

**BUNDELKHAND INSTITUTE OF  
ENGINEERING AND TECHNOLOGY  
JHANSI  
JHANSI – 284128 (U. P.), INDIA**



**EVALUATION SCHEME & SYLLABUS**

**FOR M. TECH.  
(CONSTRUCTION TECHNOLOGY AND MANAGEMENT)**



Affiliated to

**Dr. A.P.J. Abdul Kalam Technical University, Lucknow  
(Formerly Uttar Pradesh Technical University)**

## SEMESTER - I

S.No.	Course Code	Subject	Periods		Evaluation Scheme					Subject Total
					Sessional				Examination	
					Theory	L	Tut/ Prac	CT	Attendance	
1	CMCM 11	Construction Management-I	3	1	30	10	10	50	100	150
2	CMCM 12	Rehabilitation Of Civil Engg. Structure	3	1	30	10	10	50	100	150
3	CMCM 13*	Construction Technology-I	3	2	30*	10	10	50	100	100
4	CMCM 14*	Elective -I	3	2	30*	10	10	50	100	100
		Total	12	6				200	400	600

15 marks are for class tests and 15 marks for laboratory if any, otherwise 30 marks are for class test.

## SEMESTER – II

S.No.	Course Code	Subject	Periods		Evaluation Scheme					Subject Total
					Sessional				Examination	
					Theory	L	Tut/ Prac	CT	Attendance	
1	CMCM 11	Construction and contract Management-I	3	1	30	10	10	50	100	150
2	CMCM 12	Low Cost Construction Technology	3	1	30	10	10	50	100	150
3	CMCM 13*	Construction Technology-I	3	2	30*	10	10	50	100	100
4	CMCM 14*	Elective -II	3	2	30*	10	10	50	100	100
		Total	12	6				200	400	600

15 marks are for class tests and 15 marks for laboratory if any, otherwise 30 marks are for class test.

### SEMESTER - III

S.No.	Course Code	Subject	Periods		Evaluation Scheme					Subject Total
					Sessional				Examination	
					L	Tut/Prac	CT	Attendance	TA	
1	CMCM 31	Management Information system	3	1	30	10	10	50	100	150
2	CMCM 32	Effective -III	3	1	30	10	10	50	100	150
3	-	Seminar	-	2	-	-	-	100	100	100
4	DR-I*	Dissertation	-	8	-	-	-	-	-	-
		Total	6	12					200	400

\*100 marks are for dissertation work will be evaluated during IV semester.

### SEMESTER – IV

S.No.	Course Code	Subject	Periods		Evaluation Scheme					Subject Total
					Sessional				Examination	
					L	Tut/Prac	CT	Attendance	TA	
1	DR-II	Dissertation	-	18	-	-		200*	200	400
		Total								400

\*100 marks are for DR-I work of semester – III and 100 marks are for DR- III work of semester IV

**List of Electives**

- (A) COST ENGINEERING**
- (B) HUMAN RESOURCE PLANNING**
- (C) RESEARCH METHODOLOGY FOR MANAGEMENT DECISION**
- (D) WASTE MANAGEMENT**
- (E) STRUCTURAL SAFETY AND RELIABILITY ANALYSIS**
- (F) ADVANCED CONSTRUCTION MANAGEMENT**
- (G) NEW CONSTRUCTION MATERIALS**
- (H) COST ACCOUNTING**
- (I) MANAGEMENT OF MACHINES & MATERIALS**
- (J) TECHNOLOGY MANAGEMENT**

## **CONSTRUCTION MANAGEMENT –I**

### **INTRODUCTION:**

Business opportunity in construction industry, construction companies failures, need to build competence.

### **PLANNING AND MONITORING:**

Objective, planning process, activities and resources to be planned, planning techniques, reporting and monitoring system, contractual correspondence and claims, top management's involvement.

### **EXECUTION AND SITE MONITORING:**

Study of plan erection manual, mobilise efficiently, site budget, communication ,remove constraints, motivation, managing time , departmental labour ,sub contractor, supply labour, sub contractor, supply labour ,productivity, delay beyond control, responsibility to mitigate losses, liaison with owner's representative, consultants and local authority, quality assurance , wastage control, safety, measurements, billing and collection, cost control, malpractices, completion of erection of installation and preliminary acceptance, testing, commission and trial run, guarantee test, final billing demobilisation.

### **PERSONNEL MANUAL FOR A CONSTRUCTION ORGANISATION:**

Manpower requirement, recruitment , induction, training, employee evolution, confidentiality and secrecy, working hours ,salaries and wages, provident fund ,pensions and gratuity, paid holiday, leave of absence, accident while on duty, fringe benefits, increments and promotion, safety and accident prevention, temporary, casual and part time employment , resignation ,retirement, termination updating of personnel data, trade unions, works committees and staff associate.

### **PURCHASE AND STORES FOR A CONSTRUCTION ORGANISATION:**

Policy, purchase procedure, follow up, stage inspection, final inspection, packing and dispatching instruction, sales tax or VAT applicability and documentation, delivery challan, lorry receipt, railway recej bill of landing, freight to pay, demurrages, open delivery, claims , technical inspection and testing, notify defects to the seller , protection during storage, pricing, fire protection, insurance, fixation of recorder level. ABC analysis, inventory control, owners materials, standardisations, warranties pilferage, scrap.

## **CONSTRUCTION TECHNOLOGY – I**

Precast concrete funicular shells for roofs and floors, brick funicular shells for roofs , precast prestressed slab elements, use of hollow clay blocks and filler blocks and filler blocks, plate floor , system, precast RCC channel units for roofs and floors, precast RC joists planks, waffle units, ‘ L ’ panels and stone blocks.

### **BUILDING SYSTEM:**

Large panel prefabrication and prefabricated brick panel, hollow panel system , use of Ferro cement in the construction of doors, water tanks, cupboard, service core units and meter boards, fibrous gypsum plaster boards, glass reinforced gypsum, precast precast products for rural housing.

### **FORM WORK AND SCAFFOLDING:**

Current practices, economics, failures and causes, safety sections and codes of practice , scaffolding , design consideration, form materials and types, formwork supports, moulds for precast concrete, slip forms, concrete placement methods.

### **CONCRETE EQUIPMENTS:**

State of art IS specifications, scope for future developments.

### **CONCRETE BASED INDUSTRIES:**

Industries with concreting operations, precast concrete blocks, sleepers, pipe and other pressed concrete products, ancillary facilities , concrete construction and support services.

# **MANAGEMENT INFORMATION SYSTEMS**

## **INFORMATION FOR DECISION MAKING :**

Decision making, conceptual foundations of information systems, information resources management.

## **SYSTEM DEVELOPMENT:**

Overview of system analysis and design development life cycle, designing on line and distributed environments, design consideration, implementation and control projects.

## **COMPUTER NETWORKS AND DATA COMMUNICATION SYSTEMS:**

Trends in information technology hardware and software, data communication concept, computer networks.

## **INTEGRATING COMPUTERS TO CORPORATE INFORMATION SYSTEMS:**

Organising data, relational data base management system, Query language, DBMS implementation and future trends.

## **SOCIO- LEGAL ASPECTS COMPUTERISATION :**

Social dimensions of computerisation, computer viruses, legal dimensions of computerisation.

## **CASE STUDIES :**

A case study on computer application, aspects of information technology and policy making and the Caribbean community.

## **REHABILITATION OF CIVIL ENGINEERING STRUCTURES:**

Factors influencing durability of structures , design criteria for durability of structures, construction considerations for durability of structures and quality assurance of concrete structures, fatigue and creep and their influence on durability prediction of life expectancy of concrete structures.

Maintenance of concrete structures, repair and rehabilitation of concrete structures and cost benefit analysis, observation and testing of structures, including non destruction evaluation and testing of structures, including non destructive evaluation repair materials, repair techniques, fire damage and rehabilitation of concrete structures.

## **CONSTRUCTION TECHNOLOGY- II**

### **AUTOMATION IN CONSTRUCTION:**

Computer aided design , expert system in design architectural implication, product, modelling, software for building designs, building site information network, automated inspection, demolition and dismantling techniques, modelling construction process using artificial neural network.

### **QUALITY IN THE CONSTRUCTION PROJECT:**

The owner role expectation and requirements ,the coordination and communication process, procedure for selecting the design professional, the agreement for professional services alternative studies and project impacts. Design practices, pre contact planning for construction, quality assurance and quality control considerations, project quality through use of computer.

## **CONSTRUCTION AND CONTRACT MANAGEMENT**

### **TENDER :**

Negotiated tender, limited competition open competition advertisement for tenders, earnest money, security deposit extension of time limit, methods of preparing a tender, submission and opening of tender, acceptance of tender, prequalification of contractor, rejection of tender.

### **LAW OF CONTRACTS:**

Definition of contract, withdrawal of an offer or acceptance, essentials of a valid contract, parties to a contract, free consent of parties, express and implied contracts, joint liabilities, performance of reciprocal promises, time or performance delay in performance ,breach of contracts, liquidated damages, termination of agreements.

### **CONTRACT DOCUMENTS:**

Tender notice, general instructions, form of contract, conditions of contract, bill of quantities, specification, contract drawing.



## **CONTACT FOR ENGINEERING AND ARCHITECTURAL SERVICES:**

Owner's choice between architect and engineer, fees to be paid for engg. Services, nature of contract between owner and engineer, liabilities of engineer/ architect, implied duties and liabilities of architect & engineers agreement form.

## **CONTRACT BETWEEN OWNER AND CONTRACTOR:**

Lump sum contract item rate contract ,percentage rate contract ,cost plus fixed fee contract, target contract, labour contract etc.

## **CONDITIONS OF CONTRACT:**

Security deposit, time limit, measurement and payment to contractor addition and alterations, executions, execution of work, defects maintenance and improper work, subletting, breach of contract, suspension of work, various clauses, claims, depute and arbitration.

## **SPECIFICATION:**

Types, specification for materials measurement etc.

## **CONTRACT ORGANISATION AND MANAGEMENT:**

Types of organization, planning, Bar charts, mile stone chart, CPM, PERT.

## **PWD PROCEDURE OF EXECUTING A PROJECTS:**

Classification of work, administrative approval, technical sanction execution of work, contracts, employment of daily labour , rate lift, piece work day work.

## **LOW COST CONSTRUCTION TECHNOLOGY**

### **INTRODUCTION:**

Housing scenario , status of urban and rural housing and construction . land use and physical planning housing, building bye laws housing finance , approaches and strategies for housing, finance , approaches and strategies for housing urban poor.

### **DEVELOPMENT AND ADOPTION OF LOW COST HOUSING TECHNOLOGY :**

Adoption of innovative cost effective construction technology, prefabrication, precast roofing / flooring system, walls, plumbing systems.

### **ALTERNATIVE BUILDING MATERIALS FOR LOW COST HOUSING:**

Introduction, substitutes for scarce materials, timber substitution, industrial waste, agricultural waste, strategies for promotion of alternative building materials.

### **LOW COST INFRA- STRUCTURAL SERVICES:**

Introduction, present status low cost sanitation, domestic waste disposal, water supply, energy.

### **RURAL HOUSING:**

Introduction, traditional methods of construction ,appropriate rural housing technology, fire retardant treatment for roofs, soil stabilization.

### **HOUSING IN DIASATER PRONE AREAS:**

Introduction, traditional housing in disaster prove area, earth quakes, types of damages and failures, repair and rehabilitation floods, cyclones, requirements of structural safety.

### **SOCIAL HOUSING:**

Introduction, implementation of social housing program, associated agencies, performance, problems and remedies.

**(A) COST ENGINEERING**

Time value of Money and Equivalence  
Cost comparisons  
Depreciation and Taxes  
Equivalence after Taxes  
Cost comparisons after Taxes  
Profitability  
Break Even and Minimum Cost Analysis  
Cost Estimations And Control

**(B) HUMAN RESOURCE PLANNING**

Basics Of Human Resource Planning  
Job Evaluation  
Action Areas –Issues And Experiences  
Measurement In Human Resource Planning

**(C) RESEARCH METHODOLOGY FOR MANAGEMENT DECISION**

Introduction Of Research Methodology  
Data Collection And Measurement  
Data Presentation And Analysis  
Report Writing And Presentation

**(D) WASTE MANAGEMENT**

Fundamentals  
Current Management Practices  
Treatment And Disposal Methods  
Report Writing And Presentation

**(E) STRUCTURAL SAFETY AND RELIABILITY ANALYSIS**

Introduction  
Basic Statics And Probability Theory  
Resistance And Actions  
Basic Structural Reliability  
Monte Carlo Study Of Structural Safety  
Reliability Based Design

**(F) ADVANCED CONSTRUCTION MANAGEMENT**

Manual of Capital Equipment For Construction Operation  
Risk Management  
General Office Services for a Construction Organization  
Finance and Account in Construction Organization  
Corporate Planning in a Construction Organization  
Techniques to Combat Project Overruns

**(G) NEW CONSTRUCTION MATERIALS**

Ferro Cement  
Fiber Reinforced Concrete  
Polymer Concrete  
High Strength Concrete  
Geo- Synthetics  
Ceramic Materials  
Miscellaneous Materials

**(H) COST ACCOUNTING**

Cost Accounting and Cost Engineers  
Definition and Type of Accounting  
Mechanics of Accounting  
Cost Accounting for Expenditure of Construction Funds  
Cost Centers and Unit Cost  
Direct Costing and Absorption Costing  
Standard Cost and Budgets  
Joint Cost

**(I) MANAGEMENT OF MACHINES & MATERIALS**

Operations Management  
Facilities Planning  
Work and Job Design  
Operations Planning and Control  
Value Engineering and Quality Assurance  
Materials Management

**(J) TECHNOLOGY MANAGEMENT**

Technology: Issues and Implications  
Technology Development and Acquisition  
Technology Environment  
Technology Support Systems  
Case Studies