELFARE MEASURES **9 Hours**

Establishing Pay plans-Basics of compensation-factors determining pay rate-Current trends in compensation-Job evaluation–Incentives-Practices in Indian organizations-Statutory benefits-non-

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statutory (voluntary) benefits-Insurance benefits-retirement benefits and other welfare measures to build employee commitment–Laws related to welfare measures.

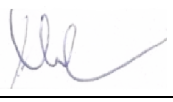
MANAGEMENT AND DEVELOPMENT METHODS **9 Hours**

Management Development-On-the-job and off-the-job-Management Developments-Performance appraisal in practice. Managing careers: Career planning and development-Managing promotions and transfers. of operations–Developing policies, practices and establishing process pattern–Competency upgradation and their assessment–New methods of training and development–Performance Management.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Charles D Pringle, Justin Gooderi Longenecter, Management, CE Merril Publishing Co. 2001.
2. Dwivedi R.S, Human Relations and Organisational Behaviour, Macmillian India Ltd.,2005.
3. Josy .J, Familaro, "Handbook of Human Resources Administration", McGraw-Hill Intemational Edition, 2007
4. D. Longford M.R. Hancock, R. Rellows& A. W. Gale, Human Recourse Management in Construction.–Longman Group Limited , fourth impression 2000.
5. Carleton Counter II and Jill Justice Coulter, "The Complete Standard Handbook of Construction Personnel Management ", Prentice Hall, Inc., New Jersey, 1989



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P18CME0006 **PREFABRICATED TECHNIQUES AND MANAGEMENT**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Describe various structural systems and standard organizing requirements.

CO2: Identify and differentiate structural behaviour of building elements.

CO3: understand the elementary concepts and techniques of business research methods,

CO4: formulate replacement programming problem and making appropriate decisions

CO5: understand a field based problem and simulating it with computer based tools and technologies

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M		M	S	M
CO2	S	M		M	S	M
CO3	S	M		M	S	
CO4	S	M		M	S	
CO5	S	M		M	S	

INTRODUCTION **9 Hours**

Types of prefabrication, prefabrication systems and structural schemes- Disuniting of structures- Structural behaviour of precast structures - Specific requirements for planning and layout of prefabrication plant - IS Code specifications.

PRECAST CAST ELEMENTS **9 Hours**

Handling and erection stresses- Application of prestressing of roof members; floor systems two way load bearing slabs, pre stressed beam , Precast column - precast shear walls Wall panels, hipped plate and shell structures.

PREFABRICATED DESIGN **9 Hours**

Designing and detailing prefabricated units for - industrial structures - Multistory buildings and Water tanks, silos bunkers etc., - Application of prestressed concrete in prefabrication

JOINTS AND CONNECTIONS **9 Hours**

Basic mechanism- Dimensioning and detailing of joints for different structural connections; compression joint-shear joint - tension joint- Pin jointed connection-moment resisting connections- beam to column- column foundation connections

PREFABRICATED BUILDINGS MACHINERY AND EQUIPMENT **9 Hours**

Production, Transportation & erection- Shuttering and mould design Dimensional tolerances- Erection of R.C. Structures, Total prefabricated buildings assembly Process - Plant machinery, casting yard- casting and stacking

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Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. KimS. Elliot (2017), Precast Concrete Structures, CRC Press
2. Handbook of Precast Concrete Buildings (2016) ICI publications.
3. Ryan E. Smith, (2010), Prefab Architecture: A Guide to Modular Design and Construction, John Wiley and Sons, London
4. Hubert Bachmann and Alfred Steinle, (2011), Precast Concrete Structures, Wiley VCH.

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P18CME0007

LEAN CONSTRUCTION CONCEPTS, TOOLS & PRACTICES

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Explains the contemporary management techniques and the issues in present scenario.

CO2: Apply the basics of lean management principles and their evolution from manufacturing industry to construction industry

CO3: Develops a better understanding of core concepts of lean construction tools and techniques and their importance in achieving better productivity

CO4: Apply lean techniques to achieve sustainability in construction projects.

CO5: Apply lean construction techniques in design and modelling.

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1		S	M	M		M
CO2		S	M	M		M
CO3			M	M		M
CO4			M	M		M
CO5			M	M		M

INTRODUCTION 9 Hours

Introduction and overview of the construction project management-Review of Project Management& Productivity Measurement Systems–Productivity in Construction–Daily Progress Report-The state of the industry with respect to its management practices–construction project phases-Essential features of contemporary construction management techniques-The problems with current construction management techniques–Current production planning.

LEAN MANAGEMENT 9 Hours

Introduction to lean management–Toyota's management principle-Evolution of lean in construction industry-Production theories in construction–Lean construction value-Value in construction-Target value design–Lean project delivery system-Forms of waste in construction industry–Waste Elimination

CORE CONCEPTS IN LEAN 9 Hours

Concepts in lean thinking–Principles of lean construction–Variability and its impact–Traditional construction and lean construction–Traditional project delivery-Lean construction and workflow reliability–Work structuring–Production control.

LEAN CONSTRUCTION TOOLS AND TECHNIQUES 9 Hours

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Value Stream Mapping–Work sampling–Last planner system–Flow and pull based production – Look ahead schedule–constraint analysis–weekly planning meeting-Daily Huddles–Root cause analysis–Continuous improvement–Just in time.

LEAN CONSTRUCTION IMPLEMENTATION **9 Hours**

Lean construction implementation-Enabling lean through information technology–Lean in design-Design Structure Matrix Location Based Management System-BIM (Building Information Modelling)-IPD (Integrated Project Delivery)–Sustainability through lean construction approach

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Corfe, C. and Clip, B., Implementing lean in construction: Lean and the sustainability agenda, CIRIA, 2013.
2. Shang Gao and Sui PhengLow, Lean Construction Management: The Toyota Way, Springer, 2014.
3. Dave, B., Koskela, L., Kiviniemi, A., Owen, R., and Tzortzopoulos, P,Implementing lean in construction: Lean construction and BIM, CIRIA, 2013.
4. Ballard, G., Tommelein, I., Koskela, L. and Howell, G., Lean construction tools and techniques, 2002.
5. Salem, O., Solomon, J., Genaidy, A. and Luegring, M., Site implementation and Assessment of Lean Construction Techniques, Lean Construction Journal, 2005

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P18CME0008 **NEURAL FUZZY AND EXPERT SYSTEMS**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Learn the mathematical theory behind the intelligent problem solving . approaches and apply them to write the code to solve a particular design problem.

CO2: Carry out three design projects in the course in neural networks, fuzzy logic, and genetic algorithms.

CO3: Covers intelligent approaches to solving engineering problems that are appropriate for pattern matching, control, optimization, and other areas.

CO4: Solve the problems pertaining to artificial neural networks, fuzzi logic and expert systems using standard software packages. .

CO5: To study the growth of MNC's in relation to construction industry.

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S		S	M	
CO2	S	S		S	M	
CO3	S	S		S	M	
CO4	S	S		S	M	
CO5	S	S		S	M	

INTRODUCTION **9 Hours**

Brief introduction to the study of artificial intelligence – An Insight to the concept of natural intelligence followed by the development of artificial neural networks – fuzzy logic systems and expert systems tool – Demonstration of the importance of artificial neural networks – fuzzy logic and expert systems with the help of at least two practical examples civil engineering for each study – Importance of nuero-fuzzy systems

NEURAL NETWORKS **9 Hours**

Components of artificial neural networks – neurons – inputs – outputs – error – error propagation – hidden layers – threshold logic – weights – bias – noise – momentum rate of learning – training and testing – Hebb's rule – Delta rule – Supervised learning – Generalized Delta rule – supervised learning – Types of Neural Networks

FUZZY SETS **9 Hours**

Crispness – vagueness – uncertainty and fuzzy sets. Basic – Definitions and operations of Fuzzy sets – approximate reasoning and membership function. Fuzzy Relations: Fuzzy relation and fuzzy composition – fuzzy aggregation procedures – Dominance Matrix – Weightages – applications of Fuzzy sets to civil engineering problems – pattern recognition.

EXPERT SYSTEMS **9 Hours**

Structure of expert systems – Knowledge acquisition – Knowledge organization – methods of representing .Knowledge – types of inference engines – reasoning under uncertainty–

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various types of expert system tools – heuristics – search mechanism – expert system developmen1 and hybrid expert systems.

EXPOSURE TO SOFTWARE PACKAGES **9 Hours**

Neural networks (Mat lab tool kit) — fuzzy logic — expert systems (L5 object).Applications of Artificial Neural Networks, Fuzzy logic and expert systems in civil engineering — Case studies with at least one problem on each aspect of ANN, FL and Expert systems.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Fuzzy Sets, Decision Making, and Expert Systems-, Zimmerman, H. J., Kluwer Academic Publications, Boston, 2007
2. "Artificial Intelligence and Expert System", Elaine Rich, Juda Pearl, Heuristics.
3. "Expert Systems in Construction and Structural Engineering" Adeli H., Chapman, 2014..
4. "Neural Networks Algorithms, Applications and Programming" Freeman, J.A., and Skapura, D.M. Addition-Wesley, Reading MA, 2015.

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P18CME0009

QUANTITATIVE TECHNIQUES IN MANAGEMENT

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: form and solve application based Linear Programming problem to optimize the objectives

CO2: understand the elementary concepts and techniques of allocation models.

CO3: structure decision making map such as Decision tree

CO4: formulate replacement programming problem and making appropriate decisions

CO5: understand a field based problem and simulating it with computer based tools and technologies

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S			S	
CO2	S	S			S	
CO3	S	S	M		S	
CO4	S		M		S	
CO5	S		M		S	

LINEAR PROGRAMMING **9 Hours**

Meaning of Linear Programming – General Mathematical Formulation of LPP – Graphical Analysis – Simplex Method – Two-phase Method – Big M-Method –Duality – Advantage and Limitations of LPP

ALLOCATION MODELS IN CONSTRUCTION **9 Hours**

Transportation Model – Transportation Algorithm (MODI Method) – the Initial Basic Feasible Solution –Moving Towards Optimality – Assignment Models – Hungarians Algorithm: (Concept of Opportunity costs) – Minimization Case – Maximization Case

DECISION THEORIES **9 Hours**

Decision-making under certainty – uncertainty and risk situations – Analytical hierarchical process theory, AHP Step-By-Step Validation – Analytical Network Process (ANP) Modelling

JOB SEQUENCING AND REPLACEMENT PROGRAMMING **9 Hours**

Johnsons Algorithm for n Jobs and Two machines – n Jobs and Three Machines – Two jobs and m Machines Problems –Replacement of assets that deteriorate with time – replacement of assets which fail suddenly.

SIMULATIONS MODELLING **9 Hours**

Introduction - Methodology of Simulation – Basic Concepts –Simulation Procedure –Application of Simulation – Monte-Carlo Simulation – Limitations.

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Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. S.L. Tang, Irtishad U. Ahmad , Syed M. Ahmed & Ming Lu, Quantitative Techniques for Decision Making in Construction, Hong Kong University Press 2015
2. C.M. Tam, Thomas K. L. Tong & H. Zhang, "Decision Making and Operations Research Techniques for Construction Management", City University of Hong Kong Press 2013
3. Barry Render, Ralph M. Stair, and Michael E. Hanna "Quantitative Analysis for Management", 12/e Global Edition, Pearson India 2018
4. Wayne L. Winston, Practical Management Science: spreadsheet modeling and applications 2013
5. Taha, Hamdy, Operations Research, 7th edition, (USA: Macmillan Publishing Company) 2011

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P18CME0010

AUTOMATION IN CONSTRUCTION INDUSTRY

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Understand the application of building management system and automation in on and off site projects

CO2: Solve the construction issues through robotic techniques

CO3: Application of computer in construction Information processing

CO4: Understand the concepts of Communication and office automation system

CO5: Application of Robotics in Construction

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S		M	S	M	S
CO2	S		M	S	M	S
CO3	S		M	S	M	S
CO4	S		M	S	M	S
CO5	S		M	S	M	S

INTRODUCTION AND SENSORS **9 Hours**

Concept and application of Building Management System (BMS) and Automation, requirements and design considerations and its effect on functional efficiency of building automation system, architecture and components of BMS- Review and analysis of state- of –art in construction automation - Field sensors actuators, controllers, non-destructive evaluation, data acquisition , examples of sensors in existing automated equipment

OFF AND ON SITE AUTOMATION IN CONSTRUCTION **9 Hours**

Off- site automation in construction Information processing (computer applications), materials processing , case study (concrete batch plant) - Existing and prototype equipment for construction – case study (concrete placement and finishing), final product design session.

BUILDING AUTOMATION **9 Hours**

Introduction to building automation systems – components– Heating, ventilation, and air conditioning (HVAC)– Lighting – Electrical systems water supply and sanitary systems– Fire safety – security -Communication and office automation system -Water pump monitoring & control - Control of Computerized HVAC Systems.

ROBOTICS IN CONSTRUCTION **9 Hours**

Automation and robotic technologies for customized component, module and building prefabrication- Elementary technologies and single – Task construction robots - Site automation- robotic on site factories.

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CONSTRUCTION ROBOTS **9 Hours**

Selecting robot- Activated concrete cutting robot, concrete floor finishing robot- Ceiling panel positioning robot- Exterior wall painting robot-safety and training- case studies.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Javad Majrouhi Sardroud, (2011),"Automated Management of Construction Projects" LAP Lambert Academic Publishing.
2. Wang Shengwei, (2010), "Intelligent Buildings and Building Automation" Taylor & Francis Group.
3. Majrouhi Sardroud Javad, (2014), "Automation in Construction Management" Scholars' Press.
4. HongleiXu and Xiangyu Wang, (2014), "Optimization and Control Methods in Industrial Engineering and Construction (Intelligent Systems, Control and Automation: Science and Engineering)" Springer.

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P18CME0011

CONSTRUCTION SITE ADMINISTRATION AND CONTROL

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Plan job site layout for any construction project

CO2: Overcome the factors affecting the project productivity

CO3: Make the project communication with various agencies involved in the project

CO4: Analyse the project escalations

CO5: Control construction project

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S		S	M	S	
CO2	S					
CO3	S		S			
CO4	S		M	M		
CO5				M		

INDIAN CONSTRUCTION INDUSTRY **9 Hours**

Overview and Introduction to Indian Construction industry – Various sectors in Indian Construction Industry, Various reasons of project delays, Contribution of Indian Construction Industry towards the GDP, Project as a business

PROJECT LIFE CYCLE AND DELIVERY SYSTEMS **9 Hours**

Project Life Cycle – Understanding the project from concept to completion/closeout, Role of client/owner, consultant, and contractor in different stages of the project. Project delivery systems – Different Project delivery systems their merits and demerits, role of agencies and people involved in different project delivery systems.

CONSTRUCTION SITE MANAGEMENT **9 Hours**

Job Site Layout, Facilities Setup, Site Safety and accident prevention, documentation and record keeping, contract appreciation document for contract administration and coordination.

FIELD PROCEDURE MANUAL (FPM) **9 Hours**

Field Procedure Manual and its importance, Labor and subcontractor management, Site waste management, measurement and billing, project control estimate, and project escalations.

PROJECT COMMUNICATION AND CASE STUDIES **9 Hours**

Meetings, review, inter & intra organizational relationships, Enterprise resource planning, Case Studies – Construction project case studies.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

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1. Mincks, W. Johnston, H. (2011). Construction Jobsite Management. Delmar Cengage Learning, New York.
2. Ritz, G. (1994). Total Construction Project Management. McGraw-Hill, Singapore.
3. Jha, N. (2015). Construction Project Management: Theory and Practice, Pearson Education; 2 Edition, India.
4. Joy, P. (2007). Handbook of Construction Management. Macmillan India Limited, New Delhi.
5. Moore, D. (2001). Project Management – Designing Effective Organizational Structures in Construction. Blackwell Publishing, London.

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P18CME0012 **REAL ESTATE PRACTICES AND MANAGEMENT**

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: govern the real estate system in the market.

CO2: understand the various statutory provisions and requirements in real estate market.

CO3: analyse various roles, responsibilities and functions of the stakeholders.

CO4: understand the various managerial aspects of real estate development .

CO5: learn the various documentation principles in real estate processes and management.

Pre-requisites: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S		M	S	M	S
CO2	S		M	S	M	S
CO3	S		M	S	M	S
CO4	S		M	S	M	S
CO5	S		M	S	M	S

REAL ESTATE MARKET **9 Hours**

Real Estate Scope – classification of real estate activities and peculiarities – Factors affecting real estate market – Role of Government in real estate market;

STATUTORY PROVISIONS **9 Hours**

Laws – rules and regulation – land use controls in property development – registration And licensing requirements – Knowledge base for assessment and forecasting the Real Estate market – environmental issues related to Real Estate Transactions.

PARTICIPANTS AND STAKE HOLDERS **9 Hours**

Role – Scope – working characteristics and principal functions of real estate participants and stakeholders – real estate consultants and their activities – role and responsibilities of property managers – Code of ethics for Real Estate participants – Good practices and managerial responsibilities.

REAL ESTATE DEVELOPMENT **9 Hours**

Functions of real development like project formulation – feasibility studies – developing – costing and financing – managing including planning – Scheduling and monitoring of real estate projects – risk management – Facilities management – marketing/advertising – post construction management etc – Real estate investment, Sources and related issues.

DOCUMENTATION **9 Hours**

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Interests in real estate – Documentation in real estate processes –Transfer of titles and records – Real estate appraisal and valuation – Types of agreement between the consultants and principal – closing the real estate transactions.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. David M.M. Geltner, Commercial real estate analysis and investments, South western Educational & Professional.
2. John Ratcliffe, Urban planning and real estate, Taylor & Francis, Inc.
3. Mike E. Miles, Gayle Berens, and Mark Eppli, Real Estate Development : Principles and Process
4. Stephen P. Peca, Real Estate Development and Investment: A Comprehensive Approach.

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P18CMO0001 **DISASTER MANAGEMENT AND MITIGATION**

L	T	P	J	C
3	0	0	0	0

Course Outcome

After successful completion of this course, the students should be able to

CO1: prepare disaster mapping using GIS.
CO2: assess disaster vulnerability of a location.
CO3: prepare disaster management plan

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	Programme Outcomes (POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		M				
CO2	M					
CO3		M				

NATURAL DISASTERS **9 Hours**

Cyclones, Floods, Drought and Desertification - Earthquake, Tsunami, Landslides and Avalanche.

MAN MADE DISASTERS **9 Hours**

Chemical industrial hazards, major power breakdowns, traffic accidents, Fire, War, Atom bombs, Nuclear disaster- Forest Fire-Oil fire –accident in Mines.

GEOSPATIAL TECHNOLOGY **9 Hours**

Remote sensing, GIS and GPS applications in real time disaster monitoring, prevention and rehabilitation-disaster mapping.

RISK ASSESSMENT AND MITIGATION **9 Hours**

Hazards, Risks and Vulnerabilities. -Disasters in India,Assessment of Disaster Vulnerability of a location and vulnerable groups- Preparedness and Mitigation measures for various Disasters Mitigation through capacity building -Preparation of Disaster Management Plans

DISASTER MANAGEMENT **9 Hours**

Legislative responsibilities of disaster management- Disaster management act 2005- post disaster recovery & rehabilitation, Relief & Logistics Management; disaster related infrastructure development- Post Disaster, Emergency Support Functions and their coordination mechanism.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Khanna B K, “All You Wanted to Know About Disasters”, New India Publishing Agency, New Delhi, 2005.

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2. Ramana Murthy, “Disaster Management”, Dominant, New Delhi, 2004.
3. Rajdeep Dasgupta, Disaster Management and Rehabilitation, Mittal Publishers, New Delhi, 2007.
4. Disaster Management in India- A Status Report- Published by the National Disaster Management Institute, Ministry of Home Affairs, Govt. of India.2004.
5. Murthy D B N, “Disaster Management: Text and Case Studies”, Deep and Deep Publications (P) Ltd., New Delhi, 2007.
6. Sundar I and Sezhiyan T, “Disaster Management”, Sarup and Sons, New Delhi, 2007.

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