

**RULES OF COURSE STRUCTURE FOR  
MASTER OF ARCHITECTURE  
(M.ARCH.)**

**RULE NO. 1 : ELIGIBILITY CRITERIA:**

The student seeking admission to M.Arch. course must have passed Bachelor's Examination in Architecture from recognized University securing minimum Second Class (min 50% marks and above, for grade equivalency refer to council of Architecture, India Norms). The admission will be based on the rules framed by the Council of Architecture competent authority from time to time.

Common Entrance Test (CET) will be conducted as per rules & regulations of Council of Architecture, New Delhi.

**RULE NO. 2 : SCHEME OF ASSESSMENT :**

A candidate to be eligible for the Masters Degree in Architecture will be required to appear for and pass examinations as under:

1. First Year M.Arch. SEM I AND SEM II
2. Second Year M.Arch. SEM III AND SEM IV

**RULE NO. 3 : GRANTING OF TERM:**

- Academic Year will consist of TWO SEMESTERS of 90 teaching days each Sessional work / assignments prepared by the students shall be continuously assessed by the Internal Teacher throughout the semester.
- The candidate will be permitted to appear for the examinations at the end of each semester only if he/she keeps term at a college affiliated to the university and produces testimonials from the Principal for,
- 75% attendance in each head of passing of Theory and / or Sessional work as prescribed by the university.
- Completion of the Sessional Work prescribed for each subject and secured at least 50 % marks in the Internal Sessional & Oral Assessment.
- Good conduct.

**RULE NO. 4 EXAMINATIONS**

At each examination

- Theory paper
- Sessional and
- Sessional and viva-voce based on Sessional Work, as prescribed in the syllabus for the Examination at the end of the each Semester, shall constitute separate heads of passing.

**RULE NO. 5 SESSIONAL WORK ASSESSMENT :**

- In respect of Session~1 work in First, second, third and Fourth semesters, target date shall be fixed for the completion of each assignment. All the assignments shall be continuously assessed by the Internal Teacher during each semester.
- For First, Second and Third Semester examinations, Sessional and Viva Assessment will be done by an External Examiner.
- For Fourth Semester Examination, external assessment shall be carried out by a professional not teaching in any of the Colleges under Shivaji University.

- An examiner for any of the subjects of examination from First to Third semester shall have minimum of 3 years of teaching *I* professional experience as per norms of Council of Architecture (COA).
- To qualify as an External Examiner at Final Semester, the examiner shall have a minimum of 5 years of teaching *I* professional experience.

**RULE NO. 6 PRE-REQUISITES AND RULES OF A.T.K.T. FOR ADMISSION TO HIGHER CLASSES :**

- A student would be allowed to keep term for the II - semester provided he does not fail in more than 4 (four) of the heads of passing in the I -semester.
- A student would be allowed to keep term for the III- semester provided he does not fail in more than 4 (four) of the heads of passing in the II -semester.
- A student would be allowed to keep term for the IV - semester provided he does not fail in more than 4 (four) of the heads of passing in the III -semester.

**RULE NO. 7 : CRITERIA FOR PASSING.**

- To pass in each semester Examination a candidate must obtain minimum 45% marks in each subject and shall not be less than 50 % in aggregate.

**RULE NO. 8 : GRADING SYSTEM**

The class shall be awarded to the student on the aggregate marks obtained by him in all heads of passing in all four semesters taken together.

The award of class shall be as follows.

- a) Aggregate 66% or more : First Class with Distinction.
- b) Aggregate 60% or more but less than 66% marks : First Class
- c) Aggregate 55% or more but less than 60% marks : Higher Second Class
- d) Aggregate 50% or more but less than 55% marks : Second Class

**SUMMARY OF TEACHING AND EXAMINATION SCHEME :**

<b>SEMISTER – I :</b>									
No.	Subject	TEACHING SCHEME (50 Min. periods/wk)				EXAMINATION SCHEME (marks)			
		Lect.	Seminar	Stud.	Total	Paper	Sess.	Viva	Total
101 *	Advanced Construction Technology – I	2	-	2	4	100	25	-	125
102	Research Methodology	2	-	-	2	-	25	-	25
103 *	Project Management – I	2	-	2	4	100	50	100	250
104	Project Resource Management	2	-	2	4	-	50	50	100
105	Information Technology in Construction	1	-	1	2	-	50	-	50
106 *	Advance Building Services	1	-	2	3	100	25	-	125
107 *	System Analysis & Operation Research	3	-	-	3	100	25	-	125
		<b>13</b>	<b>-</b>	<b>9</b>	<b>22</b>	<b>400</b>	<b>250</b>	<b>150</b>	<b>800</b>
<b>SEMISTER – II :</b>									
201 *	Advanced Construction Technology – II	2	-	2	4	100	-	-	100
202 *	Project Management – II	2	-	2	4	100	50	100	250
203	Business Development & Project Marketing	2	-	-	2	-	50	-	50
204 *	Project Finance Management	2	-	2	4	100	25	-	125
205	Management Information System	2	-	-	2	-	50	-	50
206 *	Infrastructure Services & Management	2	-	2	4	100	25	50	175
207	Seminar - I		-	2	2	-	50	-	50
		<b>12</b>	<b>-</b>	<b>10</b>	<b>22</b>	<b>400</b>	<b>250</b>	<b>150</b>	<b>800</b>
<b>SEMISTER – III :</b>									
301 *	Project Management – III	2	-	2	4	100	50	100	250
302 *	Laws & Legal Aspects in Construction Projects	2	-	-	2	100		-	100
303	Facility Management	2	-	-	2	-	50	-	50
304	Real Estate Management	3	-	-	3	-	50	50	100
305 *	Integrated Energy Conservation in Construction	2	-	2	4	100	25	-	125
306	Quality & Site Safety Management	3	-	-	3	-	50	50	100
307	Dissertation Stage - I	-	-	2	2	-	25	-	25
308	Seminar - II	-	-	2	2	-	50	-	50
		<b>14</b>	<b>-</b>	<b>8</b>	<b>22</b>	<b>300</b>	<b>300</b>	<b>200</b>	<b>800</b>
<b>SEMISTER – IV :</b>									
401	Dissertation Stage – II	-	-	4	4	-	100	150	250
402	Elective – I	2	-	-	2	-	25	50	75
403	Elective – II	2	-	-	2	-	25	50	75
		<b>4</b>	<b>-</b>	<b>4</b>	<b>8</b>	<b>-</b>	<b>150</b>	<b>250</b>	<b>400</b>

## **M.Arch. (Construction Management)**

### **First Semester programme.**

#### **Advanced Construction Technology – I**

Course no 101.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

theory paper - 100

Internal assessment - 25

External Viva - -

Total - 125

*Aim : To give a coverage on aspects of construction technologies related to building projects, the understanding of which are essential for the construction manager.*

#### **Lecture:**

Geo-technical aspects of foundations

Planning and design considerations of:

Foundation systems

Fabrication and erection of Steel structures

Pre-cast and pre-stressed concrete constructions

Composite constructions

Planning, design and construction of basements including waterproofing systems

Soil / ground improvement

Durability of foundations in aggressive soil conditions

Concrete Technology

Advanced form work

Construction chemicals

Selection of construction equipment

Good practices and managerial responsibilities.

#### **Laboratory Work:**

Experimental investigations;

Non – Destructive Testing Techniques,

In-situ and other field tests

#### **Studio Program:**

Tendering of soil investigation work of building project

Planning design and costing of appropriate foundation system for a specific case study

Foundation study of building projects.

Site visits for concrete technology.

#### **RESEARCH METHODOLOGY**

Course no 102.

Contact hours per week

Assessment:

**Aim: To impart process knowledge for undertaking research studies.**

Lecture – 2	theory paper -
Studio –	Internal assessment - 25
Total – 2	External Viva - -
	Total - 25

Research area identification

Hypothesis of research topic

Literature sourcing and search, compilation and inference drawing

Aim and objective definition

Formulation of methodology

Field study planning, survey data collection, analysis and result presentation

Research study validation

Discussion of findings of research findings

Study conclusion and recommendation formulations.

### **Project Management - I**

Course no 103.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

Theory paper - 100

Internal assessment - 50

External Viva - - 100

Total - 250

Aim: To disseminate the application of Project Management in various phases of project embracing processes including Scope management, Time management, Cost management, Communication and Integration management.

#### **Lecture:**

Principles and Practices of Construction Management

Project organizations

Work Break down Structure (W.B.S.)

Time scheduling techniques

Resource Management and scheduling techniques

Material Management:

Time cost Analysis

Introduction to the management information systems (MIS)

Computer Application in Project Management

#### **Studio Exercises**

Familiarization with the building projects

Conceptualize Construction Logic

Work breakdown Structure

Identification of activities, Milestones and construction sequencing

Calculation of quantities, cost and productivity data

Time calculation of AON-PERT Network.

Cost on Time Graph and Crashing.

Resource Histograms and Resource Leveling.

### **Project Resource Management**

Course no 104.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

theory paper -

Internal assessment - 50

External Viva - - 50

Total - 100

Aim: the main objective of the subject is to impart and train rigorously the students for various resources involved in project viz materials, manpower, equipment and their planning and management.

### **HRM**

Concepts of organizational and individual behavior; Perception and attitudes; Motivation concepts and processes; Group behavior and teams; Communication process and information management; Conflict management; Leadership; Nature of organizations; Organizational development; Principles of organization structure; Human resource policies & practices; Selection, training and assessment; Performance Appraisal; Training need assessment and dissemination of training; Participative management; HRM trends; Philosophies of values, morals and ethics; Societal responsibilities and good citizenry. Good practices and managerial responsibilities.

Manpower estimation for company and for projects. Methods and procedures of estimation at the tender stage and detailed work out at execution stage, risk due to lead time under of over manning.

Understanding workers and supervisors in their socio-cultural milieu.

Flex i labour force, flex i wage and flex i work.

Methods of recruitment, selection, placement, training, financial compensation discipline, separation etc in employing and retaining engineers , managers.

Personnel office at the head office and at the project site. Role, its functions, status, and relationship with other departments. Personnel office records and procedures. Grievances handling and inquiry procedure.

### **Materials management:**

Study of various new and emerging building materials with regards to composition, physical and chemical properties and characteristics, durability and performance requirements, inspection and testing procedures, construction specifications and working details. Study of

performance of new materials in live case studies. Exposure to various provisions of Bureau of Indian Standards and other national standards like British standards, ASTM standards etc. Good practices and managerial responsibilities. Material handling at site, inventory management, ABC analysis of materials for procurement.

**Machinery Management**

Importance and role in construction, various types of machinery used in construction, earth moving, pile driving, road construction, concrete placing, materials handling, off site and on site fabrication and repairs, mechanical and electrical equipment installation, tunneling, etc. their techniques, performance characteristics in relation to the jobs in hand. Equipment hire – purchase, their depreciation, salvage value calculation and planning for the equipments for a given project.

**Studio:**

Exercises on all the above topics

**Information technology in construction**

Course no 105.

Contact hours per week

Lecture – 1

Studio – 1

Total – 2

Assessment:

theory paper -

Internal assessment - 50

External Viva - -

Total - 50

*Aim: To familiarise basic computer concepts, operating systems, application software and usage in construction*

**Lecture:**

Computers : Concepts & Hardware

Microsoft Windows

Application Software’s - Concepts & Application

Networking and Telecommunications

Project Management Applications

Project Management Software’s

System approach to Project Management

Emerging Areas In Information Technology - Application In Construction

**Studio Pro gramme:**

Studio exercises are suitably planned to illustrate the concepts and applications on model case studies and problems with hands on experience on computers

**Advance building services:**

Course no 106.

Contact hours per week

Lecture – 1

Studio – 2

Total – 3

Assessment:

theory paper - 100

Internal assessment - 25

External Viva - -

Total - 125

Aim: To provide exposure to planning, design and execution aspects of building services for effective co-ordination during pre-construction and construction phase of projects

#### Water and Waste Management Services and Systems

Water Management

Water quality and quantity assessment

Water supply system components (hot & cold)

Cold water supply system

Hot water supply system

System Selection & Economics

Waste Management

Soil and waste quantity calculation

Soil and waste system components

Soil and waste system

Rain water drainage

Solid waste disposal

#### Heating Ventilation and Air-conditioning

Refrigeration Cycle

Heating & cooling system components & installation

Air-conditioning System Types

Direct Expansion units

Package units

Central chilled water systems

Ventilation Systems

Selection Criteria

Electrical Services

#### Electrical System Components

Power Requirement for Buildings

Sub-station installations

High-tension (HT) switch gear

Transformers

HT & low-tension (LT) panels

Capacitors & power factor maintenance

Types of electrical conductors

LT distribution system

Protection devices

Low voltage systems

#### Emergency Power Supply



Co-ordination of Services

Operation, Maintenance and Planning for Retrofitting of Services Systems

Specialized Services

Medical Gases

Steam Supply

Laundry Services

Kitchen Equipment's & Planning

Integrated Building Management System

**Studio program:**

Demand Analysis

Related to planning of the internal services and preparation of schematic diagrams and details.

**SYSTEM ANALYSIS AND OPERATION RESEARCH**

Course no 107.

Contact hours per week

Lecture – 3

Studio –

Total – 3

Assessment:

theory paper - 100

Internal assessment - 25

External Viva - -

Total - 125

- Decision Theories - decision analysis & decision making methods, Categorization analysis
- Concept of Operations Research :  
Definitions, Concept of models, modelling steps and limitations.
- Queuing theory:  
Single channel finite/infinite Queuing models, Fixation of optimum service rate and optimum number of facilities.
- Simulation:  
Concepts, Discrete event simulation approach.
- 9.6 Linear programming:  
Formulation, Simplex approach for solving problems, duality theory and economic interpretations, Sensitivity Analysis.
- Inventory Models :  
Concepts, EOQ Models, EBS Models, Models with backorders, Cases of discounts and Anticipated price increase.
- Replacement Models :  
Concepts, Replacement models with no inflation and inflation cases, Group replacement models.
- Game Theory
- Transportation & Assignment problems
- Treatment of data & information structures for computer applications

- Fuzzy Sets - concepts & applications
- Goal Programming
- Geometric Programming

**M.Arch. (Construction Management)  
Second Semester programme.**

**Advanced Construction Technology – II**

Course no 201.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

theory paper - 100

Internal assessment -

External Viva - -

Total - 100

The objective of the course is to introduce the structural system concepts and design processes methodology in relation to architectural and services systems of building projects. These concepts will help in the selection of the appropriate structural systems and the broader understanding of the design process and structural detailing aspects which are essential for the design management professionals and construction managers. The course coverage includes the following:

Study of structural requirements of buildings, various structural systems for multi-story reinforced concrete buildings and their planning and design considerations including cost economics. Earthquake and wind resistant design and detailing of buildings including the relevant code provisions. Planning and design for durability of structures, large span structures. Basic concept of computer aided structural analysis and design process. Design and detailing of structural elements including introduction to limit state design concepts. Co-ordination aspects between structural systems and architectural and building services system.

- Introduction to civil engineering structures based on functional utility, materials of construction, structural forms and methods of construction. Classification of building structural forms; load bearing structure, framed structures, spatial structures and composite structures.
- Structural requirement of buildings  
Detailed consideration on strength, stability, stiffness, and ductility requirement of buildings. Durability of structures; planning, design and detailing, construction and maintenance aspects.
- Assessment of loads on structures; dead loads, imposed loads, and lateral loads (wind and earthquake load). B. I. S. Code provisions on loading standards and load calculation procedures.
- Structural systems for reinforced concrete multi-storied buildings.
- Earthquake resistant design of buildings.
- Structural systems for large span roofs; steel truss system, single and double layered tubular space frames, composite system with steel girders and R. C. C. slabs.

Large span R. C. C. systems, grid floors, virbendeel girder system, shell roofs and folded plate systems.

- Computer aided structural analysis and design.
- Spatial structural system: Tension structures and other recent developments in the innovative structural system (case study).
- Structural systems for low cost construction and non-engineering constructions.

### **Studio programs**

- For the selected building project with architectural inputs (drawings) selection of appropriate structural systems with position of joints, type of floor systems, and framing systems. Preliminary sizing of structural members and preparation of floor wise structural arrangement drawings. Working out the quantities of concrete, steel, and form work and assessment of approximate cost of the structural components of the building.
- Assessment of vertical loads (dead loads and live loads) on structural members and calculation of earthquake loads and wind loads. Understanding of a three-dimensional structural analysis and design software and structural modelling and preparation of input data for the case study project. Running of the software and obtaining outputs and interpreting of the results. Preparation of a typical detailing of structural members (slabs, beams and columns) as per local codal requirements.
- Appraisal study of structural systems of real life major building projects. Site visits to such building projects and prepare structural system appraisal report with structural system / arrangement drawings.
- Study of literature on innovative structural systems in buildings and making presentations and reports.

### ***Project Management – II***

Course no 202.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

theory paper - 100

Internal assessment - 50

External Viva - - 100

Total - 250

*The intent of the course is to disseminate about the application of project management during the pre construction phase of a project life cycle such as initiation, feasibility, outline scheme design detailed design phases and bid and award phases of a project.*

The application of management processes such as Scope management, Cost management, Risk management, Communication management and Time management during the pre construction phase will be disseminated. Some of the major techniques to be discussed are Value engineering, Quality Function Deployment, Cost benefit analysis, Brain storming, Parametric Modeling, Risk Identification, Quantification and Response Etc.

The introductory aspects of Contract Management such as types of contracts, merits and demerits of contract types, understanding of contract conditions, procurement planning etc will be disseminated. Good practices and managerial responsibilities.

### **Project feasibility & Detailed project report**

*Intent: To make student aware of the feasibility study and various project reports and formats.*

### **Contract management**

*Intent: To help the student to understand the introductory aspects of contract management*

### **Construction Specifications**

*Objective: To write the specifications for the various items of work.*

### **Estimation & Valuation for building projects**

*Intent: To acquaint the students in the area of estimation, which is an essential aspect of contract management.*

### **Value Management**

*Intent: To Acquaint the students with overall idea about value management*

### **Building design process & design review**

*Intent: To acquaint the students with building design related aspects*

### **Management of the pre – construction phase**

### **Risk Management**

*Intent: To acquaint the student with management of associated risks in construction projects*

### **Site management**

### **STUDIO EXERCISES**

- Plinth Area Estimate
- Specifications
- Detailed Estimate
- Item Nomenclature
- Quantity Estimation
- Analysis of Rates and Bill of Quantities
- Project Specifics
- General Conditions of Contract

- Special Conditions of Contract
- Value Engineering

### ***Business development and project marketing***

Course no 203.

Contact hours per week

Lecture – 2  
 Studio –  
 Total – 2

Assessment:

theory paper -  
 Internal assessment - 50  
 External Viva - -  
 Total - 50

- Objective: The purpose of this course is to develop an understanding of the basic concepts of Marketing and acquire skills to develop necessary product, pricing, distribution and promotion strategies for marketing of product and services.

Contents:

- INTRODUCTION: Nature and Role of Marketing, The Marketing Concept, Marketing Environment, Market Mix, Marketing Planning.
- MARKET SEGMENTATION, TARGETING AND MEASUREMENT: Market Segmentation, Market Targeting, Market Measurement and Forecasting, Marketing Research and Information System.
- BUYER BEHAVIOUR: Meaning and Importance, Determinants and Consumer Behaviour, Buying Decision Process, Industrial Buyer Behaviour.
- PRODUCT DECISIONS: Product Life Cycle, Product Mix Strategies, Branding and Packaging Decisions, New product Development, Consumer Adoption Process.
- PRICING DECISIONS: Pricing Objectives, Price Determinants, Pricing Methods, Pricing Policies and Strategies.
- MANAGING DISTRIBUTION FUNCTION: Nature and importance of Distribution Channels, Patterns of Distribution Channels, Determinants of Channel Design, Determining Intensity of Distribution, Selecting Motivating and Evaluating Channel Members, Physical Distribution Task and Approaches.
- PROMOTION DECISIONS: Marketing Communication Process, Promotion Mix and its Determinants Role of Advertising, Sales Promotion and Personal Selling; Promotion Budget.
- GLOBAL MARKETING: Reasons underlying International Business, Distinction between Global and Domestic Marketing, Institutional and Policy Framework, Procedural Aspects, Regional Economic Groupings.
- CONTEMPORARY ISSUES: Direct Marketing, Customer Service, Rural Marketing, Marketing of Services, Consumer Protection.

## **Project finance Management**

Course no 204.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

theory paper - 100

Internal assessment - 25

External Viva - -

Total - 125

*The objective of the course to familiarize the fundamentals of financial management concepts and their applications in the various phases of the project cycle of construction projects. The course also aims to provide a basic knowledge to carryout the financial feasibility of projects, selection of building systems and equipment's, evaluation of project investment decisions.*

The course coverage includes the various topics of financial management; time value of money, taxation, depreciation and inflation, capital budgeting techniques, management of working capital, cash flow forecasting and cash flow management of projects, understanding and analysis of financial statements through ratio analysis. National and construction sector economics, financial accounting and budgeting. Forms of business organization, joint ventures, consortium's and international finance, financial institutions in India and their project financing norms and procedures. Financial management aspects of international projects are other areas of coverage of the course.

### **Introduction to financial management**

Realm and scope of financial management; Issues in Financial management of construction Projects and construction companies.

**Financial institutions in India; Various financial institutions (IDBI, ICICI, IFCI, etc.), Frame work and functions, Policies and norms, Financial procedures, Appraisal methods and financial indicators,**

**Forms of business organisations: Sole proprietorship, partnership, Private limited companies, public limited companies, Joint stock companies, corporations**

Long term financing methods: Money markets and capital market, Equity capital, debentures, Bonds, mutual funds, Suppliers credit, Government subsidies, Unsecured loans and deposits,

**National and Construction Sector economics**

National economics: Features and characteristics of Indian economy, liberalization of economy, wholesale price indices, consumer price indices, construction cost indices and inflation, G. D. P., management economics.

Construction sector economics: Construction economics and factors affecting construction sector. Role of construction industry in national economy, export, international contracts, concept of demand, supply and profit.

**Financial accounting and budgeting.**

Financial accounting: Generally accepted accounting principles (GAAP), Book keeping based on current A/C principles, Various types of accounting and accounting procedures.

Budgeting: Different types of budgets, Budgetary controls, Performance budgeting

**Time value of money, valuation, risks and returns.**

**Time value of money; Simple and compound interest, Future value and present value, Effective annual interest rate, Annuity / perpetuity, Amortizing loans, Effective annual interest rates.**

Valuation of long-term securities: Book value/ Market value/ intrinsic value/ Liquidation value

Risk and return: Correlation between risk and return

**Taxation, depreciation and inflation**

Taxation: Corporate taxation under Indian laws, Taxes on profit / capital gains/ Capital Transfer, Tax planning and payment of tax, Tax incentive and tax policies

**Depreciation; Common methods of depreciation, Standard depreciation values (Buildings, Equipments), Economic life/ Salvage value/ Book value of assets**

Inflation: Assessment for investment decisions



## **Financial analysis and planning**

Understanding and analyzing financial statements: Statutory requirements for accounts and audit (Companies act), Construction and analysis of balance sheet, profit and loss account and fund flow statement.

Tools for financial analysis: Ratio analysis for financial conditions, Ratio analysis for financial Performance, Five basic types of financial ratios, (Liquidity, Leverage Coverage. Activity, Profitability), Case studies of Financial statements of Indian companies

## **Cash flow forecasting of projects.**

**Prerequisites for cash flow forecasting, Preparations for cash flow statement, Use of S- curve, Composite cash flow statements (Multiple Projects), Cost of borrowing, Self financing contracts,**

## **Working capital management**

**Definition and components of W. C, Cash management, Receivable management, Payable management, Inventory management, Estimating the requirements of W. C, Working capital management of construction companies**

## **Capital budgeting procedures and techniques**

Project appraisal and selection process of independent projects: Traditional methods of appraisal, discounted cash flow methods.

## **STUDIO PROGRAMME:**

Studio problems and exercises are designed to illustrate the practical applications of construction financial management with project case studies.

## ***Management Information System (MIS)***

Course no 205.

Contact hours per week

Lecture – 2

Studio –

Total – 2

Assessment:

theory paper -

Internal assessment - 50

External Viva - -

Total - 50

Course objective: To gain skills to develop Management information System at the corporate and for various functions of construction management.

Course Content / Outline:

- Evaluation of information system technology.

- Management information System : Definition ,Concept , Role an impact.
- System development , data processing and flow chart.
- Computer application , file design, DBM , data communication Documentation, System design specifications ,System analysis and design.
- Information processing technology : Data processing technology, Communication technology distributed processing and emerging information technology .
- Development and implementation of MIS ; Long range plan , Management of quality , MIS factors of success and failure , impact of computer application.
- Case studies of MIS at corporate and project level.

### **Infrastructure services and management**

Course no 206.

Contact hours per week

Lecture – 2

Studio – 2

Total – 4

Assessment:

Theory paper - 100

Internal assessment - 25

External Viva - - 50

Total - 175

The objective of the course is to cover fire safety services and fire safety management in buildings and in the context of large residential and institutional complexes to cover the external electrical services communication system and civil infrastructure facilities.

Fire safety would include fire detection & alarm systems; fire protection systems; study of codes and standards. The electrical infrastructure services would cover substations, substation equipments, and power distribution systems, standby and alternate power supply system. The communications would cover CCTV system, telecommunication and related information technology based facilities. Coverage on civil infrastructure services for the residential and institutional complexes include planning, design, construction and maintenance of external development works such as water supply, sewerage, solid wastes, roads and storm water drainage, including raw water harvesting methods. Emphasis is also given for the management of design and construction co-ordination of these infrastructure services through project management techniques. Good practices and managerial responsibilities.

#### **Fire safety services.**

- a) Introduction to fire safety: causes of fire, fire process, fire development and growth, fire loads, concepts of fire safety.

- b) Means of escape: Objectives, exits, travel distance, protected escape routes , refuge signage etc.
- c) Compartmentalisation: objectives, compartment size, construction requirements, openings, external fire, spread, protection of equipment.
- d) Structural fire protection: Objectives, performance of materials, requirements of building components.
- e) Active fire safety systems: Fire detection, fire suppression, system reliability,.
- f) Smoke control: Objectives smoke control, application of buildings, HVAC systems, and pressurisation.
- g) Fire safety standards: fire safety codes/ standards, fire test.
- h) Fire fighting equipment, rescue, external access, fire fighting shafts and elevators.
- i) Fire risk and assessment: fire hazard analysis, fire safety audits.
- j) Fire safety management: fire safety management, fire safety, costs, problems in urban areas and slums.**

### **Electrical infrastructure**

- a) Space requirements for substation installations; substation equipment selection criteria; power distribution system and installations; street lighting; security lighting; highway lighting; diesel generating (DG) system for standby supply; standby power integration in distribution system; devices for protection of electrical system; maintenance of electrical systems;**
- b) Demand load determination; capacitors and power factor; standard tariff plans; statutory obligation of consumers;
- c) Low voltage systems: CCTV systems; telecom distribution system; LAN/WAN systems.

### **Civil infrastructure services**

- Water supply; sources, treatment; storage and distribution systems
- Sewerage; sewer network and appurtenances, ground water re-charge systems.
- Roads; road networks, geometrical standards, construction specifications and locations of services.
- Solid wastes; collection, process and disposal system including recycling methods.
- Design and construction and co-ordination of infrastructure services through network planning.
- Maintenance of infrastructure services.

**Studio program:**

The studio exercise shall be carried out to illustrate the coverage of the topic preferably on selected building and appraisal study of existing projects through site visits.

**Project Seminar – I**

Course no 207.

Contact hours per week

Lecture –

Studio – 2

Total – 2

Assessment:

Theory paper -

Internal assessment - 50

External Viva - -

Total - 50

*The objective of the seminar work is to train the students to prepare state of art report by assimilation of concepts / ideas on a chosen topic in the area of Building Engineering and Management through an extensive literature study and data collection from the field.*

The progress of the seminar work is presented and discussed by the student periodically in the classroom environment and progress monitored continuously. The seminar work develops the comprehension and presentation skills of the students. The chosen topic may be further extended with additional scope of study in the third semester or taken up for thesis work in the final semester. The students are also encouraged to seek guidance from the experts in the related fields.