

JADAVPUR UNIVERSITY,
KOLKATA- 700 032



Proposed Revised Curriculum & Syllabus

For

**Five Year Degree Course in
Bachelor of Architecture**

1st Year- 5th Year

(Semesters I - X)

[To be effective from forthcoming semester as applicable]

Submitted by

**Department Of Architecture
Jadavpur University**

Submitted to

**Faculty Council of Engineering & Technology
Jadavpur University**

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Preface

The Undergraduate Degree Program in Architecture attempts to prepare students for professional practice in the field of architecture and simultaneously provide exposure to a variety of interests around architecture to pursue further avenues. So, on one hand, this program tries to encourage sensitivity and creativity, and on the other, it tries to develop the intellectual capabilities and professional skills needed to pursue careers within and beyond architecture.

A curriculum is a statement of intentions that provides relationships between disciplines and courses, the objectives and their emphasis, through its structure. The aim is to perceive and understand our context so as to provide for a sustainable and better living environment. Our context brings together the inheritance of an ancient culture, its history and philosophy, art, architecture and their expressions, alongside the challenges of a contemporary society with new thoughts, techniques, and potentials for new expressions. The idea is to provide continuity with the beliefs of the past and our sense of place with the need for transformed expression for the present and future. Based on this context, the attempt is to address, our environmental concerns, options available in recent technology, changes in culture and society, the changing role of our profession, and so on.

The effort is to develop sensitivity to the environment for an architecture rooted in place, climate and social conditions, particularly in India. It is also to develop an understanding of technology that uses appropriate materials and techniques to make proper use of resources and process. The aim is to also develop an understanding of architecture for our immediate conditions and urban surroundings that continue from our traditions but accommodates recent techniques and technology to make way for modern and newer transformations.



The BEST way to PREDICT the FUTURE is to DESIGN IT.
-Buckminster Fuller



Jadavpur University
Department of Architecture
Curriculum and Syllabi
Semesters I to X

FIRST YEAR FIRST SEMESTER								
C. no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/111	Materials & Methods of Construction I	3		0	3	0	100	
Arch/T/112	Design Fundamentals	3		0	3	0	100	
Arch/CE/T/113	Structural Mechanics I	3		0	3	0	100	
Arch/Math/T/114	Mathematics I	3		0	3	0	100	
Arch/S/111	Materials & Methods of Construction I	0		3	0	3		100
Arch/S/112	Architectural Graphics I	0		6	0	6		200
Arch/S/113	Basic Design	0		6	0	3		100
Arch/S/114	Freehand Drawing	0		3	0	3		100
WS/ME/S/6A	Workshop Practice	0		3	0	3		100
	Sub – Total			21	12	18	400	600
		1						
		2						
	Total			33		30		1000

FIRST YEAR SECOND SEMESTER#								
C. no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/121	Materials & Methods of Construction II	3		0	3	0	100	
Hum/T/122	Humanities	4		0	3	0	100	
Arch/CE/T/123	Structural Mechanics II	3		0	3	0	100	
Arch/MATH/T/124	Mathematics II	3		0	3	0	100	
Arch/S/121	Materials & Methods of Construction II	0		3	0	3		100
Arch/S/122	Architectural Graphics II	0		6	0	6		200
Arch/T/123	Architectural Design I	0		9	0	6		200
Arch/T/124	Field work & Study I*	0			0	3		100
	Sub – Total	13		18	12	18	400	600
	Total			31		30		1000

*Field work & Study I of 10 days duration.

#NOTE:

The FIRST YEAR SECOND SEMESTER curriculum is applicable from 2015-'16 as well as through 2016- '17 onwards



SECOND YEAR FIRST SEMESTER								
C. no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/211	Architectural Construction I	3		0	3	0	100	
Arch/T/212	Evolution of Architecture I	3		0	3	0	100	
Arch/T/213	Theory of Architecture I	3		0	3	0	100	
Arch/T/214	Climate & Architecture	3		0	3	0	100	
Arch/CE/T/215	Theory of Structures I	3		0	3	0	100	
Arch/CE/T/216	Surveying	3		0	3	0	100	
Arch/S/211	Architectural Construction I	0		3	0	3		100
Arch/S/212	Architectural Design IIA	0		9	0	6		200
Arch/S/213	Computer Aided Delineation	0		3	0	3		100
	Sub – Total	18		15	18	12	600	400
	Total			33		30		1000

SECOND YEAR SECOND SEMESTER								
Code no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/221	Architectural Construction II	3		0	3	0	100	
Arch/T/222	Evolution of Architecture II	3		0	3	0	100	
Arch/T/223	Theory of Architecture II	3		0	3	0	100	
Arch/T/224	Structure for architects	3		0	3	0	100	
Arch/CE/T/225	Theory of Structures II	3		0	3	0	100	
Arch/S/221	Architectural Construction II	0		3	0	3		100
Arch/S/222	Architectural Design IIB	0		9	0	6		200
Arch/CE/S/223	Survey Practical**				0	3		100
Arch/S/224	Field work & study II*				0	3		100
	Sub – Total	15		12	15	15	500	500
	Total			27		30		1000

*Field work & study II of 10 days duration.

**Continuous training, evaluation and viva-voce of at least 6 days.



THIRD YEAR FIRST SEMESTER								
C. no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/311	Architectural Construction III	3		0	3	0	100	
Arch/T/312	Services & Equipment I	3		0	3	0	100	
Arch/T/313	Landscape Architecture I	3		0	3	0	100	
Arch/T/314	Evolution of Architecture III	3		0	3	0	100	
Arch/CE/T/315	Design of Structures I	3		0	3	0	100	
Arch/S/311	Architectural Construction III	0		3	0	3		100
Arch/S/312	Architectural Services I	0		3	0	3		100
Arch/S/313	Architectural Design IIIA	0		9	0	6		200
Arch/S/314	Interior Design	0		3	0	3		100
	Sub – Total	15		18	15	15	500	500
	Total	33			30		1000	

THIRD YEAR SECOND SEMESTER								
C. no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/321	Services & Equipment II	3		0	3	0	100	
Arch/T/322	Quantity Surveying & Specifications	3		0	3	0	100	
Arch/CE/T/323	Design of Structures II	3		0	3	0	100	
Arch/T/324	Evolution of Architecture IV	3		0	3	0	100	
Arch/S/321	Architectural Services II	0		3	0	3		100
Arch/S/322	Working Drawing	0		6	0	3		100
Arch/S/323	Architectural Design IIIB	0		9	0	6		200
Arch/CE/S/324	Civil Engineering Lab	0		3	0	3		100
	Field work & study III*				0	3		100
	Sub – Total	12		21	12	18	400	600
	Total	33			30		1000	

*Field work & study III of 10 days duration.



FOURTH YEAR FIRST SEMESTER								
Code no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/S/411	Practical Training***					18		600
Arch/S/412	Training* Report					6		200
Arch/S/413	General Seminar					6		200
	Sub – Total					30		1000
	Total					30		1000

*** Practical Training at any reputed organization of 24 weeks duration.

FOURTH YEAR SECOND SEMESTER								
Code no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/421	Services & Equipment III	3		0	3	0	100	0
Arch/T/422	Building Maintenance & Management	3		0	3	0	100	0
Arch/T/423	Introduction to Housing	3		0	3	0	100	0
Arch/T/424	Introduction to Urban Design	3		0	3	0	100	0
Arch/T/425	Introduction to Urban & Regional Planning	3		0	3	0	100	0
Arch/S/421	Architectural Services III	0		3	0	3	0	100
Arch/S/422	Architectural Design IV	0		9	0	6	0	200
Arch/S/423	Landscape Architecture II	0		3	0	3	0	100
Arch/S/424	Elective I	0		3	0	3	0	100
	Sub – Total	15		18	15	15	500	500
	Total			33		30		1000

Elective-I subjects:

1. Advanced Computer Application
2. Application of Quantitative methods in Architecture
3. Architectural Conservation and Restoration
4. Disaster Resistant Buildings
5. Environmental Science
6. Glass Architecture & Design
7. Studies in Indian Architecture.



FIFTH YEAR FIRST SEMESTER								
Code no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/T/511	Architectural Acoustics	3		0	3		100	
Arch/T/512	Professional Practice	3		0	3		100	
Arch/T/513	Building Economics & Valuation	3		0	3		100	
Arch/T/514	Project Management	3		0	3		100	
Arch/T/515	Building Science & Sustainability	3		0	3		100	
Arch/S/511	Dissertation leading to Architectural Thesis	0		3		3		100
Arch/S/512	Architectural Design V	0		9		6		200
Arch/S/513	Elective II	0		3		3		100
Arch/S/514	General Viva Voce	0		0		3		100
	Sub – Total	15		15	15	15	500	500
	Total			30		30		1000

Elective-II subjects:

1. Advanced Landscape Architecture
2. Advanced Materials
3. Architectural Design theory
4. Infrastructure Planning
5. Interior and Furniture Design
6. Studies on Urban Environment, Development and Sustainability

FIFTH YEAR SECOND SEMESTER								
Code no.	Subject	Pds/week			Credit		Marks	
		L	T	S	L	S	Exam	Sessional
Arch/S/521	Architectural Thesis			15		24		800
Arch/S/522	Architectural Thesis Viva Voce					6		200
	Sub – Total			15		30		1000
	Total			15		30		1000



DETAILED SYLLABUS

First Year

First Year First Semester



Subject: MATERIALS & METHODS OF CONSTRUCTION I(Theory); Subject Code: Arch/T/111; 3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3, Internal Assessment: Class Test: 30

Introduction to the subject & Evolution of Building Materials-

Definitions - Art, architecture, structure, materials, construction. A brief introduction on evolution of building materials by chronological approach, **explain various** properties of Building Materials Physical properties, Mechanical properties, other characteristics and explanation of various technical terms used in building industry.

Rocks & Stones

Introduction, Rock-forming Minerals, **Classification** of Rocks, Quarrying of Stones, Natural Bed of Stone, Seasoning of Stone, Dressing of Stone, Uses of Stones, **explain various** Characteristics of good Building Stone, Deterioration of Stones, Durability of Stones, Preservation of Stones, Selection of Stones, Common Building Stones, Artificial Stones, **Justify** the Applications of Stones, Principles of Stone Masonry, **Differentiate between** various Types of Stone Masonry.

Wood & Wood Products

Introduction, **Classification** of Trees, Growth of Trees, **Classification** of Timber (IS: 399), Structure of Timber, Characteristics of good Timber, Seasoning of Timber, Defects in Timber, Diseases of Timber, Decay of Timber, Preservation of Timber, Fire Resistance of Timber, **Justify** the Suitability of Timber for Specific Uses, Properties of Wood, **Differentiate between** the various types of Wood and Wood-products and their applications.

Clay & Clay Products

Introduction, Clay and **its Classifications**, Physical Properties of Clays, Bricks, **Classification** of Bricks, Characteristics of Good Brick, Ingredients of Good Brick Earth, Harmful Substances in Brick Earth, Manufacturing of Bricks, Different Forms of Bricks, **Testing** of Bricks, Defects of Bricks, Heavy Duty Burnt Clay Bricks, Burnt Clay Perforated Bricks, Burnt Clay Paving Bricks, Burnt Clay Soling Bricks, Burnt Clay Hollow Blocks, Burnt Clay Jallis, Clay Tiles, Fire-clay Bricks or Refractory Bricks, Terracotta

Structural Clay Products/ Ceramic materials- Clay bricks, Brickwork, Calcium silicate bricks, Concrete bricks, Tiles, Terracotta, Porcelain, Stoneware, Earthenware, Majolica, Glazing
General Principles of Brick Masonry, Types of Bondings in Brick Work.

Lime, Gypsum & Puzzolana

Introduction to Lime, Impurities in Limestones, **Classification**, Manufacture, Slaking, Hardening, Lime Putty and Coarse Stuff, Lime Vs. Cement,

Introduction to Gypsum, Effect of Heat and Moisture, Setting and Hardening, **Classification**, Manufacture, Plaster of Paris or Stucco, Gypsum Wall Plasters, Hard Finish Plaster, Gypsum Plaster Boards, Non-load Bearing Gypsum Partition Blocks, Pyrocell, Glass-fibre reinforced gypsum (GRG)

Introduction to Puzzolona, **Classification**, The Activity of Puzzolona, Effects of Natural Puzzolanas, Applications of Fly Ash, Calcined Clay Puzzolana (Surkhi), Ground Blast Furnace Slag, Silica Fume, Rice Husk Ash

Cement

Introduction and **classification** of Portland Cement, Chemical Composition of Raw Materials, Composition of Cement Clinker, Hydration of Cement, Rate of Hydration, Water Requirement for Hydration, Manufacture of Cement, Testing of Cement, Types of Cement, Storage of Cement, Glass-fibre reinforced cement

Aggregates

Introduction, **Classification** of Aggregates, Characteristics of Aggregate, Deleterious Materials and Organic Impurities, Soundness, Alkali-Aggregate Reaction, Thermal Properties of Aggregate, Fine Aggregate, Coarse Aggregate, Cinder Aggregates, Broken Brick Coarse Aggregate, **Testing** of Aggregates

Ceramic Materials



Introduction, **Classification** of Ceramic, Refractories, Glass, Glass Wool, Polymorphism in Ceramic Materials, Mechanical Properties of Ceramic Phases, Thermal Properties of Ceramic Phases, Electrical Properties of Ceramic Phases, Glass- Characteristics and performance- solar control, wind loading & sound transmission, Properties, Uses, Types

Polymeric Materials

Introduction, Polymerisation Mechanism, Depolymerisation, Rubbers, Plastics, Constituents of Plastics, Applications of Plastics, Properties of Plastics, Effect of Temperature on Mechanical properties, Characteristics, Uses, Types. Thermoplastics and Thermosetting Plastics, Glass-fibre reinforced plastics, Degradation of plastics, Plastics forming processes, Plastics in construction, Re cycling of plastics, Reinforced Plastics like Glass-fibre reinforced plastics & Carbon-Fibre reinforced plastics, PVC Sheets, Laminated Plastics

Suggested Books:

1. Building Materials - S.K Duggal
2. Engineering Materials, Surendra Singh
3. Building Construction & Materials (Gurcharan Singh)
4. Building Materials & Components (CBRI, Roorkee)
5. Building Construction-Sushil Kumar
6. Building Materials & Construction, Punmia
7. Construction Technology, R. Chudley, Vol-1,2,3,4
8. The Construction of Building, Barry
9. Building Construction, J.K Mckay, Vol-1-5
10. Building Materials in India: 50 yrs – BMTPC
11. Building Materials- P.C Varghese

Subject: DESIGN FUNDAMENTALS (Theory); Subject Code: Arch/T/112; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Definition of Design: **Comparison** between designed and non-designed objects. Appreciation of design criteria; Design as a process. **Visual Perception;** Light and Contrast- value, hue, intensity; **illustrate visual properties of two-dimensional forms** of both geometric and non-geometric surfaces - Line, Shape, Form; Figure-ground relationship; **Principles of two-dimensional composition** - Spatial tension, Likeness basis, balance, movement, scale, proportion, rhythm, dominance and subordination, representation and association; Visual unity; Geometric ratios and dynamic symmetry; **Identify** visual textures and tonal variations; Colour theory and colour dynamics applied to the above exercises; **Principles of three-dimensional composition applying** the basic structure of 2-D composition – solids, voids, planes, lines, closed and open forms etc.; Inter-relationship between material, structure & form; **Elementary principles of Architectural Design** on the basis of 3- '-ty's – stability, utility, beauty.

Suggested Books:

1. Design Fundamentals, Robert Scott.
2. Architecture: Form, Space and Order, F.D.K. Ching.
3. Introduction to Architecture, J. C. Snyder and A. J. Catanese.
4. Space, Time and Architecture, Gidieon.

Subject: STRUCTURAL MECHANICS I(Theory); Subject Code: Arch/CE/T/113;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,



Internal Assessment: Class Test: 30

Equilibrium of forces; concurrent forces; composition and resolution of forces; Polygon of forces; analytical and graphical methods, Bow's notations and vector diagram; Parallel forces; Moments; Couples; Maxwell's diagrams; **Analysis** of trusses of simple nature: method of joints, method of sections; Definition of statically determinate and indeterminate structures; Centroid and centre of gravity - applications; Moment of Inertia; Section Modulus.

Tutorial Problems with application shall be worked out.

Suggested Books:

1. Strength of Materials, 3e Vol. I : Elementary Theory and Problems, S. Timoshenko, CBS Publishers & Distributors; 3rd edition.
2. Fundamentals of Structural Mechanics and Analysis, M.L. Gambhir , Phi Learning Pvt. Ltd-New Delhi.
3. Strength of Materials, R. Subramanian, Oxford University Press.
4. Mechanics of Material, R.C.Hibbler, Pearson Education, 6th Ed.
5. Engineering Mechanics-Statics & Dynamics, R.C.Hibbler, Pearson Education, 11th Ed.
6. Strength of Materials 2/e, Debabrata Nag, Abhijit Chanda , Wiley India Pvt Ltd

Subject: MATHEMATICS I(Theory); Subject Code: Arch/Math/T/114; 3 Credits

Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,

Internal Assessment: Class Test: 30

Successive differentiation, Rolles Theorem (Statement only), Mean Value Theorem
Taylor's & Maclaurin's expansions. Indeterminate forms, Maxima and minima of functions of a single variable; Partial differentiation.

Taylor's & Maclaurin's expansions. Indeterminate forms, Maxima and minima of functions of a single variable; Partial differentiation.

Integration by the solution into partial fractions; properties of definite integrals;

Definite integral defined as the limit of a sum. Fundamental theorem of integral Calculus.

Important Integrals, Beta and Gamma functions; Areas bounded by Improper plane curves and straight lines; Lengths of plane curves; **calculate** Surface areas and volumes of solids of revolution; Multiple Integrals and their applications in calculation of areas, volumes etc.

Numerical Integration by Simpson's Rule. **To compute and solve mathematical problems on these topics and associate with analytical knowledge required for architecture.**

Subject: MATERIALS & METHODS OF CONSTRUCTION I(Sessional); Subject Code:

Arch/S/111; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Stone Masonry: Detail drawings for stone masonry, Ashlar & Rubble Masonry

Timber Joinery: Detail drawings for Timber joinery- , Joinery in Wood Work.

Brick Masonry: Detail drawings for Brick Masonry- Types of Brick, Brick Masonry and Different Types on Brick Bonding- English Bond, Flemish Bond, Rat-Trap Bond, Special Bond.

Project work and **seminar** on building materials.

Suggested Books: Same as Materials & Methods of Construction I

Subject: ARCHITECTURAL GRAPHICS I (Sessional); Subject Code: Arch/S/112;



6 Credits, Full Marks: 200, Contact Periods/week: 6

Introduction to Architectural Graphic Fundamentals: Construction of Lines, lettering and dimensioning, reduction and enlargement of drawings on different scales, Simple Geometrical Constructions, **Orthographic Projections:** Visualisation and Construction of Principles and projection methods of orthographic projection (First and third angle projection), introduction to architectural plans, elevations and sections. Definition of Projection of Points, Lines, Planes and Solids; Introduction to Section of solids, Development of Surfaces of Solids and Interpenetrations of Solids through construction. Principles of model making.

Use of Instruments, Pencils with different grade

Lines, lettering and dimensioning, reduction and enlargement of drawings on different scales,

Simple Geometrical Constructions 2 Sheets

Orthographic Projections: Projection of Points and Lines 1 Sheet

Projection of Planes 1 Sheet

Projection of Solids 2 Sheets

Section of solids 1 Sheet

Development of Surfaces of Solids 1 Sheet

Interpenetrations of Solids 2 Sheets

Model making

Suggested Books:

1. Engineering Drawing – Plane and Solid Geometry , N.D. Bhatt and V.M Panchal, Charotar Pub. House.
2. Perspective, Projections and Design: Technologies of Architectural Representation, M. Carpo, Routledge.
3. Architectural Graphics, F.D.K. Ching, John Wiley
4. Architectural Design Graphics, M. Ciriello, McGraw-Hill.

**Subject: BASIC DESIGN(Sessional); Subject Code: Arch/S/113; 3 Credits,
Full Marks – 100, Contact Periods/week: 6**

Basic Design, Visual Perception and Expression Skills, Human Dimension

Understanding Design and identify its relationship to Architectural Design.

Visual perception and abstraction: Analyze, visualize and illustrate design problems with the help of Visual properties and principles of 2D compositions, line and plane, figure ground relationships. Perception and principles of 3D compositions/models, demonstrate perception of form, space, and its relationship to light, ordering and organizing principles, illustrate compositions of walls and columns and resulting space, understanding scale, form and formal transformations.

Anthropometry: Anthropometry and human activities. Study of activity patterns and clarify the relationship to time and season. Function, storage and circulation. . Learning to analyze, assess and construct these basic elements and principles of design.

**Subject: FREEHAND DRAWING(Sessional); Subject Code: Arch/S/114; 3 Credits,
Full Marks – 100, Contact Periods/week: 3**

Demonstrate techniques of drawing lines of various gradations and inclinations

Finding Visual proportions and principles of perspective

Free-hand drawing of simple objects in single and group formation

Free-hand drawing of simple furniture



Outdoor **sketching** of natural objects/ buildings/ any relevant structure, etc. Study-**based illustration** on shades and shadows, on contrasts of light and on textures.

Suggested Books: 1. Rendering with pen and ink by Robert Gill

Subject: WORKSHOP PRACTICE (Sessional); Subject Code: WS/ME/S/6A; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Carpentry and Fitter Shop

Introduction to types of Indian woods used for engineering purposes and carpenter's tools; use of wood working machines; **construct** selected joinery, **to build components hand on**.

Introduction to fitter's tools, gauges, measuring instruments etc.; marking of jobs; fitter's job involving chipping, filing, sawing, drilling; use of taps and dies; pipe fittings and plumbing, , **to determine usage and functioning of different building elements**.

First Year Second Semester

Subject: MATERIALS & METHODS OF CONSTRUCTION II (Theory); Subject Code: Arch/T/121; 3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3, Internal Assessment: Class Test: 30

Ferrous Metals- Iron & Steel

Introduction, Structures of Ferrous Metal, Iron, Pig Iron, Cast Iron, Wrought Iron, Steel, Rolled Steel Sections, Reinforcing Steel Bars, Rusting and Corrosion, Tensile **Testing** of Steel Sections (IS: 1608), Alloy Steel

Non-Ferrous Metals

Introduction, Aluminium, Copper, Zinc, Lead, Tin, Nickel, Titanium, Process of metallic Corrosion, Characteristics, Properties, Uses.

Concrete

Conventional Concrete, **Classification**, Production, Water-cement Ratio, Gel-space Ratio, Strength of Concrete, Workability, Durability, Defects, Physical Properties, Proportioning, OPC, PPC and PSC cements, Admixtures for Concrete

Non - Conventional Concrete, Precast, Ferrocement, Reinforced Cement Concrete, Prestressed Concrete, Polymer Concrete, Fibre Reinforced Concrete, Light Weight Concrete, High Strength Concrete, Shrinkage Compensating Concrete, Heavyweight Concrete, Roller Compacted Concrete, Ready Mixed Concrete (RMC), Self-compacting Concrete, Shotcrete, High-performance Concrete, Bacterial Concrete,

Protective and Decorative coatings

Introduction, Composition of Oil Paint, Characteristics of an Ideal Paint, Preparation of Paint, Covering Power of Paints, Pigment Volume Concentration (P.V.C.), Painting Plastered Surfaces, Painting Wood Surfaces, Painting Metal Surfaces, Defects, Enamel, Distemper, Water Wash and Colour Wash, Varnish, French Polish, Wax Polish, Miscellaneous Paints

Tar, Bitumen and Asphalt

Introduction, Bitumen, Tar, Pitch, Asphalt, Applications of Bituminous Materials, Characteristics, Properties, Uses, Types.

Miscellaneous Materials

Adhesives, Asbestos, Linoleum, Thermocol, Heat Insulating Materials, Sound Insulating Materials, Water Proofing Materials, Fiber, Geosynthetics, Sand Lime Brick (IS:4139), Smart Materials, Composite Materials.



Green Building Materials, Building Materials Industry and Pollution/ Standardization in construction industry.

Suggested Books: Same as **Materials & Methods of Construction I (Theory)**

Subject: HUMANITIES (Theory); Subject Code: Hum/T/122; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 4,
Internal Assessment: Class Test: 30

English

1. Basic writing skills **to communicate, describe and explain**
2. Report, **Review**, Covering Letter & Curriculum-Vitae writing
3. Reading and Comprehension **to interpret and infer**
4. Selected Short Stories
5. Basic Communication Skills

Sociology

1. Sociology: Nature and scope of Sociology - Sociology and other Social Sciences - Sociological Perspectives and **to explain** of Social issues
2. Society and Technology: Impact of Technology on the Society - **A case study**
3. Social Stratification: Systems of Social Stratification - determinants of Social Stratification - Functionalist, Conflict and Elitist perspectives on Social Stratification
4. Work: Meaning and experience of work: Postindustrial society- Post-Fordism and the Flexible Firm
5. Development - Conceptions of and approaches to development - The Roles of State and the Market in the Development
6. Globalization: The concept of globalization – McDonaldization.
7. Interaction: Symbolic interaction, Garfinkel's Dramaturgy
8. Introduction to Urban Sociology

Subject: STRUCTURAL MECHANICS II (Theory); Subject Code: Arch/CE/T/123;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Stress, Strain and Elasticity; Stress-strain curves; Factor of Safety; Working stresses' problems of direct stress and strain; Thermal stress Poisson's ratio; Elastic constants, simple theory of bending of beams. B.M. and S.F. diagrams; **Analyze** Bending stresses, Shear stresses in beams; **Calculate** Moment of resistance. **Solving of** Tutorial Problems with application shall be worked out.

Suggested Books:

1. Strength of Materials, 3e Vol. I : Elementary Theory and Problems, S. Timoshenko, CBS Publishers & Distributors; 3rd edition
2. Fundamentals of Structural Mechanics and Analysis, M.L. Gambhir , Phi Learning Pvt. Ltd-New Delhi
3. Strength of Materials, R. Subramanian, Oxford University Press.
4. Mechanics of Material, R.C.Hibbler, Pearson Education, 6th Ed.
5. Structural Analysis, R.C.Hibbler, Pearson Education, 6th Ed.
6. Theory of Structures (Vol-I), Pandit,Gupta, Gupta, Tata McGraw-Hill Pvt Ltd.
7. Strength of Materials 2/e , Debabrata Nag, Abhijit Chanda , Wiley India Pvt Ltd



Subject: MATHEMATICS II(Theory); Subject Code: Arch/MATH/T/124; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Determinants; definition and properties, Cramer's Rule. Matrix and Multiplication of matrices; Inverse of a matrix; **solve** linear equations by matrix method, Mathematical Optimization (Basic concept - with working examples from Linear Programming). Some properties of plane curves; Tangent and Normal, Curvature, Asymptotes; Conic sections, Catenary, Geometry of three dimensions: Cartesian Coordinates. Curves represented by mathematical functions; Three dimensions in, direction cosines, planes and straight lines; **determine** standard equations of sphere, cylinder, cone, ellipsoid, hyperboloid of one and two sheets, hyperbolic paraboloid and their properties properties – **to compute and solve mathematical problems on these topics and associate with analytical knowledge required for architecture.**

Subject: MATERIALS & METHODS OF CONSTRUCTION II(Sessional); Subject Code: Arch/S/121; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Detail drawings for Ferrous Metals- Iron & Steel –Manufacturer's detail
Detail drawings for Non Ferrous Metals- Aluminium & Copper – Manufacturer's detail
Detail drawings for Concrete - Non-conventional Concrete Structures - Typical Strip Sections
Conventional Concrete Structures -Typical Strip Sections

Suggested Books: Same as **Materials & Methods of Construction I (Theory)**

Subject: ARCHITECTURAL GRAPHICS II (Sessional); Subject Code: Arch/S/122;
6 Credits, Full Marks – 200, Contact Periods/week: 6

Isometric and Axonometric Views: **Interpretation** using Solids, compositions and buildings,
Perspective Drawing: **Definition** of perspective technique (picture plane, stationary point etc.) and **demonstration** of their role in drawing perspectives, **One point, two point and three point perspectives** of geometrical shapes leading to perspectives of built forms, **Sciography: Study and illustration** of shades and shadows cast by simple architectural forms on plain and curve surfaces.

Isometric and Axonometric Views:

Interpretation using Solids, compositions and buildings 2 Sheets

Perspective Drawing: **Definition** of perspective technique (picture plane, stationary point etc.) and their role in drawing perspectives, One point, two point and three point perspectives of geometrical shapes leading to perspectives of built forms 5 Sheets

Sciography:

Study and **illustration** of shades and shadows cast by simple architectural forms on different surfaces. 3 Sheets

Model making

Suggested Books: Same as **Architectural Graphics I**

Subject: ARCHITECTURAL DESIGN I (Sessional); Subject Code: Arch/S/123; 6 Credits,
Full Marks – 200, Contact Periods/week: 9

Activity Space Form Structure Correlation



Case study to **visualize** and **analyze** relationship of site and of building, with respect to location, orientation, movement, activity, space, form, structure etcas well as landscape.

Design of spaces with respect to activity, form and structure, Relationship to site, location, form, movement and circulation, as well as landscape.

Design of dwellings and small structures like kiosks, canteen, guard rooms. Small institutions with emphasis on circulation, like exhibition galleries.

**Subject: EDUCATIONAL TOUR I (Sessional); Subject Code: Arch/S/124; 3 Credits,
Full Marks – 100, Contact Days/Semester: 10 days**

The students will submit a report **and present through student seminar the work done on** measured drawing/photo-documentation **of case study/ies** study of Indian architecture, traditional and contemporary, conducted during the educational tour spanning 10 days

DETAILED SYLLABUS

Second Year



Second Year First Semester

Subject: ARCHITECTURAL CONSTRUCTION I; Subject Code: Arch/T/211; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Foundations: Purpose; Essential requirements; Settlement; **Classification** – Shallow (Wall footings, Inverted arch foundation, Isolated footings, Combined footing, Strip footing, Cantilever footing, Mat or raft foundation) Deep: (Pile foundation, Pier foundation)

Floors: Timber Floor; Jack arch floor; RCC Floor - Slab (one-way, two-way & cantilever), Beam & slab, Flat Slab, Ribbed floor; Pre-cast concrete floors; Steel Floor with joist and deck-plate.

Partition Walls:

Uses and construction details

Wall Openings: Corbels, Lintels and Arches; Typical detail of a masonry window opening showing sill, lintel & chajja projection; Lintel types by construction methods: Brick lintel, RCC lintel (precast and cast-in-situ); Typical details of an arch opening with nomenclature; Types of Arches - Semi-circular, Segmental, Flat, Relieving arch etc.

Roofs: Nomenclature, Types – Flat roof, Lean-to-roof, Coupled roof, Closed couple roof, King Post Roof Truss, Queen Post Roof Truss, Steel trusses; Roofing materials with fixing details; Roof drainage systems and details.

Roofing Materials: Burnt clay tiles, slates, AC sheets, GI and Aluminium sheets. Materials for Terracing: Mud-phaska and Brick Tiles and other new systems for terracing.

Suggested Books:

1. Building Materials - S.K Duggal
2. Engineering Materials, Surendra Singh
3. Building Construction & Materials (Gurcharan Singh)
4. Building Materials & Components (CBRI, Roorkee)
5. Building Construction-Sushil Kumar
6. Building Materials & Construction, Punmia
7. Construction Technology, R. Chudley, Vol-1,2,3,4
8. The Construction of Building, Barry
9. Building Construction, J.K McKay, Vol-1-5
10. Building Materials in India: 50 yrs – BMTPC

Subject: EVOLUTION OF ARCHITECTURE I; Subject Code: Arch/T/212; 3 Credits



**Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

Introduction to the subject and its significance

Primitive Beginnings: Introduction to history and architecture with special emphasis on **identification** and **analysis** of stone age to Neolithic settlements in Europe and around with examples from Carnac and Stonehenge.

Birth of Civilization: **Identification** and **analysis** In reference to the Asia-minor region with nascent cities like Jericho, Catalhoyuk, and Hattasus etc.

Indus Valley civilization: **Description, analysis** and **inference** of architectural style particularly in reference to the town planning principles exemplified with examples from Mohenjo-Daro and Harappa.

The Aryan civilization: **Case study** of the Vedic town plan, its motifs and patterns. **Classification** and **analysis** of Buddhist Architecture: In specific reference to the lats, edicts, stupas, viharas, and chaityas, both in rock-cut or otherwise.

Hindu Architecture-Indo Aryan: **Description, analysis** and **inference** of architectural style with special attention to the evolution of the temple form, the shikhara in north India. Reference also to be made to the three schools of architecture - the Gujarat, the Khajuraho, and the Orissan styles.

Hindu Architecture-Dravidian: **Description, analysis** and **inference** of architectural style particularly in reference to the evolution of the vimana and the contributions of the Chalukyas, the Pallavas, the Pandyas and Cholas as well as the contributions of the Nayaks to the temple cities.

Jain Architecture: **Identification** and **analysis** of architectural style with specific reference to the temple cities of Palitana and Girnar.

Islamic Architecture: Introduction and understanding of 'Islam's' philosophy and its **interpretation** in building type e.g. mosque, tomb, fort and their elements like domes, minarets, arch, squinch etc.

The Sultanate Style: Comparison and interpretation of the Slave, Khalji, Tughlaq, Sayyid, Lodhis and Shershah Suri regimes (who ruled from Delhi) and their architecture.

Provincial Architecture: **Definition** of development of colloquial styles in various provinces of India like Punjab, Jaunpur, Gujrat, Bengal, Bijapur, Bidar and Deccan.

Cities and Citadels: **Description, analysis** and **inference** of Morphology of fortified cities of Jaisalmer, fort/ palaces like Mandu, Chittorgarh, Orchha, Datia, Jodhpur etc. with an overview on architectural types like havelis, stepwells, gates, baradaris etc.

Mughal Architecture: **Description, analysis** and **inference** of the architecture of the Timurids in India- Babur, Humayun, Akbar, Jahangir and Shahjahan.

The Later Moghuls: **Description, analysis** and **inference** of Oudh architecture in Lucknow and its surroundings briefly outlining the Lucknow city.

Colonial Architecture: **Description, analysis** and **inference** of British architecture of the colonial days in India- Calcutta and the capitol at Delhi emphasizing on their planning criteria and architectural features.

Suggested Books:

1. Indian Architecture Vol. 1 (Buddhist & Hindu) , Percy Brown, D.B. Taraporevala Sons & Co. Pvt. Ltd
2. Indian Architecture Vol. 2 (Islamic Period), Percy Brown, D.B. Taraporevala Sons & Co. Pvt. Ltd.
3. Islamic Architecture in India, Satish Grover, Galgotia Publishing Company, New Delhi
4. Buddhist and Hindu Architecture in India, Satish Grover, CBS
5. The Great Ages of World Architecture, G. H. Hiraskar, Dhanpat Rai



Subject: THEORY OF ARCHITECTURE I; Subject Code: Arch/T/213; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

A study and analyze briefly Greek and Roman styles of architecture along with **case studies** of characteristic features of Parthenon in Athens and Pantheon in Rome; A brief overview of various styles of architecture during centuries; **Definition** of Architecture and Architectural Design; **Definition** of Space; Study on Space as protagonist of Architecture; To **identify** Internal and external spaces related to Architecture; Study on Scale and Proportion in Architecture with note on Golden Section and Fibonacci Series; To **explain** the methods of Representation of Space; Study on Form in Architecture with respect to Envelop and Plan, Study on Geometry in Plan; Study on effect of climate on general Form; Study and **interpret** Lines – Axis, Focal Point, Direction; **Classification** of buildings as per Functions; Study and **compare** on Solid and Void in Architecture; Study on Colour Plane and effect of Colour on Architecture and People;

Suggested Books:

1. Arch form space & Order, Francis DK Ching, Wiley, 1996.
2. Experiencing Architecture, Steen Eiler Rasmussen, The MIT Press.
3. Architecture as Space, Bruno Zevi, Horizon Press, New York.
4. Elements of Architecture, M von Piere, Routledge, 1990.
5. Building construction illustrated, Francis D.K Ching, Van Nostrand Reinhold, 1991.
6. Notes of synthesis of form, C. Alexander, Harvard, 1974.
7. People & buildings, R. Gulman, Transaction Pub, 2009.

Subject: CLIMATE & ARCHITECTURE; Subject Code: Arch/T/214; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

To understand the necessity of study of climatology in architecture. Global climatic factors, Elements of climate, **Classification** of tropical climates, site climate. Concept of Thermal Comfort; different factors **determining** thermal comfort of human being in a built environment, Thermal comfort indices, bioclimatic chart –comfort range, effective temperature and its use; Thermal conductivity of building materials and its impact in thermal comfort, thermal quantities, heat exchange on buildings, Periodic heat flow. Effect of Sun in architecture; orientation of Sun: azimuth and altitude; mathematical equations to **determine** azimuth and altitude of Sun from latitude of a location, date & time; study and method of drawing sun path diagram; study of shading devices in buildings; Solar radiation & heat gain. Means of thermal control; Mechanical controls, heating, ventilation and cooling; Structural control, methods of solar control; Ventilation and air movement. Effects of rain, wind and other climatic and environmental conditions on various building materials and built environment and the science of design for creating effective human comfort conditions; Study of airflow: global and regional, in and around city and buildings. Light and lighting, lighting principles, illumination, visual efficiency daylighting, the design sky concept, daylighting in the tropics, artificial lighting. Climatic zones of India, Impact of various climatic elements in different regions of our country in building design, Solar passive architecture, Introduction to Sustainability in architecture. Tutorials on Drawing sun path diagram and utilizing it for **design** of buildings and shading devices; **design** for natural ventilation in buildings, **Study/documentation** of buildings giving due consideration to the impact of various climatic elements such as sun, airflow, precipitation etc. in different climatic regions of the country, with special emphasis on the climate of Bengal, Study



and **Documentation** on the latest developments in the field of climate and architecture; materials and methods, technology, research, fieldwork. **Understanding** of Climate and its impact on architectural design, fundamentals of climatology and environmental studies.

Suggested Books:

1. Manual of Tropical Housing and Buildings, O.H. Koenigsberger
2. Housing, Climate and Comfort, Martin Evans
3. Building in the Tropics, Maxwell Fry
4. Climate Responsive Architecture , Arvind Kishan, Baker & Szokolay
5. An introduction to Building Physics, Narashimhan

Subject: THEORY OF STRUCTURES I; Subject Code: Arch/CE/T/215; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Analyze Principal stress, shear stress, normal stress, conjugate stress. Mohr diagram. Deflection of determinate beams: Area moment Theorem, Principle of superposition;
Analysis of indeterminate beams: Propped cantilever, Fixed and continuous beams. Columns and struts: Short columns with eccentric loading (small eccentricity), Euler's theory of long columns, Empirical formulas for design of columns. **To calculate and solve problems on these topics.**

Suggested Books:

1. Theory of Structures, S. P. Timoshenko - D. H. Young
2. Fundamentals of Structural Mechanics and Analysis, M.L. Gambhir , Phi Learning Pvt. Ltd-New Delhi
3. Structural Analysis, T. S. Thandavamoorthy , Oxford University Press.
4. Strength of Materials, R. Subramanian, Oxford University Press.
5. Mechanics of Material, R.C.Hibbler, Pearson Education, 6th Ed.
6. Structural Analysis, R.C.Hibbler, Pearson Education, 6th Ed.
7. Theory of Structures (Vol-I), Pandit,Gupta, Gupta, Tata McGraw-Hill Pvt Ltd.
8. Theory of Structures (SI Units) (English) 12th Edition (Paperback), Dr. B. C. Punmia Ashok Kr. Jain, Arun Kr. Jain, Laxmi Pub.

Subject: SURVEYING; Subject Code: Arch/CE/T/216; 3 Credits,
Semester Examination: Time: 3 hrs. Full Marks – 100, Contact Periods/week: 3
Internal Assessment: Class Test: 30

Introduction to surveying: Fundamental Definitions, Errors and Accuracy; Linear & angular measurement and corrections; Traversing: Principles and Adjustments of Traverse; Plane table surveying; **Describe** Leveling: Ordinary, Reciprocal, Contouring; Area and volume measurements, Mass diagram; Introduction to Theodolite surveying. **To calculate and solve problems on these topics.**

Suggested Books:

1. Surveying & Levelling, 2nd Edition, Basak , McGraw Hill Education
2. Surveying and Levelling (English) 2nd Edition, R. Subramanian, Oxford Univ Pr
3. A Text Book of Surveying and Levelling (English) 11th Edition, R. Agor, Khanna Publishers-Delhi
4. Surveying and Leveling , S. V. Kulkarni , T. P. Kanetkar, Vidyarthi Griha Prakashan
5. Surveying: Vol- I, Dr. B.C. Punamia, A.K.Jain, A.K.Jain, Laxmi Publications
6. Textbook Of Surveying, Rao, P. Venugopala , Akella, Vijayalakshmi, Prentice Hall India



**Subject: ARCHITECTURAL CONSTRUCTION I (Sessional); Subject Code: Arch/S/211;
3 Credits, Full Marks – 100, Contact Periods/week: 3**

Detailed **construction** drawings for different types of Foundations, Floors, Partition Walls, Wall Openings, Roofs, Roof Coverings. Students would gather knowledge how to **construct** these building elements.

Suggested Books: Same as Architectural Construction I

**Subject: ARCHITECTURAL DESIGN IIA (Sessional); Subject Code: Arch/S/212;
6 Credits, Full Marks – 200, Contact Periods/week: 9**

Space Structure Correlation

Role of structure and construction to create space, to **build** structural systems as choices based on activity or function, space and form character. To **differentiate** between various structural systems, correlation between site, function, form, space and structure. **Demonstrating** the role of light and view. **Case Study** and documentation of cluster rural houses to **asses** relationship of space, form, structure, and construction.

Design of small buildings or small group of buildings of not more than 2 floors preferably in rural neighborhoods such as junior schools, community centers, neighborhood hospitals.

**Subject: COMPUTER AIDED DELINEATION (Sessional); Subject Code: Arch/S/213;
3 Credits, Full Marks – 100, Contact Periods/week: 3**

Elements of Graphics and **Visualization**

Basics of two- and three-dimensional computer graphics systems: Computer aided drawing **and 3-D modeling** and rendering, and **selected** graphics software APIs.

Introduction to graphics softwares; Short tutorials and exercises as **project work** in scene depiction; Suitably rendered sectional perspective/s or other orthographies of an architectural **design** problem set as **formulated** by the instructor.

Other topics may include interactive graphics, animation, graphical user interfaces, and the graphical presentation of information.

Second Year Second Semester

**Subject: ARCHITECTURAL CONSTRUCTION II; Subject Code: Arch/T/221; 3 Credits,
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

Water Proofing Treatments - Flat Roofs & Terraces, Parapet Wall (Details of Coping and Drip course), Window Sill & Chajja (Detail of Drip course)

Conventional Doors: Types of doors based on operation - Swing door, Revolving door, Sliding door, Sliding-folding door, Collapsible door, Rolling shutter door; Timber doors – Battened, Panelled & glazed door – Flush door; Steel doors – Collapsible door, Rolling shutter; Aluminium doors: Swing door – Sliding door; PVC/UPVC door; Fire door.

Conventional Windows: Types of windows based operation and Location – Fixed window, Casement window, Sliding window, Pivoted window, Louvered (or Venetian) window, Bay



window, Clerestory window, Corner window – Gable and Dormer window. Timber windows – Panelled & glazed timber casement window; Steel windows – Glazed fixed & casement steel window; Aluminium windows – Casement and Sliding aluminium window; PVC window

Hardware: Fixing and fastening for doors and windows – Nails, Screws, Hinges, Bolts, Rivets, and Handles etc.

Stairs: Components and requirements; **Classification** based on form, structural systems, materials; Typical construction details such as balustrade fixing, nosing, etc.

Suggested Books:

1. Building Materials - S.K Duggal
2. Engineering Materials, Surendra Singh
3. Building Construction & Materials (Gurcharan Singh)
4. Building Materials & Components (CBRI, Roorkee)
5. Building Construction-Sushil Kumar
6. Building Materials & Construction, Punmia
7. Construction Technology, R. Chudley, Vol-1,2,3,4
8. The Construction of Building, Barry
9. Building Construction, J.K Mckay, Vol-1-5
10. Building Materials in India: 50 yrs – BMTPC
11. Building Material , R.C. Smith

Subject: EVOLUTION OF ARCHITECTURE II; Subject Code: Arch/T/222; 3 Credits

Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,

Internal Assessment: Class Test: 30

Egyptian: Particularly in reference to early tomb architecture & later temple architecture with examples - Great pyramids of Cheops, Mastabas, Funery temples & later temples like Khons etc.

Mesopotamian: With special attention to cities of Mesopotomian like Ninveh, Khorsahbad, Marie, Babylon, and architectural constructs like Ziggurat.

Aegean: With reference to cities in Aegean like Troy, Sparta, Mycenae, which formed the basis of Greek civilization.

Greek Architecture: Classical orders as constituent element of Architecture. Column Orders and the articulation of temples. **Classification** of temples. Geometry and symmetry of individual buildings and their relationship with others based on different organizing principles and conditions of site. Study of important acropolis, agora, temples, theatres, tombs and house forms.

Roman Architecture: Multiple building types to correspond the complex social functions and structure. Complex axial organizations of Forums. Concrete and construction of walls, vaults and domes. Use of Classical Orders in surface articulation. Study of important forums, temples, basilicas, thermaes, theatres, amphitheatres, circuses, tombs, triumphal arches, palaces, houses and villas

Suggested Books:

1. The Great Ages of World Architecture , G. H. Hiraskar, Dhanpat Rai
2. A World History of Architecture, Marian Moffett, Michael Fazio & Lawrence Wodehouse, McGraw-Hill
3. A History of Architecture, Sir Banister Fletcher, Butterworth Heinemann, CBS Publishers & Distributors
4. The Story of Architecture From Antiquity to the present, Jan GympelKonemann
5. Puzzle of Architecture, Robin Boyd, Melbourne Architectural Press



Subject: THEORY OF ARCHITECTURE II; Subject Code: Arch/T/223; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Study on Aesthetics in Architecture including a sense of Rhyme and Pattern, Rhythm, Balance and Harmony; To study and **analyze** Perception of Architecture emphasizing qualities that characterize Architecture; **Evaluate** Art and Science issues related to Architecture; Architect's Creative Faculties; Study and **demonstrate** Architectural **Design** – Approach and Procedure; Relationship of Space, Geometry, Function, Form, Texture, Colour and Climate factors in totality in Architectural Design; Structure in Architecture – various types and systems, forces, **evaluate** limitations and possibilities; A brief overview on Earthquake Resistant Structure; A study on Basic Building Services; **Analysis** of Human factors – Anthropometry and Ergonomics; Study on Barrier-Free Design; **Compose** Design Guidelines for Natural Ventilation;

Suggested Books:–

1. Notes of synthesis of form, C. Alexander, Harvard, 1974.
2. The pattern language, C.Alexander, Oxford Univ. Press, 1977.
3. Building construction illustrated, Francis, D.K. Ching, Van-Nostrand-Reinhold, 1991.
4. People & buildings, R. Gulman, Transaction Pub, 2009.
5. Architecture for People, Byron Mikellides (Edited by),Harber, G.M., Thomas O. Blank & Group (Ed). 1992.
6. Building Design for Handicapped and Aged Persons. McGraw-Hill, Inc. New York, USA.
7. Low-Energy Cooling, Donald W. Abrahams.

Subject: STRUCTURE FOR ARCHITECTS; Subject Code: Arch/T/224; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Illustrative study of new structural systems with emphasis on limitation and scope of these systems - multistoried R.C.C and steel buildings, pre-stressing, shells, folded plate, space frame, suspension structures. Emphasis will be given to the structural philosophy and not on the rigorous calculation. Models of structural form.

Suggested Books:

1. Structure for Architects, Salvadori & Heller
2. Shell Structures, Felix Candela
3. Tensile Structures, Frei Otto

Subject: THEORY OF STRUCTURES II; Subject Code: Arch/CE/T/225; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Strain Energy: Castigliano's theorems, **Analysis** of indeterminate structures by use of energy principle and moment distribution method; **Compare** Effect of wind and earthquake on framed structures; Portal and Cantilever method for analysis of frames under wind and earthquake forces. **To calculate and solve problems on these topics.**

Suggested Books:

1. Theory of Structures, S. P. Timoshenko - D. H. Young Structural Analysis, T. S. Thandavamoorthy , Oxford University Press.
2. Structural Analysis, R.C.Hibbler, Pearson Education, 6th Ed.



3. Theory of Structures (Vol-I & II), Pandit, Gupta, Gupta, Tata McGraw-Hill Pvt Ltd.
4. Intermediate Structural Analysis, Chu-Kia Wang, TBS
5. Theory Of Structures (SI Units) (English) 12th Edition (Paperback), Dr. B. C. Punmia, Ashok Kr. Jain, Arun Kr. Jain, Laxmi Pub.

**Subject: ARCHITECTURAL CONSTRUCTION II (Sessional); Subject Code: Arch/S/221;
3 Credits, Full Marks – 100, Contact Periods/week: 3**

Detailed drawings for different types of Doors,
Detailed drawings for different types of Windows,
Detailed drawings for different types of Hardware,
Detailed drawings for different types of Staircases
- to visualize, categorize, sketch and demonstrate these building components

Suggested Books: Same as **Architectural Construction II**

**Subject: ARCHITECTURAL DESIGN IIB (Sessional); Subject Code: Arch/S/222;
6 Credits, Full Marks – 200, Contact Periods/week: 9**

Climate, Culture and Place dimensions of Space

Relationship of culture, place, environment, on built form. Understanding the effect of sun, wind, temperature, rain, and its relationship to space and form. Correlation of structure and basic services in buildings. Understanding social and cultural behavior of people in a place. Design of a cluster of dwellings and small institutions such as market place, clubs, small neighborhood centers and theaters.

**Subject: SURVEY PRACTICAL (Sessional); Subject Code: Arch/CE/S/223; 3 Credits,
Full Marks – 100, Contact Days/Semester: 10 days**

Field Work to demonstrate and verify the theory taught in Surveying course done through project work.

**Subject: FIELD WORK & STUDY II (Sessional); Subject Code: Arch/S/224; 3 Credits,
Full Marks – 100, Contact Days/Semester: 10 days**

A study and analysis of Indian architecture both traditional and contemporary to be done during the educational tour and a precise report to be submitted and presented through student seminar. Identification and Thorough measured drawing of architecture/ architectural elements/ pieces to be done to explain a particular style, period, influence, spatial appraisal, social or cultural importance etc. at least within seven days at a particular location of interest and should be submitted by each student.





DETAILED SYLLABUS

Third Year

Third Year First Semester

**Subject: ARCHITECTURAL CONSTRUCTION III (Theory); Subject Code: Arch/T/311;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

To define and describe the following building components:

Special Doors: Definition, Characteristics, Uses, Types.

Special Windows: Definition, Characteristics, Uses, Types.

Wall Panelling: Definition, Characteristics, Uses, Types.

Curtain Walls: Definition, Characteristics, Uses, Types.

Suspended Ceilings: Definition, Characteristics, Uses, Types.

Special Structural System: Definition, Characteristics, Uses, Types.

Suggested Books:

1. Building Materials - S.K Duggal
2. Engineering Materials, Surendra singh
3. Building Construction & Materials (Gurcharan Singh)
4. Building Materials & Components (CBRI, Roorkee)
5. Building Construction-Sushil Kumar
6. Building Materials & Construction, Punmia
7. Construction Technology, R. Chudley, Vol-1,2,3,4
8. The Construction of Building, Barry



9. Building Construction, J.K McKay, Vol-1-5
10. Building Materials in India: 50 yrs – BMTPC
11. Building Material , R.C. Smith

Subject: SERVICES & EQUIPMENT I (Theory); Subject Code: Arch/T/312; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Water Supply & Drainage

Water supply, sources (surface and underground), Methods of lifting and storage and supply, Standard of potable water and methods of removal of impurities, Standard of requirement of water for daily uses. Simple principles of design for water supply, system for low as well as high buildings.

Equipment for water supply- pipes, pumps, tube well, reservoirs and cisterns for storage, different types of pipes and accessories, controlling fixtures like valves, taps, etc. receptacles like wash basins, sink bath- tubs, shower-trays, etc.

Drainage- Different types of drainage for rain water waste and soil, systems of collection carriage and disposal; simple graphical methods of determining sizes, jointing system of pipelines and fixtures. **Employ** Equipment like- trap, yard outlines, man-holes, water closets, urinals, slop sinks, septic tanks, etc. Garbage disposal, incinerators, protective devices against insects, rodents, etc. **Assess and identify various services required in a building and work towards solving the issues associated with it.**

Minimizing pollution, Recycling processes. Fire fighting in buildings - regulations and requirements, different types- dry and wet risers, sprinkler system, chemicals.

Means of vertical transportation (mechanised) in a building- details of elevators and escalators- regulations and requirements.

Suggested Books:

1. Environmental Technologies in Architecture, Bertram York, Kinzey Jr. & Howard M. Sharp.
2. Textbook of Water Supply and Sanitary Engineering, S.K. Husian.
3. Plumbing, H. E. Babbitt.
4. Plumbing Technology, F. Hall.

Subject: LANDSCAPE ARCHITECTURE I (Theory); Subject Code: Arch/T/313; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Introduction to the theory of landscape architecture; Landscape design principles; Landscape elements including natural- vegetation, water & landform and man-made – landscape shelters & outdoor furniture; **compare** landscape techniques, materials and methods. Site planning, grading, drainage, ecological and environmental concerns; Study and **analyze** of different historical landscape styles across the globe through different ages; Contemporary landscape design; Understanding ecological and sustainability issues in landscape including management of plant, water and soil resources, soil and water conservation, rain water harvesting; **application** in architectural design.

Student seminar and **project work** on selected topics

Suggested Books:

1. An Introduction to Landscape Architecture, Michael Laurie.
2. Landscape Architecture: A manual of site planning and design, John O. Simonds.



3. Landscape of man: Shaping the environment from pre-history to the present day, G. Jellicoe, and S. Jellicoe, 1979.
4. The Gardens of Mughal India: A history and a guide, Sylvia Crowe *et al.*
5. Landscape design with plants, ed. by Brian Clouston, 1977
6. Common Trees, H. Santapau, 1966.
7. Flowering Trees, M.S. Randhawa.

**Subject: EVOLUTION OF ARCHITECTURE III (Theory); Subject Code: Arch/T/314;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

Early Christian Architecture: **Demonstrate** development of early church from Roman basilica. **Illustrate** the concept of center and path of Christianity manifested through centralized and longitudinal church. Interiority of churches and the articulation of interiors to create spiritualized space. Study of different basilica churches in Italy.

Byzantine Architecture: **Explain** centralization in Byzantine churches. Centrality and interiority of both cross-domed and cross in square planned church. Indistinct exterior of churches and the domed 'heavenly' interior. Construction of dome over polygonal compartments through the use of pendentives. Study of important churches in Constantinople.

Romanesque Architecture: **Demonstrate** Massiveness and verticality of medieval churches. Combination of the five towered structures and longitudinal basilica. Gradual integration of tower from early to later examples. Integration of centralized and longitudinal plans. Articulation of external wall like arcaded interiors resulting in dematerialization of exterior. Study of important cathedrals and churches from Italy and France.

Gothic Architecture: **Explain** continued integration of centralized and longitudinal plans. Spatial and formal integration of Romanesque churches. Integration of wall and vault. Ribbed vault and the dissolution external wall to allow light. Sensitivity to light and use of stained glass for mysterious interiors. Need and development of different external buttressing. Study of important cathedrals and churches in France.

Renaissance Architecture: **Demonstrate** and **explain** break with medieval churches for sources from Roman antiquity. Spatial centralization through simple addition of independent spatial elements. Use of elementary geometrical forms unified through symmetry and simple mathematical ratios. Reintroduction of anthropomorphic Classical Orders. Study of palazzos and development of centralized church form through specific examples from Italy.

Mannerism: Conflict and tension in Mannerism in place of harmony and order of Renaissance. Dynamic interplay of contrasting elements as against static addition of independent units of Renaissance church. Interplay between manmade and nature in villas. Dynamism of urban spaces. Centralized longitudinal and the elongated central church plans. Study of important villas, churches and urban spaces in Italy.

Baroque Architecture: Dynamism and systemization of Baroque architecture. Vitality and spatial richness with underlying systematic organization. Space as constituent element of architecture, as a complex totality and indivisible figure, comprising of interacting spatial elements based on inner and outer forces. Sensitivity to effects of texture, color, light and water. Study of important urban spaces and churches in Italy and Germany.

- to explain and interpret these phases of evolution of architecture.

Suggested Books:

1. A History of Architecture, Sir Banister Fletcher, Butterworth Heinemann, CBS Publishers & Distributors
2. The Great Ages of World Architecture, G. H. Hiraskar, Dhanpat Rai



3. A History of Architecture, Kostof, Spiro.
4. A World History of Architecture, Marian Moffett, Michael Fazio & Lawrence Wodehouse, McGraw-Hill
5. Crash course in Architecture, Eva Howarth, Caxton Editions.
6. Puzzle of Architecture, Robin Boyd, Melbourne Architectural Press
7. Architecture Highlights!, Adams Hubertus and Paul Jochen, Dumont monte
8. Architecture of Today, Andreas Papadakis & James Steele, Terrail
9. At the end of the century: One hundred years of Architecture, Edited by Russel Ferguson, The Museum of Contemporary Art, Los Angeles, Harry N. Abrams Inc., Publishers
10. The Story of Architecture From Antiquity to the present, Jan Gypfel, Konemann

Subject: DESIGN OF STRUCTURES I(Theory); Subject Code: Arch/CE/T/315; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Theory of reinforced concrete, properties and assumptions; **Tests** for measuring workability and strength of concrete; **Design** of singly reinforced rectangular and T-beams; Slabs spanning in one direction. **Design** of R.C. columns subjected to axial loads only.

Design of members and joints of M.S. truss with riveted joints and welded joints.

Design of laterally restrained steel beams with R.S.J.; **Design** of columns subjected to axial load only using R.S.J.; Design of slab-base. **To calculate and solve problems on these topics.**

Suggested Books:

1. Fundamentals of Reinforced Concrete Design, M.L. Gambhir, Phi Learning Pvt. Ltd-New Delhi
2. Reinforced Concrete Design 3/E (English) 3rd Edition S. Pillai, Devdas Menon, McGraw Hill Education
3. Limit State Design of Reinforced Concrete, 2/E (English) 2nd Edition, P. C. Varghese, Phi Learning
4. Limit State Design of Reinforced Concrete (English) 1st Edition, Punmia B C, Laxmi Publications-New Delhi
5. Limit State Design of Steel Structures (English) 2nd Edition, S. K. Duggal, McGraw Hill Education
6. Design of Steel Structures [With CDROM] (English) 1st Edition, N. Subramanian, Oxford University Press, USA

Subject: ARCHITECTURAL CONSTRUCTION III (Sessional); Subject Code: Arch/S/311;
3 Credits, Full Marks – 100, Contact Periods/week: 3

Construction of Detailed drawings for different types of Special Doors, Special Windows, Wall Paneling, Curtain Wall, Suspended Ceiling and Special Structural Systems. **Construction** of scaled models of iconic buildings

Suggested Books: Same as Architectural Construction III

Subject: ARCHITECTURAL SERVICES I (Sessional); Subject Code: Arch/S/312;
3 Credits, Full Marks – 100, Contact Periods/week: 3

Project works for large scale plan, section, elevation of attached and detached type of lavatories and Kitchens, Sculleries etc. showing fixtures and connections of water supply drainage and sewage disposal. **Illustrative** layout drawing **and illustrative study of** sewage and storm water drainage etc. rain water disposal system for roof terraces etc.



Drawing of Lift, Lift well and Lift machine room; Escalator with necessary details.
Drawings related to building automation, preparation of flow charts, detailing and systems involved.

Suggested Books: Same as **Services & Equipment I**

**Subject: ARCHITECTURAL DESIGN IIIA (Sessional); Subject Code: Arch/S/313;
6 Credits, Full Marks – 200, Contact Periods/week: 9**

Structure Construction and Services. Emphasis on Landscape

Formulate program, **evaluating** site level – building level relationship and associated environmental impact. **Arranging** movement, activity, space, form, materials, construction and services. **Defining** open spaces with emphasis on landscape.
Design of schools, hostels, clubhouses, guesthouses, small hotel, small residential complex, etc..

**Subject: INTERIOR DESIGN (Sessional); Subject Code: Arch/S/314; 3 Credits,
Full Marks – 100, Contact Periods/week: 3**

Understanding the various elements associated with Interior Design such as colour and colour theory, Evolution of furniture, Furnishings, Fittings and Fixtures, Construction Materials, Plant materials, Illumination, Co-ordination and implementation drawings. **Evaluate and analyze the various Interior Design styles followed by a case study. Identify and visualize a space to demonstrate its design capacity.**

Third Year Second Semester

**Subject: SERVICES & EQUIPMENT II (Theory); Subject Code: Arch/T/321;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

Ventilation- Natural and Forced or mechanical, standard of requirement quantity, and velocity for different conditions of living and works, principles of natural ventilation and simple methods of induced or forced ventilation.

Airconditioning – **Group Discussion** on Control of quality, quantity, temperature and humidity, conditions for comfort, principles refrigeration and its commercial application in air-conditioning.

Psychrometry: the properties of air and measurement, psychrometric terms, numerical problems on psychrometry, advanced psychrometric process

Simple calculations for finding cooling load, major equipment used, their characteristics and suitable place for location; consideration and reduction of heat gain and for economic layout for supply and return air ducts.

Mechanical equipment for vertical transport, recommended use for escalators and elevators; simple calculation to determine number if type of escalators and elevation sketch drawings showing the air-conditioning system of an auditorium, multi-storeyed hotel and office Buildings. Plan and section of elevators, machine room and escalators.

Various methods of building automation, general overview.

Suggested Books:



1. Principles of Air conditioning, V. Paul Lang.
2. Modern Air Conditioning Practice, Norman C. Harris & David F. Conde.
3. Refrigeration and Airconditioning, P.L. Ballaney.

Subject: QUANTITY SURVEYING & SPECIFICATIONS (Theory); Subject Code: Arch/T/322; 3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3, Internal Assessment: Class Test: 30

Standard method of measurement and unit, procedure of **calculating** quantities and estimating for all trades involved in **construct** a building of medium complexity, abstracting and preparation of bills of quantities. Describe different types of estimates, derive estimate of buildings, **Schedule** of rates, **analysis and evaluation** of rates, Quantity survey of materials, Types of specification, Specifications of different materials and classify various items of work, Method of measurement of works, writing of measurement books.

Suggested Books:

1. Estimating, Costing, Specification & Valuation, M. Chakraborty.
2. Estimating & Costing, B. N. Dutta.
3. A textbook of Estimating and Costing, D.D Kohli and R.C Kohli.

Subject: DESIGN OF STRUCTURES II (Theory); Subject Code: Arch/CE/T/323; 3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3, Internal Assessment: Class Test: 30

Design of doubly reinforced concrete beams, two way R.C. slabs, column sections subject to combined bending and thrust. **Design** of isolated and combined footing. **Design** of laterally unrestrained beams, M.S. plated beams and compound columns. **Design** of eccentric connection in steel structures. **To calculate and solve problems on these topics.**

Suggested Books: Same as Design of Structures I

Subject: EVOLUTION OF ARCHITECTURE IV (Theory); Subject Code: Arch/T/324; 3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3, Internal Assessment: Class Test: 30

Picturesque and Neo- classical architecture: Purity and structural honesty of antiquity preferred over ornamentation and exaggeration of Baroque. Representation of ancient Roman monuments in imaginary compositions. Archeological purism and importance of pictorial values in historical settings. Recreation of antique Roman simplicity and splendor for modern living. Study of important palaces and public buildings in Britain and France.

Enlightenment and beginnings of Modern: Belief in creation of 'new' and 'ideal' world through return to fundamentals, 'true' and 'original' values. Romanticizing elementary geometrical forms with undecorated surfaces. Iron and glass construction for openness and lightness: Art Nouveau. Repetitive, Orthogonal, skeletal systems for horizontal and vertical expansion. Latter attempts to dissociate references to past styles.

Modern Architecture: Social intentions and search for ideal world. Pluralism in place of past unity of styles. Search for paradigms in historical sources: It return to fundamentals and origins in geometry, nature and paradigms of technology.

Expressions of construction and technology. Equating technology and progress with present. Functionalism and functional appropriateness. Thoughts and works of frank Lloyd Wright, Walter Groupies, Le Corbusier, Mies van der Rohe, Alvar Aalto, Louis Kahn, Dutch De Stijl Italian futurists and Russian Constructivists.



International style: Oversimplification of the modern Movement into functional, steel and glass, cubes. Monotonous functionalist abstractions and Modernism as a style.

Disenchantment of modern cities and fall of modern Movement.

Post Modern Architecture: Post Modern Architecture as a revision of Modern architecture and resistance to functional containers of 60's. Objective, representational and emphasis on content. Pluralistic and differing trends.

Post Modern – Historicism: Rooted to place and history. Regards of expression: ornaments, symbolism and context with irony and humour, exemplified through the works of James Stirling, Michael Graves, Charles Moore, Arata Isozaki.

Neo- Modern: Disregard historical imaginary to recapture ideas for modern architecture of 20's. Hi-tech metal abstractions of Richard Rogers, Norman Foster, showing structure and equipment as implied ornament. References of Russian Constructivists. The early works of New York Five including later works of Richard Mier as complicated, exaggerated and sophisticated revival of the modern grid and Corbusier's geometry. Synthesis of Hi-Tech and Historicism in the works Aldo Rossi, Mario Botta, Cesar Pelli.

Deconstructivist Architecture: Narrative and representational. Sources in Russian Constructivism. Non perfection in the works of Frank Gehry, Peter Eisenman, Bernard Tschumi, Daniel Libeskind, questioning traditional purity of form, geometry and structure. **to explain and interpret these phases of evolution of architecture.**

Suggested Books:

1. A History of Architecture, Sir Banister Fletcher, Butterworth Heinemann, CBS Publishers & Distributors
2. The Great Ages of World Architecture, G. H. Hiraskar, Dhanpat Rai
3. A History of Architecture, Kostof, Spiro.
4. A World History of Architecture, Marian Moffett, Michael Fazio & Lawrence Wodehouse, McGraw-Hill
5. Crash course in Architecture, Eva Howarth, Caxton Editions.
6. Puzzle of Architecture, Robin Boyd, Melbourne Architectural Press
7. The Language of Post-Modern Architecture, Charles Jenks, Academy Editions, London
8. Architecture Highlights!, Adams Hubertus and Paul Jochen, Dumont monte
9. Architecture of Today, Andreas Papadakis & James Steele, Terrail
10. At the end of the century: one hundred years of architecture, Edited by Russel Ferguson, The Museum of Contemporary Art, Los Angeles, Harry N. Abrams Inc., Publishers
11. The Story of Architecture From Antiquity to the present, Jan Gypfel, Konemann

Subject: ARCHITECTURAL SERVICES II (Sessional); Subject Code: Arch/S/321; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Location of air conditioning plant room, air handling unit rooms, systems of horizontal and vertical ducts layouts for conveying conditioned air, return air fresh air, chilled water and return water pipes **through sketch, project work and/or student seminar.**

Subject: WORKING DRAWING (Sessional); Subject Code: Arch/S/322; 3 Credits, Full Marks – 100, Contact Periods/week: 6

To **explain** the Building Bye-Laws of Local Development Authorities and National Building Codes. **Definition** and **Interpretation** of Bye-Laws applicable to small, Residences and Housings, as well as, small Commercial, Educational and Institutional Buildings.

Making Local Development/ Regulatory Authority drawings for a small residence or an institution **designed** in any of the previous semesters with desired **design** modifications needed as per Local Authority or NBC guidelines.



Composing complete set of Working Drawings and **Design Details** for the residence or institution presented earlier or any other small project designed in any of the previous semesters. The drawings to incorporate all **building services** needed for **construction** along with **schedules** and **design specifications**.

Subject: ARCHITECTURAL DESIGN IIIB (Sessional); Subject Code: Arch/S/323;
6 Credits, Full Marks – 200, Contact Periods/week: 9

Design development and Details. Emphasis on Interior Design

Design of small institutional project to develop **construction** drawings and details.

Analyze design problem and develop it with intensive research and case studies. **Demonstrate the design with working drawings and details involved.** Understand and **determine** the materials, products and construction principles associated with it. Integration of structural analysis and building services to **illustrate** the understanding of the task assigned.

Subject: CIVIL ENGINEERING LAB (Sessional); Subject Code: Arch/CE/S/324; 3 Credits,
Full Marks – 100, Contact Periods/week: 3

Using civil engineering lab for various materials, **test** their structural properties and tests involved. General discussion and guidelines to enrich the concept of structure and different materials involved.

Structural **models** and their **analysis**. Study and **analysis** of any specific problem related to architecture and structure. **To demonstrate and verify various theory of structures learnt.**

Subject: FIELD WORK& STUDY III (Sessional); 3 Credits,
Full Marks – 100, Contact Days/Semester: 10 days

a) A **case** study of Indian architecture both traditional and contemporary to be done during the educational tour and a precise report to be submitted **and presented through student seminar.**

b) **Identification, analysis** and Thorough measured drawing of architecture/ architectural elements/ pieces to be done to **explain** a particular style, period, influence, spatial appraisal, social or cultural importance etc. at least within seven days at a particular location of interest and should be submitted by each student.



DETAILED SYLLABUS

Fourth Year

Fourth Year First Semester

Subject: PRACTICAL TRAINING (Sessional); Subject Code: Arch/S/411; 18 Credits, Full Marks – 600

The practical training **on real-life project works** of 24 weeks duration shall be carried out in the office of an experienced architect registered with the Council of Architecture or trained professional of the relevant field **to apply, demonstrate and employ the knowledge and skills acquired in practical scenario**. The practical training shall be supervised and evaluated by the institution after completion of the training.

Subject: TRAINING REPORT (Sessional); Subject Code: Arch/S/412; 6 Credits, Full Marks – 200



At the end of the semester, each student would be required to submit a portfolio on the work done by him/her during the practical training and explain the lessons learnt.

Subject: GENERAL SEMINAR (Sessional); Subject Code: Arch/S/413; 6 Credits, Full Marks – 200

At the end of the semester, each student would be required to make a formal presentation on any approved topic of his/her research interest related to subjects taught in previous semesters including project works of Practical Training in form of a student seminar to demonstrate their knowledge and skills acquired so far.

Fourth Year Second Semester

Subject: SERVICES & EQUIPMENT III (Theory); Subject Code: Arch/T/421; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Illumination and domestic wiring

Determine Concepts of Light Source, Luminaire, Photometry, Colorimetry/Color science.

Introduction to Lighting Design to associate with architecture, Design directives for illumination in interiors of commercial buildings, educational institutions, housing, gallery, marketplace, heritage building; Design directives for illumination in exterior spaces like roads, pathways, building facade; Miscellaneous standards and codes

Green building certification concept, compare LPD based on ECBC, differentiate between building area method, and space function method.

Introduction of Domestic Wiring/Electrical to associate with architecture.

Power Distribution System for a particular project -Components of the substations, High tension voltage and low tension voltage gradation, concept of 3-phase and 1-phase, transformers, HT & LT distribution boards, its area coverage locations preferable locations with respect to the project.

Electrical design of Domestic wiring systems (exposed and concealed) for small residence and high-rise buildings. development of SLD, protection against lightning, earthing.

Suggested Books :

1. Lighting in Architectural Design, D. Phillips.
2. Lighting: Interior & Exterior, Robert Bean.
3. Building Services, Peter R. Smith & Warren G. Julian.
4. Lighting in Architecture, W. Kohler.
5. Light, Colour, Environment, F. Birren.

Subject: BUILDING MAINTENANCE & MANAGEMENT (Theory); Subject Code: Arch/T/422; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3, Internal Assessment: Class Test: 30

Explain Causes of Damage and Decay in Buildings; Inspection of a Building – Methodology, Equipment and Format of Report; **Analyze** Various Methods of **Assessment** of damages; Building Foundation and its Problems; Damages in Walls and Method of Repair of Walls; Rising Dampness – Causes and Effects, Remedial Measures; Study on Roofs of Old and New Buildings; **Identify** Causes of Deterioration of Plain and Reinforced Concrete; Problems in Timber;



Remedial Measures for damage of Roof; **Formulate** Remedial Measures for damages of RCC Columns and Beams; Study on Maintenance, Conservation and Restoration of Architecture;

Suggested Books:

1. Building Maintenance Management, B. Chanter & P. Swallow, Wiley, 2008.
2. Maintenance and repair of buildings- 2nd Ed., P.K. Guha, New Central Book Agency, Kolkata, India, 2006.
3. Diagnosis and Assessment of Concrete Structures - State-of-Art Report, CEB (1989).
4. Concrete Repair and Maintenance Illustrated: Problem Analysis; Repair Strategy; Techniques, P.H. Emmons Kingston, MA: RS Means, 2002.
5. Testing of Concrete in Structures – 4th edition, J.H Bungey, S.G. Millard, & M.G. Grantham, 2006. London: Taylor & Francis.

Subject: INTRODUCTION TO HOUSING (Theory); Subject Code: Arch/T/423; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Concepts and Definitions

Shelter as a basic requirement, determinants of housing form, Census of India definitions, Introduction to policies, housing need, demand and supply, dilapidation, structural conditions, materials of constructions, housing age, occupancy rate, crowding, housing shortage, income and affordability, poverty and slums, houseless population. **To study** various housing typologies viz. traditional houses, plotted development, group housing, multi-storied housing, villas, chawls, etc.

Social and Economic Dimensions

Housing as social security, role of housing in development of family and community well-being, status and prestige related to housing, safety, crime and insecurity, deprivation and social vulnerability, ghettoism, gender issues, housing for the elderly.

Contribution of housing to micro and macro economy, contribution to national wealth and GDP, housing taxation, national budgets, fiscal concessions, forward and backward linkages.

Housing and the City

Understanding housing as an important land use component of city plan / master plan, considerations for carrying out city level housing studies, projections, land use provisions; Suitability of land for housing, housing stress **identification**, projecting housing requirements, calculating housing shortages, housing allocation.

Housing Environments

Slums and squatters, night shelters, public health issues related to housing, various theories of housing, concept of green housing, green rating of housing projects; basic services for housing neighborhoods. Approaches to neighborhood living in traditional and contemporary societies, elements of neighborhood structure, Planning and design criteria for modern neighborhoods, norms and to **study and evaluate** criteria for area distribution, housing and area planning standards, net residential density and gross residential density, development controls and building byelaws, UDPFI & URDPFI guidelines, NBC 2005 provisions and Case studies of neighborhood planning.

Suggested Books:

1. People and Housing in Third World Cities, D.J. Dwyer, Orient Longman, 1981.
2. Housing : a factual analysis , Glen H Beyer, The Macmillan Co. NY, 1958.
3. Man's Struggle for Shelter in an Urbanizing World, Charles Abrams, MIT, Harvard, 1964.
4. Urban Housing in the Third World, Geoffrey Payne, Routledge and Keegan Paul, USA, 1977.
5. Inside the Civano Project (Green Source Books): A Case Study of Large-Scale Sustainable Neighborhood Development, Al Nichols, Jason Laros, (Mcgraw-Hill's Green source Series) 2009 McGraw-Hill Professional.
6. Sustainable Urbanism: Urban Design with Nature, Douglas Farr, John Wiley & Sons, 2007.



7. Shelter in India – Sustainable Development Series, Aromar Revi, Stosius Inc / Advent Books Division, 1990
8. Eco housing Assessment criteria Version II, International Institute for Energy Conservation.

**Subject: INTRODUCTION TO URBAN DESIGN (Theory); Subject Code: Arch/T/424;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

Outline of History.

Discussion of Definitions, Objectives, Requirements.

Comparisons of Architecture, Urban Design & Urban Planning.

Explanation of Theories & Concepts – Historic, Modern.

Description of Present Scenario.

Determination of Process.

Identification of Parameters – Image & Characteristics.

Illustration of Scale, Types, Examples.

Suggested Books:

1. Urban Design. The Architecture of towns & cities- Paul D. Spreiregen, McGraw Hill
2. The Consise Town Scape, Gorden Cullen.
3. Town Design, Sir Frederick Gibberd
4. Design of cities, Edmond Bacon.
5. Image of the city, Kevin Lynch.
6. The City in history, Lewis Mumford.
7. Town Planning, S. C. Rangwala.
8. Urban Pattern, Arthur Gallion.

**Subject: INTRODUCTION TO URBAN & REGIONAL PLANNING (Theory); Subject
Code: Arch/T/425; 3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact
Periods/week: 3, Internal Assessment: Class Test: 30**

Evolution of City Building

Relevance of the study of evolution of settlements; Hunter, gatherer, farmer and formation of organized society; Cosmological and other influences, origins and growth of cities, effects of cultural influence on physical form; Human settlements as an expression of civilizations; Basic elements of the city; Concepts of space, time, scale of cities.

Planning History

Town planning in ancient India; Medieval, renaissance, industrial and post industrial cities; City as a living spatial entity; Concepts of landmark, axis, orientation; City form as a living space; City as a political statement: through review of New Delhi, Chandigarh, Washington D.C. Brasilia etc; Contribution of individuals to city planning: Lewis Mumford, Patrick Geddes, Peter Hall, etc; Dynamics of the growing city, impact of industrialization and urbanization, metropolis and megalopolis.

Definitions and Objectives of Planning

Definitions of town and country planning; Orthodoxies of planning; Goal formulation, objective, scope, limitations; Sustainability and rationality in planning; Components of sustainable urban and regional development.

Theories of City Development and Planning Theories

Explain theories of city development including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory and other latest theories; Land use and land value theory of William Alonso; Ebenezer Howard's Garden City Concept; and Green Belt Concept; City as an organism: a physical, social, economic and political entity; Emerging Concepts: global city, inclusive city,



safe city, etc.; City of the future and future of the city; Shadow cities, divided cities; Models of planning: Advocacy and Pluralism in Planning; Systems approach to planning: rationalistic and incremental approaches, mixed scanning and middle range planning; Equity planning; Political Economy Model; Types of development plans, plan making process.

Suggested Books:

1. Text Book of Town Planning, A. Bandyopadhyay, Arunabha Sen, Kolkata, India, 2010.
2. Ekistics: An Introduction to the Science of Human Settlements, C.A. Doxiadis, Hutchinson, London, 1968.
3. Housing and Urban Renewal, Andro D.Thomas, George Allen and Unwin, Sydney, 1986.
4. Urban Development Plans: Formulation & Implementation–Guidelines-1996, Ministry of Urban Affairs and Employment, Government of India, New Delhi.
5. Report of the National Commission on Urbanisation, Government of India, 1988.
6. Ministry of Urban Development, Government of India, New Delhi,, 'URDPFI 2015
7. Urban pattern, Arthur Gallion.

Subject: ARCHITECTURAL SERVICES III (Sessional); Subject Code: Arch/S/421; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Design and layout Drawing of wiring and lighting system in a residence, working drawing (with symbols).A complete site drawing **as case study** comprising of Electrical Portions such as transformer, switch, gear unit, distribution boards of panels, wiring system and switch boards. Introduction to Renewable sources.

Outline B.O.Q development comprising of server room detail (Communication cable/ cable management source), M.C.C., P.C.C., High tension and low-tension panels, Cable tracing, Converter/ electrical board, brief introductions to the working of a generator. **Project work to calculate** LPD for different space typologies.

Subject: ARCHITECTURAL DESIGN IV (Sessional); Subject Code: Arch/S/422; 6 Credits, Full Marks – 200, Contact Periods/week: 9

Complex Structural Systems and Services. Emphasis on Interior Design

Outline to emphasis on complex structural systems and services. **Design** of multistoried buildings with extensive vertical and horizontal circulation, **describe** plumbing and electrical services. Addressing local authority norms. Emphasis on design of interiors. Design of multistoried office or commercial buildings, auditorium buildings and multiplexes, design of multistoried hotels and hospitals.

Subject: LANDSCAPE ARCHITECTURE (Sessional); Subject Code: Arch/S/423; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Study, **analysis** and critical appraisal of existing landscapes/ **case-studies**; landscape documentation, site planning exercises; landscape **design** of residential/institutional/commercial/recreational/public landscapes; study & **identification** of plant species; learning to inventorize landscape assets and plants through short assignments/**projects/seminars** and visit to botanical gardens/ agri-horticultural gardens/ nurseries.

ELECTIVE I (Sessional); Subject Code: Arch/S/424; 3 Credits, Full Marks – 100, Contact Periods/week: 3



Subjects under Elective-I:

1. ADVANCED COMPUTER APPLICATION [non-graphic] (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Developing skills in non-graphic applications of computer as required for architectural profession and office management, such as word processing, spreadsheets, power point presentations, databases, etc.

General structure of electronic computers; concept of bit, byte and word.

Binary, octal, decimal, hexadecimal, BCD & floating point numbers;

Idea about machine language, assembly language, high level language, interpreter & compiler.

Digital electronics and Boolean Logic, Digital circuits, Analog digital interface.

Mention of programming language paradigms, Common examples like block (eg. C), object oriented, modular etc.

General introduction to C; structure of a C program; Data types, variables, operators, statements and functions in C; Standard input and output; Conditional statements and control structures;

Arrays; Functions, parameter passing; Pointers to **compute**;

Introduction to advanced topics, Time complexity function O() of algorithms; Common data Structures; Graphs, AutoLisp, **Computer modelling**.

2. APPLICATION OF QUANTITATIVE METHODS IN ARCHITECTURE (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Architecture Design is a holistic and creative process, which must be supported by the **analysis** of corresponding data with the help of appropriate qualitative and quantitative methods. **Definitions** of qualitative and quantitative methods, **Clarify** the details of different qualitative methods (like, Delphi method, consumer market survey etc.) and quantitative methods (like, Regression analysis, Cluster analysis, Queuing theory, Analytical hierarchy process, etc.); **Application** of qualitative and quantitative methods in the process of architectural **design**.

3. ARCHITECTURAL CONSERVATION AND RESTORATION (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

To study the definition, history and theory of conservation, Philosophy of conservation, Values and Ethics, Cultural heritage, Conservation methods, Classifications. To **describe** the conservation- principles defined in the Venice Charter and Burra Charter. Students have to **case** study a historic building appropriate for conservation in context of the various conservation-values, study the architectural style and survey to prepare a floor plan layout, inspect its structural and physical condition and suggest the possible method of restoration, management of historic sites.

Role of various organizations.

4. DISASTER RESISTANT BUILDINGS (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Describing risks, hazards and **justify** vulnerability; **categorize** all types of disaster; to make a **list** of disaster zones of India, disaster preparedness and mitigation; **Determine** the Factors causing disaster for buildings in all climate zones, Study of building **designs** to resist earthquake, natural disasters like flood, cyclones, tornados and avalanche. To **explain** Fire protection provisions in



buildings, infrastructure provisions for flood mitigation. . To **cell** Post disaster problem resolutions.

**5. ENVIRONMENTAL SCIENCE (Sessional); 3 Credits,
Full Marks – 100, Contact Periods/week: 3**

Multidisciplinary nature of environmental studies -Definition, scope and importance.

Natural Resources – **Distinguish and assess** natural resources and associated problems.

Renewable and non-renewable resources- Forest resources ,Water resources, Mineral resource, Food resource, Energy resources, Land resources , Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles.

Ecosystems - Concept of an ecosystem, Structure and function of an ecosystem, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and function of the different ecosystems - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems.

Biodiversity and its conservation Definition: genetic, species and ecosystem diversity.

Biogeographical **classification** of India, Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation, Hot-spots of biodiversity, Threats to biodiversity, Endangered and endemic species of India, Conservation of biodiversity.

Environmental Pollution - Definition, Cause, effects and control measures of - Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management, Role of an individual in prevention of pollution, Disaster management.

Social Issues and the Environment -Sustainable development, Urban problems related to energy, Water conservation, Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation, Consumerism and waste products. Environment Protection Act, Issues involved in enforcement of environmental legislation, Public awareness.

Human Population and the Environment -Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health.

**6. GLASS ARCHITECTURE& DESIGN (Sessional); 3 Credits,
Full Marks – 100, Contact Periods/week: 3**

Glass – The building Material

Evolution & importance of Glass in Modern Architecture, Applications of Glass in Buildings (façade/ interior applications), Understanding the Production & properties of Glass, Value additions - Coating Technology: Importance & necessity, Processing, Concepts on Tempering, Heat Strengthening, DGU, Laminated, Ceramic Fritting, Different Types of Glass: Mirror, Lacquered, Fire Resistant & Modern Glass with different applications; Glass for segments-Hospitals, Green Homes, Airports, Offices, Other buildings; Understanding Glass & Human safety Compliances; Role of Glass in Fire Safety Considerations: Class E, EI & EW, Role of Glass in Acoustics; International Standards & Codal Provisions Green Building Visit Green Building Visit report

Glass and Green Architecture

Building Physics: Theory of electromagnetic radiation, Understanding of internal & external reflections; Day-lighting in Buildings: Introduction & basic concepts (VLT), Solar Control and



thermal Insulation(SF, UV, SHGC), Need for Green Buildings: Energy efficient buildings, Benefits of going green, Achieving energy efficiency using glass, Factors of energy efficient material selection: Performance parameters, Energy codes and Green ratings: ECBC, IGBC, GRIHA, Approaches of energy efficiency; Prescriptive method; Trade off method – Accommodating Passive architecture; Whole Building Simulation; **Case study** of Green Building Designed predominantly with energy efficient materials; Calculations involving basic factors in Glass Design; Optimization of Glass: For wastage reduction & standardization of Design Industry Visit Report on Industry Visit

Software Analysis and **Case Studies**

CREATE your building: Interactive Modelling; Sun Path Analysis, Solar exposure **Analysis**, Building Orientation **Analysis**, Simulating the NEIGHBORHOOD: Site Shadow **Analysis**; Accommodate COMFORT: Daylight Analysis and Acoustic analysis; SAFETY check: Thickness **analysis**; LOOK: Colour and aesthetics; Costing: WASTAGE optimization;.AC load calculations and PAYBACK **analysis** – A comparative case study; Creative use and solutions of Glass

7. STUDIES IN INDIAN ARCHITECTURE (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Study of ideas, elements, and examples that help articulate Indian architecture in relation to land, climate, light, movement, construction techniques, sustainability, and so on, through primary and/or secondary sources, **executed through project works, group discussion and student seminars.**



DETAILED SYLLABUS

Fifth & Final Year



Fifth Year First Semester

Subject: ARCHITECTURAL ACOUSTICS (Theory); Subject Code: Arch/T/511; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

The Physics of Sound – Wave motion, Sound frequency, sound velocity, particle velocity and wavelength, the Decibel Scale, Combining Sound Levels, Sound Attenuation by Distance, Sound Fields

Sound Measurement and Hearing – Sound Level Meter, The Ear's Sensitivity, The Haas Effect, Sound Masking, Binaural Hearing

Sound Reflection, Diffraction and Diffusion – The Boundary Phenomena, Absorption Coefficient of Sound, Sound Diffraction, Relevance of Acoustical Shadows, Acoustical Transparency of a Screen, Diffuse and Specular Reflections, Sound Diffusion, Flutter Echo

Sound Absorbing Materials –Types of Sound Absorbing Materials, Porous Absorbers, Panel Absorbers, Volume Absorbers

Noise Control in Buildings – Interior Noise Criteria, Interior Noise Control through Architectural Design, Sound Absorptive Treatment and Barriers, Exterior Noise Criteria, Exterior Noise Control through Site Planning and Barriers

Control of HVAC Noise – HVAC Systems, Noise Attenuation in Ducts, Noise Generated by Air Flow, Sound Radiation by Duct Walls, Estimating HVAC Noise Levels, Active Noise Control in HVAC Systems

The Behavior of Sound in Rooms –Impulse Response of a Room, Impulse Diagram and Sound Diffusion, Reverberation Time, Sabine's Law, Coupled Rooms

Design of Rooms for Speech – Speaker-Listener Distance, Balcony and Hall Depth, Room Shape and Volume, Reflecting and Absorbing parts of a Room, Floor Rake, Ceiling Reflections

Design of Rooms for Music – Musical Attributes and Acoustical Phenomena, Early Decay Time and Clarity, Intimacy, Spaciousness, Warmth and Brilliance, Loudness, Concert Hall Design Procedure

Acoustical Instruments – Some examples and descriptions **through case study/ies.**

Suggested Books:

1. Architectural Acoustics – Principles and Design, Madan Mehta, James Johnson and Jorge Rocafort, Prentice Hall Inc., Upper Saddle River, New Jersey.
2. Acoustical Designing in Architecture, V. O. Knudsen and C. M. Harris.

Subject: PROFESSIONAL PRACTICE (Theory); Subject Code: Arch/T/512; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Study of Building Control Standards, Codes of practices and Bye laws prevalent in different development authorities, municipalities/ corporations and urban arts commissions in India.

Identify various environmental acts & laws, special rules governing hill area development & coastal area management, heritage act of India, Real Estate Laws.

Study of office practices, Office administration, Accounting.

Formulate expression of Interest.

Tendering- Tender and its different constituents- **Determine** conditions of engagement, Specifications of Workmanship & Materials, **classifying** different items of works, Schedule of quantities. Supervision and **evaluation** of projects. **Verifying** and certifying contractor's bills.



Contracts and Arbitration, Valuation, Professional conduct and ethics. Architects Act 1972, Role of COA and IIA.

Suggested Books:

1. Professional practice, Roshan Namavati.
2. Architects Act 1972.
3. Publications of Handbook on Professional practice by IIA.
4. Publications of Council of Architecture-Architects (Professional conduct) Regulations
5. Architectural Practice and Procedure, Ar. V.S. Apte, Mrs. Padmaja Bhide, 2008
6. Consumer Protection Act, 2011
7. Arbitration Act, 2005
8. Persons with Disabilities Act, 1995
9. The West Bengal Municipal (Building) Rules, 2007.
10. Kolkata Municipal Corporation Building Rules, 2013.

**Subject: BUILDING ECONOMICS & VALUATION (Theory); Subject Code: Arch/T/513;
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30**

Building Economics

Detail study on PERT, CPM, Bar Chart.

Building Economics

Economic Principles-Definition of Economics and Economic System, Factors of production with special emphasis on land, Types of Business organization, Business units, Analyze Cost of production. Market : differentiate Perfect, Imperfect and Monopoly, Law of Demand, determine Supply and Pricing.

Accounting- Definition of Accounting -Types of Accounting, Definition of cost classification and interpretation of cost, Preparation of cost sheet, Marginal costing and Management Decision, Contract costing, Accounting Ratios, Value analysis and project evaluation.

All the above factors should be considered with respect to Building Operation as economic activity to evaluate building economics.

Valuation

General Principles of Valuation.

Concepts : Value, Price and Cost.

Definitions : Value in Use and Value in Exchange, Market Value.

Classify and distinguish Reproduction Value, Replacement Value, Re-installment Value, Book Value.

Reproduction Value, Replacement Value, Re-installment Value, Book Value.

Salvage Value / Scrap Value, Capital Value / Sinking Fund, Depreciation and Obsolescence, Rent- Ground Rent, Gross Rent, Rack Rent, Net Rent, Leases and Reversion - examples by sums on rent and valuation of Lease-holds.

Net Income : Tear's Purchase, examples by sums on Income Computation.

Categorize Property : Freehold, Lease-hold, Condominiums and Co-operatives, Timeshared Property, Developmental Rights.

Explain Principal Methods of Valuation : Cost Approach, Income Approach, Market Approach

Suggested Books:

Building Economics:

1. Economics, Paul Samuelson & William Nordhaus



2. Principles of Economics, N. Gregory Mankiw.
3. Business Economics.
4. Land Economics, Edited by Daniel W. Bromley
5. Urban Land Economics, Hard Press Publishing.
6. Principles of Accountancy, Hrishikesh Mukherjee.
7. Costing, P.V. Ratnam.
8. Principles of Costing, B.K. Bhar.
9. Project planning & Control with PERT & CPM, B.C Punmia & K.K. Khandelwal.
10. PERT & CPM- Principles and Applications, 3rd Edition, L.S. Srinath.

Valuation:

1. J. A. Parks- Principles & Practice of Valuation, 6th Edition, edited by D. N. Bannerjee & assisted by Basudev Dey.
2. Valuation of Real Property – Principles & Practice, Syamales Datta .
3. Professional Valuation Practice, Ashok Nain.

Subject: PROJECT MANAGEMENT (Theory); Subject Code: Arch/T/514; 3 Credits
Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Entrepreneurship Development

To **define** entrepreneur and entrepreneurship. Entrepreneurship concept and its types, Characteristics, Decision Process, Functions and role, Growth of Entrepreneurship in India.

Woman Entrepreneurship

To **describe** rural entrepreneurship meaning, concept and **purpose**, Rural Entrepreneurship/Industrialization in Retrospect, Problems, How to Development, NGOs and Rural Entrepreneurship

Social Entrepreneurship and Family Business: Introduction and Meaning, Perspective of Social Entrepreneurship and in Practice, Family Business in India: A Historical Perspective, To **identify** the advantages and disadvantages, Planning and its Effectiveness

Growth, Motivation and development Programs: Factors affecting Entrepreneurship, Motivating Factors and its Cycle or Process, Changes in Entrepreneurship Motivation, Entrepreneurship Development Programs(EDPs)in India: A Historical Perspective

Project Management

Project Appraisal: Meaning and Concept of Business Plan, Project Appraisals and its Methods, Environmental Clearance for small and medium enterprises(SMEs), Planning Commission Guideline for **Formulating** Project Reports, Network Analysis

Financing of Enterprise: Meaning and need for Financial Planning and for Industrial Finance, Sources of Finance, Capital Structure of the Business, Industrial Finance and Term loans

To **explain** different forms of Business Ownership: Introduction, Meaning and Types: Sole Proprietorship, Partnership, Company, Co-operative, Public Sector Enterprise

To **demonstrate** the fundamentals of management: Meaning and Characteristics of Management, justification, Scope and Functions of Management, Principles and Process of Management, Difference between Management and Administration

Development: IPR-Intellectual Property Rights and MSMEs-Micro small and Medium Enterprises, Need and Objectives of Accounting, Growth Strategies, Promotion of Enterprise, Sickness.



Suggested Books:

1. Professional construction Management & Project administration, W.B. foxhall, 1972.
2. Project Management for the Design Professional, D. Burstein & F. Stasiowski.
3. Project Management in Construction, A. Walker.
4. Project Management: A systems approach to planning, scheduling & controlling- 11th Edition, Harold R. Kerzner.
5. Project planning & Control with PERT & CPM, B.C Punmia & K.K. Khandelwal.
6. PERT & CPM- Principles and Applications, 3rd Edition, L.S. Srinath.

Subject: BUILDING SCIENCE & SUSTAINABILITY (Theory): Subject Code: Arch/T/515
3 Credits Semester Examination: Time: 3 hrs. Full Marks: 100, Contact Periods/week: 3,
Internal Assessment: Class Test: 30

Building physics, Building Envelope – state and operations, compare and differentiate insulation and building envelope materials and systems including polymeric, mineral, cellulose-based, and composites, building interactions with the environment, occupants, and allied building materials, components, and sub-systems, green roofing, double skinned envelopes and interaction of building enclosure with mechanical systems; Hygro-thermal, acoustical and light related properties of building components (roofs, façade, windows, partition walls etc.), rooms, buildings & building assemblies; Building heat transfer, Thermal performance of buildings & comfort parameters, passive & active cooling options; Heating, ventilating & Air conditioning load, lighting load, electrical power; Global energy scenario, principles of energy systems, energy and global environment, Use of energy in buildings, energy conservation and assess efficiency in buildings, ECBC compliance in buildings, life cycle energy & water analysis, concepts of embodied energy & embodied water, operation water, energy, water & ecological/carbon footprint of buildings; Design, construction & operation of high performance buildings. Need, definition and concept of sustainability; Brundtland Commission, sustainable development, sustainable consumption and production, Visions of sustainability, Source and ethics of sustainability; Ecology and sustainability, Concept of ecological balance & conservation of natural resources, Sustainability and Climate Change, Sustainable sites, Green Building in the context of sustainability, Green Building Ratings – GRIHA, LEEDS, BREEAM, Sustainable construction practices, sustainable cities/eco-City.

Suggested Books:

1. Energy and environment in architecture: A technical design guide, N. Baker and K. Steemers, 2000
2. Energy and environment in developing countries, Chattergy, M, 1981
3. Energy and habitat; town planning and building design for energy conservation, 1984.
4. Energy conservation and energy management in buildings, edited by A.F.C. Sherratt, 1976.
5. Energy conservation in hot climates, D. Holm, 1983.
6. Energy design for architects, A. Shaw, 1989.
7. Green building handbook ;a guide to building products and their impact on the environment , T. Woolley and others, 1999.
8. Sustainability through building, edited by N.K. Bansal and J. Cook, 2001
9. Sustainable place: A place of sustainable development, C. Phillips, 2003. SSSS

Subject: DISSERTATION LEADING TO ARCHITECTURAL THESIS (Sessional);
Subject Code: Arch/S/511; 3 Credits, Full Marks – 100, Contact Periods/week: 3

The students should take help from the Thesis Coordinator and the panel of teachers from time to time pertaining to formulate action plan including methodology of selection of the topics, case



studies, site selection, literature reviews, case studies, functional requirements, design methodologies, drafting procedure and defense techniques.

Students are to select architectural topics of individual interest reflecting social and technological considerations. The topics so chosen should be subjected to discussions and criticisms by a panel of teachers from time to time.

At the end of the semester, each student would be required to make a formal presentation of their project work through student seminar chosen and approved subject of Thesis.

Subject: ARCHITECTURAL DESIGN V (Sessional); Subject Code: Arch/S/512; 6 Credits, Full Marks – 200, Contact Periods/week: 9

Urban Insertion: Context and Character

Urban Institutions

Analyze Inter-relationship to urban context and neighborhood, institutional character. Design development and detail. Nature of urban institutions and their relationship to urban structure, typology, correlation to urban laws and regulations, urban services and building services.

Design of buildings or group of buildings in an urban context and demonstrate as insertion in an urban fabric.

Subject: GENERAL VIVA VOCE (Sessional); Subject Code: Arch/S/514; 3 Credits, Full Marks – 100.

A Viva-voce would be conducted by a panel of teachers of the Department to test the market preparedness and employability of the students. The test would cover the topics related to the various subjects taught to the students throughout their all previous academic sessions and would also contain topics of general nature related to Architecture whereby a student would be asked to define, describe and explain.

ELECTIVE II (Sessional); Subject Code: Arch/S/513; 3 Credits, Full Marks – 100, Contact Periods/week: 3

Subjects under Elective-II:

1. ADVANCED LANDSCAPE ARCHITECTURE (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Broad perspective on landscape planning, microclimate, planting design, landscape engineering, Project work on Landscape typologies: Heritage landscape, cultural landscapes, Urban landscape; Landscape illumination, Emerging/New concepts in landscape architecture; Sustainability issues, Landscape and Green Buildings, Case studies on Green rating for landscapes, special landscapes like roof/ terrace gardens and interior landscapes, Green/cool roof; understanding aspects of landscape practice, preparation of landscape working drawings, construction details, calculate BOQ & cost estimation.

2. ADVANCED MATERIALS (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3



Introduction of prestressing, prefabrication and systems building. Jointing, tolerances and modular coordination.

Mass production, transportation, storage and handling of materials. Describe characteristics, performances and application of mechanized construction equipments. Advanced construction techniques.

Compare and differentiate natural and artificial materials.

Cost effective and environmentally friendly materials.

Vernacular materials. PVC & FRP, frameless glass doors and windows and partitions. Wooden/Steel/Aluminum 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, aluminum composite panel cladding.

Insulation materials – Thermal and sound insulation materials. Glass – 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.

3. ARCHITECTURAL DESIGN THEORIES (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Principles, ideas and theories, such as, social, cultural, philosophical, scientific, semantic, technological, formal, and so on, that have influenced Western thought and architecture.

4. INFRASTRUCTURE PLANNING (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Definitions of infrastructure; Necessity and Importance for infrastructure; Identify and Describe various physical infrastructural facilities like transportation network, Water Supply System, Drainage and Sewerage Systems, Waste Disposal System, treatment, recycle & reuse, Urban rain water harvesting, Street furniture, Electrification, Gas Supply System, etc. and social infrastructural facilities like education, health, recreational, religious, postal, etc.; Government organizations, Public agencies associated for planning of such infrastructure. Outline of Planning strategies of various infrastructural facilities in a new and existing town. Outline for Planning for infrastructure of rural areas of the country. Current National and International trends in infrastructural planning. Analyze the Technology for execution of such infrastructure

5. INTERIOR AND FURNITURE DESIGN (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Historicity, Principles, Theory of interior design, traditional & contemporary crafts, design of built-in and movable furniture, Interior fittings and furnishings, Color, form, texture and lighting in interiors, Materials used in interiors and landscaping elements., Building services related to interiors. A student will take any one or more of the above topics and write a paper or a project design in consultation with the teacher-in-charge.

6. STUDIES ON URBAN ENVIRONMENT, DEVELOPMENT AND SUSTAINABILITY (Sessional); 3 Credits, Full Marks – 100, Contact Periods/week: 3

Studies on urban ecology and environment; role of water bodies, open spaces and parks; quality of air and water in a city; various pollutants in air and water; sources of air pollution; sources of water pollution; understanding of groundwater and the reason of its depletion; study on



urbanization and development in the city; the mechanism of water supply, drainage and sewerage, and solid waste management in a city; effect of development on environment and population; meaning of sustainable development; a comprehensive planning for environmental sustainability in a city.

Fifth Year Second Semester

Subject: ARCHITECTURAL THESIS (Sessional); Subject Code: Arch/S/521; 24 Credits, Full Marks – 800, Contact Periods/week: 15

Students should select their individual subjects for theses by the middle of the first semester of the final year of the course. Along with a programme of action, the subjects so selected should be approved by the Thesis Coordinator, the Head of the Department and BOS. The Subjects should be restricted to areas of Architecture meaning without going into Urban Design or Town Planning. The project work is to be done under faculty guidance involving case studies, literature review, & architectural design and visualized & presented in a graphic form, model, computer generated graphics and report. The knowledge earned during the five years of study should be reflected and demonstrated in the Theses works. The student should have the ability to conduct investigative research through library and other resources, co-ordinate all pertinent architectural issues with the design concept and objectives to outline a viable solution in solving of the selected problem.

The candidate shall submit a synopsis of the Thesis Project and the institution will approve this before the candidate is allowed to proceed with the Thesis project.

The institution shall conduct the internal evaluation stages (at least 3 reviews) for the Architectural Thesis/Project with the guide as a co-assessor.

A jury comprising of internal and external examiner and the guide shall conduct the final examination of the Architectural Thesis/ Project work in the institution at the end of the semester through a student seminar presentation..

Subject: ARCHITECTURAL THESIS VIVA VOCE; Subject Code: Arch/S/522; 6 Credits, Full Marks –200.

The individual student has to present his final outcome on Architectural Thesis and defend the same. The presentation should explain the work done and portray the performance demonstrated through drawings, models, etc. The verbal communication should reflect the command over the work and justify the design solution.

