

**ANNA UNIVERSITY OF TECHNOLOGY MADURAI****MADURAI – 625 002****AFFILIATED INSTITUTIONS****REGULATION 2010****CURRICULUM AND SYLLABI****B.Arch****SEMESTER I**

<b>S. No.</b>	<b>Subject Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
<b>Theory</b>						
1	<b>10177MA101</b>	Mathematics	3	0	0	3
2	<b>10166AR102</b>	History of Architecture and Culture I	2	0	0	2
3	<b>10166AR103</b>	Building Materials I	2	0	0	2
4	<b>10166AR104</b>	Environmental Science	3	0	0	3
<b>Theory Cum Studio</b>						
5	<b>10166AR105</b>	Art Studio	1	0	4	3
6	<b>10166AR106</b>	Architectural Drawing I	1	0	4	3
<b>Studio</b>						
7	<b>10166AR107</b>	Basic Design	0	0	14	7
<b>Total</b>						<b>23</b>

**SEMESTER II**

<b>S. No.</b>	<b>Subject Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
<b>Theory</b>						
1	<b>10166AR201</b>	Mechanics of Structures I	2	0	0	2
2	<b>10166AR202</b>	History of Architecture and Culture II	2	0	0	2
3	<b>10166AR203</b>	Building Materials II	2	0	0	2
<b>Theory Cum Studio</b>						
4	<b>10166AR204</b>	Building Construction I	1	0	4	3
5	<b>10166AR205</b>	Theory of Architecture	2	0	4	4
6	<b>10166AR206</b>	Architectural Drawing II	1	0	4	3
<b>Studio</b>						
7	<b>10166AR207</b>	Architectural Design I	0	0	14	7
<b>Total</b>						<b>23</b>

**SEMESTER III**

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Theory</b>						
1	<b>10166AR301</b>	Mechanics of Structures II	2	0	0	2
2	<b>10166AR302</b>	History of Architecture and Culture III	2	0	0	2
3	<b>10166AR303</b>	Building Services I	3	0	0	3
4	<b>10166AR304</b>	Climate and Built Environment	3	0	0	3
<b>Theory Cum Studio</b>						
5	<b>10166AR305</b>	Building Construction II	1	0	4	3
<b>Theory Cum Practical</b>						
6	<b>10166AR306</b>	Computer Aided Drafting	1	0	4	3
<b>Studio</b>						
7	<b>10166AR307</b>	Architectural Design II	0	0	14	7
<b>Total</b>						<b>23</b>

**SEMESTER IV**

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Theory</b>						
1	<b>10166AR401</b>	Design of Structures I	3	0	0	3
2	<b>10166AR402</b>	History of Architecture and Culture IV	2	0	0	2
3	<b>10166AR403</b>	Building Materials III	2	0	0	2
4	<b>10166AR404</b>	Building Service II	3	0	0	3
5	<b>10166AR405</b>	Site Planning	3	0	0	3
<b>Theory Cum Studio</b>						
6	<b>10166AR406</b>	Building Construction III	1	0	4	3
<b>Studio</b>						
7	<b>10166AR407</b>	Architectural Design III	0	0	14	7
<b>Total</b>						<b>23</b>

### SEMESTER V

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Theory</b>						
1	<b>10166AR501</b>	Design of Structures II	3	0	0	3
2	<b>10166AR502</b>	History of Architecture and Culture V	3	0	0	3
3	<b>10166AR503</b>	Building Materials IV	2	0	0	2
4	<b>10166AR504</b>	Building Services III	3	0	0	3
5	<b>10166AR505</b>	Interior design	3	0	0	3
<b>Theory Cum Studio</b>						
6	<b>10166AR506</b>	Building Construction IV	1	0	4	3
<b>Studio</b>						
7	<b>10166AR507</b>	Architectural Design IV	0	0	16	8
<b>Total</b>						<b>25</b>

### SEMESTER VI

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Theory</b>						
1	<b>10166AR601</b>	Design of Structures III	3	0	0	3
2	<b>10166AR602</b>	Urban economics and sociology	3	0	0	3
3	<b>10166AR603</b>	Professional Practice and Ethics I	3	0	0	3
4	<b>10166AR604</b>	Specification and Estimation	3	0	0	2
5	<b>E01</b>	Elective I	x	x	x	3
<b>Theory Cum Studio</b>						
6	<b>10166AR606</b>	Architectural Detailing	1	0	4	3
<b>Studio</b>						
7	<b>10166AR607</b>	Architectural Design V	0	0	16	8
<b>Total</b>						<b>25</b>

### SEMESTER VII

S. No.	Subject Code	Course Title	L	T	P/S	C
1	<b>10166AR701</b>	Internship Program I	x	x	x	12
<b>Total</b>						<b>12</b>

### SEMESTER VIII

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Theory</b>						
1	<b>10166AR801</b>	Internship Program II	x	x	x	12
2	<b>10166AR802</b>	Dissertation	x	x	x	2
<b>Total</b>						<b>14</b>

### SEMESTER IX

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Theory</b>						
1	<b>10166AR901</b>	Professional Practice and Ethics II	3	0	0	3
2	<b>10166AR902</b>	Sustainable planning and Architecture	3	0	0	3
3	<b>10166AR903</b>	Human Settlements Planning	3	0	0	3
4	<b>10166AR904</b>	Landscape and Ecology	3	0	0	3
5	<b>E02</b>	Elective II	x	x	x	3
<b>Theory Cum Studio</b>						
6	<b>10166AR906</b>	Urban Design	3	0	0	3
<b>Studio</b>						
7	<b>10166AR907</b>	Architectural Design VI	0	0	16	8
<b>Total</b>						<b>26</b>

### SEMESTER X

S. No.	Subject Code	Course Title	L	T	P/S	C
1	<b>E03</b>	Elective III	x	x	x	3
2	<b>E04</b>	Elective IV	x	x	x	3
3	<b>10166ARX03</b>	Thesis	0	0	34	17
<b>Total</b>						<b>23</b>

**Total no of Credits for completion of Semester : 217**

**Note:**            **L** – Lecture period                      **T**- Tutorial period **S** –Studio period                      **C** – Credits

**P**-Practical

### LIST OF ELECTIVES

S. No.	Subject Code	Course Title	L	T	P/S	C
<b>Elective I (Sixth semester)</b>						
1.	<b>10166ARE11</b>	Vernacular Architecture	3	0	0	3
2.	<b>10166ARE12</b>	Energy efficient Architecture	3	0	0	3
3.	<b>10166ARE13</b>	Structure and Architecture	3	0	0	3
<b>Elective II (Ninth semester)</b>						
4.	<b>10166ARE21</b>	Urban Housing	3	0	0	3
5.	<b>10166ARE22</b>	Industrial Building Systems	3	0	0	3
6.	<b>10166ARE23</b>	Principles of Traditional Indian Architecture	3	0	0	3
<b>Elective III (Tenth semester)</b>						
7.	<b>10166ARE31</b>	Digital tools in Architecture	1	0	4	3
8.	<b>10166ARE32</b>	Construction Technology	3	0	0	3
9.	<b>10166ARE33</b>	Earthquake Resistant Architecture	3	0	0	3
<b>Elective IV (Tenth semester)</b>						
10.	<b>10166ARE41</b>	Architectural Conservation	3	0	0	3
11.	<b>10166ARE42</b>	Safety Systems and Building Management	3	0	0	3
12.	<b>10166ARE43</b>	Project Management	3	0	0	3

## SEMESTER VI

### 10166AR601 – DESIGN OF STRUCTURES III

**L T P/S C**  
**3 0 0 3**

#### **AIM:**

The course is structured to teach the design of Reinforced concrete column, footings and retaining walls and to introduce the concept of pre-stressed concrete.

#### **OBJECTIVES:**

- To use limit state design for the analysis and design of columns.
- To enable the learning of design of structural elements like footings, retaining walls and masonry walls.
- To understand the principle, methods, advantages and disadvantages of pre stressed concrete.

#### **UNIT I**

##### **LIMIT STATE DESIGN OF COLUMNS**

**10**

Types of columns – Analysis and Design of Short Columns for Axial, Uniaxial and biaxial bending – Use of Design aids.

#### **UNIT II**

##### **DESIGN OF FOOTINGS**

**10**

Types of footings – Design of wall footings – Design of Axially loaded rectangular footing (Pad and sloped footing). Design of Combined Rectangular footings.

#### **UNIT III**

##### **DESIGN OF RETAINING WALLS**

**10**

Types of Retaining walls – Design of RCC cantilever Retaining walls.

#### **UNIT IV**

##### **DESIGN OF MASONRY WALLS**

**8**

Analysis and Design of masonry walls – use of Nomograms - code requirements.

#### **UNIT V**

##### **INTRODUCTION TO PRESTRESSED CONCRETE**

**7**

Principle of Prestressing – Methods of Prestressing, advantages and disadvantages.

**Total: 45 Periods**

#### **REQUIRED READING:**

1. B.C. Punmia, Reinforced Concrete Structures, Vol. 1 & 2, - Laxmi Publications, Delhi, 1994.
2. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
3. SP – 16, Design Aids for Reinforced Concrete to IS 456
4. National Building Code of India, 2005
5. IS 1905, Code of Practice for Structural Safety of Buildings

**REFERENCES**

1. P.Dayaratnam , Design of Reinforced Concrete Structures, Oxford and IBH Publishing CO., 1983.
2. N.C.Sinha and S.K.Roy, Fundamentals of Reinforced Concrete, S.Chand and Co., New Delhi, 1983.
3. Ashok K.Jain Reinforced Concrete (Limit State Design) - Nemchand, Bros Roorkee 1983.
4. Krishna Raj, Prestressed Concrete Structures

## 10166AR602-URBAN ECONOMICS AND SOCIOLOGY

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To give input in terms of sciences and humanities as an integral part of architecture that architect is a humanist and social reformer and that architecture can flourish and be practice with an understanding of urban economics. It enables student also to understand how architecture influences social values and built environment.

### **OBJECTIVES:**

- To enable the student to have general idea about the sociological and economical principles and their relevance to building industry.
- To have clear understanding about how land economic concepts, their principles and various laws are related to urban environments.
- To make the student understand the relevance of economics and its applicability in the building execution and also in the various programmes like urban design, urban renewal, housing etc,
- To understand the evolution of the society, various concepts of the society and its needs and requirements contributing to human value systems.
- The environmental issues and its impact to be identified and understood during the role of development plans and programmes in the context of the society.

### **UNIT I**

#### **ROLE OF URBAN ECONOMICS & SOCIOLOGY**

**4**

Subject matter of Economics and Sociology as related to built environment.

### **UNIT II**

#### **URBAN ECONOMICS**

**8**

Principles of consumption, production and distribution and their relevance's; market demand and supply and price changes, laws of returns and urban land values, built environment and municipal taxes.

### **UNIT III**

#### **BUILDING ECONOMICS, URBAN RENEWAL AND URBANIZATION**

**5**

Construction labour market, economic evaluation of urban renewal, building and housing, urbanization and urban problems.

### **UNIT IV**

#### **SOCIOLOGICAL CONCEPTS AND SOCIAL CHANGES**

**8**

Concepts of Society, community, group, culture, Institutions, role of status, social norms, social structure and charges.

### **UNIT V**

#### **ECOLOGICAL PROCESSES AND DEVELOPMENT IMPACTS**

**5**

Ecological processes and land use structures of cities, impact or urbanization and developmental programmes on social development

**Total: 30**

### **TEXT BOOKS**

1. Hirsch W.Z., Urban Economics, Macmillan, New York, 2001
2. Gopal Bhargava (ed) Urban Problems and policy perspectives, Abhinav Publications, New Delhi, 2000



**REFERENCES**

1. Desai A.R., Rural Sociology, Popular Prakasham, Bombay, 2000
2. Muttalib, A.A., Public Housing, Sterling Publishers, New Delhi, 2001.
3. Rao, ULSP, Urbanisations in India, Concept Publishing Co., New Delhi
4. Subramanian, K.K. et.al. Construction Labour Market: A study in Ahmedabad, Concept Publishing Co., New Delhi, 2000

**AIM:**

To provide the students a general understanding of the architectural profession and the importance of ethics in professional practice.

**OBJECTIVES:**

- To give an introduction to the students about the architectural profession.
- To enable the students to grasp the elementary issues concerning professional practice.
- To teach the students about the role of professional and statutory bodies in the conduct of professional practice.
- To teach the students about the importance of code of conduct and ethics in professional practice.
- To expose the students some of the important legislation which have a bearing on the practice of architectural profession.

**UNIT I****INTRODUCTION TO THE ARCHITECTURAL PROFESSION****8**

Importance of Architectural Profession – Role of Architects in Society – Alternatives open on entering the profession – Registration of Architects –Architect's office and its management (location, organization structure, responsibility towards employees, consultants and associates, elementary accounts, tax liabilities).

**UNIT II****PROFESSIONAL ETHICS AND CODE OF CONDUCT****9**

Role of Indian Institute of Architects – Architects Act 1972 (intent, objectives, provisions with regard to architectural practice) – Council of Architecture (role and functions) – Importance of ethics in professional practice (Council of Architecture guide lines) – Code of conduct for architects as prescribed by Council of Architecture, punitive action for professional misconduct of an architect.

**UNIT III****ARCHITECT'S SERVICES & SCALE OF FEES****9**

Mode of engaging an architect – Comprehensive services, partial services and specialized services – Scope of work of an architect – Schedule of services – Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement.

**UNIT IV****ARCHITECTURAL COMPETITIONS****9**

Importance of Architectural competitions – Types of competitions (open, limited, ideas competition) – Single and two stage competitions – Council of Architecture guidelines for conducting Architectural competitions –International Competitions (case studies).

**UNIT V****LEGAL ASPECTS & LEGISLATION****10**

Copy rights and patenting – (provisions of copy right acts in India and abroad, copy right in architectural profession) – Easement – (meaning, types of casements, acquisition, extinction and protection) – Development Regulations in Second master plan for Chennai Metropolitan Area, Chennai Corporation Building rules 1972 – The Panchayat rules 1940 – Persons with Disabilities Act (provisions, responsibilities of architect and local body on creating barrier free environment).

**Total: 45 Periods**

**REQUIRED READING:**

1. Architects Act 1972.
2. Publications of Handbook on Professional practice by IIA.
3. Publications of Council of Architecture-Architects (Professional conduct) Regulations 1989, Architectural Competition guidelines
4. Roshan Namavati, Professional practice, Lakhani Book Depot, Mumbai 1984.

**REFERENCES:**

1. J.J.Scott, Architect's Practice, Butterworth, London 1985.
2. Ar. V.S. Apte, Architectural Practice and Procedure, Padmaja Bhide, Pune, 2008.
3. Development Regulations of Second Master Plan for Chennai Metropolitan Area – 2026.
4. Chennai City Corporation Building Rules 1972.
5. Persons with Disabilities Act.
6. T.N.D.M. Buildings rules, 1972.

## **10166AR604 – SPECIFICATIONS AND ESTIMATION**

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To enable students understand the method of writing specifications for the various items of works involved in the building to expose him / her the procedure involved in estimating quantities of materials and works, various costs involved, various financial institutions and to prepare feasibility report of a project – simple projects will be introduced for preparation of specification and estimates.

### **OBJECTIVES:**

- To inform to students the need and importance of specification, how to write specification – important aspects of the design of a specification.
- To inform to students the need for estimation the concept of abstract and detailed estimates based on measurement of materials and works.
- To inform to students cost control and budgeting and operation cost and to make students know the various financial agencies involved in land and building development.
- To enable students understand the importance of feasibility report, implication and importance of valuation and depreciation.

### **UNIT I**

#### **SPECIFICATION**

**5**

Necessity of specification, importance of specification, - How to write specification, - Types of Specification, -Principles of Specification writing, - Important aspects of the design of specification – sources of information – Classification of Specification.

### **UNIT II**

#### **SPECIFICATION WRITING**

**10**

Brief Specification for 1<sup>st</sup> class, 2<sup>nd</sup> class, 3<sup>rd</sup> class building. Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second-class brickwork, Damp proof course, ceramic tiles/marble flooring and dadoing, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace.

### **UNIT III**

#### **ESTIMATION**

**10**

Types & purpose, Approximate estimate of buildings – Bill of quality, - Requirement for preparing estimation, factors to be considered, - principles of measurement and billing, contingencies, Elementary billing and measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work – abstract of an estimate.

### **UNIT IV**

#### **DETAILED ESTIMATE**

**10**

Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, woodwork, iron works, plastering, painting, flooring, weathering course for a single storied building using centre line method and long and short wall method.

### **UNIT V**

#### **COST ESTIMATING & COST BUDGETTING**

**10**

Function of Cost planner – liaison with consultant, operation cost Exercise in variation, Cost adjustment and Cost analysis.

Role of various financial agencies for building & land development. Economic feasibility reports – valuation, depreciation and its implications.

**Total: 45 Periods**

**REQUIRED BOOKS**

1. Estimating, Costing and Valuation(Professional practice) By Rangwala – S.C CHAROTAR PUBLISHING HOUSE, INDIA.

**REFERENCES**

1. Estimating & Costing – By B.W. Dutta (Revised by S. Dutta) UBS Publishers Distribution P.Ltd. India.
2. Estimating Costing and Specification. – By M. Chakraborti 21.B – Bhabananda Road, Calcutta – 700 026.
3. Estimating Costing and Valuation – By Gurcharan singh & Jagdish singh. Standard Publishers Distributors, 1705 – B, Nai sark post box no.1066. Delhi – 110 006.
4. T.N. Building practice, Vol:1 Civil Govt Publication.
5. PWD Standard Specifications. Govt Publication.

**AIM:**

Learning of building construction will not realize its full objectives unless it is supplemented by a thorough understanding of the methods for achieving sound detailing. It is necessary for the students to understand the principles of detailing as applicable to various structural and non-structural situations in Indian context.

**OBJECTIVES:**

- To enable students to appreciate the challenges in detailing for both the newly designed buildings as well as while carrying out additions and alterations to existing buildings.
- To enable students to understand the various Fittings, Furniture & Equipment (FFE) that are needed in buildings and their installation methods.
- To train students towards adopting an integrated approach while dealing with complex buildings incorporating various allied requirements.

**UNIT I**

**INTRODUCTION TO CURRENT DEVELOPMENTS IN BUILDING INDUSTRY 10**

**Smart Materials:** Characteristics, classification, properties, energy behaviour, intelligent environments.

Recycled and ecological materials and energy saving materials: Straw-bale, card board, earth-sheltered structures, recycled plastics, recycled tyres, paper-crete, sandbags, photovoltaic, solar collectors, light-pipes, wind catchers.

**Exercises of the above through case studies and drawings.**

**UNIT II**

**DETAILING OF WALLS, ROOFS AND FLOORING FOR INSTITUTIONAL BUILDINGS 20**

- a) Detailing of a residence - selected spaces.
- b) Detailing of classrooms, library (in school, college)
- c) Detailing of lecture hall, auditorium, exhibition spaces

**Exercises of the above through case studies and drawings.**

**UNIT III**

**DETAILING OF WALLS, ROOF, FLOORING FOR COMMERCIAL BUILDINGS 20**

- a) Detailing of shop-fronts, office spaces for commercial buildings including detailing of crucial elements such as entrance porches, main doors, staircases, show-windows, enclosed and air-conditioned atrium spaces.
- b) Detailing of façade and selected spaces for apartment buildings, hotels and hostels.

**Exercises of the above through case studies and drawings.**

**UNIT IV**

**DETAILING OF BUILT-IN FURNITURE AND FITTINGS 10**

Detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting.

**Exercises of the above through case studies and drawings.**

## **UNIT V**

### **DETAILING OF EXTERIOR AND INTERIOR ARCHITECTURALELEMENTS 15**

Detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces. Detailing of interior architectural elements in existing buildings (e.g. Staircase in bookshops, restaurants, playpen in restaurants, reception areas in hotel lobbies etc.)

**Exercises of the above through case studies and drawings.**

**Total: 75 Periods**

### **REQUIRED READING**

1. De Chiara and Callendar, Time Saver Standard Building Types, McGraw Hill Co,1980.
2. Richardson Dietruck, Big Idea and Small Building, Thames and Hudson, 2002
3. Edward D Mills, Planning – The Architecture Handbook, British Library Cataloguing in Publication Data, 1985

### **REFERENCES**

1. Susan Dawson, Architect's Working Details(Volume 1-10), 2004
2. Swimming Pools, Lane Book Company, Menlo Park, California
3. Nelson L Burbank, House Carpentry Simplified, Simmons-Board- Man Publishing Corporation, New York,
5. David sauter, Landscape Construction, Cengage learning 3<sup>rd</sup> edition.
6. Grant W. Reid, Landscape Graphics, Whitney Library of Design, 1987

**AIM:**

To explore the design and form of building typologies that are the result of pressure on urban ands with a thrust on issues like urban land economics, technology and ecology.

**OBJECTIVES:**

- To create an awareness with regard to the design of green buildings and sustainable architecture.
- To inculcate the importance of services integration and construction in spatial planning in he context of design of High-rise buildings and service intensive buildings.
- To highlight on the importance of High rise buildings as elements of identity in urban areas and urban design principles that govern their design.
- To explore computer aided presentation techniques involving 2D and 3D drawings, walkthrough and models as required.

**Scale and Complexity:** Advanced and complex problems involving large scale Multistoried buildings and complexes for Residential/ Commercial/ Institutional/ Mixed-Use in an urban context with focus on visual characteristics, service integration and sustainable practices.

Areas of focus/ issues:

- Sustainable building practices, green issues, alternative energy
- Intelligent building techniques and service integration
- Architectural Detailing
- Advanced building practices

Typology/ project: office building, multi-use centre, convention center, multiplex, corporate complex, health care and hospitality building

**Total: 240 Periods**



## **SEMESTER VII**

### **10166AR701 – INTERNSHIP PROGRAM I**

**L T P/S C**  
**x x x 12**

#### **AIM:**

To expose students to the daily realities of an architectural practice through a one year intensive internship program

#### **OBJECTIVE:**

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.
- The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture of India/respective countries.
- Minimum of one internship programme must be done in India.

The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The students would be evaluated based on the following criteria:

1. Adherence to time schedule, Discipline.
2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.
3. Ability to work as part of a team in an office.
4. Ability to participate in client meetings and discussions.
5. Involvement in supervision at project site.

At the end of the Internship program a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

**Total: 36 Weeks**

## **SEMESTER VIII**

### **10166AR801 – INTERNSHIP PROGRAM II**

**L T P/S C**  
**x x x 12**

**AIM:** To expose students to the daily realities of an architectural practice through a one year intensive internship program

**OBJECTIVE:**

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.
- Minimum of one internship programme must be done in India.

The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture.

The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The students would be evaluated based on the following criteria:

1. Adherence to time schedule, Discipline.
2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.
3. Ability to work as part of a team in an office.
4. Ability to participate in client meetings and discussions.
5. Involvement in supervision at project site.

At the end of the Internship program a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

**Total: 36 Weeks**

## **10166AR802 – DISSERTATION**

**L T P/S C**  
**x x x 2**

Dissertation offers an opportunity to look at architecture, history and design primarily through textual. However, like design, dissertation involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of there interest. They may range from analyzing the works of an architect, history, typological changes, writing, design process and many more. The dissertation should state its objectives, followed by exhaustive documentation and arguments. The emphasis however, could vary according to the topic. The dissertation study may lead to the thesis in final semester.

The dissertation proposal in about 1500 words stating the topic issues to be explored and the scope must be submitted. After approval the work would be periodically reviewed. A well written report of a minimum 15,000 words must be submitted in the prescribed format, if any provided by the University. The student would subsequently make a presentation of his/her work and defend them.

### **REFERENCES**

1. Ian Border, Kurt Rueideu, The Dissertation, An Architectural Students Hand Book, Architectural Press, 2000
2. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002

## **SEMESTER IX**

### **10166AR901 – PROFESSIONAL PRACTICE AND ETHICS II**

**L T P/S C**  
**3 0 0 3**

#### **AIM:**

To expose the students to advanced issues concerning architectural practice such as Tendering, Contracting including alternative practices in project execution, Arbitration and Project management and to enable them to understand the implications of globalization on architectural practice.

#### **OBJECTIVES:**

- To further the students understanding of the professional practice.
- To enable the students to grasp the advanced issues concerning professional practice such as tendering, contracting including alternative practices in project execution, arbitration and project management.
- To expose the students to the implications of globalization on professional practice with particular reference to WTO and GATS.
- To expose the students on some of the important legislations concerning architectural practice in India as well as International laws.

#### **UNIT I**

##### **TENDER**

**9**

Types of Tenders-Open and closed tenders-Conditions of tender-Tender documents-Tender notice-Concept of EMD-Submission of tender-Tender scrutiny-Tender analysis-Recommendations- E tendering (advantages, procedure, conditions).

#### **UNIT II**

##### **CONTRACT & ARBITRATION**

**10**

Contents of Contract document (Articles of Agreement, Terms and Conditions of Contract, Important clauses – Appendix) – Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award, Conduct of arbitration proceedings) – Arbitration clause in contract agreement (role of architect, excepted matters) – case studies.

#### **UNIT III**

##### **NEW TRENDS IN PROJECT FORMULATION AND EXECUTION**

**9**

Turn key offer (Expression of interest, Request for Proposal Document, Conditions for inviting turn key offer, finalisation of the bidder) – Current practices in Project execution.  
[Build operate and Transfer (BOT), Build Operate Lease and Transfer (BOLT) and Build Operate and Own (BOO) and others – case studies.

#### **UNIT IV**

##### **IMPLICATIONS OF GLOBALISATION IN ARCHITECTURAL PRACTICE**

**8**

Globalisation (meaning, advantages) – WTO and GATS and their relevance to architectural profession in India – Pre-requisites for Indian architects to work in other countries – Preparedness and infrastructure requirements for global practice – Entry of foreign architects in India (views for and against) – Information Technology and its impact on architectural practice

## **UNIT V**

### **EMERGING SPECIALISATIONS FOR AN ARCHITECT**

**9**

Construction management (Role, function, and responsibilities of a construction manager) – Project management (Concept, Objectives, Planning, Scheduling, Controlling and Role and Responsibilities of project manager) – Suitability of architect as construction / project manager – Programme evaluation review Techniques (event, activity, dummy network rules, graphical guidelines for network – PERT network).

**Total: 45 Periods**

#### **REQUIRED READING:**

1. Ar. V.S. Apte, Architectural Practice and Procedure, Padmaja Bhide, Pune, 2008.
2. Architects Act 1972.
3. Dr. B.C. Punmiya and K.K. Khandelwal – Project Planning and Control with PERT /CPM, Laxmi Publications, New Delhi, 1987.
4. Arbitration Act.
5. WTO and GATT guidelines.

#### **REFERENCES:**

1. Architects Act 1972.
2. Publications of Handbook on Professional practice by IIA.
3. Publications of Council of Architecture-Architects (Professional conduct) Regulations 1989, Architectural Competition guidelines
4. Roshan Namavati, Professional practice, Lakhani Book Depot, Mumbai 1984.

## **10166AR902 – SUSTAINABLE PLANNING AND ARCHITECTURE**

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To provide an overview of the concepts of sustainable practices in planning the built environment.

### **OBJECTIVE:**

- To understand the concept of sustainability and sustainable development
- To inform the various issues like climate change, ecological footprint, etc.
- To understand low impact construction practices, life cycle costs and alternative energy resources.
- To familiarize the students with the various rating systems for building practices with case studies.
- Through case studies to understand the concept of sustainable communities and the economic and social dimensions.

### **UNIT I**

**7**

Concept of Sustainability – Carrying capacity, sustainable development – Bruntland report – Ethics and Visions of sustainability.

### **UNIT II**

**8**

Eco system and food chain, natural cycles – Ecological foot print – Climate change and Sustainability.

### **UNIT III**

**10**

Selection of materials Eco building materials and construction – Biomimicry, Low impact construction, and recyclable products and embodied energy. Life cycle analysis. Energy sources – Renewable and non-renewable energy.

### **UNIT IV**

**10**

Green building design – Rating system –LEED, GRIHA, BREEAM etc., case Studies.

### **UNIT V**

**10**

Urban ecology, social and economic dimensions of sustainability, urban heat Island effects, sustainable communities – Case studies.

### **REFERENCES:**

1. Sustainable Architecture and Urbanism: Concepts, Technologies and examples by Gauzin- Muller(D) – Birkhauser 2002.
2. Eco-Tech : Sustainable Architecture and High Technology by Slessor© - Thames and Hudson 1997.
3. Ecodesign : A manual for Ecological Design by Yeang(K) – Wiley Academy 2006.

### **REQUIRED READINGS:**

1. Sustainable Architecture : Low tech houses by Mostaedi (A) – Carles Broto 2002.
2. HOK guide book to sustainable design by Mendler (S) & Odell (W) – John willey and sons 2000.
3. Environmental brief : Path ways for green design by Hyder(R) – Taylor and Francis 2007.
4. Green Architecture: Design for a sustainable future by Brenda and Vale (R) – Thames and Hudson 1996.

## **10166AR903 – HUMAN SETTLEMENTS PLANNING**

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To provide an overview of the vocabulary of Human settlements, while looking at planning concepts and processes in urban and regional planning and urban renewal.

### **OBJECTIVES:**

- To introduce the elements of Human settlements and the classification of Human settlements.
- To outline the form and structure of settlements and illustrating through case studies.
- To familiarize the students with modern concepts of Settlement Planning.
- To outline the scope and content of Urban planning, Urban renewal and Regional planning and the various plans to be prepared.

### **UNIT I**

#### **INTRODUCTION**

**9**

Elements of Human Settlements – human beings and settlements – nature shells & Net work – their functions and Linkages – Anatomy & classification of Human settlements – Locational, Resource based Population size & Occupational structure.

### **UNIT II**

#### **FORMS OF HUMAN SETTLEMENTS**

**9**

Structure and form of Human settlements – Linear, non-linear and circular – Combinations – reasons for development – advantages and disadvantages – case studies – factors influencing the growth and decay of human settlements.

### **UNIT III**

#### **PLANNING CONCEPTS**

**9**

Planning concepts and their relevance to Indian Planning practice in respect of Ebenezer Howard – Garden city concepts and contents – Patrick Geddes – Conservative surgery – case study – C.A. Perry – Neighborhood concept Le Corbusier – concept and case studies

### **UNIT IV**

#### **URBAN PLANNING**

**9**

Scope and Content of Master plan – planning area, land use plan and Zoning regulations – zonal plan – need, linkage to master plan and land use plan – planned unit development (PUD) – need, applicability and DCR

### **UNIT V**

#### **URBAN RENEWAL AND REGIONAL PLANNING**

**9**

Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – Regional Plan – Area delineation, Land utilization plan, hierarchical system of settlements, their sizes and functions

**Total: 45 Periods**

### **REQUIRED READING:**

1. C.L. Doxiadis, 'An Introduction to the Science of Human Settlements', Hutchinson, London, 1968.
2. Andro D. Thomas, 'Housing and Urban Renewal', George Allen and Unwin, Sydney, 1986.
3. Ministry of Urban Affairs and Employment, Government of India, New Delhi, 'Urban Development Plans: Formulation & Implementation' - Guidelines - 1996.

**REFERENCES:**

1. Madras Metropolitan Development Authority, 'Master Plan for Madras Metropolitan Area, Second Master Plan - 1995.
2. Government of India, 'Report of the National Commission on Urbanisation', 1988.
3. Hansen N., 'Regional Policy and Regional Integration' Edward Elgar, UK, 1996.
4. Centre for Human Settlements, Anna University, Chennai 'Development Plan for Uthokottai Taluk, Cheyyur Taluk', 1999.



## **10166AR904 – LANDSCAPE AND ECOLOGY**

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To familiarize students with landscape architecture and many facets this profession entails.

### **OBJECTIVES:**

- To familiarize students with the various elements of landscape architecture and the principle of landscape design.
- To provide an overview of ecological balance and impacts of human activities and stress the need for environmental protection and landscape conservation.
- To develop and strengthen the competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales.

### **UNIT I**

#### **INTRODUCTION**

**6**

Introduction to landscape architecture, ecology, ecological balance, landscape conservation, reclamation and landscaping of derelict lands, environmental impact assessment.

### **UNIT II**

#### **ELEMENTS IN LANDSCAPE DESIGN**

**10**

Hard and soft landscape elements; Plant materials - classification, characteristics, use and application in landscape design; Water and Landform,

### **UNIT III**

#### **GARDEN DESIGN**

**10**

Landscape and garden design in history - Japanese, Italian Renaissance and Moghul gardens in India, Study of notable examples, Spatial development in landscape design.

### **UNIT IV**

#### **SITE PLANNING**

**10**

Organisation of spaces - circulation, built form and open spaces, site planning and micro climate, site planning for neighbourhood parks, children's play area and campus development.

### **UNIT V**

#### **LANDSCAPING OF FUNCTIONAL AREAS**

**9**

Urban open spaces and principle of urban landscape; Street landscaping, landscape design for waterfront areas and functional areas in urban centers; green roofs

**Total: 45 Periods**

### **REQUIRED READING:**

1. Michael Laurie, An Introduction to Landscape Architecture, Elsevier, 1986.
2. Geoffrey And Susan Jellicoe, The Landscape of Man, Thames And Hudson, 1987.

**REFERENCES:**

1. T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995
2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company , 1993.
3. Brian Hacket, Planting Design, Mc Graw Hill, Inc, 1976
4. Handbook of urban landscape, Cliff Tandy, Architectural press, 1973
5. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers, Calcutta, 1991.

## **10166AR906 – URBAN DESIGN**

**L T P/S C**  
**2 0 2 3**

### **AIM:**

To understand the continuity of built environment from the macro to the micro scale as well as to make aware of the discipline of urban design

### **OBJECTIVES:**

- To understand the scope and nature of urban design as a discipline
- To introduce the components of a city and their interdependent roles.
- To understand the evolution of historic urban form
- To learn to interpret the city in different ways and layers.
- To create awareness of contemporary urban issues as well as learn about possible ways to address them

### **UNIT I**

#### **INTRODUCTION TO URBAN DESIGN**

**6**

Components of urban space and their interdependencies- outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline

### **UNIT II**

#### **HISTORIC URBAN FORM**

**10**

Western: morphology of early cities- Greek agora- Roman forum- Medieval towns- Renaissance place making- ideal cities – Industrialization and city growth- the eighteenth century city builders Garnier's industrial city- the American grid planning- anti urbanism and the picturesque- cite industrielle- citte nuovo-radiant city .  
Indian: evolution of urbanism in India- Temple towns- Mughal city form- medieval cities -colonial urbanism- urban spaces in modernist cities: Chandigarh, Bhuvaneshwar and GandhiNagar- subsequent directions

### **UNIT III**

#### **THEORISING AND READING URBAN SPACE**

**10**

Ideas of Image ability and townscape: Cullen, Lynch- place and genius loci- collective memory- historic reading of the city and its artifacts: Rossi- social aspects of urban space: life on streets and between buildings, gender and class, Jane Jacobs, William Whyte

### **UNIT IV**

#### **ISSUES OF URBAN SPACE**

**10**

Understanding and interpreting of urban problems/ issues- place-making and identity, morphology: sprawl, generic form, incoherence, privatized public realm- effects/ role of real-estate, transportation, zoning, globalisation - ideas of sustainability, heritage, conservation and renewal- contemporary approaches: idea of urban catalyst, transit metropolis, community participation.

### **UNIT V**

#### **BEST PRACTICE IN URBAN DESIGN**

**9**

Contemporary case studies from developing and developed economies that offer design guidelines and solutions to address various issues/ aspects of urban space

**Total: 45 Periods**

**REQUIRED READING:**

1. A.E.J. Morris, History of Urban Form before the Industrial Revolution, Prentice Hall 1996
2. Edmund Bacon, Design of Cities , Penguin, 1976
3. Gordon Cullen, The Concise Townscape, The Architectural Press, 1995
4. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
5. Time Saver Standards for Urban Design
6. Kevin Lynch, Image of the City

**REFERENCES:**

1. Jonathan Barnett, An Introduction to Urban Design
2. Lawrence Halprin, Cities, Reinhold Publishing Corporation, New York, 1972
3. Gosling and Maitland, Urban Design, St. Martin's Press, 1984
4. Urban Design Futures
5. Geoffrey Broadbent, Emerging Concepts in Urban Space Design

**AIM:**

To explore the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning

**OBJECTIVES:**

- To understand the various components and aspects of the urban environment as well as their interrelationships
- To understand in specific components/issues such as public spaces, physical infrastructure, socio-cultural aspects- heritage, gender, class, dynamics of urban growth
- To understand people as users of the urban environment in various scales.
- To explore techniques of mapping and diagramming to understand the dynamic urban environment.
- To take design decisions in a comprehensive manner understanding their implications in the larger context.

**Scale and Complexity:** projects involving the urban context and architecture in the urban context with a thrust on understanding interdependencies and formulating appropriate design directions.

Areas of focus/ issues:

- Exploration of relationship between building and larger context
- Contemporary processes in design
- Appropriate architecture
- Addressing issues in urban areas – transportation, sustainability, heritage, sprawl, place making, identity, collective memory
- Mixed use programming

Typology/ project: those involving large scale urban interventions as well as large scale projects which have impact on the urban context- revitalization and renewal of urban fragments, evolving guidelines for heritage areas, adaptive reuse, urban waterfront development, transportation nodes, new communities, multi-use urban complexes.

**Total: 240 Periods**

**REQUIRED READING:**

1. Jonathan Barnett, An Introduction to Urban Design
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. I. Jawgeih, Life between Buildings,- Using Public Space, Arkitektens Forleg 1987
4. Time Savers Standard for Urban Design
5. Urban design Futures

**REFERENCES:**

1. Edmund Bacon , Design of Cities , Penguin, 1976
2. Gordon Cullen, The Concise Townscape, The Architectural Press, 1995
3. Lawrence Halprin, Cities, Reinhold Publishing Corporation, New York, 1972
4. Gosling and Maitland, Urban Design, St. Martin's Press, 1984
5. Kevin Lynch, Site Planning, MIT Press, Cambridge 1984

## **SEMESTER X**

### **10166ARX03 – THESIS**

**L T P/S C**  
**0 0 34 17**

#### **OBJECTIVE**

All the five years of architectural design culminate in the thesis Project to motivate students to involve in individual research and methodology. This is to train them in handling projects independently.

#### **TOPICS OF STUDY**

The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design including urban-infill, rural settlements, environmental design, conservation and heritage precincts, landscape design, housing etc.

However, the specific thrust should be architectural design of built environment.

#### **METHOD OF SUBMISSION**

The Thesis Project shall be submitted in the form of drawings, project report, models, slides and reports.

**Total : 510 Periods**

#### **REQUIRED READING:**

1. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002

#### **REFERENCES:**

1. Donald Appleyard, The Conservation of European Cities, M.I.T. Press, Massachusetts
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. Richard Kintermann and Robert small, Site planning for cluster Housing ,van nastrand reinhold company, Jondon/New York 1982.
4. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
5. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1984.
6. Geoffrey And Susan Jellico, The Landscape of Man, Thames And Hudson, 1995.
7. Arvind Krishnan & Others, Climate Responsive Architecture, A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001

## **ELECTIVE I (Sixth Semester)**

### **10166ARE11 – VERNACULAR ARCHITECTURE**

**L T P/S C**  
**3 0 0 3**

#### **AIM:**

To study everyday architecture in the traditional context built in various cultural and geographical regions of India with an emphasis on building types, use, materials, construction and building process.

#### **OBJECTIVE:**

- To introduce the study of vernacular architecture as a process and not a product.
- To provide an overview of the various approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the various regions of the country.
- To look at the impact of Colonial rule on the vernacular architecture of India.

#### **UNIT I**

##### **INTRODUCTION**

**8**

Definition and classification of Vernacular architecture – Vernacular architecture as a process – Survey and study of vernacular architecture: methodology- Cultural and contextual responsiveness of vernacular architecture: an overview

#### **UNIT II**

##### **APPROACHES AND CONCEPTS**

**7**

Different approaches and concepts to the study of vernacular architecture: an overview – Aesthetic, Architectural and anthropological studies in detail

#### **UNIT III**

##### **VERNACULAR ARCHITECTURE OF THE WESTERN NORTHERN REGION OF INDIA**

**10**

Forms spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following:

- Deserts of Kutch and Rajasthan; Havelis of Rajasthan
- Rural and urban Gujarat; wooden mansions (havelis); Havelis of the Bohra Muslims
- Geographical regions of Kashmir; house boats

#### **UNIT IV**

##### **VERNACULAR ARCHITECTURE OF SOUTH INDIA**

**10**

Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following:

- Kerala: Houses of the Nair & Namboothri community; Koothambalam, Padmanabhapuram palace.
- Tamil Nadu: Houses and palaces of the Chettinad region; Aghrahams.

## **UNIT V**

### **WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA**

**10**

Colonial influences on the Tradition Goan house

Evolution of the Bungalow from the traditional bangla, Victoria Villas – Planning principles and materials and methods of construction.

Settlement pattern and house typologies in Pondicherry and Cochin.

**Total: 45 Periods**

#### **REQUIRED READINGS:**

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
2. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.
3. R W Brunskill: Handbook on Vernacular Architecture

#### **REFERENCES:**

1. V.S. Pramar, Haveli – Wooden Houses and Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
2. Kulbushanshan Jain and Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad 1992.
4. G.H.R. Tillotsum – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.
5. Carmen Kagal, VISTARA – The Architecture of India, Pub: The Festival of India, 1986.
6. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000



## 10166ARE12 – ENERGY EFFICIENT ARCHITECTURE

**L T P/S C**  
**3 0 0 3**

### **AIM:**

In the face of a crisis of depleting resources the aim is to familiarize the student with passive design consideration and the use of non renewable sources of energy in buildings.

### **OBJECTIVES:**

- To inform the need to use renewable sources of energy in view of the depleting resources and climate change.
- To familiarise the students with passive design considerations and passive heating and cooling of buildings and the various methods used.
- To inform about the importance of day lighting and natural ventilation in building design through analysis and case studies.

### **UNIT I**

#### **ARCHITECTURE AND ENERGY**

**9**

Solar System and Earth - Renewable Sources of Energy - Global Climates and Architecture in Historic Perspective - Contemporary Trends - Sustainability and Architecture

### **UNIT II**

#### **SOLAR PASSIVE ARCHITECTURE**

**9**

Design Considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and Thermal Performance of Walls and Roofs

### **UNIT III**

#### **PASSIVE HEATING**

**9**

Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium – Isolated Gain

### **UNIT IV**

#### **PASSIVE COOLING**

**9**

Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels

### **UNIT V**

#### **DAY LIGHTING AND NATURAL VENTILATION**

**9**

Daylight Factor - Daylight Analysis - Daylight and Shading Devices - Types of Ventilation - Ventilation and Building Design

**Total: 45 Periods**

### **REQUIRED READING:**

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi - 1999
2. Arvind Krishnan & Others, Climate Responsive Architecture, A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001

### **REFERENCES:**

1. Fuller Moore, Environmental Control Systems, McGraw Hill INC, New Delhi - 1993
2. Sophia and Stefan Behling, Solpower, the Evolution of Solar Architecture, Prestel, New York, 1996
3. Givoni .B, Passive and Low Energy Cooling of Buildings, Van Nostrand Reinhold, New York, 1994

**AIM:**

This course is geared towards the integration of contemporary structural design in the form making process of architectural design. It will encourage the student to exercise judgement in areas of structure, form and process.

**OBJECTIVE:**

- To study evolution of structural systems through history.
- To familiarise the students with concepts of structural design through works of architects/ engineers.
- To study architectural expression through relevant case studied.
- To evaluate the understanding of the relationship between form & structure through a seminar.

**UNIT I****HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA 9**

Development of monolithic and rock cut structures- trabeated construction-arcuate construction-vaults and flying buttresses- tents and masted structures and bridges through ancient and medieval history.

**UNIT II****HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD 9**

Post Industrial modular construction of large span and suspension structures in steel and concrete-projects of Pier Luigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.

**UNIT III****CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – I 8**

The select case studies could include

KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Norman Foster and Stansted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw

**UNIT IV****CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – II 8**

The select case studies could include

Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Renzo Piano Building Workshop

**UNIT V****SEMINAR 10**

Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.

**Total: 45 Periods**

## **REFERENCES**

1. “Paper Arch” and Japan Pavilion at Expo 2000 in Hannover by Shigeru Ban
2. Greene King Draught Beer Dept and Schlumberger Cambridge Research Centre, UK by Michael Hopkins
3. Design Center, Linz, Austria and Two Family House in Pullach Thomas Herzog
4. King Abdul Aziz International Airport, Haj Terminal by SOM
5. Pavilion of the Future, Expo 92, Seville by Martorell, Bohigas & Mackay (MBM)
6. Darling Harbour Expo Center, Sydney Australia by P. COX
7. Olympic Archery Building by Enric Miralle & Carme Pinos
8. Eagle Rock House by Ian Ritchie
9. Le Grande Arche de La Defense by J O Spreckelsen

## **Elective II (Ninth Semester)**

### **10166ARE21 – URBAN HOUSING**

**L T P/S C**  
**3 0 0 3**

#### **AIM:**

The course is designed to inform about the process of housing in the context of the depleting housing resources in India.

#### **OBJECTIVES:**

- To outline the Issues concerning housing in the Indian Context and the various agencies involved in the production of housing.
- To outline factors that influence housing affordability and to familiarize students with various schemes and policies of the government in the housing sector.
- To inform about the standards and guidelines for housing
- To inform about the various housing design typologies and the processes involved in housing project development.

#### **UNIT I**

##### **INTRODUCTION TO HOUSING AND HOUSING ISSUES – INDIAN CONTEXT 9**

Housing and its importance in Architecture and its relationship with neighbourhood and city planning. Housing demand and supply – National Housing Policy – Housing agencies and their role in housing development – impact of traditional life style – Rural Housing, Public, private sector housing.

#### **UNIT II**

##### **SOCIO-ECONOMIC ASPECTS 10**

Social economic factors influencing housing affordability – equity in housing development sites and services/-slum upgradation community participation – Indira Awas Yojana Crime prevention, Health principles in Housing.

#### **UNIT III**

##### **HOUSING STANDARDS 6**

UD PFI – guide lines, standard and regulations – DCR – performance standards for housing.

#### **UNIT IV**

##### **SITE PLANNING AND HOUSING DESIGN 10**

###### **4. a) Site Planning**

Selection of site for housing, consideration of physical characteristics of site, locational factors, orientation, climate, topography – Landscaping.

###### **4.b) Housing design**

Traditional housing, row housing, cluster housing – apartments and highrise housing relating to Indian situations – case studies in India – integration all types of services, parking, incorporation of green sustainable practices –prefabrication in housing.

#### **UNIT V**

##### **HOUSING PROCESS 10**

Various stages and tasks in project development –community participation and housing management – Environmental aspects and national calamities and disaster mitigation.

**Total: 45 Periods**

**REFERENCES:**

1. Richard Kintermann and Robert small site planning for cluster Housing van nastrand reinhold company, Jondon/New York 1977.
2. Joseph de Chiara and others – Time saver standards for Housing and Residential development, Mcgraw Hill Co, New York 1995.
3. Forbes Davidson and Geoff Payne, Urban projects Manual. Liverpool University press, Liverpool 1983.
4. Christopher Alexander, A pattern Language, Oxford University press, New York 1977
5. HUDCO publications – Housing for low income, sector model.

## **10166ARE22 – INDUSTRIAL BUILDING SYSTEM**

**L T P/S C**  
**3 0 0 3**

### **UNIT I**

#### **INTRODUCTION**

**9**

Five year plans and thrust in housing – Issues in Urban Housing – use of modern building materials – application of modern technology – meaning of industrial building system.

### **UNIT II**

#### **APPLICATION OF INDUSTRIAL BUILDING SYSTEM**

**9**

Feasibility of using industrial building system in Residential and Non-Residential buildings – manufacturing of building components – Technology requirements for industrial building system – use of Industrial building system as an option for disaster mitigation.

### **UNIT III**

#### **MODULAR CO-ORDINATION AND INDUSTRIALISED SYSTEM**

**9**

Concept and definition of Modular dimensional discipline – Advantages and Limitations of modular principle – Components of residential buildings – precast elements.

### **UNIT IV**

#### **PRE-FABRICATION SYSTEM**

**9**

Objective and necessity – Off site on site prefabrication elements and construction joints – architectural and technical limitations.

### **UNIT V**

#### **PROCEDURES AND ORGANISATION**

**9**

Equipments used – manufacturing processes – transportation of components – assembly and finishing – Structural, social and economic issues related to industrial building system.

**Total: 45 Periods**

### **REFERENCES:**

1. Industrial Building and Modular Design Henrik Missen – C & CK, UK 1972.
2. Albert G.H.Dietz, Laurence Secotter – “Industrialized Building Systems for Housing” – MIT, special summer session, 1970 USA.
3. “Industrialized Building Construction” – Proceedings of National Seminar, Nov-17-18, 2000, Indian Concrete Institute, Mumbai.
4. “Innovative Construction Materials” – Proceedings of Seminar, Jan 20-21, 2001, Veermata Jeejabai Technical Institute, Mumbai.

## **10166ARE23 – PRINCIPLES OF TRADITIONAL INDIAN ARCHITECTURE**

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how integration of built form with site happens at metaphysical level based on articulation of celestial grid.

### **OBJECTIVE:**

- To introduce the principles of Vastu and Vaasthu and relationship between building and site.
- To familiarize the students with the units of measurement in traditional architecture.
- To introduce concepts of orientation and cosmogram according to the Vasthu Purusha Mandala.
- To study the detailing and design of various building components and their material and method of construction.

### **UNIT I**

#### **INTRODUCTION**

**9**

Vastu and Vaastu - its definition and classification - Relationship to earth.

Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

### **UNIT II**

#### **MEASUREMENT AND RESONANCE TO VIBRATION**

**9**

Units of measurement - Tala system and Hasta system of measures Theory of vibration - vibration as time, equation of time and space - Time space relationship and measurement of the same.

### **UNIT III**

#### **SITE PLANNING AND COSMOGRAM**

**9**

Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types. The Vaastu Purusha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

### **UNIT IV**

#### **COMPONENTS AND DETAILING**

**9**

Building heights -Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

### **UNIT V**

#### **MATERIALS AND CONSTRUCTION**

**9**

Use of wood, stone, metal, brick and tile - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

**Total : 45 Periods**

**REQUIRED READINGS:**

1. Dr.V.Ganapati Sthapati - :Sthapatya Veda” Dakshina Publishing House, Chennai-41, India, 2001.
2. Stella Kramrisch - The Hindu Temple Vol.I Motilal Banarsidass Publishers Pvt. Ltd., Delhi - 1991.
3. K.S.Subramanya Sastri - Maya Matam - Thanjavur Maharaja Sarjoji Saraswathi Mahal Library - Thanjavur - 1966.
4. Dr.V.Ganapati Sthapati - :Sthapatya Veda” Dakshina Publishing House, Chennai-41, India, 2001

**REFERENCES:**

1. Bruno Dagens - Mayamatam, Vol.I & II IGNCA and Motilal Banarsidars Publishers Pvt. Ltd., Delhi - 1994.
2. Dr.V.Ganapati Sthapati - Vastu Purusha Mandalam, Dakshina Publishing House, Chennai, 1998.
3. Ananda Kentish Coomaraswamy, Symbolism of Indian Architecture” – Historical Research Documentation Programme, Jaipur, 1983
4. Stella Kramrisch - The Hindu Temple Vol. II Motilal Banarsidass Publishers Pvt. Ltd., Delhi - 1991.



### **Elective III (Tenth Semester)**

#### **10166ARE31 – DIGITAL TOOLS IN ARCHITECTURE**

**L T P/S C**  
**1 0 4 3**

#### **AIM:**

This course aims to introduce the digital art to the students through series of sessions of demonstration of software and projects and to engage students with media in the specific Context and Design fundamentals.

#### **OBJECTIVE:**

- To impart training in video editing, image editing and vector editing.
- To impart training in Pixel and vector animation
- To impart training in web presentations to enable web publishing.
- To introduce students to Flash and Director to enable the production of presentations and CDs

#### **UNIT I**

##### **VIDEO EDITING**

**15**

Importing avis and mpegs, sequencing, cutting trimming, decrease and increase the speed of the movie, filters, transitions, output settings, saving the output.

#### **UNIT II**

##### **IMAGE EDITING & VECTOR EDITING**

**10**

Using tools, transparency, layers, masking, effects, image adjustments, transform, text, history, gradient (fill types), cropping, image size, resolution, keyboard shortcuts, etc. image editing (pixel image types) using tools. Vector characters, bizer and grip editing, transform, fill types, text formatting, colour overlays, etc.

#### **UNIT III**

##### **PIXEL AND VECTOR ANIMATION**

**10**

GIF animation and other various animation types, morphing etc. vector animation – using time line, understanding sequencing, using symbols (library), shape and motion Tweening

#### **UNIT IV**

##### **WEB**

**9**

Web presentations, understanding links & navigation, creating web pages, creating ‘folder tree’

#### **UNIT V**

##### **NON LINEAR PRESENTATION (FLASH & DIRECTOR)**

**15**

Importing files using standard and linking options. Using scripts and behaviors, understanding stage, cast and time line, using cast library, Tweening, using swf movie, presentation using voice over and presentation demos, creating auto run Cd-rooms

**Total: 60 Periods**

#### **REQUIRED READINGS:**

1. Photoshop 7 Bible Professional Edition, Wiley John & Son INC, New York, DekeMcClelland, 2000.
2. Flash Web Design, The Art of Motion Graph, Curtis Hillman, New Riders Publishing, Indianapolis, IN. U.S.A, 2000

**REFERENCES:**

1. M.E. Morris, and R.J. Hinrichs, Web Page Design, Prentice Hall, 1996.
2. Mark Von Wodtke, Mind over Media : Creative Thinking Skills for Electronic Media, McGraw- Hill, New York, 1993

**AIM:**

The course is designed to give the students an overview of the building industry and the various advancements in the area of construction technology and practice

**OBJECTIVES:**

- To study the advancements in construction with concrete for large span structures.
- To familiarize the students with the manufacture, storage and transportation of concrete.
- To inform the various equipment used in the construction industry and the criteria for choice of equipment.
- To familiarize the students with an overview of construction management, planning and scheduling

**UNIT I****GENERAL BUILDING REQUIREMENTS****6**

Classification of buildings - Sites and Services - Requirements of parts of buildings.

**UNIT II****CONSTRUCTION SYSTEMS****10**

Planning - Cast in situ construction (ready mixed pumped etc.) Reinforced concrete and prestressed concrete constructions precast concrete and pre- fabrication system – Modular coordination – Structural schemes.

**UNIT III****CONSTRUCTION PRACTICE****10**

Manufacture, storage, transportation and erection of precast component forms, moulds and Scaffoldings in construction - safety in erection and dismantling of constructions.

**UNIT IV****CONSTRUCTION EQUIPMENT****10**

Uses of the following: Tractors, bulldozers, shovels draglings, cableways and belt conveyors, batching plants - Transit mixers and agitator trucks used for ready mix concrete pumps Guniting equipments - Air compressors - welding equipment - cranes and other lifting devices Choice of construction equipment for different types of works.

**UNIT V****CONSTRUCTION MANAGEMENT****9**

Overview of construction management topics including estimating, cost control, quality control, safety, productivity, value engineering, claims, and legal issues - planning and scheduling

**Total : 45 Periods****REQUIRED READINGS:**

1. R. Chudley, Construction Technology, Longman Group Limited, England, 2005
2. R. Barry, The Construction of Buildings, The English Language Book Society and Crosby Lockwood, Staples, London, 1996

**REFERENCES:**

1. National Building Code of India, 2005
2. Frank R. Dagostino, Materials of Construction – Details given Reston Publishing Company, nc.Virginia, 1997.
3. M. Mohsin, Project Planning and Control, Vikas Publishers, New Delhi, 1983
4. R. Chudley, Building Construction Handbook, Butterworth-Heinemann, 2010
5. Edward Allen & Joseph Iano, Fundamentals of Building Construction, Wiley 2008.

## 10166ARE33 – EARTHQUAKE RESISTANT ARCHITECTURE

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To provide basic knowledge of earthquake resistant design concepts to students of Architecture, as it has become evident in recent years that some of the seismically active areas of the world are located within Indian and live lost during past earthquakes due to damage of homes and other buildings are enormous.

### **OBJECTIVES:**

- To understand the fundamentals of Earthquake and the basic terminology
- To inform the performance of ground and buildings.
- To familiarise the students with design codes and building configuration
- To understand the various types of construction details to be adopted in a seismic prone area.
- To apply the knowledge gained in an architectural design assignment

### **UNIT I**

**7**

Fundamentals of earthquakes

- a) Earth's structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.
- b) Predictability, intensity and measurement of earthquake
- c) Basic terms- fault line, focus, epicentre, focal depth etc.

### **UNIT II**

**8**

Site planning, performance of ground and buildings

- a) Historical experience, site selection and development
- b) Earthquake effects on ground, soil rupture, liquefaction, landslides.
- c) Behaviour of various types of building structures, equipments, lifelines, collapse patterns
- d) Behaviour of non-structural elements like services, fixtures in earthquake-prone zones

### **UNIT III**

**8**

I. Seismic design codes and building configuration

- a) Seismic design code provisions – Introduction to Indian codes
- b) Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings- like short stories, short columns etc.

### **UNIT IV**

**10**

II. Various types of construction details

- a) Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures.
- b) Seismic design and detailing of RC and steel buildings
- c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components

### **UNIT V**

**12**

III. Urban planning and design

- a) Vulnerability of existing buildings, facilities planning, fires after earthquake, socioeconomic impact after earthquakes.
- b) Architectural design assignment- Institutional masonry building with horizontal spread and height restriction, multi-storeyed RC framed apartment or commercial building

**Total: 45 Periods**

**REQUIRED READING:**

1. Guidelines for earthquake resistant non-engineered construction, National Information centre of earthquake engineering (NICEE, IIT Kanpur, India)
2. C.V.R Murthy, Andrew Charlson. "Earthquake design concepts", NICEE, IIT Kanpur India.

**REFERENCES**

1. Ian Davis (1987) Safe shelter within unsafe cities" Disaster vulnerability and rapid urbanization, Open House International, UK
2. Socio-economic developmental record- Vol.12, No.1, Jan-Feb 2005
3. Learning from Practice- A review of Architectural design and construction experience after recent earthquakes- Joint USA-Italy workshop, Oct.18-23, 1992, Orvieto, Italy.
4. S.K.Duggal, Earthquake resistant design of structures, Oxford university press, USA, 2007
5. David.J.Dowrick, earthquake resistant design and risk reduction, Wiley 2009.

## **Elective IV (X semester)**

### **10166ARE41 – ARCHITECTURAL CONSERVATION**

**L T P/S C**  
**3 0 0 3**

#### **AIM:**

This course is designed to address Conservation as an idea that enhances quality of life, as an effective planning strategy, a criticism of universal modernism and a way to address issues of memory and identity. An overview of current status of conservation in India is also provided

#### **OBJECTIVES:**

- To introduce the various issues and practices of Conservation.
- To familiarize the students with the status of conservation in India and the various agencies involved in the field of conservation worldwide and their policies.
- To outline the status of conservation practice in the country and the various guidelines for the preservation, conservation and restoration of buildings.
- To inform the students about the character and issues in our heritage towns through case studies.

#### **UNIT I**

##### **INTRODUCTION TO CONSERVATION**

**9**

Understanding Heritage. Types of Heritage. Heritage conservation- Need, Debate and purpose. Defining Conservation, Preservation and Adaptive reuse. Distinction between Architectural and Urban Conservation. International agencies like ICCROM , UNESCO and their role in Conservation

#### **UNIT II**

##### **CONSERVATION IN INDIA**

**9**

Museum conservation – monument conservation and the role of Archeological Survey of India – role of INTACH – Central and state government policies and legislations – inventories and projects- select case studies of sites such as Hampi, Golconda, Mahabalipuram -craft Issues of conservation

#### **UNIT III**

##### **CONSERVATION PRACTICE**

**9**

Listing of monuments- documentation of historic structures- assessing architectural character – historic structure report- guidelines for preservation, rehabilitation and adaptive re-use of historic structures- Case studies of Palaces in Rajasthan, Chettinad and Swamimalai dwellings, seismic retrofit and disabled access/ services additions to historic buildings heritage site management

#### **UNIT IV**

##### **URBAN CONSERVATION**

**9**

Over view of urban history of India and Tamil Nadu- understanding the character and issues of historic cities – select case studies of towns like Srirangaram, Kumbakonam and Kanchipuram - historic districts and heritage precincts.

#### **UNIT V**

##### **CONSERVATION PLANNING**

**9**

Conservation as a planning tool.- financial incentives and planning tools such as Transferable Development Right(TDR)-urban conservation and heritage tourism-case studies of sites like for Cochin, Pondichery French town.- conservation project management

**Total:45 Periods**

**REQUIRED READING**

1. Donald Appleyard, The Conservation of European Cities, M.I.T. Press, Massachusetts
2. James M. Fitch, Historic Preservation: Curatorial Management of the Built World by University Press of Virginia; Reprint edition (April 1, 1990)
4. Conservation Manual, Bernard Fielden; INTACH Publication

**REFERENCES:**

1. B.K. Singh, State and Culture, Oxford, New Delhi
2. A.G. K. Memon ed. Conservation of Immovable Sites, INTACH Publication, N.Delhi.
3. Nahoum cohen-urban conservation-MIT press 1999.
4. Seminar Issue on Urban Conservation.
5. A Richer Heritage: Historic Preservation in the Twenty-First Century by Robert E. Stipe



## **10166ARE42 – SAFETY SYSTEMS AND BUILDING MANAGEMENT**

**L T P/S C**  
**3 0 0 3**

### **AIM:**

The course is designed to impart the basic knowledge in Safety, security and building automation and integrated building management systems

### **OBJECTIVE:**

- To familiarize the student with minimum safety requirements for a high rise building with exposure to NBC.
- To study fire alarm systems and fire suppression systems and their installation..
- To inform students of various types of security systems and their application in building.
- To outline the importance and objectives of an Integrated building management system.

### **UNIT I**

#### **SAFETY REQUIREMENTS**

**5**

Minimum safety requirements for a building, particularly for a high rise building as per the National Building Code.

### **UNIT II**

#### **FIRE ALARM SYSTEMS**

**10**

Objectives of a Fire Alarm System, Essential components of a Fire Alarm System, Technology of detection, Type of Statutory Standards followed in direction, Explanation on the essential clauses, various types of technologies employed in the Fire Alarm System, basic knowledge on how a Fire Alarm System is designed and installed

### **UNIT III**

#### **FIRE SUPPRESSION SYSTEMS:**

**12**

Objectives of a Fire Suppression System, Explanation on fire triangle, Essential components of a Fire Suppression System, different types of Fire Suppression Systems, Type of Statutory Standards followed in Suppression, Explanation on the essential clauses and basic knowledge on how a Fire Suppression System is designed and installed.

### **UNIT IV**

#### **SECURITY SYSTEMS**

**12**

Introduction to different types of Security Systems and why they are required. Introduction to Access Control, CCTV, Intruder Alarm and Perimeter protection Systems, Essential components of each system, various types of technologies employed in these Systems, basic knowledge on how they are designed and installed.

### **UNIT V**

#### **INTEGRATED BUILDING MANAGEMENT SYSTEM**

**6**

The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

**Total: 45 Periods**

**REQUIRED READING:**

1. Building Automation Systems – A Practical Guide to selection and implementation – Author : Maurice Eyke
2. National Building Code of India 1983 (SP 7:1983 Part IV) – Published by Bureau of Indian Standards
3. IS 2189 – Selection, Installation and Maintenance of Automatic fire Detection and Alarm System – Code of Practice (3<sup>rd</sup> Revision) – Published by Bureau of Indian Standards.

**REFERENCES:**

1. The Principles and Practice of Closed Circuit Television – Author: Mike Constant and Peter Turnbull
2. Rules of Automatic Sprinkler Installation – 2<sup>nd</sup> Edition – Published by Tariff Advisory Committee.
3. Fire Suppression Detection System – Author : John L. Bryan
4. Design and Application of Security/Fire Alarm system – Author: John E. Traister.
5. CCTV Surveillance – Author: Herman Kruegle
6. Security Systems and Intruder Alarm Systems – Author: Vivian Capel

## 10166ARE43-PROJECT MANAGEMENT

**L T P/S C**  
**3 0 0 3**

### **AIM:**

To establish and develop project management skills and network techniques. At this stage the student are exposed to network logic and to develop alternate strategies

### **OBJECTIVES:**

- The students learn traditional management system.
- They learn project programming and unidimensional management techniques.
- They understand CPM network analysis and network logic
- They learn probabilistic time estimate and PERT network analysis.
- They are exposed to optimum solution of project time and cost.

### **UNIT I**

#### **INTRODUCTION TO PROJECT MANAGEMENT**

**6**

Introduction to project Management concepts - background of management, purpose, goal and objectives, characteristics of projects and different aspects of management. Traditional management system, Gantt's approaches load chart, progress-chart, bar-chart merits and limitation. Schedule, time estimates units

### **UNIT II**

#### **PROJECT PROGRAMMING**

**6**

Project programming, resources balancing, phasing of activities, programmes, scheduling, project control, reviewing, updating and monitoring.

Introduction to modern management, concepts, unidimensional management techniques - Introduction to PERT and CPM introduction to network concepts, network elements and inter-relationships.

### **UNIT III**

#### **NETWORK TECHNIQUES**

**12**

Network techniques, network logic - interrelationships, activity information, data sheets, and development of network.

CPM for management, CPM network analysis, identification of critical path floats computation result sheets.

### **UNIT IV**

#### **PERT NETWORK**

**6**

PERT Network, introduction to the theory of probability and statistics, probabilistic time estimation for the activities of PERT network

### **UNIT V**

#### **PROJECT COST**

**15**

Introduction to two dimensional network analyses, activity cost information. Cost time relationship, crashed estimates for the activities, compression potential, cost slope, utility, data sheet, project direct cost and indirect cost.

Crashed programmes, network compression least cost solution least time solution, optimum time solution.

Network techniques, PERT/CPM, generating alternative strategies using computers

**Total: 45 periods**

**TEXT BOOKS**

1. Dr. B.C. Punmiya and K.K. Khandelwal - Project Planning and Control with PERT\CPM Laxmi Publications, New Delhi, 2000.
2. S.P. Mukhopadyay, Project Management for Architects and Civil Engineers, IIT, Kharagpur, 2001

**REQUIRED READINGS**

1. Jerome D. Wiest and Ferdinand K. Levy, A Management Guide to PERT/CPM, Prentice Hall of Indian Pub. Ltd. New Delhi, 2001
2. SR.A. Burgess and G. White, Building production and Project Management, The Construction Press, London 2002.