

**MODEL CURRICULUM**

**FOR**

**UNDERGRADUATE PROGRAMME**

**IN**

**BACHELOR OF ARCHITECTURE 2013**



**ALL INDIA COUNCIL FOR TECHNICAL EDUCATION**

**7<sup>th</sup> Floor, Chandralok Building, Janpath**

**New Delhi ó 110 001**

## **Foreword**

It is with great pleasure and honour that I write a forward for the Model scheme of instruction and syllabi for the Undergraduate Engineering Degree programs prepared by the All India Board of Architecture Education with Prof. Rajiv Mishra as its Chairman and other members. All India Council for Technical Education has the onerous responsibility for uniform development and qualitative growth of the Technical Education system and preparation of syllabi to maintain uniform standards throughout the country. In pursuance to clause 10 (2) of the AICTE Act 1987 AICTE has the objective of bringing about uniformity in the curriculum of Engineering. In that direction, the efforts of the All India Board of Architecture Education has been quite commendable and praiseworthy. An academic effort was made by the Chairman, members of the Board and various working groups composed of experts from leading institutions in framing of the Instruction and Syllabi. The Board was ably assisted by the officials of the Academics Bureau in successfully organizing the meetings making available necessary documents and follow up action on the minutes of the meetings.

**Chairman**

**All India Council for  
Technical Education**

# BACHELOR'S DEGREE COURSE IN ARCHITECTURE

## Model Syllabus for the SEMESTER Academic Session

### APPROACH TO ARCHITECTURE EDUCATION – POLICY FOR FUTURE

#### GENERAL CONSIDERATIONS

That the new era will bring with it grave and complex challenges with respect to the social and functional degradation of many human settlements, characterized by a shortage of housing and urban services for millions of inhabitants and by the increasing challenges for the Professionals to address the gigantic task of large scale urbanization.

This makes it essential for projects and research conducted in academic institutions to formulate new solutions for the present and the future.

That architecture, the quality of buildings, the way they relate to their surroundings, the respect for the natural and built environment as well as the collective and individual cultural heritage are matters of public concern.

That there is, consequently, public interest to ensure that architects are able to understand and to give practical expression to the needs of individuals, social groups, and communities regarding spatial planning, design organization, and construction of buildings as well as conservation and enhancement of the built heritage, the protection of the natural balance, and rational utilization of available resources with emphasis on sustainable habitat.

That methods of education and training for architects are extremely varied; this constitutes a cultural richness which should be preserved.

Nevertheless, it is prudent to provide a common ground for future action, not only in the pedagogical methods used but also with the aim of achieving an appropriate elevated level by establishing criteria which permit countries, schools, and professional organizations to evaluate and improve the education given to the future architects.

In view of globalized economy and increasing mobility of architects between the different countries in the WTO regime, it calls for a mutual recognition or validation of individual degrees, certificates, and other evidence of formal qualification.

Therefore, the mutual recognition of degrees, certificates or other evidence of formal qualification and practice in the field of architecture has to be founded on objective criteria, **guaranteeing that holders of such qualifications have received and maintain the kind of training called for.**

That the vision of the future world cultivated in architectural schools should include the following goals:

- A decent quality of life for all the inhabitants of human settlements.
- A technological application which respects the social, cultural" and aesthetic needs of people.
- An ecologically balanced and sustainable development of the built environment.

### **EDUCATIONAL OBJECTIVES**

Since architecture is created as synthesis of reason, emotion, and intuition, architectural education should be regarded as the manifestation of the ability to conceptualize, co-ordinate, and execute the idea of building rooted in human tradition.

Architecture is an interdisciplinary field that comprises several major components: humanities, social and physical sciences, technology, and the creative arts. Architectural education is available at universities, polytechnics, and academies; The education leading to formal qualifications and permitting professionals to practice in the field of architecture has to be guaranteed to be at university level with architecture as the main subject.

The basic goal is to develop the architect as a generalist able to resolve potential contradictions between different requirements, giving form to the society's and the individual's environmental needs.

*Architectural education involves the acquisition of the following:*

- An ability to create architectural designs that satisfy both aesthetics and technical requirements.
- An adequate knowledge of the history and theories of architecture and the related arts, technologies, and human sciences.
- A Knowledge of the fine arts as an influence on the quality of architectural design.
- An adequate knowledge of urban design, planning and the skills involved in the planning process.
- An understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human needs and scale.
- An understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take into account social factors.
- An understanding of the methods of investigation and preparation of the brief for a design project.
- An understanding of the structural design, constructional, and engineering problems associated with building design.
- An adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate.
- The design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.
- An adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.

Architectural students should be made critically aware of the political and financial motivations behind clients' briefs and building regulations in order to foster an *ethical* framework for decision-making within the built environment. Young architects should be encouraged to assume responsibilities as professionals within society.

## SCHEME OF TEACHING AND EXAMINATION OF I SEM B.ARCHITECTURE.

Educational programmes should promote architectural design which considers the cost of future maintenance, also taking into account that, unlike traditional construction methods with low maintenance materials, some contemporary, experimental, and unproved industrial systems and materials require constant and expensive maintenance.

The training should be formalized by an examination at the end of the programme of studies, the principal part being an individual presentation and defence of an architectural project demonstrating the acquired knowledge and concomitant skills" For this purpose, juries should include practicing architects and teachers from other schools.

In order to benefit from the wide variety of teaching methods, exchange programmes for teachers and advanced level students are desirable. Ideally, final projects should be shared among schools as a means of facilitating comparison between results and self-evaluation of teaching establishments, through a system of national awards and exhibitions.

Research activities by the Faculties should be encouraged and mandated for upgradation of academic skills and encouragement to the students.

### OBJECTIVES

The Bachelor of Architecture Degree programme prepares students for professional practice in the field of Architecture. Being an undergraduate programme, it has a broad scope, providing exposure to a variety of interests in this field and assisting students to discover their own directions for further development.

There is increasing recognition today of Architecture as an intellectual discipline, both as art and as a profession. Architects make a vital contribution in the shaping of our environment and society, in the design and technology for a diverse range of situations, both in the rural and urban contexts. In India, we have further complexities of different social, cultural, geographical, economic and technical nuances which are unique and typical of every region in our country.

It is the appreciation of this over-changing context that the architect must bring to bear of his work. This demands appropriate skills, understanding and knowledge and a deep commitment to professed ideals. Addressing Architectural Design as a comprehensive creative process, this programme is based on the following broad intentions:

- a) To stimulate sensitivity and unveil creative talents.
- b) To reinforce intellectual capabilities and develop proficiency in professional skills to enable graduates to competently pursue alternative careers, within the broad spectrum of architecture.
- c) To provide opportunities to students to try out the role they will eventually play as responsible members of society, under supervision and interactive guidance.

Sl. No	Subject Code Units	Title of the Subject	Teaching Scheme in Periods per Week				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Term work Marks	Total
1.	1.1	<u>Architectural Design-I</u>	-	08	-	08	-	-	50	200	250
2.	1.2	<u>Building Construction &amp; Materials ó I</u>	01	05	-	06	-	-	50	100	150
3.	1.3	<u>Graphics ó I</u>	-	04	-	04	-	-	50	100	150
4.	1.4	<u>Early Civilizations ó Art, Culture and Architecture Structures ó I</u>	04	-	-	04	03	100	50	-	150
5.	1.5	<u>Structures ó I</u>	03	-	-	03	03	100	50	-	150
6.	1.6	<u>Basic Design &amp; Visual Arts</u>	-	06	-	06	-	-	50	-	50
7.	1.7	<u>Communication Skills</u>	02	-	-	02	-	-	50	-	50
8.	1.8	<u>Workshop ó I</u>	-	-	03	03	-	-	50	-	50
			10	23	03	36		200	400	400	1000

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Term work Marks 40%.

**SCHEME OF TEACHING AND EXAMINATION OF II SEM B.ARCHITECTURE.**

Sl. No.	Subject Code Units	Title of the Subject	Teaching Scheme in Periods per Week				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Term work Marks	Total
1.	2.1	<u>Architectural Design-II</u>	-	09	-	09	-	-	50	200	250
2.	2.2	<u>Building Construction &amp; Materials ó II</u>	01	05	-	06	-	-	50	100	150
3.	2.3	<u>Graphics ó II</u>	-	04	-	04	-	-	50	100	150
4.	2.4	<u>History of Architecture I</u>	04	-	-	04	03	100	50	-	150
5.	2.5	<u>Structures ó II</u>	03	-	-	03	03	100	50	-	150
6.	2.6	<u>Surveying &amp; Levelling</u>	02	-	02	04	03	100	50	-	150
7.	2.7	<u>Art Appreciation</u>	03	-	-	03	03	100	50	-	150
8.	2.8	<u>Workshop ó II (Arch. Model Making)</u>	-	-	03	03	-	-	50	-	50
			13	18	05	36		400	400	400	1200

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Term work Marks 40%.

**SCHEME OF TEACHING AND EXAMINATION OF III SEM B.ARCHITECTURE.**

Sl. No.	Subject Code Units	Title of the Subject	Teaching Scheme in Periods per Week				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	3.1	<u>Architectural Design ó III</u>	-	09	-	09	-	-	50	200	250
2.	3.2	<u>Building Construction &amp; Materials ó III</u>	01	05	-	06	-	-	50	100	150
3.	3.3	<u>Building Services ó I</u>	04	-	-	04	03	100	50	-	150
4.	3.4	<u>History of Architecture ó II</u>	04	-	-	04	03	100	50	-	150
5.	3.5	<u>Structures ó III</u>	03	-	-	03	03	100	50	-	150
6.	3.6	<u>Computer Applications in Architecture ó I</u>	-	-	06	06	-	-	50	-	50
7.	3.7	<u>Climatology</u>	04	-	-	04	03	100	50	-	150
8.	3.8	<u>Vacation Assignment /Study tour-I</u>	-	-	-	-	-	-	50	-	50
			16	14	06	36		400	400	300	1100

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Viva VOCE marks 50%.

**SCHEME OF TEACHING AND EXAMINATION OF IV SEM B.ARCHITECTURE.**

Sl. No.	Subject Code Units	Title of the Subject	Teaching Scheme in Periods per Week				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	4.1	<u>Architectural Design ó IV</u>	-	09	-	09	-	-	50	200	250
2.	4.2	<u>Building Construction &amp; Materials ó IV</u>	01	05	-	06	-	-	50	100	150
3.	4.3	<u>Building Services-II</u>	04	-	-	04	03	100	50	-	150
4.	4.4	<u>History of Architecture ó III</u>	04	-	-	04	03	100	50	-	150
5.	4.5	<u>Structures ó IV</u>	03	-	-	03	03	100	50	-	150
6.	4.6	<u>Computer Applications in Architecture ó II</u>	-	03	03	06	-	-	50	-	50
7.	4.7	<u>Climate Responsive Architecture</u>	-	04	-	04	-	-	50	-	50
			12	21	03	36	-	300	350	300	950

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Viva VOCE marks 50%.

**SCHEME OF TEACHING AND EXAMINATION OF V SEM B.ARCHITECTURE.**

Sl. No.	Subject Code Units	Title of the Subject	Teaching Scheme in Periods per Week				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	5.1	<u>Architectural Design ó V</u>	-	09	-	09	-	-	50	200	250
2.	5.2	<u>Building Construction &amp; Materials ó V</u>	01	05	-	06	-	-	50	100	150
3.	5.3	<u>Building Services-III</u>	04	-	-	04	03	100	50	-	150
4.	5.4	<u>History of Architecture ó IV</u>	04	-	-	04	03	100	50	-	150
5.	5.5	<u>Structures ó V</u>	03	-	-	03	03	100	50	-	150
6.	5.6	<u>Computer Applications in Architecture ó III</u>	-	-	03	03	-	-	50	-	50
7.	5.7	<u>Sociology &amp; Economics.</u>	04	-	-	04	03	100	50	-	150
8.	5.8	<u>Theory of Architecture ó I</u>	03	-	-	03	03	100	50	-	150
9.	5.9	<u>Vacation Assignment/Study tour- II</u>	-	-	-	-	-	-	50	-	50
			19	14	03	36		500	450	300	1250

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Viva VOCE marks 50%.

**SCHEME OF TEACHING AND EXAMINATION OF VI SEM B.ARCHITECTURE.**

Sl. No.	Subject Code Units	Title of the Subject	Teaching Scheme in Periods per Week				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	6.1	<u>Architectural Design ó VI</u>	-	09	-	09	-	-	50	200	250
2.	6.2	<u>Building Construction &amp; Materials ó VI</u>	01	05	-	06	-	-	50	100	150
3.	6.3	<u>Building Services-IV</u>	03	-	-	03	03	100	50	-	150
4.	6.4	<u>Contemporary Architecture</u>	03	-	-	03	03	100	50	-	150
5.	6.5	<u>Structures ó VI</u>	03	-	-	03	03	100	50	-	150
6.	6.6	<u>Estimating &amp; Costing</u>	03	-	-	03	03	100	50	-	150
7.	6.7	<u>Working Drawing</u>	-	06	-	06	-	-	50	-	50
8.	6.8	<u>Theory of Architecture ó II</u>	03	-	-	03	03	100	50	-	150
			16	20	-	36		500	400	300	1200

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Viva VOCE 50%.

SCHEME OF TEACHING AND EXAMINATION OF VII SEM B.ARCHITECTURE.

Sl. No.	Subject Code	Title of the Subject	Teaching Scheme in Periods per Week (50 Mts)				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	7.1	<u>Architectural Design ó VII</u>	-	09	-	09	-	-	50	300	350
2.	7.2	<u>Building Construction &amp; Materials ó VII</u>	01	05	-	06	-	-	50	100	150
3.	7.3	<u>Physical Planning</u>	03	-	-	03	03	100	50	-	150
4.	7.4	<u>Professional Practice ó I</u>	03	-	-	03	03	100	50	-	150
5.	7.5	<u>Structures ó VII</u>	03	-	-	03	03	100	50	-	150
6.	7.6	<u>Interior Design</u>	01	03	-	04	-	-	50	-	50
7.	7.7	<u>Landscape Architecture</u>	02	02	-	04	03	100	50	-	150
8.	7.8	<u>Earth Quake Resistant Structures</u>	04	-	-	04	-	-	50	-	50
			17	19	-	36		400	400	400	1200

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Viva VOCE marks 50%.

**SCHEME OF TEACHING AND EXAMINATION OF VIII SEM B.ARCHITECTURE.**

Sl. No.	Subject Code	Title of the Subject	Teaching Scheme in Periods per Week (50 Mts)				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
8.1		<u>Architectural Design Project(Thesis)</u>	-	12	*	12	-	-	200	300	500
8.2		<u>Elective-I</u>	03	-	-	03	-	-	50	-	50
8.3		<u>Elective-II</u>	03	-	-	03	-	-	50	-	50
8.4		<u>Professional Practice 6 II</u>	04	-	-	04	03	100	50	-	150
8.5		<u>Constitutional Law</u>	02	-	-	02	-	-	50	-	50
			12	12	-	24		100	400	300	800

Progressive Marks to be awarded by the subject teacher.

Minimum Marks for passing: Theory Marks 40%, Progressive Marks 50%, Viva VOCE marks 50%.

SCHEME OF TEACHING AND EXAMINATION OF IX SEM .ARCHITECTURE.

Sl. No.	Subject Code	Title of the Subject	Teaching Scheme in Periods per Week (50 Mts)				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	9.1	<a href="#"><u>Professional Training-I</u></a>	16 weeks				-	-	-	300	300

Minimum Marks for passing: Viva VOCE marks 50%.

SCHEME OF TEACHING AND EXAMINATION OF X SEM B.ARCHITECTURE.

Sl. No.	Subject Code	Title of the Subject	Teaching Scheme in Periods per Week (50 Mts)				Examination Scheme				
			Lecture	Studio	Pract	Total	Duration (hrs)	Theory Marks	Prog. Marks	Viva Marks	Total
1.	10.1	<a href="#"><u>Professional Training-II</u></a>	16 weeks				-	-	-	300	300

Minimum Marks for passing: Viva VOCE marks 50%.

\*The student has the choice to either do Professional Training II with the same Architectural firm under which he/she did Professional Training I or to do it in another firm for more exposure to different practice

## Unit 1.1: ARCHITECTURAL DESIGN-I

**CONTACT PERIODS: 8 (STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**TERM WORK MARKS : 200**

**OBJECTIVE:** To develop the ability to translate abstract principles of design into architectural solutions for simple problems.

**OUTLINE:** Basic anthropometrics, human functions and their implications for space requirements. Minimum and optimum areas for mono functions. User's data, Movement and circulation diagrams. Spatial interpretations of various activities and their relationship with spaces. Functional furniture layout, circulation, lighting and ventilation for spaces such as living/dining, bedrooms, Architect's office, Doctor's clinic etc., Design of simple building elements such as gate, welcome Arch, Memorial, edifice, Bus shelter and layout of parks, Design of Bungalows and integration of form and function.

Note- The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing.

The portfolio covering the above topics shall be presented for term work.

### **REFERENCES:**

1. "Time Saver Standards for Architectural Design Data" by John Hancock
2. "Architectural Graphic Standards" by Ramsay and Sleeper

## Unit 1.2: BUILDING CONSTRUCTION & MATERIALS-I

**CONTACT PERIODS: 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**TERM WORK MARKS : 100**

**OBJECTIVE:** To give an introduction to building elements and contemporary local construction methods and materials.

**OUTLINE: Construction** of Introduction to various building components and their function, various conventions used for drawing plan, sections and elevations.

Brick Construction of Types of brick masonry walls and bonds, foundations, plasters, buttresses, arches and lintels.

Stone construction of Types of walls, bonds, arches and lintels

Foundation of Functions of foundations, types of foundations, simple load bearing foundations in brick and stone

Concrete Blocks of Hollow and solid, stabilised mud blocks.

Doors of Types of wooden Doors, i.e., Battened, ledged, braced, panelled, flush and glazed

doors. Study of joinery details.

Windows ó Types of wooden glazed windows, study of joinery details.

### **Materials –**

Introduction to Material Science.

Bricks and Tiles ó Types, properties, uses and manufacturing methods.

Stones ó Types, properties and uses, quarrying

Sand ó Availability, properties

Aggregate ó Sources and types

Timber ó Quality of timber used in buildings, defects, seasoning and preservation of timber.

Types ó Natural, hard and softwood.

Introduction to types, properties, uses and application of non-ferrous metals.

Note ó Minimum one plate on each topic, site visits to be arranged by studio teacher. Study of material application in the form of portfolio. All the plates on construction and portfolio on material application shall be presented for term work.

### **REFERENCES:**

1. óBuilding Constructionö by W.B. Mackay
2. óConstruction Technologyö by Chudley
3. óConstruction of Buildingsö by Barry

## Unit 1.3: GRAPHICS-I

**CONTACT PERIODS: 4 (STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**TERM WORK MARKS : 100**

**OBJECTIVE:** To introduce the students to the fundamental techniques of architectural drawings.

**OUTLINE:** Introduction to the basic principles of drawing, sign conventions. Practice in lettering, lettering used in architectural drawings, including different fonts. Introduction to plane geometry and exercises in lines and angles, construction of triangles, quadrilaterals and regular polygons. Construction of plane curves, ellipse, parabola, hyperbola and ovals. Arches, typical arch forms and methods of drawing them. Scales, construction of plain and diagonal scales and their uses in practice. Orthographic projection (first angle projection). Principles of orthographic projection, projection of points, lines, planes, solids. Three dimensional representation, isometric and axonometric projection of solids.

Plates on each of the above topics shall be presented for term work.

### **REFERENCES:**

1. ÷Engineering Drawingö. by ND Bhat
2. ÷Geometrical Drawing for Arts Studentsö by IH Morris
3. ÷Engineering drawing Vol I and IIö by KR Gopalakrishna

## Unit 1.4: EARLY CIVILISATIONS- ART, CULTURE AND ARCHITECTURE

**CONTACT PERIODS: 4 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**PROGRESSIVE MARKS : 50**

**EXAM MARKS : 100**

**OBJECTIVE:** To provide an introduction to the culture and architecture of early civilizations.

**OUTLINE:** Critical appreciation of works and synoptic study of architectural characteristic features from the following phases and periods: Pre-Historic world ó Primitive man - shelters, settlements, religious and burial systems

Eg: Oval hut, Nice, Dolmen tomb, gallery grave, passage grave Houses at Catal Huyuk, Henge Monuments, Stone Henge

River valley cultures ó Indus, Tigris and Euphrates, Nile, Pre-classical Aryan, Vedic and Epic Age, Mauryan and early Buddhist Cultures, Design norms, standards, prescription and style.

Eg: Layout of Mohenjodaro, House plan, Community well, Great Bath, Granary, Ziggurats at Warka, Ur and Tchoga Zanbil, Palace of Sargon, Mastaba Tombs, Pyramid of Cheops, Temple of Khons, Karnak, Vedic Village.

Classical (Buddhist) ó Mahayana phase, stupa and rock cut cave architecture Pre-Classical- Mycenea, Persia, Etruscan.

Eg: Great Stupa at Sanchi, Chaitya at Karli, Viharas at Ajanta, Toranas at Sanchi, The Palace, Tiryns, The Temple of Juno Sospita, Lanuvium, The Palace of Persepolis.

### **REFERENCES:**

1. "History of Architecture in India" by Tadgell Christopher
2. "Indian Architecture, Buddhist and Hindu period" by Brown Percy
3. "Architecture of India, Buddhist and Hindu" by Grover, Satish

## Unit 1.5: STRUCTURES I

**CONTACT PERIODS: 3 (LECTURE PER WEEK)**

**DURATION OF EXAM : 3 HRS**

**PROGRESSIVE MARKS : 50**

**EXAM MARKS : 100**

**OBJECTIVE:** To give an introduction to the basic principles governing structural systems.

**OUTLINE:** Principles of Statics - Scalars and Vectors. Characteristics and classification of forces. Composition and resolution of forces. Principle of transmissibility of forces. Resultant and equilibrant of coplanar, concurrent and non-concurrent force systems. Equations of static equilibrium. Free-body Diagrams. Equilibrium of coplanar, concurrent and non-concurrent force systems. Support Reactions ó Types of loading and support conditions and their significance. Concept of statically determinate and indeterminate structures. Determination of support reactions for statically determinate beams and trusses.

2. Friction ó Types of friction, laws of dry friction, problems on block, wedge, ladder
3. Centroid and moment of Inertia ó Determination of Centroid of simple lamina (symmetrical and asymmetrical). Moment of Inertia and Radius of Gyration of simple cross-sections of beams and columns including built-up sections. Concept of Polar Moment of Inertia.
4. Analysis of Trusses ó Definition of perfect, deficient and redundant trusses. Analysis of determinate trusses by method of joints and method of sections(only theory and no problems).

**REFERENCES:**

1. Engineering Mechanics ó RK Bansal and Sanjay Bansal, Laxmi Publications, New Delhi, Third edition.
2. Engineering Mechanics ó Ferdinand L Singer, Harper Collins Publications, Third Edition

## Unit 1.6: BASIC DESIGN & VISUAL ARTS

**CONTACT PERIODS:6 (STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**OBJECTIVE:** To introduce and develop an understanding of principles of design in abstract and to introduce the student to visual arts.

**OUTLINE:** Understanding the design elements like Line, Shape, Texture, Colour. Design principles like Contrast, Harmony, Rhythm, Proportion and Unity. Application of design principles in two dimensional and three dimensional compositions. Freehand drawing ó Use of various drawing and sketching tools like pencils, ink pens, charcoal pencils etc., Exercises in free hand drawing of household furniture, street furniture, human beings, cars, trees etc.,

Painting ó Use of Painting tools and materials like easels, brushes, paper, water colour, poster colour etc., Colour theory, colour wheel, Primary, secondary and tertiary colours, colour schemes, exercises in understanding of colour value and intensity.

Sculpture ó Sculpture in different media, clay, plaster of Paris, Wood, Wire and any other media

### **REFERENCES:**

1. -Principles of three Dimensional Designøby Wucius Wong
2. -Principles of two Dimensional Designøby Wucius Wong
3. -Principles of color compositionøby Wucius Wong
4. øRendering with Pen and Inkø by Robert Gill

## Unit 1.7: COMMUNICATION SKILLS

**CONTACT PERIODS: 2 (LECTURE) PER WEEK**

**PROGRESSIVE MARKS : 50**

**OBJECTIVE:** To develop skills in effective communication ó both written and verbal.

**OUTLINE:** Understanding the differences among seminars, conferences, convention, congress, debates, extempore speeches, panel discussions etc., Verbal presentations on architectural topics.

- Simple grammar ó using appropriate words, filling of blanks, completing of sentences, active and passive voice, correcting mistakes in texts. Use of proverbs, metaphors.
- Reading and listening comprehension, to develop the ability to read and listen with understanding and draw reasoned conclusions.
- Interpretation of materials such as questionnaires, application forms, analysis of materials such as texts, reports, technical literature.
- Notes taking from spoken and written English.
- Comprehension of lectures and speeches to locate key points.

Writing ó To develop the ability to write concisely and correctly and present ideas in a logical manner. Professional letters to fellow architects, clients, public authorities, contractors, enquiries to industries, dealers. Essay writing on current political, technical and social problems.

### **REFERENCES:**

1. Working in English: Teachers Book, Jones Leo.
1. Communicative English for Professional Courses, Mudambadithaya G.S.
2. English Conversation Practice, Taylor, Grant.

## Unit 1.8: WORKSHOP-I

**CONTACT PERIODS: 3 (PRACTICAL) PER WEEK**

**PROGRESSIVE MARKS : 50**

**OBJECTIVE:** To train the students in basic skills of carpentry.

**OUTLINE:** Carpentry ó Introduction to the use of different types of tools used in carpentry.

Joints ó Different types of joints, joinery details (which are commonly used in timber construction and interiors). Application of veneers/laminates on different types of timber surfaces i.e., Teak and commercial woods viz ply, block boards, particle boards. Engraving and carving. Polishing and painting. Clay Work, brick, cob, wattle and daub, rammed earth Masonry construction ó walls, arches and corbel

Marking of geometrical forms on the ground.

## Unit 2.1 ó ARCHITECTURAL DESIGN - II

**CONTACT PERIODS :9 (STUDIO) PER WEEK**

**TERM WORK MARKS: 200**

**PROGRESSIVE MARKS : 50**

**OBJECTIVE:**

1. To expose the students to the grammar of creating architectural space and form.
2. To study individual variables like light, movement, transformation, scale, structure and skin in the formation and evolution of architectural form
3. To explore the relationship between human feelings and architectural form

**OUTLINE:**

In the earlier part of the studio, projects shall be restricted to walls, floors, roof planes, openings and structural elements. Functional assignment to spaces shall be avoided to restrict the dimensions of investigation. Projects shall be attempted with the help of models and sketches. Space making projects may be tied to the context, but objective shall be to illustrate the variables like colour, material, texture and scale in evoking the necessary conditions for the prescribed activity. Final project shall be formulated as a process of testing the various elements of space making learnt earlier in the semester.

Eg: Nursery School, Primary Health Center, Post Office, Bank Branch, Guest House, Restaurant etc.

Term work: Minor Exercises related to building elements mentioned in the outline and One Major Project presented in the form of a portfolio.

## Unit 2.2: BUILDING CONSTRUCTION & MATERIALS-II

**CONTACT PERIODS: 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**TERM WORK MARKS : 100**

**OBJECTIVE:** To acquaint the students with contemporary construction practices pertaining to roofing for medium spans, foundations and staircases.

**OUTLINE: Construction –**

Roof ó Timber and steel trussed roof, various parts, their purposes and method of construction. Use of AC sheet, GI sheets and aluminium sheets for roofing.

Study of principles and methods of construction of RCC foundations and columns, types of foundations ó Raft foundations, Grillage foundations and combination. Requirements of staircase. Types of Staircases, construction methods of ó Masonry staircase, timber staircase, RCC staircase, steel Staircase and composite staircase. Study of fire escape staircase

## **Materials – Cement – Types of cement, their applications, laboratory and field tests.**

Concrete Ingredients, grades of concrete, admixtures, properties of concrete, form work, production of concrete, mix, proportioning, mixing, transporting, placing, compaction, curing of concrete, sampling and testing of concrete. Concreting under water, special concretes like light weight and heavy weight concrete. Construction joints, expansion joints, finishes in concrete, chemical admixtures

Properties and architectural uses of mild steel and stainless steel.

Note ó Minimum one plate on each topic. Site visits to be arranged by studio teachers. Study of material application in the form of portfolio. The portfolio pertaining to the topics on construction and materials shall be presented for term work.

### **REFERENCES:**

- 1 öBuilding Constructionö by W.B. Mackay
- 2 öConstruction Technologyö by Chudley
- 3 öConstruction of Buildingsö by Barry

## Unit 2.3: GRAPHICS-II

**CONTACT PERIODS : 4 (STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**TERM WORK MARKS : 100**

**OBJECTIVE:** To introduce the students to the fundamental techniques of architectural drawings and to enhance their visualisation skills.

**OUTLINE:**

- Section of solids, true shapes of sections
- Development of surfaces
- Inter-penetration of geometric solids, prism with prism, cylinder with cylinder, cone with cylinder, cylinder with prism.
- Perspective ó principles and visual effects of three dimensional objects
- Study of picture plane, station point, vanishing point, eye level, ground level, their variation and their resultant effects.
- Perspective drawings of simple geometrical objects like pyramids, cubes, prisms, cylinders, cones and their combinations.
- Freehand perspectives of simple objects.
- Principles of drawing shade and shadow with source of light being Sun.

The class work portfolio pertaining to the above topics shall be presented for term work.

**REFERENCES:**

- 1     ōEngineering Drawingö. by ND Bhat
- 2     ōGeometrical Drawing for Arts Studentsö by IH Morris
- 3     ōEngineering drawing Vol I and IIö by KR Gopalakrishna
- 4     ōPerspectiveö by SH Mullik

## Unit 2.4: HISTORY OF ARCHITECTURE-I

**CONTACT PERIODS: 4 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**PROGRESSIVE MARKS : 50**

**EXAM MARKS : 100**

**OBJECTIVE :** To develop the appropriate skills of reading, discussion and writing as well as understanding of the physical experience of buildings in order to appreciate the complexity of the influences bearing on architecture, as reflected in the major historical periods.

**OUTLINE:** Critical appreciation of works and synoptic study of architectural characteristics, features from the following phases and periods.

Classical ó Greek and Roman, study of principles of design, proportion, composition, visual effects

Eg: Doric, Ionic, Corinthian, Tuscan & Composite orders, Optical Corrections, Parthenon, Theatre at Epidauros, Pantheon, Colosseum, Thermae of Caracalla, Pont du gard, Nimes, Basilica of Trajan, Arch of Septimius Severus, Column of Trajan.

Ecclesiastical ó Early Christian, Byzantine, Medieval and Gothic

Eg: Basilican church of St Peter's, St Clemente, Baptistery at Nocera, Hagia Sophia, Pisa Cathedral, The Campanile and Baptistery, Pisa, Angouleme Cathedral, Notre Dame, Paris.

**References:**

1. History of Architecture by Sir Bannister Fletcher
2. Architecture of the world - Greece by Henri Stierlin
3. Architecture of the world - The Roman Empire by Henri Stierlin
4. Architecture of the world - Romanesque by Henri Stierlin

## Unit 2.5: STRUCTURES II

**CONTACT PERIODS: 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**PROGRESSIVE MARKS : 50**

**EXAM MARKS : 100**

**OBJECTIVE:** To give an introduction to the basic principles governing structural systems.

**OUTLINE:**

1. Simple Stresses and Strains ó Concept of Deformable Bodies, Types of stresses (compressive, tensile, bending, shear) and strain (axial, shear, volumetric). Simple problems. Modulus of Elasticity, Typical stress-strain behaviour of steel and concrete.
2. Elastic Constants- Elastic constants, Rigidity Modulus, Poisson's Ratio, Bulk Modulus and Shear Modulus. Relations- Modulus of Elasticity and Modulus of Rigidity. Application to uniform sections
3. Bending Moment and Shear Force Diagrams ó Concept of Shear force and Bending Moment. BMD and SFD for statically determinate beams subjected to combinations of concentrated and uniform loadings, uniformly varying load. Relationship among Load, Shear force and Bending Moment.
4. Bending and Shear Stresses for Beams ó Theory of Bending with assumptions. Flexure formula. Bending stress distribution for simple sections (symmetrical about vertical axis). Strength of a section. Equation for shear stress distribution across a section. Shear stress distribution for simple sections.

**References:**

- 1 ó Strength of Materials ó RK Bansal, Laxmi Publications, New Delhi, Third Edition
- 2 ó Applied Mechanics and Strength of Materials ó IB Prasad

## Unit 2.6: SURVEYING & LEVELLING

**CONTACT PERIODS: 4 (2 LECTURE + 2 PRACTICAL) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**PROGRESSIVE MARKS : 50**

**EXAM MARKS : 100**

**OBJECTIVE:** To develop the knowledge and skills related to surveying and levelling principles and practice.

**OUTLINE:** Surveying ó Definition, classification, principles of surveying, character of work, shrunk scale.

Chain Survey ó Instruments used, Types of chain, Instruments for ranging. Setting out angles, erecting perpendiculars.

Field Work ó Chain triangulation, recording and plotting, errors in survey.

Plane table survey ó Plane table and accessories. Methods of plane table survey, Radiation, Intersection, traversing and resection, field problems.

Levelling ó Definition, classification, booking and reduction of levels, longer levelling, errors  
Theodolite ó Study of instruments, definition of different terms, temporary adjustments, uses, measuring horizontal and vertical angles, method of repetition, extension lines

Contouring ó Characteristics of contours, direct and indirect methods of contouring, interpolation, uses of contours, setting out works such as centre lines of a building, grade for sewer, centre line of a bridge.

**References:**

1. óSurveying Vol Iö by DR PC Punmia
2. óSurveying and Levelling (Part-1)ö by Kanetkar TP and Kulkarni SV

## Unit 2.7: ART APPRECIATION

**CONTACT PERIODS: 3 ( LECTURE ) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**PROGRESSIVE MARKS : 50**

**EXAM MARKS : 100**

**Objective:** To provide appreciation and understanding of various types of arts.

**Outline:** What is a work of Art? Role and meaning of art-various types of arts- fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art etc., relationship of architecture with other arts like Painting and Sculpture.

Nature and characteristics of the following types of arts.

1. Painting
2. Sculpture
3. Architecture
4. Dance
5. Drama
6. Music
7. The Film
8. Literature
9. Photography
10. Almost Art

**References:** ÷Humanities through the Artsö by F. David Martin and Lee A Jacobus

Unit 2.8: WORKSHOP II (ARCHITECTURAL MODEL MAKING)

**CONTACT PERIODS : 3 (PRACTICAL) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To develop the ability to appreciate the three dimensional implications of design and to introduce the students to the techniques of model making.

**Outline:** Making of three dimensional forms such as cubes, pyramids, cones etc.,  
Using different types of materials such as paper, card board, mount board, balsa wood, wax, plaster of Paris etc.,

## Unit 3.1 ó ARCHITECTURAL DESIGN - III

**CONTACT PERIODS: 9 (STUDIO) PER WEEK**

**VIVA MARKS: 200**

**PROGRESSIVE MARKS : 50**

### **Objectives:**

1. To understand the meaning of cultural and physical context of built environment and techniques of reading such contexts
2. To isolate the various factors of the context, which influence the design of built environments
3. To understand the nature of place making as an architectural goal

### **Projects:**

Studio projects shall be structured to deal with two (or more) distinctly different contexts with programme being identical. Studio could be divided into two groups with different sites and resulting solutions shall be discussed in the class to highlight the various differences, which can be attributed to the contextual reasons. In the second project, context with a number of constraints shall be chosen and the process of enhancing the context, in other words, "Place Making" shall be investigated. Studio shall attempt to define the nature of relation between built and un built spaces and the need of using un built spaces for programmatic needs shall be highlighted.

Eg: Hotel, Motel, Recreation Club, Museum, Polyclinic, Nursing home etc. One minor / time problem and one major Project shall be presented for viva exam.

## Unit 3.2 ó BUILDING CONSTRUCTION & MATERIALS ó III

**CONTACT PERIODS: 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**VIVA MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To acquaint the students with construction practices pertaining to RCC ,floors, roofs and flooring with different materials..

**Outline: Construction** - Study of principles and methods of construction of RCC, one way, two way slabs-cantilever slabs, sloping RCC roof, vaults, domes including form-work techniques and reinforcement details. Construction with materials alternative to RCC.

Flooring ó in mud, murrum, stones ó marble, granite, tandur/kota stone, mosaic, terrazzo, ceramic tiles and wooden flooring

Paving ó Cast in situ concrete, concrete tiles, interlocking blocks, clay tiles, brick and stone

Plaster ó Method of plastering a) Internal (use of various finishes viz., lime, cement, plaster of paris, puffing etc., b) External ó smooth, rough, textured, grit plaster

**Materials** – Paints, varnishes and distempers, emulsions, cement base paints. Constituents of oil paints, characteristics of good paints, types of paints and process of painting different surfaces. Types of varnish, methods of applying varnish and French polish and melamine finish.

Note ó Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material applications in the form of portfolio. The entire portfolio on Construction and Materials shall be presented for viva exam.

### **References:**

- 1) óConstruction Technologyö by Chudley
- 2) óBuilding Materialsö by Duggal SK

## Unit 3.3 ó BUILDING SERVICES ó I (WATER SUPPLY AND SANITATION)

**CONTACT PERIODS: 4 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**THEORY MARKS: 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To impart the knowledge and skills required for understanding the building services of water supply and sanitation and their integration with architectural design.

**Outline: Water Supply** ó Introduction, sources of water supply, qualitative and quantitative aspects, impurities, purification ó sedimentation, coagulants, filtration, disinfection, water softening and miscellaneous treatment of water. Sources of water pollution and preventive measures. Public water distribution system, methods of layout of distribution pipes.

Pipe sizes, fittings, valves, types of taps, wash basins, sink, bath tubs, flushing cistern. Domestic water supply systems ó mains, ferrules, service pipe, water meter, sump, pumps, overhead tank, distribution pipes, cold water and hot water supply for single and multistoried buildings,. Provision for fire fighting ó fire hydrants. Study of solar heating systems, gas and electric geysers.

**Sanitation** ó Introduction, importance and purpose of sanitation, definitions ó bacteria, invert, sewer, sewerage, types of refuse, collection and disposal of refuse, systems of drainage ó separate, combined and partially separate system, advantages and disadvantages of each system. Sanitary requirements for various types of buildings, types of pipes.

Man holes ó drop manholes, manhole with intercepting trap, inspection chambers, self cleansing velocity, drains on sloping sites, sub soil drainage, storm water disposal ó catch basins, inlets, storm water regulators.

Importance of pumps and sewage pumping stations, septic tanks ó soak pit, soak well, design aspects, disposal of effluent.

House drainage ó principles, traps-floor trap, multi-trap, gully trap, grease and oil trap, urinals, Indian, European, Anglo Indian type of water closet, squatting urinal, bidet

Definitions ó Siphonage, anti-siphonage pipe, cowl, fresh air inlet, soil and waste pipes, vent pipe

Systems of plumbing ó single stack, one pipe, one pipe partially ventilated, two pipe disposal of waste water from buildings ó typical plan of residence with garage ó showing all the traps, inspection chambers, pipes connected to public sewer line ó alternatively connecting the same layout of pipes to septic tank.

Testing of drains and drain pipes

Brief study - Natural methods of sewage disposal ó by dilution and land treatment, self purification of natural waters, oxidation, sewage treatment, oxidation ponds, aqua privy, garage drainage and layout of simple drainage systems, sewers, materials, laying and testing of sewers, ventilation of sewers, surface drains, sewer, cleaning of sewers, re-cycling of sewage water. Rain water harvesting.

Rural sanitation, biogas, different methods of collection and disposal of dry refuse and night soil

Site visits ó Water treatment plant, sewage treatment plant, multistoried apartments for studying water supply and sanitary arrangements.

**References:**

- 1) "Sanitary Engineering ó (Vol I and II)" by RS Deshpande
- 2) "Water supply and Sanitary Engineering" by S Birdii
- 3) "Relevant IS Codes of India"

## Unit 3.4 ó HISTORY OF ARCHITECTURE ó II

**CONTACT PERIODS: 4 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**THEORY MARKS: 100**

**PROGRESSIVE MARKS : 50**

**Objective:**To provide an understanding of the evolution of Hindu Architecture in India in its various stylistic modes, characterized by technology, ornamentation and planning practices

**Outline:**Evolution of Hindu temple ó both Indo Aryan and Dravidian ó Early temples at Udaigiri, Tigawa and Sanchi óExperiments at Aihole (Durga temple and LadKhan temple), Deogarh, Bhitargaon and Badami.

Beginnings of Dravidian architecture ó Pallavas, rathas at Mamallapuram, Shore temple, Kailsanatha and Vaikuntaperumal temples at Kancheepuram.

The Cholas ó Brihadeshwara temple at Thanjavur and Gangaikonda Cholapuram.

The Pandyan contribution ó gopurams

The Hoysala temples at Belur, Halebid and Somnathpur.

Eg: Channakesava temple, Belur, Hoysalesvara temple, Halebid, Kesava temple, Somnathpur

Indo Aryan Mode ó the beginnings in Orissa ó the Lingaraja at Bhubaneshwar.

Hindu architecture at Rajputana (Temple of Surya, Osia, Marwar) and Gujarat (Temple of Surya, Modhera). The Khajuraho group ó Khandariya Mahadev, Jain temples ó Chaumukh temple at Ranpur

Later Dravidian period ó the Vijayanagar and Madurai Dynasties ó Noted temples at Hampi (Vitthala temple and Hazara Rama temple), Madurai (Meenakshi temple) and Srirangam.

### **References:**

- 1) óIndian Architecture, Buddhist and Hindu Periodö by Brown, Percy
- 2) óArchitecture of India ó Buddhist and Hinduö by Grover Satish

## Unit 3.5 ó STRUCTURES ó III

**CONTACT PERIODS: 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**THEORY MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To give an insight into the structural behavior of columns and beams

**Outline:** Introduction to Torsion theory with simple problems.

Columns and Struts ó Effective length, critical load, slenderness ratio, Euler's equation for different end conditions. Rankine's formula Slope and deflections of Cantilever, simply supported and overhang beam using double integration and Macaulay's method of different load conditions. Moment area method for simple case of loading

Note: The teacher is also expected to expound the structural concepts introduced in non-mathematical terms with examples and application in architectural design.

**References:**

- 1) óStrength of Materialsö by SS Bhavikatti
- 2) óStrength of Materialsö by Basavarajaiah BS and Mahadevappa

## Unit 3.6 6 COMPUTER APPLICATIONS IN ARCHITECTURE-I

**CONTACT PERIODS: 6 (PRACTICAL) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:**

To develop awareness and familiarity with Computer applications in architecture and to equip students with skills required in using Computers as a digital media for design.

**Outline:**

Introduction to 3-D modeling and integrating architectural design with 3-D model building and generating 2-D drawings, using application software like Auto CAD, REVIT, Archi CAD etc.

Use of Computers for scanning, image editing & presenting with softwares like Adobe packages.

**Assignment:** Implementation of the above for a design project of second semester.

## Unit 3.7 ó CLIMATOLOGY

**CONTACT PERIODS: 4 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**THEORY MARKS: 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To develop the knowledge required for understanding the influence of climate on architecture.

**Outline:** Introduction ó Elements of climate, measurement and representations of climatic data. Classifications of tropical climates, Major climatic zones of India.

Thermal comfort: Effect of climatic elements on thermal comfort environment. Body's heat exchange with surrounding environment. Thermal comfort indices viz., Effective temperature, bio-climatic chart etc., Kata-thermometer and globe thermometer.

Thermal performance of building elements: effect of thermo-physical properties of building materials and elements on indoor thermal environment. Thermal properties. Conductivity, resistivity, diffusivity, thermal capacity and time lag and  $U$  value. Construction techniques for improving thermal performance of walls and roofs. Natural ventilation: Functions of natural ventilation, Design considerations, effects of openings and external features on internal air flow.

Site Climate: Effect of landscape elements on site/micro climate.

Day Lighting: Advantages and limitations, Day light factor, components of Day light factor, design considerations.

Shading devices ó Sun-path diagram, use of solar charts in climatic design. Types of shading devices. Procedure of designing shading devices. Design considerations for buildings in tropical climates with special reference to hot-dry, warm-humid and composite climates

**References:**

- 1) óManual of Tropical Housing & Buildings (Part-II)ö by Koenigsberger
- 2) óHousing, Climate and Comfortö by Martin Evans
- 3) óBuildings in the tropicsö by Maxwell Fry
- 4) Climate Responsive Architecture öby Arvind Kishan, Baker & Szokolayö.

### Unit 3.86 VACATION ASSIGNMENT/STUDY TOUR 6 I

#### **PROGRESSIVE MARKS : 50**

**Objective:** To expose students to Historical, Vernacular and Contemporary architecture.

**Outline:** Vacation Assignment/ Study tour is to be undertaken after the end of II semester exam and before the commencement of III semester classes. This assignment could be a measured drawing and documentation of a noted building or a study tour for visiting places of architectural interest. The choice of the building to be documented and the places to be visited is left to the concerned department. The assignment may be given as group work (4 to 6 students per group). The students have to submit a report on the measured drawing or the study tour within 15 days from the beginning of the III Semester. The reports are to be assessed by the departments for progressive marks.

**CONTACT PERIODS: 9 (STUDIO) PER WEEK**

**VIVA MARKS : 200**

**PROGRESSIVE MARKS : 50**

**Objectives:**

1. To understand the difference in housing as a process and a product, the role of an architect in creating the product and facilitating the process
2. To understand the needs of privacy, communal spaces, efficiency of open spaces and ideas of extended living areas
3. To differentiate and understand the nature of organic and planned communities.

**Outline:**

Scale of the project shall be limited to allow for intensive study rather than repetition of typical configuration. Housing projects can be attempted with added complexities for example, dense context, occupation based, traditional urban fabric, social status and prevalent social strata. Details from the dwelling cell to immediate shared space to communal space shall be emphasized and worked out. Socio cultural layer of the occupants shall form a strong fabric in the ultimate weave of the design. Projects shall aim at developing a very sensitive attitude towards micro level human habitation and role of architecture in enhancing or curbing the quality of living.

Eg: Apartments for IT employees, Govt. servants, teaching faculty, Textile weavers, etc.

Luxury flats in the center of the city. Group Housing in the suburbs.

**Note:** The design shall be sensitive to the needs of disabled, aged people and children. The context for the design problems could be both rural and urban.

One major project and one minor/ time problem to be tackled in the semester.

Detailing of architectural features of the major project like entrance lobby, skylights and staircases has to be attempted.

## Unit 4.2 ó BUILDING CONSTRUCTION & MATERIALS ó IV

**CONTACT PERIODS : 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**VIVA MARKS : 100**

**PROGRESSIVE MARKS : 5**

**Objective:** To study construction systems with focus on roofing and techniques of pile foundation and metal doors, windows and partitions.

**Outline:**

**Construction** – Mild steel and Aluminium doors and windows and partitions. Details of RC framed structures with reinforcements, beams including cantilever beams, columns, flat slab, ribbed filler slabs, waffle roof.

Pile foundation ó Precast piles, cast-in-situ piles, types of piles, method of driving piles, pile caps etc.,

**Materials** – Anti-termite treatment to foundation, masonry walls and wood work (pre construction) water proofing materials and weather proofing materials like chemical admixtures and surface applications. Lime and brick bats etc., Pest control treatment.

Note ó Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material application in the form of portfolio. The entire portfolio on construction and materials shall be presented for viva exam.

**References:**

- 1) óConstruction Technologyö by Chudley
- 2) óBuilding Materialsö by Duggal SK

**(ELECTRICAL SERVICES & ILLUMINATION)**  
**CONTACT PERIODS : 4 (LECTURE) PER WEEK**  
**DURATION OF EXAM : 3 HRS**  
**EXAM MARKS: 100**  
**PROGRESSIVE MARKS : 50**

**Objective:**

To introduce students to electrical services and illumination and to sensitise them with respect to their integration into Architectural Design.

**Outline:** Part ó A

Importance of electrical services in buildings, introduction to commonly used terminology

Supply and distribution of electricity to buildings ó substations (including ó high tension panels, transformers, low tension panels, generators) and overhead versus underground distribution systems, panel boards etc.,

Internal supply and distribution ó brief description of various cabling types, conduit, PVC casing and capping wiring systems;

Earthing and brief description of protective devices ó fuses, MCBs, ELCB, etc.,

Electrical load estimation

Introduction to power and lighting circuits (Not to be asked in the exam)

Indian Electricity Rules-Relevant codes of Practice

Part-B

Quality and quantity of light;

Methods of lighting: ambient, task and accent lighting

Systems of luminaries: direct, indirect etc

Various types of electrical lamps ó incandescent, fluorescent/CFL, HIDs, neon lamps and their lighting characteristics

Design considerations for different types of occupancies and tasks

Preparation of a lighting and electrical scheme

**References:**

- 1) -Electrical Technology by H Cotton.
- 2) -Electrical Wiring, Estimating & Costing by L.Uppal.
- 3) -Basic Electrical Engg by Anwari.

**CONTACT PERIODS: 4 ( LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS: 100**

**PROGRESSIVE MARKS : 50**

**Objective:**

To provide an understanding of the evolution of Islamic and Colonial Architecture in India in their various stylistic modes characterized by technology, ornamentation and planning practices.

**Outline:**

Coming of Islam in 11<sup>th</sup> century AD

Imperial Style ó Slave, Khilji, Tughlaq, Sayyid & Lodi dynasties

Eg: Quwaat-UI-Islam Mosque, Qutb-Minar, Enlargement of Quwaat-UI-Islam Mosque by Iltumish, Tomb of Itumish, Enlargement of Qutb complex by Ala-Ud-din Khilji,

Alai Darwaza, Tomb of Ghias-Ud-in Tughlaq, Khirki Masjid, Delhi, Tomb of Feroz Shah Tughlaq, Shish Gumad & Tomb of Mubarak Shah Sayyid.

Provincial Style ó Ahmedabad, Jaunpur, Bengal and Bijapur

Eg: Atala Masjid, Jaunpur, Jami Masjid, Jaunpur, Jami Masjid, Bijapur, Ibrahim Rauza, Bijapur

Gol Gumbaz, Bijapur, Adina Masjid, Pandua, Eklakhi tomb, Pandua, Dakhil Darwaza, Gaur, Jami Masjid, Ahmedabad.

Moghul period ó Monumental buildings in the regime of Humayun, Akbar, Jehangir, Shahjahan & Aurangzeb.

Eg: Humayanø tomb, Fatehpur Sikri (layout, Jami Masjid, Buland Darawaza, Tomb of Salim Chisti, Diwani Khas), Akbarø Mausoleum, Taj Mahal.

Arrival of British ó Early colonial period, monumental buildings executed in the regime India Company up to middle of 19<sup>th</sup> century

Eg: St Paulø Cathedral, Calcutta & Bombay Town Hall.

Later colonial period ó Contribution of Edwin Lutyens and Herbert Baker to the layout and architecture of New Delhi

Eg: Layout of New Delhi, Rashtrapathi Bhavan and Parliament House.

**References:**

- 1) øHistory of Architecture in Indiaö by Tadgel, Christopher
- 2) øIndian Architecture ó Islamic periodö by Brown, Percy

**CONTACT PERIODS : 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To give an insight into the structural behaviour of portal frames.

**Outline:**

Analysis of propped cantilever, fixed beams, Shear Force Diagrams and Bending Moment Diagrams. Analysis of continuous beam (maximum three spans) by

- a) Clapeyron's Three Moments Theorem
- b) Moment Distribution Method

Analysis of portal frame (single bay, single story with sway and non-sway) by moment distribution method

Note: The teacher is also expected to expound the structural concepts introduced in non-mathematical

terms with examples and application in architectural design.

**References:**

- 1) Structural Analysis by SS Bhavikatti
- 2) Theory of Structures by Vazirani and Ratwani

## Unit 4.6 ó COMPUTER APPLICATIONS IN ARCHITECTURE-II

**CONTACT PERIODS : 3 (PRACTICAL)+3(STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:**

To develop awareness and familiarity with Computer applications in architecture and to equip students with skills required in using Computers as a digital media for design.

**Outline:**

Use of appropriate software like AutoCAD, Revit, ArchiCAD etc, for modeling of buildings and presentation of design projects as Photo realistic images and virtual architecture.

**Assignment:**

Presentation of a studio project handled in the third semester.

## Unit 4.76 CLIMATE RESPONSIVE ARCHITECTURE

**CONTACT PERIODS : 4 (STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To apply the principles of Solar Passive Architecture to design of buildings.

**Outline:** Introduction to passive techniques of cooling such as evaporative cooling, earth tubing, wind scoops, roof ponds, shaded courtyards etc.,

Two design exercises (in hot dry and warm humid climate) with an objective to integrate passive cooling systems in the design.

**References:**

- 1) *Housing, Climate and Comfort* by Martin Evans
- 2) *Climate Responsive Architecture* by Arvind Kishan, Baker and Szokolay.

**CONTACT PERIODS : 9 (STUDIO) PER WEEK**

**VIVA MARKS : 200**

**PROGRESSIVE MARKS : 50**

**Objectives:**

1. To understand the need for creating architecture as an envelope to system dependent programme
  2. To understand the use of technologies developed in other fields as a precursor to creating architecture
  3. To understand the role of symbolic and aesthetic thematic abstracts and imagery in influencing architecture
- Various utilities, which remain invisible in most of the buildings, become visible and important in certain categories of buildings. Architecture in such buildings remains at the level of envelopes. Buildings of such nature shall be identified and studied.

**Outline:**

Projects shall be of urban scale with multiple functions and a need for imagery as one of the architectural goals. Museums, art galleries, theme-based hotels, transport interchanges, terminals and shopping areas can be chosen. Design emphasis shall be on the use of innovations in materials and techniques of construction. Concurrent or sequentially, another project shall be attempted with utilities and service dominant buildings like pharmaceutical manufacturing units or medical facilities. Consultants in the field of utilities and services shall be called as part of studio review.

Alternative to the emphasis on imagery, projects involving large span structures like industrial structures may be attempted. Design emphasis shall be on the skins and support of structural systems and resulting architectural form.

Note: The design shall be sensitive to the needs of disabled, aged people and children.

One major project and one minor/ time problem to be tackled in semester.

Detailing of architectural features of the major project like entrance lobby, skylights and staircases has to be attempted.

## Unit 5.2 ó BUILDING CONSTRUCTION & MATERIALS ó V

**CONTACT PERIODS : : 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**VIVA MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To study constructional systems and detailing of special doors, windows, structural glazing and cladding

**Outline: Construction** – PVC & FRP, frameless glass doors and windows and partitions. Wooden/Steel/Aluminium sliding and folding doors and partitions. Steel doors for garages and workshops. Collapsible gate and rolling shutters, remote control systems of doors and gates. Structural glazing, aluminium composite panel cladding.

**Materials** – Insulation materials ó Thermal and sound insulation materials. Glass ó its manufacture in its various types like plate, tinted, decorative, reinforced, laminated glass block, fibre glass, glass murals, partially coloured glass, etching of glass and its applications in building industry for both exteriors and interiors. Glass fabrication techniques, fibre reinforced composite materials and products.

Note ó Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material applications in the form of portfolio. The entire portfolio on construction and materials shall be presented for viva exam.

**References:**

- 1) óConstruction Technologyö by Chudley
- 2) óConstruction of Buildingsö by Barry

## Unit 5.3 ó BUILDING SERVICES - III

**CONTACT PERIODS :4 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:**

To develop the knowledge and skills required for understanding the mechanical services in buildings and their integration with architectural design.

**Outline:** Part ó A Mechanical/Artificial Ventilation ó

Need for mechanical ventilation in buildings. Rate of ventilation for different occupancies. Methods and equipment employed for mechanical ventilation in buildings.

Air Conditioning ó

Definition, advantages and disadvantages, brief introduction to psychrometric process, air-cycle and refrigeration cycle. Summer and winter air-conditioning, calculation of air-conditioning loads, Zoning: purpose and advantages. Air-distribution systems: Ducts and duct systems. Air-outlets

Air-conditioning methods and equipment: window units, split units and central Air-conditioning systems. Location of air-conditioning equipment in buildings. Architectural requirement of various equipment.

Residential and commercial air-conditioning, energy conservation techniques. Introduction to the concept of -Clean Roomøand its architectural requirements.

Part ó B Elevators (Lifts) and escalators ó

Brief history-types of Elevators like traction, Hydraulic etc., Double-decker, sky lobby, lift lobby, lift interiors etc., Definition and components

Elevating a building: environmental considerations i.e., location in building, serving floors, grouping, size, shape of passenger car, door arrangement etc.,

Service requirements: Quality of service, quantity of service, time, passenger handling capacity, space and physical requirements, machine room spaces and their typical layout

Escalators ó Definition, Application. Location and arrangement in buildings. Space requirement, Escalators V/S Elevators, Conveyor belts-movement of passengers and goods

Part ó C Causes of fire, reasons for loss of life due to fire, development of fire, fire load, fire hazards, grading of structural elements due to fire as per NBC. Classification of building types as per NBC

Brief description of characteristics of combustible and non-combustible materials in case of fire

Concepts in passive fire protection and control ó including design of escape routes, pressurization and compartmentation, etc.,

Active fire control using portable extinguishers. Basic concepts in fixed fire fighting

installations. Automatic fire detection and alarm systems

Rules for fire protection and fire fighting requirements for High-rise buildings in India.

**References:**

- 1) -Principles of Refrigeration by Roy J Dosat
- 2) -Air Conditioning and Refrigeration Data Hand book by Manohar Prasad
- 3) -Refrigeration and Air Conditioning by Don Kundwar

## Unit 5.4 ó HISTORY OF ARCHITECTURE - IV

**CONTACT PERIODS : 4(LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To provide an understanding of Western Architecture during Renaissance, Baroque, Neo Classical and Modern periods

**Outline:** Background and influences on Renaissance Architecture. Characteristics of Renaissance Architecture in general.

Eg: St Andrea, Mantua and Palazzo Rucellai by Leon Alberti, Villa Rotunda (Capra) by Palladio, (New) St Peter's Rome by Michelangelo and others, St Paul's London by Sir Christopher Wren.

General characteristics of Baroque.

Eg: St Peter's Piazza by Bernini.

Transitional Period ó A brief account of the situation before the change over to Modern architecture in Europe. Palladian Revival in Britain, Greek Revival and Gothic Revival

Eg: Chiswick House, London, Mereworth castle, Kent, St Pancras Church, London, West Minister Palace, London, Arc de Triomphe, Paris. Impact of Industrial Revolution in Europe ó The Social, economic and political changes effected, new requirements of the society, new materials and technological developments.

The Chicago School ó works of Louis Sullivan, Early Industrial buildings, Contributions of Bauhaus, De Stijl movement, Italian Futurism, Art Nouveau movement and Arts and Crafts Movement to Modern Architecture

Eg: Wainwright Building, St Louis, Guaranty Building, Buffalo, Crystal Palace, London. Bauhaus school at Dessau, Schroder house by Rietveld, Casa Mila, Casa Batlo, Sagrada Familia, Tassel House, Brussels, Paris Metro Station entrance, Red house, Kent.

Ideas and works of Great Masters ó Le Corbusier, FL Wright, MV Rohe, Walter Gropius

Eg: Villa Savoy, Unite de Habitation, Ronchamp Church, Monks' Quarters, Lyon, Robie House, Falling Waters, Guggenheim Museum, Johnson Wax Tower, Dr Farnsworth house, Seagram Building, Crown Hall, IIT, Fagus Factory

Contributions of Brazilian architect Oscar Niemeyer

Eg: Alvorada Palace, National Congress Complex and Metropolitan Cathedral, Brasilia.

### **References:**

- 1) óModern Architecture ó A Critical Historyö by Frampton Kenneth
- 2) óA History of Architectureö by Fletcher, Bannister

## Unit 5.5 ó STRUCTURES - V

**CONTACT PERIODS : 3(LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To provide an introduction to design of reinforced concrete structures

**Outline:** Concrete:Composition, Basics of mix design, water cement ratio, strength, durability, workability requirements. Relevance of RCC in Architectural practice. Advantages of RCC over other conventional structural practices. Steel for RCC ó Plain & Twisted bars, IS 456 code provisions.

Working Stress method of design ó Basic concept, types of loads, assumptions. Calculation of MR for singly RC beam (only).

Limit state method of design ó Necessity and philosophy of limit state design. Limit state design of simply supported slabs, beams, T beams, columns (axial and uniaxial bending) and footings (axially loaded square footing). Use of SP 16, IS 456 permitted

Design of Dog legged and open well stairs (waist slab type)

Note ó The teachers are expected to expose the students to demonstration models, tests and experiments with materials and structural systems related to the above topics.

The teacher is also expected to expound the structural concepts introduced in non-mathematical terms with examples and application in architectural design.

**References:**

- 1) óRCCö by Jain and Jaikrishna
- 2) óRCCö by Ramamrutham
- 3) óRCCö by N Krishna Raju and RN Pranesh

## Unit 5.6 6 COMPUTER APPLICATIONS IN ARCHITECTURE-III

**CONTACT PERIODS : 3 (PRACTICAL) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To develop awareness and familiarity with Computer applications in architecture and to equip students with skills required in using Computers as a digital media for design.

**Outline:** Introduction to rendering and appropriate presentation softwares like Photoshop, Maya, Flash, 3D studio Max, Artlantis etc. Explore walkthroughs, animation and virtual reality of design studio projects. Introduction to interactive multimedia technology for design presentation.

**Assignment:** Working on a design studio project of fourth semester integrating the topics covered.

## Unit 5.7 ó SOCIOLOGY AND ECONOMICS

**CONTACT PERIODS : 4(LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To familiarize students with the basic concepts of Sociology and Economics and their influence on Architecture.

### **Part A**

#### **Outline:**

Nature, scope and utility of Sociology, relation between Sociology and society. Essential elements of society, bio-social and socio-cultural systems. Rural and urban communities and their characteristics. Origin, growth and influence of cities. Definition of urbanization ó patterns of life and influence of urbanization on rural life, urbanization process in India. Migration and its impact on urbanization, social problems of urbanization ó problems relating to public health, public transport and public housing, sociological understanding of slums. Social surveys and Social research ó principles of social research, scope of research, units of study, choice of research topics, sources of information, literature review ó official and unofficial documents, library references, publication etc., Field survey ó adoption of suitable techniques in field research viz., Questionnaires, interview, case study etc., analysis and classification of data.

### **Part B**

Definition of Economics, Economic laws, Economic goods, utility, value, price and wealth. Economic organization of society. Consumption, wants, their characteristics and laws based upon them. Standard of living, market value, opportunity cost, the laws of diminishing, increasing and constant returns. Urban land values, land utilization, factors involved in development of urban land. Cost and cost indices, preliminary for building. Concepts of life cycle costing with reference to buildings. Time value of money-present worth and inflation. Sources of finance for buildings.

#### **References:**

- 1) óSociology ò by Neil J Smelser
- 2) óUrban Economicsö by Warner Z Hirsch

## Unit 5.8 ó THEORY OF ARCHITECTURE-I

**CONTACT PERIODS :3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To acquaint the students with the basic aesthetic principles involved in architectural design.

**Outline:** Principles of architectural composition ó unity, balance, proportion, scale, contrast, harmony, accentuation, restraint, definition, repose, vitality, strength - with the help of illustrations of buildings, both historical as well as contemporary.

Organizing principles of architectural composition ó symmetry, hierarchy, datum, axis, rhythm

ó different types of spatial organizations of masses ó linear, centralized, radial, clustered, grid organization ó illustrations of buildings both historical as well as contemporary.

Use and need of ornament in architectural design ó different types of ornamentation in buildings ó historical perspective of the use of ornament in buildings.

Use of different materials like brick, timber, stone, concrete, glass for aesthetic and structural purposes.

Style in architecture ó basis for classification of styles ó evolution of styles.

**References:**

1. 'Form, Space and Order' by Francis DK Ching
2. 'Design Fundamentals in Architecture' by Pramir VS

## Unit 5.96 VACATION ASSIGNMENT/STUDY TOUR II

### **PROGRESSIVE MARKS : 50**

**Objective:** To expose students to Historical, Vernacular and Contemporary Architecture.

**Outline:** Vacation Assignment/ Study tour is to be undertaken after the end of IV semester exam and before the commencement of V semester classes.

This assignment could be a measured drawing and documentation of a noted building or a study tour for visiting places of architectural interest. The choice of the building to be documented and the places to be visited is left to the concerned department. The assignment may be given as group work (4 to 6 students per group). The students have to submit a report on the measured drawing or the study tour within 15 days from the beginning of the V Semester. The reports are to be assessed by the departments for progressive marks.

## Unit 6.1 ó ARCHITECTURAL DESIGN - VI

**CONTACT PERIODS: 9 (STUDIO) PER WEEK**

**VIVA MARKS : 200**

**PROGRESSIVE MARKS : 50**

### **Objectives:**

1. To understand the differences and similarities between institutional goals and architectural goals.
2. To understand creating of spaces for learning. Formal, informal and interactive processes of learning and role of the built environment.
3. To understand the role of built environments in therapeutic and nurturing institutions

### **Outline:**

Institutional projects like facilities of higher learning, vocational training or a small-scale campus may be given. Project brief shall contain clearly articulated goals of the institutions regarding the role of built environment in its functioning. Case studies of contemporary campus architecture (built since 1980s) shall be carried out. There are two distinct typologies of campuses, one that has integrated into the urban fabric at the edges of its boundary and the other that has ignored the urban fabric. Campus planning may be attempted as a two-stage project, with site planning, as one and other stage could be a detailed design of one of the identified buildings. The design has to respond to Climatic, Environmental and ecological factors.

Examples of projects: Engineering college campus, medical college campus, management institute campus, hotel management institute, Law college campus, Dental college campus, Nursing college campus, Juvenile Correction Centre, etc

Note: The design shall be sensitive to the needs of disabled, aged people and children.

One major project and one minor/ time problem to be tackled in semester.

Detailing of architectural features of the major project like entrance lobby, skylights and staircases has to be attempted.

## Unit 6.2 ó BUILDING CONSTRUCTION & MATERIALS ó VI

**CONTACT PERIODS: 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**VIVA MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To study the construction systems of roofing for large span and complex buildings

### **Outline:**

**Construction** ó Steel trusses for various spans, ridged truss, saw tooth truss with lattice girders, roof lighting, a/c sheet and profiled MS sheet cladding and roof fixing details.

Roofs ó Shell roof, folded plate, geodesic domes, space frame, tensile structures, pneumatic structures, pre-engineering metal buildings

**Materials** ó Plastics ó types, properties and uses of plastics such as polycarbonates, acrylics, PVC polymer films, fibre reinforced plastic. Rubber and Asbestos cement products. Water Proofing elements, construction chemicals and additives, adhesives, plaster of Paris, gypsum, Polysterenes, sealants.

Note ó Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material applications in the form of portfolio. The entire portfolio on construction and materials shall be presented for viva exam.

**References:**

- 1) óConstruction Technologyö by Chudley
- 2) óConstruction of Buildingsö by Barry

Unit 6.3 óBUILDING SERVICES ó IV (ACOUSTICS)

**CONTACT PERIODS : : 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To develop the knowledge and skills required for understanding acoustics in buildings and its integration with architectural design.

**Outline:**

Partó A

Introduction to the study of acoustics ó nature of sound, basic terminology ó frequency, pitch, tone, sound pressure, sound intensity, decibel scale, loudness, threshold of audibility and pain, masking, sound and distance ó inverse square law.

Behaviour of sound in enclosed spaces ó reflection of sound, nature of reflection from plane, convex and concave surfaces, sound diffraction, Absorption of sound, sound absorption coefficient, reverberation, reverberation time calculation, use of Sabine's and Eyring's formulae, sound absorbents, porous materials, panel or membrane absorbers and cavity or Holmboltz resonators, role of functional absorbers.

Absorption coefficients of indigenous acoustical materials, use of IS code 2526-1963, method of setting out of raked seating.

Acoustical design requirement for halls used for speech, drama and music ó general purpose halls used for both speech and music, cinema theatres, open air theatres. Study of auditoria designed and acoustically treated.

Part ó B

Introduction to environmental noise control, noise and its classification, outdoor and indoor noise, airborne noise and structure borne noise, impact noise, community and industrial noise. Transmission of noise and transmission loss. Maximum acceptable noise levels.

Means of noise control and sound insulations. Constructional measures of noise control and sound insulation. Use of sound measuring instrument.

Sources of industrial noise ó impact, friction, reciprocation, air turbulence and other noise. Methods of reduction by enclosures and barriers, sources of outdoor noise ó air traffic, rail traffic, road traffic and seashore and inland. Traffic planning and design against outdoor noise for air traffic, road traffic and rail traffic.

**References:**

- 1) "Environmental Acoustics" by Leslie L Doelle
- 2) "Acoustical Designing in Architecture" by Knudson, Vern
- 3) "Acoustics: Noise and Buildings" by Parich, Peter
- 4) "Architectural Acoustics" by David Egan

## Unit 6.4 ó CONTEMPORARY ARCHITECTURE

**CONTACT PERIODS : : 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To provide an understanding and appreciation of Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects.

**Outline:** Post-Independence Architecture in India ó Works of Corbusier in Chandigarh and Ahmedabad (Legislative Assembly Complex including High Court, Legislative assembly and Secretariat, Chandigarh and Mill Ownersø Building, Ahmedabad) Louis Kahnø contributions ó the IIM, Ahmedabad, Ideas and works of BV Doshi (Institute of Indology Ahmedabad, IIM-Bangalore and Gufa, Ahmedabad), Charles Correa (RamaKrishna House, Ahmedabad, Kanchen Junga Apartments, Mumbai and MRF Headquarters, Chennai), Raj Rewal (Pragati Maidan, New Delhi and Asian Games Village, New Delhi), Achyut Kanvinde(IIT, Kanpur and Nehru Science Centre, Mumbai), Uttam Jain(Lecture Theatres, Jodhpur and Engineering College, Kota), Laurie Baker(Centre for Development Studies, Thiruvananthapuram and St. John Cathedral at Tiruvalla) and Anant Raje(IIFM, Bhopal and Management Development Centre, IIM-A)

Western Architecture ó Ideas and works of Richard Meier (Smith House, Connecticut and Getty Centre, Brent Wood, Los Angeles), Charles Moore (Architectø Own House at Orinda and Piazza døItalia, New Orleans), Bernard Tschumi (Kyoto Railway Station Project and Parc de la Villete, Paris), Frank Gehry (AeroSpace Museum, Santa Monica and Guggenheim Museum, Bilbao), Norman Foster (Hong Kong Shanghai Bank and Renault Distribution Centre, Swindon, England), Zaha Hadid (The Peak Club, HongKong and IBA Housing Block 2, West Berlin), Daniel Libeskind(Jewish Museum, Berlin and World Trade Centre, New York ), Rem Koolhaas(Dance Theatre, The Hague and Netherlands Sports Museum), Santiago Calatrava(Lyon-Satolas Railway Station and Olympic Stadium at Athens), Renzo Piano(Pompidou Centre, Paris and Menil Museum, Houston).

### **References:**

- 1) øContemporary Architectureö by Morgan, Ann Lee & Taylor Colin
- 2) øModern Architecture in Indiaö by Bahga, Bahga and Bahga

## Unit 6.5 ó STRUCTURES - VI

**CONTACT PERIODS : : 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To give an introduction to the design of steel structures.

**Outline:** Design of simple and eccentric riveted and welded connections.

Design of tension and compression members in trusses.

Design of built-up columns (lacing only)

Design of slab base (no guzzeted base) and simple column and footing connection details

Design of laterally restrained beams (simple and compound)

Provision for fire protection for steel structures ó relevant code provision

Note: The teacher is also expected to expound the structural concepts introduced in non-mathematical terms with examples and application in architectural design.

**References:**

- 1) óDesign of steel Structuresö by Ramachandra
- 2) óDesign of Steel Structuresö by Kazimi and Jindal
- 3) óIS 800 ó 1984, IS 883-1970ö
- 4) óIS special publication for the design of steel structuresö [SP-6 (1)]

## Unit 6.6 ó ESTIMATING AND COSTING

**CONTACT PERIODS : : 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To develop the necessary skills for estimation and writing specifications for various types of buildings and developmental work.

**Outline:** Introduction, importance of estimation, types of estimates, mode of measurement etc.,

Study of local SR rates, market rates, measurement book (MB), RA bill, interim and final certificate

Detailed rate analysis of building items as per current schedule of rates (CSR) of local PWD ó for information only

Percentage of various materials used in building items like cement, steel, rubble, metal, sand, brick, tiles etc.,

Abstract and detailed specifications for various materials and items of work used in building

Estimate of

- a) Load bearing and RCC framed structure with one example for each
- b) Typical interior items of a residence and an office
- c) Various types of roofs like steel and wood including roofing materials like Mangalore tiles, AC, GI sheet etc.,
- d) Water supply and sanitary works
- e) A typical layout plan with roads, culverts etc.,

**References:**

- a) óEstimating and Costingö by SK Dutta
- b) óEstimatingö by SC Rangawala

## Unit 6.7 ó WORKING DRAWING

**CONTACT PERIODS: 6 (STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:**

To enable students to learn the techniques of preparing drawings which are used for construction of buildings.

**Outline:**

Architectural Drafting-Lettering, Dimensioning lines, Drafting conventions, Title blocks, Office standards, representation of different materials in section. Graphic symbols, drafting and preparing foundation plans, floor plans, exterior elevations, sections, roof plans, interior elevations, site planning and its detailing, schedules of doors, windows, finishes, electrical drawings, water supply and sanitary drawings.

The above drawings need to be prepared for one design project like Residence, Apartments, Factory buildings, Swimming pool etc., handled in an earlier Architectural design studio.

Note ó Use of CAD techniques in working drawing may be encouraged.

## 6.8 ó THEORY OF ARCHITECTURE-II

**CONTACT PERIODS : : 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HRS**

**EXAM MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To provide an insight into the ideas of influential theorists from antiquity to the present time.

**Outline:** Theory in Antiquity and Renaissance ó Concepts of Vitruvius, Leon Alberti, Andrea Palladio ó Jacques Francois Blondel and Claude Perrault of French Academic Tradition 18<sup>th</sup> Century Theory ó Ideas of Laugier, Boullée, Ledoux

19<sup>th</sup> Century Theory ó Concepts of Viollet Le Duc, John Ruskin, Quatremere de Quincy and Gottfried Semper

Modern Movement Theory ó Ideas of Adolf Loos, Eero Saarinen, Erich Mendelsohn, Richard Neutra, Otto Wagner, Kenzo Tange.

Post Modern Theory ó Ideas on Post-Modern Classicism by Robert Venturi, Charles Jencks

Deconstruction ó Fundamental beliefs and philosophy. Ideas of Peter Eisenman

Contribution to architectural thought by Kenneth Frampton, Christopher Alexander, Geoffrey Broadbent, Amos Rapoport.

Architectural Criticism ó Definition, Sources, Types of Criticism according to Wayne Attoe

Jon Lang ó Positive and Normative Theories in Architecture

**References:**

- 1) "Design in Architecture" by Broadbent, Geoffrey
- 2) "Creating Architectural Theory" by Lang, Jon

## Unit 7.1 ó ARCHITECTURAL DESIGN ó VII

**CONTACT PERIODS: 9(STUDIO) PER WEEK**

**VIVA MARKS : 300**

**PROGRESSIVE MARKS : 50**

### **Objectives:**

1. To learn about reading and documenting urban contexts and to understand the idea of urban space. To understand the difference between urban design as opposed to urban development.
2. To understand the role of architecture in shaping urban fabric.
3. To create architecture which fits into a specific urban context.

### **Outline:**

The role of urban space as a public realm and the need to create such spaces as extension of private domain in a public building shall be investigated and shall become one of the architectural goals of the project. Some of the prerequisites of the project shall be; 1. Multiple functions, 2. Public access to majority of the spaces, 3. Large gathering areas which are open and extendable to the immediate urban context. Projects like transport interchanges, large retail areas with entertainment areas, transport terminals with commercial areas, performing art center with museums and such multiple functions shall be taken. Study part of the studio shall be documented and shall be reviewed as part of the viva.

Eg of Projects: Bus Terminal, Shopping Complex, Art galleries, Cultural center, Sports stadium, Performing Arts Centre etc.

## Unit 7.2 ó BUILDING CONSTRUCTION & MATERIALS - VII

**CONTACT PERIODS: 6 (1 LECTURE + 5 STUDIO) PER WEEK**

**VIVA MARKS : 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To familiarize students with construction techniques in interior spaces and to provide an introduction to prefabrication

**Outline:** Construction ó Detail of wardrobes, modular kitchens, cabinet shelves and show cases for residence, offices, book stores and commercial buildings, work stations. Internal finishes to wall and ceiling using plywood, PVC, marble, granite, cement, fibre board, plaster of Paris, particle board, wood wool, straw and any other materials introduced in the market. Partition systems, false ceiling systems. Introduction to prefabrication and post tensioning of building components. Advantages and relevance in the Indian context.

Materials ó Plywood, block board, particle board, hard board, laminates, MDF, HDF, HDPE wood wool, sound insulating materials, Bituminous products. Note ó Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material applications in the form of portfolio. The entire portfolio on construction and materials shall be presented for viva exam.

**References:**

- 1) óConstruction Technologyö by Chudley
- 2) óConstruction of Buildingsö by Barry

Note: The design shall be sensitive to the needs of disabled, aged people and children.

One major project and one minor/ time problem to be tackled in semester.

Detailing of architectural features of the major project like entrance lobby, skylights and staircases has to be attempted.

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## Unit 7.3 6 PHYSICAL PLANNING

**CONTACT PERIODS: 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To give an introduction to the discipline of urban and regional planning

**Outline:** Human settlements ó Urban settlements and Rural settlements, differences, origins, evolution and growth of settlements. Major functions of a city, city forming and city serving functions. Problems faced by a typical city. Relation between urban and rural settlements, characteristics and planning efforts of cities and towns of various historical periods like Egyptian, Greek, Roman, Medieval, Renaissance, Neo-classical. Industrial Revolution and its impact on cities, the contemporary city. Cities of Indus valley and Vedic period, cities of Moghul period and British period, typical Indo-Aryan cities, typical Dravidian temple city.

Planning Theories ó enunciated by Ebenezer Howard, Patrick Geddes, Soria Y Mata, Doxiadis, Le-Corbusier, Clarence Stein, Clarence Arthur perry, Hilberseimer ó their relevance to Indian conditions.

Land use planning, land use classification for cities and rural settlements, analysis of land uses in Indian cities.

Urbanisation, Industrialisation and urban growth, definitions and inter relationship. Trends in urbanization in India since Independence. Growth of metropolitan cities, their growth and management problems, world urbanization trends.

Components of a settlement ó activity pattern and land use, traffic and road network, density of population and population distribution. Central business district of a city, other business districts, urban nodes, rest of the city, fringe area and suburbs. Growth and aging of various parts of the city particularly the CBD, the problems caused due to this including slums, internal spatial structure of cities ó concentric zone theory, sector theory, multiple nuclei concept and work-home concept.

Planning Techniques ó study and analysis of existing settlements, methodology of conducting diagnostic surveys and studies, land use survey, density survey, FSI survey, traffic surveys, presentation of data

Regional Planning ó relation among various settlements of a region, pattern of settlements in a region. Definition of a region, various types of regions, basic principles of regional planning

Urban Renewal ó causes and consequences of urban blight and obsolescence ó slums and shanties ó methods of conducting surveys, analysis and presentation of data, prevention of formation of slums and squatter settlements. Environmental and management issues.

**Reference:**

- 1) óThe Urban Pattern: City Planning and Designö by Gallion and Eisner
- 2) óUrban Planningö by Chapin

## Unit 7.4 6 PROFESSIONAL PRACTICE 6 I

**CONTACT PERIODS: 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS 100**

**PROGRESSIVE MARKS : 50**

### **Objectives:**

To understand the responsibilities & liabilities of the Profession.

To understand the process of Contract management.

### **Outline:**

**Profession:** Idea of profession and essential difference among profession, trade and business. Profession of architecture, its essential tenets, duties and liabilities. Types and extent of services offered by architects, scale of fees, stages of payment, and contract between client and architect. Code of Professional Conduct, Architects Act of 1972. Role of Council of Architecture and the Indian Institute of Architects in the functioning of the Profession.

**Practice:** Types of Architectural firms, proprietorship, partnership, associate ship, and private limited concerns. Advantages and disadvantages of each type of firm. Various means of building client base and gaining projects. Architectural competitions,

Guidelines of COA, procedure of conduct of such competitions.

Administration and basic accounting procedures. Taxes and implications of service tax. Implication of GATS on the profession in India.

**Building Industry:** General overview of the industry. Various participants and dimensions of building industry. Finance, statutory controls, construction procedures, enforcement issues related to building industry and the role of architect, employer, and contractor.

**Contract Management:** Overview of procedures in contract management with a focus on Architect's role.

**Tender:** Procedure of calling for tender, documents necessary for tendering process. Tender document and its content. Types of tenders, suitability of different types to various categories of projects. Advantages and disadvantages of each type of tender. Tender notices, opening, scrutiny, process of selection and award. Architect's role in tender process. Essential characteristics of Tender Notice, Earnest Money Deposit, Security Deposit, Retention Amount, Mobilization Amount and Bonus & Penalty Clauses.

Various issues arising out of tendering process and the role of an architect in maintaining objectivity in the process.

**Contract:** General Principles, types of contract, definitions of various terms used in the contract document. Contract document, contents and sections dealing with various aspects of contract management. Conditions and Scope of Contract and the role of an architect in ensuring a positive completion of a contract. Architect's role in the contract and vested authority.

**Issues of Contract:** i) Termination of contract, ii) Certificates of value and quality, iii) Virtual completion and final completion, iv) Defects liability period, v) Latent and patent defects, vi) Liquidated and un-liquidated damages, vii) Extension of time, delays and penalty, viii) Non tendered items, extras, extra work, additional works, variations, rate analysis and architect's role in certification of variations, ix) Prime cost, provisional sum, x) Types of insurance necessary during contract including fire insurance for safeguarding client's interest.

**References:**

- 1) Professional Practice for Architects & Engineers by Roshan Namavathi
- 2) Legal and Contractual Procedures for Architects by Bob Greenstreet
- 3) AJ Legal Handbook
- 4) Professional Practice by KG Krishnamurthy and SV Ravindra.

Unit

## Unit 7.5 ó STRUCTURES - VII

**CONTACT PERIODS: 3 (LECTURE) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**EXAM MARKS 100**

**PROGRESSIVE MARKS : 50**

**Objective:** To give an introduction to pre-stressed concrete, special structural forms and detailing of RCC structural members.

**Outline:** Basic concepts of pre-stressed concrete-pre-stressing systems, materials, behaviour of pre-stressed concrete beams and losses in pre-stress.

Introduction to special structural forms and basic structural concepts about : shells, folded plates, domes, grid structures, flat slabs(RCC), space frames, tensile structures and pneumatic structures (no problems to be solved for these).

Detailing of typical ó Beam (singly and doubly reinforced), slab (one way and two way), column footing (square isolated), and staircase (dog legged and open well)

Note: The teacher is also expected to expound the structural concepts introduced in non-mathematical terms with examples and application in architectural design.

### **References:**

- 1) óPre-stressed Conceptsö by N Krishna Raju
- 2) óStructuresö by DL Schodek
- 3) óForm and Structure in Architectureö by Alexander Zamen
- 4) óRCC ó design and practiceö by N Krishna Raju and RN Pranesh

## Unit 7.66 INTERIOR DESIGN

**CONTACT PERIODS: 4 (1 LECTURE + 3 STUDIO) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To introduce the students to the discipline of Interior Design and to develop basic skills required for handling simple interior design projects ó

**Outline:** Designing the size and form of interior spaces using user ó activity, analysis and anthropometrics, effect of enclosure, fenestration, colour and lighting on perception of interior space, application of scale, proportion to enhance the quality of interior space, psychological effects of space.

Elements of interior space ó design for comfort ó climatic comfort, natural and artificial lighting, air conditioning and acoustics. Services ó air conditioning ducts, electrical wiring, water supply and removal of waste water, elements of furnishing and surface treatment and the need and scope.

Applied decoration ó colour, texture, plane and fixtures in relation to emphasis of background of space through change of levels and structural form modulation through artificial and natural lighting, emphasis of focal points and unity in interior design.

Furniture design ó Role of furniture, ergonomic factors of furniture design and materials used. Matching furniture to decorative style, fitted furniture, its characteristics and application. Functional classification of space, barrier free design.

Surface treatment and plant scape ó decorative materials for ceiling, walls, floors, drapery, upholstery for openings and furniture respectively and matching them with overall colour scheme and composition. Sources and collection of information, elements of indoor plants and interior landscape and use of water.

The class work shall include two interior design projects (one major and one minor) to be handled with complete design, detailing, furniture layout, specification for the materials, and their application. The projects shall relate to interiors of residential, commercial educational or other public spaces. Note ó Use of computers may be encouraged.

**References:**

- 1) óHuman Dimension and Interior Spaceö by Panero Julious & Zelink Martin
- 2) óDesign of Interior Environmentö by Alexander and Mercourt

## Unit 7.7 6 LANDSCAPE ARCHITECTURE

**CONTACT PERIODS: 4 (2 LECTURE + 2 STUDIO) PER WEEK**

**DURATION OF EXAM : 3 HOURS**

**PROGRESSIVE MARKS : 50**

**Objective:** To introduce students to the discipline of landscape architecture and to develop basic skills required in handling simple landscape design projects

**Outline:** Introduction to landscape architecture, definitions

Noted landscape architects and their concepts and definitions

Natural and manmade landscape, Urban and rural landscape

Elements of landscape architecture like vegetation, land forms and water bodies and their application in design

Introduction to Site planning and site analysis

Landscape materials and plant materials study, introduction to taxonomy

Study and analysis of contemporary landscape designs

Study of existing landscaped areas like courtyards, gardens, urban spaces etc.,

Street and site furniture

Application of landscape design for site plans, small gardens, residential areas, urban spaces, courtyards etc.,

**References:**

•Landscape Architecture: by JO Simmonds

•Introduction to landscape architecture• by Michel Laurie

## Unit 7.86 EARTHQUAKE RESISTANT STRUCTURES

**CONTACT PERIODS: 4(LECTURE) PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To provide awareness and introduction to earthquake prevention measures in buildings

**Outline:** Building Safety from natural Hazards: an introduction

Earthquake Cyclone effects: High winds, storm surge, cyclone safety aspects in buildings  
Floods Landslides

Elementary Seismology Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India and the states

Causes of earthquake, seismic waves, magnitude, intensity, epicenter and energy release, characteristics of strong earthquake, ground motions Seismological instruments: Seismograph, Accelerograph, Seismoscope/Multi SAR

Introduction to Theory of Vibration

Single degree undamped and damped systems, resonance response to earthquakes, elastic response, concepts of response spectrum

Flexibility of long and short period structures; concepts of response spectrum

Site planning, Building Forms and Architectural Design Concepts for Earthquake resistance

Historical experience

Site selection

Site development

Building forms ó Horizontal and vertical eccentricities, mass and stiffness distribution, soft storey etc.,

Seismic effects related to building configuration

Plan and vertical irregularities, redundancy and setbacks

Special Aspects ó Torsion, appendages, staircases, adjacency, pounding, Contemporary international approaches

Performance of Ground and Building in past earthquakes

Earthquake effects ó On ground, soil rupture, liquefaction, landslides

Behaviour of various types of buildings, structures, power plants, switch yards, equipment, life lines and collapse patterns

Behaviour of Non-structural elements like services, fixtures, mountings

Social and Economic consequences of earthquakes

Lab simulation of models

Seismic Design Principles

Concept of seismic design, stiffness, strength, period, ductility, damping, hysteric energy

dissipation, center of mass, center of rigidity, torsion, design eccentricities.

Ductility based design: Design of energy absorbing

Seismic base isolation and seismic active control

### Structural Detailing

Innovations and selection of appropriate materials

IS code provisions for the buildings

IS 1893-2002, IS 4326-1993

Horizontal and Vertical Seismic co-efficients, valuation of base shear, distribution of shear forces in multistory building.

Seismic detailing provisions: Masonry and Wooden buildings (IS 4326, IS 13828) Adobe houses

Seismic Designs and detailing of RCC and steel buildings: IS 1893 ó 2002, IS 13920- 1993  
IS 456-2000 IS 800-2004

Special reinforcing and connection details in structural drawings.

### Earthquake Resistant Construction Details

Various types of construction details of:

Foundations, soil stabilization, retaining walls, plinth fill, flooring, walls, openings, roofs, terraces, parapets, boundary walls, under ground and overhead tanks, staircases and isolation of structures

Local practices: traditional regional responses

### Construction Quality Control

Sequence of Construction: Good supervision practices, critical check point and certification at certain stages, reporting, maintenance of records, testing Vulnerability Assessment and Seismic strengthening of Buildings

Seismic vulnerability evaluation of existing buildings

Weakness in existing buildings, aging, weathering, development of cracks

Concepts in repair, restoration and seismic strengthening, materials and equipment for restoration of masonry and concrete structures

Methodologies for seismic retrofitting

Techno-legal and Techno-financial aspects in Building Projects

Building Bye-laws

Cost Benefit studies

### References:

1. Manual of EQR, Non engineered construction, Indian Society of Earth Quake Technology, Roorkee.

2. Seismic Conceptual Design of Buildings, Basic principles for

Engineers, architects, building owners and authorities, Hugh Bachmann

## Unit 8.1 6 ARCHITECTURAL DESIGN PROJECT(THESIS)

**CONTACT PERIODS: 12(STUDIO) PER WEEK**

**VIVA MARKS : 300**

**PROGRESSIVE MARKS : 200**

### **Objectives:**

1. To demonstrate an ability to comprehend the nature of architectural problem and create a brief which sets the frame work for design
2. To demonstrate an advanced level design ability to convert the brief set forth earlier into a speculative proposition of design
3. To articulate and delineate the propositions of design into an architectural solution addressing all the dimensions

### **Outline:**

Architectural Design projects can be of any scale and size (in terms of built areas) as long as the required rigor and depth is demonstrated by the student to merit consideration as a final project. Very large campus projects can be avoided as the work tends to be repetitive and more often ends with a large number of Structures but with minimal variations and content. It is expected that all genre of projects (study or design) would end with a design solution; in fact all projects should be grounded in some kind of critical enquiry. The maximum weight age for study will be 25% in the case of a Study + Design Project. The depth of enquiry can be extended and the time spent on design can be reduced in a specific case, but such a project should demonstrate clarity in terms of research design. The following stages have been identified as a generic model of the studio. The stages can be fine tuned depending on the resources. It is expected that this project will be run as a studio with individual guidance under a project coordinator.

1. **Pre-Project** – This stage should ideally be accomplished in the previous semester. The work involves students to discuss with the faculty to identify an area of interest or specific types of buildings. The pre project stage should end with a project proposal giving routine information on site, location, need, broad requirements and scale. In addition, the proposal should clearly indicate the 'project question' or an area (or areas) of interest.

2. **Project seminar** – Student shall present a seminar on the project topic which would include the following; 1. Precedents of similar projects, either actual visit to such projects or through literature reviews. 2. Cultural, contextual, historical, technological, programmatic concerns of the project. 3. Prevalent or historical models of architectural approach to such projects and a critique of such models and 4. A rhetorical or a speculative statement that would be the basis of further investigation. (For example: Architecture in the information age: Design of libraries in the new virtual reality regime). Documentation which is a part of

this presentation shall be taken as completion of case study part of the final requirement.

**3. Mid Review** – There shall be a review to clarify the conceptual statements and assumptions of the students. Students shall present a clearly articulated response to context, programme and users. Conceptual framework and preliminary architectural scheme shall be the end products of this stage.

**4. Final Review** – Final review should consist of all the works which would be presented at the viva. Mode of presentation shall be tentative. Number of sheets shall be limited to maximum of 15 plus two case study sheets. Study Models are expected to be presented.

The final output shall include a report, all drawings, study models and a presentation model.

The report in typed or computer printed form shall discuss the programme, site- analysis, literature review, case studies, design criteria, concept and detailed design. Three copies of the reports shall be submitted along with drawing and models.

Note ó

1) The requirements pertaining to the handicapped and elderly people and children are to be addressed in design and detailing.

2) At the time of Viva examination, the student shall show to the jurors the portfolio containing the evolution of his/her design from the beginning to the final output. All the drawings and reports shall be certified by the Head of the Department as bonafide work carried out by the student during the semester.

## Unit 8.2 ó ELECTIVE - I

**CONTACT PERIODS: 3 PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To expose students to specialized areas of architecture.

**Outline:** The electives offered are 1) Urban Design 2) Construction Management and 3) Ecology & Architecture. The detailed syllabus for the elective subject shall be worked out by the respective colleges.

**CONTACT PERIODS: 3 PER WEEK**

**PROGRESSIVE MARKS : 50**

**Objective:** To expose students to specialized areas of architecture.

**Outline:** The electives offered are 1) Housing 2) Conservation and 3) Building Automation Systems. The detailed syllabus

for the elective subject shall be worked out by the respective colleges.

**Outline:**

**Supervision & Contract Administration:** Site visits, site meeting, co-ordination with various agencies, site book, site instructions, clerk of works and site office. Bill checking, quality auditing, handover procedures and final certification. Disputes in contract and architect's role in resolving such disputes. Case studies from practice highlighting disputes in contract and methods adopted to solve such disputes.

**Arbitration:** Arbitration and conciliation act 1996, arbitrator, umpire, order of reference, selection of arbitrators, powers and duties of arbitrators, arbitration award and implementation of award.

**Valuation and Dilapidation:** Definitions and architect's role in preparation of valuation and dilapidation reports and certifications. Physical and Economic life of buildings. Introduction to valuation, essential characteristics, classifications and purpose of classifications. Methods of valuation, standard rent and cost of construction.

**Byelaws and easements:** Building byelaws, National Building Code, floor area ratio, floor space index, floating FAR, zoning regulations. Easements, various easement rights, architect's role in protecting easement rights.

**Laws related to Property and Land:** Land tenure, types of land holdings, land registration, easement rights, covenants, trespass and nuisance etc.

**General Law:** Understanding of common law, statute law, equity, criminal law, civil law etc., Role of courts in dispensing of various types of cases. Liability of an architect with respect to breach of contract and negligence with respect to standard of care. Liabilities for users and employees. Safeguards in construction industry such as performance bonds, insurance warranties, retention, indemnities, and estoppels and liquidated damages.

**References:**

- 1) Professional Practice for Architects & Engineers by Roshan Namavathi
- 2) Legal and Contractual Procedures for Architects by Bob Greenstreet
- 3) AJ Legal Handbook
- 4) Professional Practice by KG Krishnamurthy and SV Ravindra.

## Unit 8.5 6 CONSTITUTIONAL LAW

**CONTACT PERIODS: 2 (LECTURE) PER WEEK**

**PROGRESSIVE MARKS : 50**

Preamble to the Constitution of India ó Evolution of Constitutional Law.

Scope and Extent of Fundamental Rights under Part III ó Details of Exercises of Rights, Limitations and Important Cases.

Relevance of Directive Principles of State Policy Under Part IV.

Significance of Fundamental Duties under part IV (a)

Union Executive, President, Vice-President, Prime Minister, Council of Ministers, Parliament and Supreme Court of India.

State Executive, Governor, Chief Minister, Council of Ministers, Legislature and High Courts.

Constitutional provisions for scheduled castes and tribes; women and children and backward classes.

Emergency Powers, Major Constitutional Amendments.

Electoral Process.

**References:**

- 1) öIntroduction to the Constitution of India (Student Edition)ö by Durga Das Basu
- 2) öConstitution of India ó Latest Editionö by VN Shukla

## Unit 9.1 ó PROFESSIONAL TRAINING I

**DURATION: ONE SEMESTER (16 Weeks)**

**DURATION OF EXAM : VIVA (15 MNTS PER STUDENT)**

**VIVA MARKS : 300**

**Objective:** To provide exposure to the various dimensions of architectural practice.

**Outline:** The student is expected to be exposed to preparation of working drawing, detailing, preparation of architectural models, computer applications in design and drafting, filing system in respect of documents, drawing and preparation of tender documents. Site experience may be given in respect of supervision of the construction activity, observing the layout on site, study of the stacking methods of various building materials, study of taking measurement and recording.

Students will have to maintain a day to day record of their engagement for the period of training. This will be recorded in an authorized diary to be counter signed by the architect at the end of each month and the same diary shall be sent to the department once in a month. At the end of the training period, a student will have to produce a certificate of experience and satisfactory performance from the concerned office in the prescribed format.

The viva-voice marks shall be awarded based on the following works to be submitted by the student and presented during the viva.

- 1) Training Report: This shall contain copies of various drawings done by the student either drafted or designed. It shall also contain other works like photographs of sites visited, models done, computer output produced etc.,
- 2) Building Study ó This shall be a detailed critical study of a building designed by the architect with whom the student has worked. It shall include the study of function, aesthetics, context, structure etc., This shall be presented through drawings, photographs, write ups etc.,
- 3) Building Material Study ó This shall be a detailed study of a new or relatively new building material available in the market. A study of its properties, uses, cost, maintenance etc., is expected to be done. Samples of materials shall also be obtained and presented.
- 4) Detailing study ó This shall be a study of any interesting detail done in the firm where the student has undertaken training. This shall include sketches and photographs of the detail. )
- 5) A candidate failing in the viva examination shall repeat the training afresh for 16 weeks, the starting date coinciding with the beginning of a subsequent semester.

## Unit 10.1 ó PROFESSIONAL TRAINING II

**DURATION: ONE SEMESTER (16 Weeks)**

**DURATION OF EXAM : VIVA (15 MNTS PER STUDENT)**

**VIVA MARKS : 300**

**Objective:** To provide exposure to the various dimensions of architectural practice.

**Outline:**

The student is expected to be exposed to preparation of working drawing, detailing, preparation of architectural models, computer applications in design and drafting, filing system in respect of documents, drawing and preparation of tender documents. Site experience may be given in respect of supervision of the construction activity, observing the layout on site, study of the stacking methods of various building materials, study of taking measurement and recording.

Students will have to maintain a day to day record of their engagement for the period of training. This will be recorded in an authorized diary to be counter signed by the architect at the end of each month and the same diary shall be sent to the department once in a month. At the end of the training period, a student will have to produce a certificate of experience and satisfactory performance from the concerned office in the prescribed format.

The viva-voice marks shall be awarded based on the following works to be submitted by the student and presented during the viva.

- 1) Training Report: This shall contain copies of various drawings done by the student either drafted or designed. It shall also contain other works like photographs of sites visited, models done, computer output produced etc.,
- 2) Building Study ó This shall be a detailed critical study of a building designed by the architect with whom the student has worked. It shall include the study of function, aesthetics, context, structure etc., This shall be presented through drawings, photographs, write ups etc.,
- 3) Building Material Study ó This shall be a detailed study of a new or relatively new building material available in the market. A study of its properties, uses, cost, maintenance etc., is expected to be done. Samples of materials shall also be obtained and presented.
- 4) Detailing study ó This shall be a study of any interesting detail done in the firm where the student has undertaken training. This shall include sketches and photographs

of the detail.

- 5) A candidate failing in the viva examination shall repeat the training afresh for 16 weeks, the starting date coinciding with the beginning of a subsequent semester.
- 6) The student has the choice of working with the same architectural firm during the 9<sup>th</sup> and 10<sup>th</sup> semesters or with two different architectural firms. However, the work presented for the viva-voce exam shall relate only to the period of the corresponding semester. No work presented for 9<sup>th</sup> semester shall be presented again during the 10<sup>th</sup> semester.