

**Scheme of Teaching and Examination for
6 th Semester of 3 Years Diploma in Architecture Engineering**

Duration of Semester : **14 Weeks**
 Student Contact Hours : **36 Hrs**
 Total Marks : **800**
 Effective from : 2017 -18 Session

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Industrial Engineering & Management	601	Theory	3	-	-	3	100	80	20	26	40
2.	Structure II	AAA602	Theory	3		-	3	100	80	20	26	40
3.	Construction Management	AAA603	Theory	3	-	-	3	100	80	20	26	40
4.	Architectural Design-IV	AAA604	Theory	3	-	-	4	100	80	20	26	40
5.	Elective II	AAA605/606/607 /608	Theory	3	-	-	3	100	80	20	26	40
6.	Arch. Design-IV Lab	AAA609	Sessional	-	-	4	-	100	60	40	-	50
7.	Construction Management Lab	AAA610	Sessional	-	-	4	-	50	30	20	-	25
8.	Elective II Lab	AAA611/612/613 /614	Sessional	-	-	4	-	50	30	20	-	25
9.	Project Work	603	Sessional	-	-	4	-	50	30	20	-	25
10.	Professional Practices	602	Sessional	-	-	4	-	50	30	20	-	25
Total Hours of Teaching per week :				15		20						

Elective (Vastusastra - AAA605/ Intelligent Building - AAA606/ Urban Design - AAA607/ Architectural Professional Practices - AAA608)

Total Marks: Theory : Practical : Sessional :
 L : Lecture, T : Tutorial P : Practical

- Note:
1. Period of Class hours should be of 1 hrs duration as per AICTE norms.
 2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.
 3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.
 4. Board will depute examiner for Practical examination.
 5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Subject : Industrial Engineering & Management (Common Paper)

Subject Code : 601

Full Marks : 80+20= 100

L T P

3 0 0

Rationale:

After completion of three years of technical training, Polytechnic students are expected to enter in to the World of Work. The business environment is altogether different and new to the students. A proper introduction and understanding of Business Processes is therefore essential for all Polytechnic students. Management is a subject which deals with basics of Management science required to understand the processes the in Industrial & Commercial environment. This will enable the students of Polytechnic to become familiar and to understand various Business Organizational structures, their functioning and the Role these technicians will have to play in these setups with responsibilities.

Industrial Engineering is concerned with the design, improvement and installation of integrated systems of people, materials, equipment and energy. Polytechnic students must be able to analyze the use and cost of the resources of the organization in order to achieve the objective, i.e. to increase productivity, profits etc. and carryout the policies efficiently and effectively.

Objective:

The students will able to:

1. Familiarize environment in the world of work.
2. Explain the importance of management process in Business.
3. Identify various components of management.
4. Describe Role & Responsibilities of a Technician in an Organizational Structure.
5. Apply various rules and regulations concerned with Business & Social responsibilities of the technician.

Detailed Syllabus

1. **Productivity :**

02 Hrs

Production and productivity, importance of productivity, factors affecting productivity, means of increasing productivity.

2. **Plant Layout and Material Handling :** **02 Hrs**
Definition of plant layout, objectives of good plant layout, principles of plant layout, types of plant layout, flow pattern, steps in planning the layout for a new enterprise, definition of material handling, functions and principles of material handling, material handling devices.
3. **Work Study :** **04 Hrs**
Definition, concept and need for work study, objectives of method study and work measurement, basic procedure/steps in method study, recording technique, critical examination, principles of motion economy, stop watch procedure for collecting time study data, including performance rating and allowances, work sampling.
4. **Production Planning and Control (PPC) :** **04 Hrs**
Definition and objectives of PPC, functions of PPC, routing, scheduling, loading, dispatching, production control definition and objectives, principle of sound production control system.
5. **Material, Purchase and Stores Management :** **04 Hrs**
Definition, functions& objectives of materials management, inventory control, economic order quantity (EOQ), ABC analysis. Objectives of purchasing department, buying techniques, purchasing procedure (steps involved in one complete purchasing cycle); functions of stores department, location and layout of stores, receipt and issue of materials.
6. **Quality Control and TQM :** **04 Hrs**
Meaning of quality and quality control, dimensions of quality, quality circle, concept and definition of TQM, elements of TQM, Kaizen, 5 'S' and six sigma.
7. **Management :** **04 Hrs**
Various definition, concept of management, levels of management, administration and management, scientific management by F. W. Taylor. Principles of management (14 principles of Henry Fayol). Functions of management - planning, organizing, coordinating, directing, controlling, decision making.
8. **Organizational Management :** **04 Hrs**
Organization - definition, steps in forming organization. Types of organization. Types of organization - line, line and staff, functions, project type. Departmentation- Organized and decentralized, authority and responsibility, span of control (management). Forms of ownership - proprietorship, partnership, joint stock company, co-operative society, govt. sector.

9. **Human Resource Management :**

06 Hrs

Personnel Management – Introduction, definition, function. Staffing – Introduction to HR, Introduction to HR Planning, Recruitment procedure. Personnel- Training & Development – Types of training, Induction, Skill enhancement. Leadership & Motivation – Leadership- Styles & types, Motivation- Definition, Intrinsic, & Extrinsic, Maslow's theory of Motivation and its significance. Safety Management – Causes of accident, Safety Procedures. Introduction, Objectives & feature of Industrial Legislation such as – Factory act, ESI act, Workman compensation act, Industrial dispute act and salary & wages.

10. **Financial Management :**

04 Hrs

Financial Management- Objectives & Functions. Capital Generation & Management- Types of capitals, Sources of finance. Budgets and accounts- Types of budgets, Production budget (including variance report), Labour budget, Introduction to Profit & Loss Accounts (Only concept), Balance sheet etc.

11. **Entrepreneurship :**

04 Hrs

Concept and definition of entrepreneur and entrepreneurship, factors influencing entrepreneurship, entrepreneurial characteristics, need for promotion of entrepreneurship and small scale industries, steps in setting up a small scale industrial enterprise.

References Books:

1. Industrial Engineering and Management by O. P. Khanna
2. Industrial Engineering and Production Management by M. Mahajan.
Publisher :Dhanpat Rai Publication (P) Ltd. New Delhi
3. Business Administration and Management by Dr. S. C. Saksena
Publisher :Sahitya Bhawan, Agra.

Subject : Structure-II
Subject Code : AAA602
Full Marks : 80+20=100
Hours : 42

RATIONALE

This subject is an applied engineering subject. Diploma holders in Architecture Engineering will be required to supervise RCC construction and fabrication. He may also be required to design simple structural elements, make changes in design depending upon availability of materials (bars of different diameters). He must be able to read and interpret structural drawings of different elements. This subject thus deals with elementary design principles as per BIS code of practice and their relevant drawings.

DETAILED CONTENTS

1. GENERAL

Reinforced cement concrete-Concept of composite material-Purpose of providing reinforcement materials used in R.C.C and their requirement -different grades of cement and steel-Characteristic strength and grades of concrete-modular ratio of R.C.C-type of loads on structures as per (IS:875). Analysis, Design & Detailing. Methods of design-working stress method, limit state method.

2. INTRODUCTION TO WORKING STRES METHOD

Assumption made in the working stress method-Permissible stresses(IS:456-2000) Flexural members singly reinforced rectangular section-strain and stress distribution due to bending-actual and critical neutral axes-under/over reinforced sections-balanced sections-lever arm-moment of resistance of singly reinforced rectangular sections (simple problems).

3. INTRODUCTION TO LIMIT STATE METHOD

Concept-different limit states- Characteristic strength and design strength of materials-Characteristic loads-partial safety factor for loads and material strength limits state of collapse in flexure-assumption -stress strain curves for concrete and steel-stress block-maximum strain in concrete-limiting values of neutral axis for different grades of steel- moment of resistance of singly doubly reinforced rectangular sections- problems. Limiting value of moment of resistance and limiting percentage of steel required for balanced singly R.C. Section. Simple numerical problems on determining design constants, moment of resistance and area of steel.

4. ANALYSIS AND DESIGN OF BEAMS FOR FLEXURE BY L.S.M

Effective span of cantilever, simply Supported and continuous beam-breadth and depth requirement of beam-control of deflection -minimum and maximum reinforcement, spacing for main enforcement and side face reinforcement as per IS 456-2000-design bending moments-design of singly and doubly reinforced rectangular beams - cantilever, simply supported beams. Necessity of providing doubly reinforced Section, reinforcement limitations. Analysis of doubly reinforced section, strain diagram, stress diagram, depth of neutral axis, moment of resistance of the section. Simple numerical problems on finding moment of resistance and design of beam sections.

5. SHEAR, BOND AND DEVELOPMENT LENGTH (LSM)

Nominal Shear stress in R.C. Section, design shear strength of concrete, Maximum shear stress, Design of shear reinforcement, Minimum shear reinforcement, forms of shear reinforcement. Bond and types of bond, Bond Stress, check for bond stress, Development length in tension and compression, anchorage value for hooks 90° bend and 45° bend Standard Lapping of bars, check for development length. Simple numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum

shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilevers beam and slab, check for development length.

6. DESIGN OF SLABS BY L.S.M

Classification of slabs - Effective spans- Imposed loads on slabs (IS: 875) - strength and stiffness requirements - minimum and maximum permitted size, spacing and area of main and second reinforcement as per IS 456 – 2000. Simple numerical problem related to one way slab.

Introduction to two way slab - Effective span - thickness of slab for strength and stiffness requirements Middle and edge strips -B.M. coefficients - design B. Ms. - simply supported and restrained slabs - tension and torsion reinforcement requirement (No numerical problem).

7. DESIGN OF COLUMNS AND FOOTINGS BY L.S.M

Limit state of collapse in compression - assumptions - limiting strength of short axially loaded compression members effective length of compression members - slenderness limits for columns -classification of column minimum eccentricity for column loads longitudinal and transverse reinforcement as per IS 456 - 2000 . Design of axially loaded short columns with lateral ties. Simple numerical problems.

Types of footings - Footings with uniform thickness and sloped footings - minimum thickness - critical sections minimum reinforcement, distribution of reinforcement , development length anchorage , cover , minimum edge thickness requirements as per IS 456 - 2000 – Design steps of isolated footing (square and rectangular) with uniform / varying thickness by limit state method (No numerical problem).

REFERENCE BOOKS:

1. Jai Krishna and Jain. OP; "Plain and Reinforced Concrete". Vol.1. Roorkee. Nem Chand and Bros.
2. Handoo ,BL: Mahajan. VM and Singla. DR; "Elementary- of RCC Design" New Delhi Satya Prakashan.
3. Mallick. SK: and Gupta, AP; "Reinforced Concrete" New Delhi. Oxford and IBH Publishing Co.
4. Punmia BC; "Reinforced Concrete Structure Vol. I Delhi Standard Publishers Distributors.
5. N. Subramanian " design of Rainforced concrete structure" oxford University Press.
6. A.K Jain" Limit State Methods of design" .

Subject : Construction Management
Subject Code : AAA603
Full Marks : 80+20=100
Hours : 42

Course Objective:

- Develop a bar chart for construction project of medium scale
- Analyze the resource allocation and cost requirement from bar chart
- Apply the network theory to assess the critical path for a project
- Compare the financial feasibility of various project options Evaluate the optimum cost-time relation of a small scale project
- Explain and adopt the concept of different project monitoring technique

Module 1.

06 Hrs

Introduction and various stages of Construction Management. Introduction to Management Principles. Introduction and objective of Construction Management. Types of construction Projects. Responsibilities of Project Manager. Life cycle of Project and various stages of Construction Management.

Module 2.

06 Hrs

Bar Chart & Milestone chart Introduction to Construction Planning & Scheduling techniques. Traditional techniques: concept of Bar Charts and Milestone charts. Cost & Resource Scheduling through Bar Chart Examples. Merits and demerits of Bar Chart.

Module 3.

06 Hrs

Network Theory –I (CPM) Introduction of Network Theory. Definitions and different types of: Event, activity, dummy, Network rules, Network event numbering (Fulkerson Rule), Hierarchies of complex network, Examples. CPM. Different element of CPM network with examples, Floats, Numerical Problems. Introduction of Project management software.

Module 4.

06 Hrs

Network Theory –II (PERT) Introduction to PERT, Conceptual difference between PERT and CPM, Time Estimates, Event times, Slack, Time Computations with normal probability theory. Numerical Problems

Module 5.

06 Hrs

Project Feasibility & Monitoring Technique Project alternative selection technique, Time value of money, Investment Criteria: Pay Back Period, IRR NPV, Benefit Cost Ratio, and Break-Even Analysis. Project Monitoring Technique: Work Breakdown Structure, Progress Curve Method, Line of Balance.

Module 6.

06 Hrs

Cost & Resource Optimization Techniques Cost Model: Direct & Indirect Cost component of Project, Cost Slope. Project Cost-Time analysis and optimization. Resource Usage Profile, Histograms. Resource allocation, smoothing & levelling Techniques. Project Updating

Module 7.

06 Hrs

Construction Equipments, safety and quality control Different types of Construction Equipments, Construction Safety requirements, Factor effecting quality of construction, Introduction to computer aided project management techniques.

Subject : Construction Management Lab

Subject Code : AAA610

List of practical:

Based on the theoretical paper, the students shall prepare Assignments and Case Studies in the form of reports or sheets on any five topics:

1. What is the objective of Project management? Discuss the classification of projects based on purpose. Enumerate the types of construction projects. Enlist the responsibilities of Project Manager.
2. Analyses the life cycle of Project and various stages of Construction Management.
3. Write a brief note on the following citing practical examples:
 - I. Resource Allocation
 - II. Resource Smoothing
 - III. Resource Levelling
4. With adequate examples, discuss the reason for safety management, and provide the list of different types of Construction Equipment.
5. Briefly describe the event and activity classification.
6. Evaluate the Project Monitoring Techniques with examples from field.
7. What are work Breakdown Structure, Process Curve Method, and Line of Balance.
8. Differentiate Between
 - I. Float and Slack
 - II. Forward pass and Backward pass
 - III. Normal cost and Crash cost
 - IV. Normal time and Crash time
9. Identify the differences between
 - I. PERT & CPM
 - II. Cost over-run and Time over-run
 - III. CAT & RAT schedule
 - IV. Direct and Indirect cost
10. Discuss with flow chart the various steps involved in following
 - I. Project Planning
 - II. Project Scheduling
 - III. Project Controlling

Book:

1. Dr. B. C. Punmiya and K. K. Khandelwal – Project Planning and Control with PER\CPM Laxmi Publications, New Delhi, 1987.
2. Jerom wiert and F. K. Lavy; “A management Guide to PERT/CPM”
3. S. P. Mukhopadhaya; “Project Management for Architect and Civil engineers”
4. Peurifoy & Schexnayder; “Construction Planning, Equipment, and Methods”
5. Prasanna Chandra; “Projects Planning, Analysis, Financing, Implementation, & review”
6. D.Upadhayay; “Construction Management”
7. Mantri Institute; “Building Construction Management”
8. James J .O’Brien,Fredrick L Plotnik,;CPM in Construction Management; Mc Grawhill;Construction Engineering.
9. CPM & PERT by Srivastava

Subject : Architecture Design IV
Subject Code : AAA604
Full Marks : 80+20=100
Hours : 42

Contents: Theory

Architectural design

Development of Architectural design and drawing of

- | | |
|--------------------------|--------|
| 1. Hospital/Nursing Home | 12 Hrs |
| 2. Bank | 08 Hrs |
| 3. Cinema Hall | 10 Hrs |
| 4. Residential School | 12 Hrs |

Subject : Architecture Design IV Lab
Subject Code : AAA609

List of practical:

1. Minimum two projects should be completed in semester
2. Students should be asked to do case studies & prepare case study reports.
3. Students have to prepare presentation Drawing line plan, sections, elevations, site plan with landscape and prospective view.
4. Minimum five sheets should be prepared in me project.

Subject : Architecture Professional Practices (Elective-II)
Subject Code : AAA608
Full Marks : 80+20=100
Hours : 42

Course Objective:

- To introduce to the professional, vocational and legal aspects of architectural practice.
- To inform about the professional services and ethics to be shown towards society, clients, fellow architects and co-workers.
- To inform about the scope of services to be provided and project responsibilities during design and construction.
- To inform about the scale of charges for the different architectural services to be rendered To give a know-how about the establishment and management of a private architectural office and familiarize the students with project and office management aspects.
 - To familiarize with various kinds of building regulations and codes to followed to control and promote the ordered growth of a city/town.
 - To inform about the different types of tenders and contracts, its merits and demerits, tendering process and suitability w.r.t to different types of architectural projects. To inform about the method of seeking municipal approval and submission plans.
 - To explain about the significance, purpose and types of architectural competitions

Content :

Module: 1 04 Hrs

Architects Act 1972 Detailed study of the act, its provisions and recent amendments, Role and responsibilities of Council of Architecture, role of its electorate, procedure of membership.

Module: 2 04 Hrs

Role of Professional body - Indian Institute of Architects Its working, constitution and bye laws, categories of membership, election procedures, Code of conduct, Role of its conventions, its publications, etc.

Module: 3 08 Hrs

Role of an Architect in Society Architectural profession as compared to other professions; Architects approach to works; ways of getting works; types of works, works partly executed by other architect; conditions of engagement between the architect and client; Architects (Professional Conduct) Regulations, 1989; Architects' Professional Liability; Professional Misconduct; Scope of work; Copy rights; Scale of charges; Variation of charges; Mode of payment; Schedule of payment; Termination of services; Specialized building services; Professional service tax; Architects relation with other parties connected with works such as client, contractor, sub-contractors, consultants, municipal and public authorities.

Module: 4 04 Hrs

Architectural Competitions Its purpose, types of Architectural competitions, its guidelines for participation, prizes, assessment, etc.

Module: 5 06 Hrs

Architects in practice (a) Private practice - Partnership office management, methods of organization, filing, documentation and working. Tax- liability (b) Salaried appointment - Public sector, Private sector jobs, procedure of operation in government organization.

Module: 6

08 Hrs

Tendering process Preparation of tender documents, method of writing tenders, opening of tenders. Tender valuation process, Contracts; types of contracts such as item rate, labour, lump-sum, cost plus percentage etc; their merits and demerits. General principles of Indian contract Act; Building contracts, conditions and forms of contract, study of standard contract of the Indian Institute of Architects. Preparation of contract documents, general conditions of contract, Administration of contract; Interim certificates, defect liability periods, retention amount, security deposits, mobilization money and virtual completion

Module: 7 .

08 Hrs

Principle of Arbitration, Indian Arbitration Act 1940, Powers and duties of arbitrators, revoking authority; umpire, award etc. Easement: definition; various types of easements; document and servant owners; essential conditions for enjoyment of easement; Fire insurance's definition, cover note; insurance for new work and additions; insurable value of property, claim for damage due to fire Preliminary knowledge of transfer of property Act; registration, stamp duty under Registration process . Tax Liability, wealth, land acquisition Acts; general information about land acquisition procedures. Accidents during progress of work and after completion, damage to persons and properties affected; workmen's compensation Act with regards to the affected persons and properties. Consumer protection Act and related acts on Architects.

Subject : Architecture Professional Practices (Elective-II)

Subject Code : AAA614

List of Experiments:

1. Architects Act 1972
2. Indian Institute of Architects.
3. Role of Architecture in society
4. Architectural competitions
5. Different types of Architectural Practices.
6. Tender and its types
7. Contract and its types
8. Architects Regulation 1989
9. Indian Arbitration Act, 1940
10. Fire insurance.

Recommended Books:

1. Roshan Namavati; Professional practice.
2. Code of Professional Practice : I. I. A.
3. Architect Act 1972.
4. Handbook of Professional Documents- 2005, by Council of Architecture.

Subject : Vastusastra (Elective-II)
Subject Code : AAA605
Full Marks : 80+20=100
Hours : 42

1. Introduction :

3 Hrs

What is Vaastu
Terminology of vaastu- shastra, fundamental concepts, elements of vaastu,
Origin of Vaastu
Development of Vaastu System
Philosophy of Vaastu Shastra
Components of Vaastu Shastra

2. Mythology related to Vaastu and the Modern interpretation, Pad & Deities: 05 Hrs

Vaastu Purush
Vishwakarma
King Prithu
Development of Vaastu Pad System
Vaastu pad Vinyans – 49, 64, 81, 100
Introduction of Vaastu Deities, their mythological background and symbolic importance in 81 pada Vaastu Nighantu

4. Energy Pattern in Vaastu & Directions :

4 Hrs

Basis of energy pattern
Magnetic energy
Kinetic energy
Gravitational energy
Geothermal energy
Cosmic Receptions
Planets ruling directions.
Deities ruling directions
Body parts of Vaastu purusha Occupying the directions
Energy concealed in directions
Modern Interpretations

5. Vaastu Planning :

06 Hrs

Introduction of Varahmihir
Vaastu Planning by Varahmihir
Astrological basis of Varahmihir planning
Varahmihir planning in modern context
The designs based on directional alignments, laws of nature. Residential vaastu planning for different-rooms.
Results of extension & curtailment in context to limbs of Vaastu Purusha
Myths regarding extensions & Curtailments

6. Sequence of construction as per Vaastu rules :

08 Hrs

Water Reservoir

Foundation
Beam
Base
Door and Window
Ceiling
Precautions in Finishing

8. Door & Room Planning Vaastu rules :

06 Hrs

Deities of Door

Results of Vaastu Doors
Ascertaining Auspicious Door as per the dimensions of the plot
Bed Room
Drawing Room
Pooja
Kitchen
Pooja
Concept of Color and Furniture

9. Brahmasthan & Marmasthan :

02 Hrs

Importance of Brahmasthan & Marmasthan
Calculation of Brahmasthan & Concept of Courtyard
Results of violation of rules related to Brahmasthan & Marmasthan.

10. Vaastu Dosha And Remedy Related to :

08 Hrs

Extensions and curtailments
Door Planning
Water reservoirs
Brahma and Marma sthan
Distribution of rooms and sitting-sleeping postures
Purchase of neighbouring land Vastushastra. Case studies and practical remedies for houses and commercial building as per vastu etc.

Subject : Vastusastra Lab (Elective-II)

Subject Code : AAA611

List of Practical:

Based on the theoretical paper, the students shall prepare Assignments and Case Studies in the form of reports or sheets on any five topics:

1. Elaborate the concept of Vastu and discuss its elements. Discuss the origin of Vaastu and development of Vaastu System along with the components of Vaastu Shastra.
2. Provide the Basis of energy pattern – the Magnetic energy, the kinetic energy, the Gravitational energy, the geothermal energy.
3. Discuss the Cosmic Receptions and the Planets ruling directions.
4. Briefly describe the Deities ruling directions and the Body parts of Vaastu purusha occupying the directions and the Body parts of Vaastu purusha occupying the directions, with adequate examples.
5. Examine the Energy concealed in directions along with Modern Interpretations with an example of a modern residence, or any other project.
6. Converse on the Vastu Planning by Varahnihir and Varahmihir planning in modern context in the context of an example.
7. Describe the Residential vastu planning for different rooms with adequate examples.
8. Evaluate the designs based on directional alignments.
9. Analyse the sequence of construction as per Vaastu rules for Water Reservoir, Foundation, Beam, Base, Door and Window, Ceiling and Precautions in Finishing.
10. Provide the ideal Location of Door & Room Planning as per Vaastu rules.
11. Analyse the concept of Colour and Furniture in Vastu with suitable example.

Books

1. Vaastu by Satish Sharma
2. Vaastu by Navneet Kaushik
3. Vaastu by Dr. Ravi Kumar
4. Interior Designing Vaastushastra- Prem Kumar Sharma, Raja Pocket Books, Delhi
5. Remedial Vaastushastra- Dr. Bhojraj Dwivedi

Reference books:

- 1 . Vishwakarma Prakash
2. Brihat Samhita
3. Vaastu Saukhyam
4. Samraangan Sutra

Subject : Intelligent Building (Elective-II)
Subject Code : AAA606
Full Marks : 80+20=100
Hours : 42

UNIT 1. Intelligent buildings Characteristics: 05 Hrs

Concepts , definitions of intelligent buildings, Concept of GPS, Significance of Intelligent Buildings, intelligent architecture and structure, evolution of intelligent buildings, IB assessment criteria.

UNIT 2. Building Automation System (BAS): 08 Hrs

Binary data, digital controller, input and output units, sensors and actuators; architecture and configuration of BAS, BAS outstation and central station, programming environment and platform, monitoring interface and development platform, building energy management functions.

UNIT 3. Local Area Network (LAN) and BAS communications Standards: 06 Hrs

Local Area Network (LAN), protocol standards and OSI model, medium access schemes, LAN standards, Ethernet, ARC net, Lon Talk, wireless technologies, Zig Bee, applications of wireless technologies in BAS.

UNIT 4. Applications of Internet Technologies in BMS: 08 Hrs

Internet and Internet protocols, convergence networks and total integration Central air-conditioning system control and optimisation :VAV and CAV system control and optimization, ventilation control and optimization, chiller performance and optimal control, optimal control of heat rejection systems, sequence control of multiple chiller plants, pump speed and sequence control of chilled water systems.

UNIT 5. Lighting Control Systems: 06 Hrs

Purpose of lighting control, basic components of lighting and lighting control systems, analogue control and digital control,DXM512-A, digital addressable lighting interface (DALI), systems based on common automation protocols, energy management and lighting control strategies.

UNIT 6. Security and Safety Control Systems: 06 Hrs

CCTV systems, analogue CCTV systems and IP-surveillance systems; Access control system, different types of access control, intelligent readers and system topologies; Burglar alarm system, functions of burglar alarm systems; Fire alarm systems, typical fire detectors, conventional fire panels, addressable fire panels. Modern security systems.

UNIT 7. Modern Intelligent Vertical Transportation Systems: 05 Hrs

Sky lobby, double-deck lifts, twin lifts, advanced call registration systems, large scale monitoring systems, applications of artificial intelligence in supervisory control, energy saving measures related to lift systems/escalator system.

Subject : Intelligent Building Lab (Elective-II)
Subject Code : AAA606

Perform any 10 (Ten) practical

1. Study of Building Wide VLAN Model
2. Study of Area Controller Network Security.
3. Study of Area Controllers (VAVs)
4. Study of Sensors.
5. Study of Zone Controllers (FEC)
6. Study of Building Controllers.
7. Study of LON.
8. Study of Digital Lightening Interface (DALI)
9. Study of CCTV and its configuration and operation.
10. Study of Burglar alarm system.
11. Study of fire alarm system.
12. Study of water to water heat pumps and Chilled Water System.
13. Study of lift systems and Escalator system.
14. Study of Advanced Call Registration System.
15. Study of Ground source heat pump (GSHP).
16. Study of Hydronic Loops of the Semi-virtual Laboratory.

Books /Reference Books:

1. Derek, Clements – Croom (ed), “Intelligent Buildings: Design, Maintenance and Operation, Thomas Telford, London, 2004.
2. Michael Nigginton & Jude Harris, “Intelligent skins” Architectural Press, Oxford, 2002.
3. Albert Ting-Pat so & Wai Lokchan, “Intelligent Building Systems (The international series on asian studies in computer and information science), Springer, 1999.
4. Andrew Harrison & Eric Loe, “Intelligent Buildings in South East Asia”, Spon Press, 1997
5. Clements-Croome, Derek : Intelligent Buildings: An introduction, Routledge, 2014
6. Shengwei Wang : Intelligent Buildings and Building Automation, Spon Press, 2010
7. Jim Sinopoli : Smart Building Systems for Architectures, Owners and Builders, Elsevier, 2010
8. P. Manolescu : Integrating Security into Intelligent Buildings, Cheltenham, 2003
9. A. Dobbelsteen : Smart Building in a Changing Climate, Techne Press, 2009
10. D. Clements-Croome, Intelligent Buildings: An Introduction, Routledge, 2014
11. W.T. Grondzik, & A.G. Kwok : Mechanical and Electrical Equipment for Buildings, Wiley, 2015

Subject : Urban Design (Elective-II)
Subject Code : AAA607
Full Marks : 80+20=100
Hours : 42

UNIT 1

10 Hrs.

INTRODUCTION AND HISTORY OF URBAN FORM

Relationship between Architecture, Urban Design and City planning, Evolution of cities-prehistoric, classical, medieval, renaissance, industrial, modern, colonial & postcolonial and post-world war II urban projects, zoned city and its critics, inclusive urbanism, contemporary urban form, Comparative analysis of public spaces, their organization, location, distribution in towns.

UNIT 2

10 Hrs.

URBAN DESIGN THEORY

The city, urban morphology, movement as motivating factor in design, Urban Design theories - monuments and dwelling, genius loci, street and square, urban conservation, collage city, responsive environments, checklist for pedestrian spaces and plazas, social life of small urban spaces, new urbanism, landscape urbanism, sustainable urban form and transit oriented development.

UNIT 3

10 Hrs.

PRACTICE THEORY

Urban design as public policy, Case studies of contemporary cities, new towns, new urbanist settlements, transit villages, urban infill projects, public place making projects, eco and sustainable projects, brown field and adaptive reuse developments.

UNIT 4

12 Hrs

URBAN DESIGN POLICY

Urban renewal policy, scope and challenges-Role of planning agencies, Government and quasi government agencies, urban project finance corporations and their role- existing legal framework for urban growth in residential, commercial, recreational and mixed use sectors, opportunities and limitations- urban design charettes - public participation in urban design - Emerging global policy practices for sustainable, equitable urbanism. Max. 30 Hours

Subject : Urban Design Lab (Elective-II)
Subject Code : AAA613

List of Practical

1. To study the relation b/w Architecture, urban design & city planning
2. Evolution of cities and urban projects
3. comparative analysis of public spaces
4. urban design theories.
5. Study of New urbanism and landscape urbanism
6. Case studies of new town & new urbanist settlements.
7. ECO and sustainable project
8. Urban renewal policy.
9. Public participation in urban design
10. Report on existing legal framework for urban growth

TEXT / REFERENCE BOOKS

1. Morris A. E. J., History of Urban form: Before the Industrial revolutions, Rutledge , 1994
2. Spreiregen Paul D., Urban Design-The Architecture of Towns and Cities, Mc Graw Hill Book Company, Newyork, 1965.
3. Gordon Cullen, The Concise Townscape, Van Nostrand Reinhold, New York, 1961
4. Jan Gehl, Life between buildings: Using Public space, Island Press, 2011
5. Michael S. Bernick and Robert B. Cervero, Transit Villages in the 21st century, Mc Graw Hill Companies, Newyork, 1996
6. Edmund N. Bacon, Design of Cities Thames and Hudson, London, 1967
7. Jonathan Barnett, An Introduction to Urban design, Harper and Row, New York, 1982
8. David Gosling, Concepts of Urban Design, Academy Editions, St. Martin's Press, New York, 1994
9. Alexander R.C., Designing Cities - Critical readings in Urban design, Blackwell Publishers Ltd, 2003

Subject : Professional Practices (Common Paper)
Subject Code : 602

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Activities to be undertaken:

Students are expected to undertake these activities:

1. Acquire information from different sources (Print and electronic) on the topics of specialization and related to the subjects of II nd and final year. The class is to be divided in groups of not more than five to six students in a group and all groups are to be allotted topic of their choice. The topic should not be repeated to other group for originality of work to be performed by the group. This activity will develop interdependence and leadership among the students.
2. Prepare notes for given topic at point no 1. The notes will be in form of a project report, having all the sections of report. The report should not be of 30 – 50 pages.
3. Prepare presentation and Present the learning and finding on given topic in a seminar. The presentation should be prepared in Power Point module having more than 25 slides. All students should be asked to deal with suitable parts decided by the group itself.
4. Interact with peers to share thoughts. After the final presentation the students should be encouraged to interact with the faculty members, students' fellows and other experts for suggestions and advanced and structured learning.
5. Undertake industrial visit of their area and choice. Prepare a report on industrial visit. Expert lectures on the topic selected may be invited for the students and these expert lectures also the students should be asked to prepare a report and present the same in seminar or have a group discussion before the expert and faculty members.
6. Develop entrepreneurial traits. Students group may be asked to have a field survey and product assessment and analysis for a product of their choice. Prepare a report for all the inputs of their requirement and submit it for evaluation.
7. To prepare for start ups. Expert lectures for exploring this option may be arranged as this is also a viable option and much talked about option for self employment and avail the encouragement by the government.

Based on the above rationales students will advised to develop traits under guidance of dedicated faculty members / mentors.