Bachelor of Architecture SYLLABUS

First Year		
Semester I		
OPBRC1101	Paper I	English Communication
OPBRC1102	Paper II	Mathematics
OPBRC1103	Paper III	Introduction to Architecture
OPBRC1104	Paper IV	Architecture Drawing
OPBRC1105	Paper V	Art and Graphics-I
OPBRC1106	Paper VI	Basic Design and Field Trip
OPBRC1107	Paper VII	Workshop Practice: Photography, carpentry and
		Model Making
OPBRC1110	Paper VIII	Seamless learning
OPBRC1111	Paper IX	Co-Curricular Activities
Semester II		
OPBRC1201	Paper I	Ecology and Environment
OPBRC1202	Paper II	Construction Materials I
OPBRC1203	Paper III	History of Architecture I
OPBRC1204	Paper IV	Architectural Design I
OPBRC1205	Paper V	Art and Graphics II
OPBRC1206	Paper VI	Theory of Design I
OPBRC1207	Paper VII	Building Construction I
OPBRC1208	Paper VIII	Computer System and Programming
OPBRC1210	Paper IX	Seamless learning
OPBRC1211	Paper X	Co-Curricular Activities

Second Year

Semester III

OPBRC1301	Paper I	History of Architecture II
OPBRC1302	Paper II	Building Science I (Climatology)
OPBRC1303	Paper III	Construction Materials II
OPBRC1304	Paper IV	Architectural Design II
		(Including measured Drawing Camp)
OPBRC1305	Paper V	Art and Graphics III
OPBRC1306	Paper VI	Building Construction II

Paper VII	Computer Application in Architecture I
Paper VIII	Surveying
Paper IX	Seamless learning
Paper X	Co-Curricular Activities
	Paper VII Paper VIII Paper IX Paper X

Semester IV

OPBRC1401	Paper I	History of Architecture III
OPBRC1402	Paper II	Construction Materials IV
OPBRC1403	Paper III	Architectural Structures I
OPBRC1404	Paper IV	Architectural Design III
OPBRC1405	Paper V	Building Services
OPBRC1406	Paper VI	Building Construction III
OPBRC1407	Paper VII	Computer Application in Architecture II
OPBRC1408	Paper VIII	Remote Sensing and GIS
OPBRC1410	Paper IX	Seamless learning
OPBRC1411	Paper X	Co-Curricular Activities

Third Year

Semester V

OPBRC1501	Paper I	History of Architecture IV
OPBRC1502	Paper II	Sociology
OPBRC1503	Paper III	Construction Materials IV
OPBRC1504	Paper IV	Architectural Structures V
OPBRC1505	Paper V	Architectural Design IV (Including Educational
Tour)		
OPBRC1506	Paper VI	Quantity Surveying and specification
OPBRC1507	Paper VII	Building Construction IV
OPBRC1508	Paper VIII	Elective I
		a. Interior Design
		b. Conservation
OPBRC1510	Paper IX	Seamless learning
OPBRC1511	Paper X	Co-Curricular Activities
Semester VI		
OPBRC1601	Paper I	Building Services II (Electrical Services)
OPBRC1602	Paper II	Construction Material V
OPBRC1603	Paper III	Architectural Structure V
OPBRC1604	Paper IV	Technical Communication
OPBRC1605	Paper V	Architectural Design V
OPBRC1606	Paper VI	Site Planning and Landscape
OPBRC1607	Paper VII	Building Construction V

OPBRC1608	Paper VIII	Elective II
		a. Product Design
		b. Design for Disabled
OPBRC1610	Paper IX	Seamless learning
OPBRC1611	Paper X	Co-Curricular Activities

Fourth Year

Semester VII

OPBRC1701	Paper I	Building Services III (Mechanical Services)
OPBRC1702	Paper II	Building Science II (Acoustics and illumination)
OPBRC1703	Paper III	Architectural Structure VI
OPBRC1704	Paper IV	Construction Management
OPBRC1705	Paper V	Architectural Design VI (With Field Trip)
OPBRC1706	Paper VI	Working Drawings
OPBRC1707	Paper VII	Elective III
		a. Alternate Energy System in Architecture
		b. Vernacular Architecture
OPBRC1708	Paper VIII	Introduction to planning
OPBRC1710	Paper IX	Seamless learning
OPBRC1711	Paper X	Co-Curricular Activities

Semester VIII

OPBRC1801	Paper I	Practical Training (140 Days)
		a. Monthly work report from architect's office
		b. Critical appraisal of build projects
		c. Field documentation of architectural details
		d. Case studies of build projects

e. Training report

Fifth Year Semester IX

OPBRC1901	Paper I	Professional Practice and Management
OPBRC1902	Paper II	Housing
OPBRC1903	Paper III	Building Economics and Legislation
OPBRC1904	Paper IV	Architectural Design VII (With Field trip)
OPBRC1905	Paper V	Practical Training and Presentation
OPBRC1906	Paper VI	Dissertation
OPBRC1907	Paper VII	Elective IV
		a. Urban Conservation

		b. Urban Design and Earth quake resistance
OPBRC1910	Paper IX	Seamless learning
OPBRC1911	Paper X	Co-Curricular Activities
Semester X		
OPBRC11001	Paper I	Thesis Project
OPBRC11002	Paper II	Elective V Related to advanced objective in Thesis project
OPBRC11003	Paper III	Elective V a. Disaster Resistant b. Structure Architecture Development and Legislation
OPBRC11010 OPBRC11011	Paper IX Paper X	Seamless learning Co-Curricular Activities

Detail Syllabus First Year Semester I

OPBRC1101

Paper I English Communication

Unit I

Communication Skills in English

Introduction; The Importance of English; English as the First or Second language; Uses of English; Other Uses of English

Unit II

Listening Skills

What is listening? ; Types of Listening; Objectives; Active Listening- an Effective; Listening Skill; Note Taking Tips; Barriers for Good Listening; Purpose of Listening; Outlines and Signposting; Gambits; Exercise

Unit III

Reading Skills

Importance of Reading; Definition of Reading; Levels of Reading; Requirements of ; Reading; Types of Reading; Techniques of Reading; Academic Reading Tips; Exercise

Unit IV

Writing Skills

What is writing?; The Sentence ; The Phrase ; Kinds of Sentences ; Parts of Sentence ; Parts of Speech ; Articles ; Types of Sentences ; Time Management Tips ; Test Preparation Tips ; Tips for Taking Exams ; What is a Paragraph? ; Construction of Paragraph ; Linkage and Cohesion ; Example ; Exercise ; Academic Essay Writing ; Thesis ; Procedure for Thesis Approval and Deposit ; Summary ; Precis Writing ; Report Abstracts ; Letter Writing ; Memo ; Cover Letter ; Resume writing

Unit V

Communication Skills- Speaking Skills

Definition ; Barriers of Communication ; Types of Communication ; Know What You ; Want To Say

OPBRC1102 Paper II Mathematics

Unit I

Statistics: Mathematical expression, moments and M.G.F., probability – simple problems; Binomial, Poisson and normal distributions – simple applications.

Correlation and regression, coefficient of correlation, lines of regression – simple applications.

Unit II

Differential Equations: First order and first degree – variables separable, homogeneous form, reducible to homogeneous form, linear differential equation, reducible to Linear form, exact equations, second order ODE with constant coefficients.

Unit III

Matrices: Rank of a matrix, solution of linear simultaneous equation, inverse of matrix by elementary transformations, Eigen values, Eigen vectors, Cayley Hamilton Theorem (without proof).

Unit IV

Linear Programming: Standard, Augmented, Duality, Algorithms, Unknown Integers, Dynamic programming, Simplex Algorithm, Shadow Price, LP Example, Job Shop Problem

Unit V

Coordinate Geometry of Three Dimensions: Sphere, Cylinder, Cone, Equation of Sphere, Tangent, Plane, Line, Cylinder, Equation of Cylinder, Right Circular Cylinder, Cone, Equation of Cone, Right Circular Cone.

OPBRC1103 Paper III Introduction to Architecture

Unit I

Role of an Architect in an Architectural Project and In Society through History; **Unit II**

Disciplines and Skills to Be Learnt By an Architect;

Unit III

Factors Influencing Architecture Of A Place, Climate, Materials, Socio Cultural, Technological, Etc.;

Unit IV

Introduction to Old and New Architectural Works;

Unit V

Understanding the Terms Such As Vernacular, Traditional, Classical, Modern, Post Modern and Neo Modern Renaissance, European, Oriental.

EXERCISES: Presentation of Observation at the Respective Native Places of Students. During Educational Trips/ Site Visits, Visits to Buildings of Architectural Significance.

OPBRC1104 Paper IV Architecture Drawing

Unit I

Familiarization of drawing material and equipment, free hand drawings

Unit II Lettering, Fonts and Scale and Plane geometry Unit III Plane, Solid section and intersection, development of Surface of solids Unit IV Isometric, Axonomietric of solids Sciography of simple Geometric forms Unit V Perspective, Graphical presentation and rendering

Exercises: Studio Assignments based on above topics

OPBRC1105 Paper V Art and Graphics-I

Unit I Sketching / Line drawing and pencil shading Unit II Nature Study / Shapes Textures and Characters Unit III Still life study (Vegetation) Unit IV Water color study and color wheel study Unit V Rendering techniques and perspective study

EXERCISES: Pencil Sketching- Human Figures, Vegetation, Automobiles, Buildings, Still Life, Etc. Pen And Ink Sketching. Use of Water Colours, Poster Colours, Pencil Colours, Crayons, Oil Pastels, Etc. In Rendering , Drawings And Sketches. Colour Wheel Study Of Primary, Secondary And Tertiary Colours.

OPBRC1106 Paper VI Basic Design and Field Trip

Unit I

Elements of Visual Composition

Role of basic elements of visual design existing in paintings, compositions, murals, sculptures, building and in nature - Dots (points), life's planes, patterns, shapes, forms, spaces, colour, texture, levels. Light, fenestrations

Unit II

Principles of Visual Compositions

Repetition, rhythm, radiation, focal point, symmetry, asymmetry background, foreground, sense of direction, harmony balance and proportion

Unit III

Study of Planer forms and Paper forms

To create abstract sculptures out of mount board, box board, metal foils and any other planer materials and also exploring the adoptability of these sculptures to Architectural functions.

Unit IV

Building Appraisal

Analytical study of the sculptural building forms and its critical appraisal of visual character

Unit V

Application of Basic Design in Architecture

Compositions, murals and sculptures for semi recreational and semi functional architectural spaces

OPBRC1107 Paper VII Workshop Practice: Photography, carpentry and Model Making

Photography

To Provide Technical Know How About Cameras, Its Accessories And Their Applications Including The Following: Camera- Definition, History, Types And Usage, Aperture, Shutter Speed, Types Of Lenses And Accessories. Film Rolls, Types and Usages. Flash, Types And Usage. Film Processing Description and Method (Colour and B/W). Composition-Settings With Respect To View Finder, Weather, Place, Colour, Mood And Purpose. Architectural-Exteriors And Interiors With Respect To Scale, Composition, Texture, Colour, Skyline, Light And Shade, Exploration And

Carpentry and Model Making

Usage of Various Materials Used In Building Construction and Model Making. Types of joints in wood and metals; Tee shaped joint, L shaped joint, overlap joint, halved joint, cogged joint, housed.

Cube with thermocoal pyramid with hardboard, square with ply board, Cylinder with paper and wire, stare with handmade sheet or soft board, hexagonal cylinder having inside a square with plyboard and paper

EXERCISES: Shooting Pictures of Landscape, Portraits, Interiors and Buildings. Developing and Printing of Pictures in Laboratory, Making Scaled Models with Different Materials, Workshop/Assignments Based On Construction Joints In wood and metals.

OPBRC1201 PAPER I ECOLOGY AND ENVIRONMENT

Unit I

Fundamentals of Ecosystem, Our Earth's Environment,

Unit II

Resource and Environment, Management of Environment,

Unit III Environmental Legislation, Environmental Quality and Indicators, Unit IV Environmental Planning and Design Guidelines, Unit V Human Impact on Environment, Environmental pollution

EXERCISES: Study of Relevant Ecosystems, Botanical & Zoological Specimens at Both Micro & Macro Levels, Effects of Pollution and Prevention and Control of both Natural & Manmade Hazards.

OPBRC1202 Paper II Construction Materials I

In the context of materials like Stone, Brick and Timber, study of

Unit I The Nature Of Materials, Unit II The Manufacturing Process, Unit III Structural, Visual And Textural Properties, Unit IV Identification And Selection, Unit V Their Application in Buildings

EXERCISES: Identification and Study of Relevant I.S. Codes. Seminars and Preparation of Reports, Visits to Manufacturing Units Are Desirable. Field Studies Should Preferably Form an Integral Part of Tutorial work

OPBRC1203

Paper III History of Architecture I

Architecture of: Unit I Indus valley, Unit II Buddhist era, Unit III Hindu empires, Unit IV Islamic rule, Unit V Moghul era – In terms of design parameters such as cross cultural theories relating to art and architecture construction methods etc.

Exercises: Analytical and illustrative exercises related to above topics such as papers seminars etc.

OPBRC1204 Paper IV Architectural Design I

Analysis of activities and spaces in a given predominant function; Its representation in graphic form. Design exercise evolving out of single functions such as ticket counters/reception offices, security offices, Kiosks, booths, Information cells etc. Multiple function such as primary health centers, convenient shopping etc.

At least one design problem to concentrate on comprehensive graphic representation to form a prelude to measure drawing.

Measure drawing camp to include study of a building/group of buildings/settlements of architectural importance, involving detailed drawings, constructional details, material used giving due importance to the given context.

OPBRC1205 Paper V Art and Graphics II

Unit I Element of Design Unit II Principle of Design Unit III Development of surfaces Unit IV 3 D Compositions 3 D Compositions in Different Mediums. Unit V History of Arts Introduction to History of Art, Artistic Tradition and Theories

EXERCISES: 2 D Compositions In Various Colour Mediums, Textures. 3 D Compositions in Plaster Of Paris, Clay, Paper, Cardboard, Etc.

OPBRC1206 Paper VI Theory of Design I

Unit I Organization of form Study of space usage and its implications Unit II Architecture design process Unit III Application of principles of design and design philosophies Unit IV Study of time, life, works and philosophies and Chieago School Unit V Concept and individual work of Architects

OPBRC1207 Paper VII Building Construction I

Unit I

Bricks – Types; bonds; single one and half and two brick, thick wall, cavity wall, jointing and pointing and bonding of bricks, stainless steel types.

Unit II

Stone – Random rubble un-coursed, random rubble coursed, square rubble brought to course, square rubble course, polygon walling, chisel craft surface.

Unit III

Foundation – Types of foundation, Strip footing, Simple lintels, Introduction to simple brick arch, opening

Unit IV

Opening

Jambs of opening, head of openings, steel lintels, Introduction of simple brick arch, opening

Unit V

Roofing and Flooring

Types of roofs, pitched roof (roof slopes), Flat roofs, Parapet walls, Solid ground floor, Suspended timer ground floor, Brick flooring

OPBRC1208 Paper VIII Computer System and Programming

Computer as a Tool for Architects-

Introduction to Computer and Its Peripherals, Hardware Brief (Useful For Architects) Viz. CPU, Keyboard, Mouse, Printer, Plotter, Scanner, Digitizer, Etc. Introduction to Various Software's Relevant To Architects Viz. Ms Word, Excel, Power-point, Introduction to Basic Internet Applications,

EXERCISES: Assignments Related to Various Applications of These Software's.

Second Year Semester III

OPBRC1301 Paper I History of Architecture II

Study of evolution of design concepts, philosophy construction techniques, materials and structural solutions with the help of selected examples, with reference to social, cultural, geographical political and intellectual climate of the place and period, as styles of Architecture like:

Unit I Eqyptian, Unit II West Asiatic, Unit III Greek, Roman, Unit IV Early Christian, Romanesque, Unit V Byzantine and Gothic

Assignments: Analytical and illustrative exercises, as tests, seminars or papers.

OPBRC1302 Paper II Building Science I (Climatology)

Unit I

Elements of climate : Solar radiation, terrestrial radiation, temperature, humidity, wind, cloud, precipitation etc. Factors affecting climate of macro and micro-level. Measurement and quantification.

Unit II

Effect of climate on man : body heat balances, thermal indices, thermal comfort, solar chart, psychometric chart and its application.

Unit III

Analysis of climate data, climatological site analysis and its application in site planning and design evolution.

Unit IV

Effect of climate on building envelope : heat flow, heat transfer, heat storage and time lag of various building materials and elements. Day lighting, air movement and ventilation

Unit V

Passive means of thermal control; Solar movement and sun shading devices **Exercises:** *Analytical and illustrative exercises, related to above topics.*

OPBRC1303 Paper III Construction Materials II

In the context of materials like Mud, Lime and Cement, study of

Unit I The Nature of Materials, Unit II The Manufacturing Process, Unit III Structural, Visual and Textural Properties, Unit IV Identification and Selection, Unit V Their Application in Buildings EXERCISES: Identification and Study of Relevant I.S. Codes; Seminars and Preparation of Reports. Visits to Manufacturing Units Are Desirable. Field Studies Should Preferably Form an Integral Part of Tutorial Work.

OPBRC1304 Paper IV Architectural Design II (Including measured Drawing Camp)

Development of surfaces of solids, Isometric, axonometric of solids. Sciography of Simple Geometric; Forms Leading to Sciography of Architectural Forms.

Perspective-One Point, Two Point And Three; Points. Exercises from Simple Geometrical Forms Leading To Perspective of Building Forms. Plotting of Sciography on Perspective Drawings. Graphical Presentation and Rendering in Pen and Ink of Architectural Drawings and Materials.

EXERCISES: Studio Assignments Based On Above Topics.

OPBRC1305 Paper V Art and Graphics III

Emphasis is to be laid on graphic skills/presentation techniques/model making etc. Indoors and outdoors sketching in pencil/crayons/color/charcoal/ink of objects/buildings/ automobiles/vegetation/human figures etc.

Sculpture/mural exercises in clay/POP/ceramics/metal/junk & scrap materials etc. Study of 3D forms and spaces with basic principles of design like repetition, symmetry, rotation and rhythm. Study of various color scales.

OPBRC1306 Paper VI Building Construction II

Details of Joinery in Timber and study of various basic elements like foundation, walls, roofs/floors and openings along with their principles of construction and Architectural details. Introduction to Construction, Machinery and Equipments. Site Visits Should Form An Integral Part Of The Studio Work.

Unit I Foundation Unit II Structure Unit III Roof and Flooring Unit IV Staircases Unit V Simple timber roofs

EXERCISES: *Preparation of Drawings, Site Reports and Other Exercises Covering the Above.*

OPBRC1307 Paper VII Computer Application in Architecture I

CONTENTS:

Computer as a Tool For Architects. Introduction to Various Software's Relevant to Architects Viz.

AutoCAD, 3DS Max, Corel draw, Adobe Photoshop, Pagemaker, Etc. Advanced Internet Applications.

Exercises: Assignments Related To Various Applications Of These Softwares

OPBRC1308 Paper VIII Surveying

Unit I

Introduction - principles and classification of survey, basic measurements in surveying, basic methods of surveying. Different types of transverse Unit II Chain survey - Introduction, instruments, types of chains and tapes, their uses and construction details Unit III Compass survey; Theodolite survey Unit IV Leveling; Contouring Unit V Setting out work for buildings

Semester IV

OPBRC1401 Paper I History of Architecture III

Unit I

Renaissance and Baroque Architecture – The works of Brunelleschi, Bermini, Michel Angelo, Raphael, Andrea Palladio and Christopher Wren.

Unit II

British–Colonial Architecture in India, Indo–Gothic, Indo-Saracenic and Indo– Renaissance Architecture. Planning and Design of New Delhi by Sir Edwin Lutyens. Unit III

Modern Architecture and its development during Industrial revolution and its influence thereby. The great international exhibitions.

Unit IV

Development of various Movements, Thoughts and Philosophies during 19th Century such as Neoclassicism, Arts & Crafts movement, Art Nouveau and The Viennese Secession.

Unit V

Development of various Movements, Thoughts and Philosophies during 20th Century such as Deutscher Werkbund, Futurism, Constructivism, Expressionism, Art Deco, Cubism and De Stijl.

Exercises: Analytical and illustrative exercises of above topics in the form of papers and seminars.

OPBRC1402 Paper II Construction Materials IV

Contents: of physical, chemical, visual and textural properties of metals and alloys; Unit I

Application of metals and alloys in buildings, structural and non-structural applications;

Unit II

Metals like iron, aluminium, copper and

Unit III

Alloys like steel, brass, and are to be studied;

Unit IV

Protective finishes on metals;

Unit V

Study of metal applications in hardwares

OPBRC1403 Paper III Architectural Structures I

Unit I

Concept of Force, Graphical Presentation of Force, Coplanar and Ten Coplanar Forces,

Concurrent and Non Concurrent Forces, Composition and Resolution of Coplanar Forces by Graphical and Analytical Methods.

Unit II

Built Up Steel Sections, Centre Of Gravity and Moments of Inertia, Parallel Axes Theorems, Product Of Inertia, And Use Of Steel Tables.

Unit III

Stress And Strain, Concept Units, Tensile, Compressive And Shear Stresses, Modulii of Elasticity And Their Relationship, Linear And Lateral Strains, Poisson's Ratio, Stress Strain Curve, Elastic Limit, Yield Point, Breaking Stress, Factor Of Safety, Safe Stress Values For Timber, Cast Iron, Mild Steel And For Steel In Tension Compression, Shear And Bending As Per Isi Code.

Unit IV

Types of Loads- Dead, Live, Wind, Impact, Earthquake, Concentrated, Uniformly Distributed And Varying Loads, Moment of a Force,

Unit V

Couple And Its Moment, Conditions of Statistical Equilibrium of Forces, Concept of Beams and Various Support Conditions, Determination of Support Reactions, Both Analytically And Graphically.

OPBRC1404 Paper IV Architectural Design III

Design of an Institution or public building at the community scale of infill scale, Understanding essential

Character of an Institution or Public building. Influence of culture, land, climate, technology and finance on the

Building design, Part details of the project to understand design resolution.

Projects: Community Hall, Neighborhood school, Bank building, Religious Institution, Shopping Plaza.

OPBRC1405 Paper V Building Services

Unit I

Supply of water to different types of buildings; Sources of water, modes and methods of conveyance of water, fixtures and appliances.

Unit II

Distribution of water, methods of distribution, different distribution systems, and their principles of layout, Design of water distribution system in a campus, and in a building, overhead and underground water storage tanks.

Unit III

Refuse; different forms of refuse, garbage, sludge, toilet waste and storm water collection and disposal system, Requirements for various building types.

Unit IV

Sanitation; manholes, grease chambers, etc. Traps, ventilation of drains and sewers, Principles of design of drainage lines, drainage layouts for building premises, Longitudinal sections of drains. Drainage in non municipal area – soak wells, septic tanks.

Unit V

Sanitation, Fittings & Fixtures; water closets, flushing valves, flushing tanks, basins and its accessories, rain water, drainage pipes, spouts, sizing of rain water pipes, disposal system of rain water at ground level, storm water drainage.

Exercises: Study of IS Codes. Preparation of reports, visit to construction site and documentation. Market survey to study water supply and drainage products.

OPBRC1406 Paper VI Building Construction III

Emphasis should be laid on understanding of constructions in R.C.C. in different parts of building through basic building elements.

Foundation: R.C.C. footings, isolated, with their connections with superstructure along with Damp proof course.

Structure: Simple R.C.C. frame with beams and columns.

Roof: Flat R.C.C. roof with water proofing details study of different R.C.C. roof forms and its connection with structure.

Flooring: R.C.C. flooring, mosaic flooring & cement tile flooring, interlocking paving blocks in ground and upper floors.

Staircases: Staircases in R.C.C. with different types.

OPBRC1407 Paper VII Computer Application in Architecture II

2D drafting in any popular architectural software e.g. ACAD (latest version). Management of Data Processing

Software e.g. MS Excel, Tools related to Bar Charts, Pie Charts and Tables to be introduced. Simple calculation functions like addition, average and sorting to be learnt.

Exercises: Drafting simple geometrical object in 2 dimensions. Creation of double lime Plans of simple building types.

Creation of Data tables, Pie charts and Bar charts, Simple mathematical exercises using the same data.

OPBRC1408

Paper VIII Remote Sensing and GIS

Remote Sensing

- Fundamentals of RS
- Electromagnetic energy and remote sensing
- Sensors, platforms and RS data acquisition system
- Multispectral, hyper spectral and thermal sensors
- Image enhancement and visualization
- Image interpretation and classification
- Microwave thermal remote sensing
- Radar and laser altimetry

Geographical Information System (GIS)

- Theory of GIS supported by extensive practical exercises
- Geographic information and spatial data types
- Hardware and software; GIS; Steps of spatial data handling
- Spatial referencing
- Spatial data input, data preparation
- Data visualization

Third Year

Semester V

OPBRC1501 Paper I History of Architecture IV

Unit I

Modern Architecture after the great masters : Alvar Aalto, Eero Saarinen, Jorn Utzon and Louis I Kahn.

Unit II

Post – Modern Architecture : Robert Venturi, Philip Johnson, Charles Moore and Michael Graves.

Unit III

High Tech Architecture : James Sterling, Renzo Piano, Richard Rogers and Norman Foster.

Unit IV

Deconstruction Architecture : Peter Eisenman, Frank Gehry, Bernard Sthumi and Zaha Hadid.

Unit V

Post Independence Architecture in India : Le-Corbusier, Louis I Kahn, Kanvinde, B.V. Doshi, Stien, Charles Correa, Uttam Jain, Raj Rewal and A.D. Raje.

Exercises: Analytical and Illustrative exercises of above topics in the form of papers and seminars.

OPBRC1502 Paper II Sociology

To develop a sociological base for Architecture

Unit I

Man, environment and society. Rural society, traditional patterns and trends of change. The concept of social

Unit II

Stratification, urbanization and modernization. Concept of social structure, cultural and social institutions,

Unit III

Relation between social structure and special structure, Social aspects of housing and problems of slums.

Unit IV

Social theories of Gandhi and Nehru and Contemporary India.

Unit V

Community development and panchayati Raj.

Exercises: Seminars and preparing paper.

OPBRC1503 Paper III Construction Materials IV

Unit I

Application of metals and alloys in buildings, structural and non-structural applications; Unit II Metals like iron, aluminium, copper and Unit III Alloys like steel, brass, and are to be studied; Unit IV Protective finishes on metals; Unit V Study of metal applications in hardwares.

OPBRC1504 Paper IV Architectural Structures V

Unit I
Design of spread footing, combined footing, simple raft foundation.
Unit II
R.C.C. design – T beams, L beams, Columns and Isolated column footing,
Unit III
RCC wall, retaining wall.
Unit IV
Design of one way and two way slabs.
Unit V
Design of RCC cantilevers.

OPBRC1505 Paper V Architectural Design IV (Including Educational Tour)

Understanding correlation between function, structure, material, construction and services.

Design of a building to understand the relation between function and structure. The idea of form follows function and vice versa.

The structural system as a design element. This design concept is to be constructed with the understanding of materials and construction techniques and various services needed for the functions of the building.

Project: Design of public buildings such as multistory apartment, commercial building, multiplex, etc.

OPBRC1506 Paper VI Quantity Surveying and specification

Unit I

Introduction to procedure of estimating, date require for framing an estimate, type of estimates. Approximate and detailed estimate, Abstract of Estimates, bills of quantities, Contingencies, taking of quantities for principal building works, electrical works.

Unit II

Analysis of rate for Principal civil works, item rate considering, current market rate for building materials and labor wages as well as P.W.D. scheduled of rates. Composition of rate - percentage distribution for materials, labor, tools plant and Contractor's Profit.

Unit III

Preparation of Tender Document, notice inviting tender and advising the client regarding selection of contractor.

Unit IV

Mode of measurement. Signification of specification in building construction. General and detailed specification for all kind of principal building works and building materials.

Unit V

Contract Documents & Byelaws

- a) Nature of building contracts; types; Condition of contract; obligations and responsibilities of clients, contractors and architects.
- b) Tenders calling, scrutiny and recommendations, open and selective tender systems; two stages tender, scrutiny process, Pre-tender qualifications and registrations of contractors.
- c) Deposits, labor laws and obligations: disputes and settlement of disputes.
- d) Building bylaws: ground coverage, Set Backs, FAR calculations, building height regulations, building use regulation, NA NOC, BU certificate.
- e) Buildings services approvals and completion certificate procedure.

Exercises: *Preparing estimate and tender document for a building. Studying tender document of Government projects and private projects.*

OPBRC1507 Paper VII Building Construction IV

Unit I

Structures: Structures with riveted and welded joints. Roof Covering in G.I., Asbestos and Fiber sheets etc. Flooring: Industrial flooring.

Unit II

Staircase: Metal staircase, Terrace water proofing, Basement damp proof construction,

Unit III

Paneling :Wood Paneling, Stone paneling, Advanced Doors and Windows - Heavy paneled and moulded doors in timber, fully

Unit IV

Glazed sliding & folding doors and windows and bay windows, rolling shutters. Curtain Walls - Curtain walls in glass, aluminum, precast concrete units etc. for buildings Like laboratories, offices, cinemas etc. Unit V

R. C. C. Construction - Frame construction, advantages over load bearing construction, study of column grid, detailing of R. C. C. work with reinforcement for slabs, beams, Columns, footing, staircases (ordinary and spiral).

Exercises: Preparing Construction drawings bases on above topics. Preparing report of a building selected from site and presentation.

OPBRC1508	Paper VIII	Elective I
		a. Interior Design
		b. Conservation

a. Interior Design

• History of interiors and traditional trends, Study of interiors of different nature like homes, restaurants, offices, hotels etc. covering aspects like furniture, lighting, flooring, ceiling etc.

• Market survey of different materials used in interiors like wood, veneers, laminates, metals, lighting fixtures etc. Construction details of furniture, wood joinery, metal fabrication, false ceiling, flooring etc.

• Designing for human comfort and ergonomics. Design exercises will consist of designing of interiors of residences, offices, hotels etc.

b. Conservation

Semester VI

OPBRC1601 Paper I Building Services II (Electrical Services)

Unit I Electrical distribution systems in buildings, Unit II Main and sub distribution, switches and controls, Unit III Layout system for lighting, fans, telephones. Electric drawings with symbols Unit IV Service systems: Lifts, pumps, air-conditioning system, computer systems, etc. Unit V Earthing and lightening protection in building.

Exercises: *Preparation of reports, visit to construction site and documentation.* Market *survey to study electrical products;*

OPBRC1602 Paper II Construction Material V

Unit I Ferro cement, Unit II Precast construction, Unit III Pre-stressed construction, Unit IV Structural steel roofing and steel construction, Unit V Cost effective building material

Exercise: Study of IS codes, seminars and preparation of reports and visit to construction site.

OPBRC1603 Paper III Architectural Structure V

Unit I

Properties of cement, coarse aggregate and fine aggregates, properties of concrete in fresh and hardened state. Durability of concrete and introduction to concrete mix design procedures.

Unit II

Introduction to working stress method of design. Limit State method of Design, difference between limit state and working stress method.

Unit III

Design of beams, singly and doubly reinforced rectangular beams and T- Beams subjected to flexure, shear and torsion.

Design of slabs, one-way slab, and two-way slab with corners free to lift and held down condition using 8.I.S. codes; Designof doglegged staircase.

Unit IV

Design of Column; short column and long columns with lateral ties and helical reinforcement.

Unit V

Design of footing. Isolated column footings, concept of combined footing, raft and pile foundation.

Pre-stressing: Methods and losses in pre-stressing.

OPBRC1604 Paper IV Technical Communication

- a. Effective writing and Reading
 - Enriching vocabulary
 - Reading Comprehension
 - Paragraph development
 - Job application and Resume writing
 - Report writing
- b. Oral communication (Including language lab)
 - Interview skills
 - Introduction type of interviews, Job interview, Building Personality traits
- c. Group discussion
- d. Effective presentation: Strategies and Skills

OPBRC1605 Paper V Architectural Design V

Design of a building to understand the relation between function and structure; The idea is to form follows:

- Function and vice versa.
- The structural system as a design element.

Note: This design concept is to be constructed with the understanding of materials and construction techniques and various services needed for the functions of the building. Project: Design of public buildings such as multistory apartment, commercial building, multiplex, etc.

OPBRC1606 Paper VI Site Planning and Landscape

Unit I

- Introduction to landscape architecture.
- Elements of landscape design and their relation to build environment.
- Unit II
 - Plant characteristics The structure, color, form and foliage of various trees and shrubs and climbers and ground covers.

• Study and identification of Indian plants and trees etc. Plant propagation. Unit III

- Study of landscape In historical perspective Indian, Persian, Mughal, Japanese, Chinese etc.
- landscape designing site analysis and development.
- Unit IV
- Designing and presentation of landscape schemes for building projects, gardens/parks,
- Historical monuments and places of tourist Interest etc.
- Unit V
- Contemporary attitudes to landscape design.
- Design of road layouts, parking and campus planning. Exercises: Design of landscape for building projects and public spaces.

OPBRC1607

Paper VII Building Construction V

- Sky light,
- North light,
- Curtain wall, structural glazing, ,
- Section windows,
- Aluminum windows and
- Pre-cast construction
- Metal cladding

Exercises: Preparing construction drawings based on above topics. Preparing report of a building selected from site and presentation.

OPBRC1608

Paper VIII Elective II a. Product Design b. Design for Disabled

a. Product Design

Introduction to product design, history of product design, design concepts and methodologies, design Process, current trends and case studies of various products. Economics, introduction to various manufacturing processes and materials.

Exercise: Study of various products in market. Design of small hand held products like mobiles, watches, cameras etc. Design of home appliances.

b. Design for Disables

Fourth Year Semester VII

OPBRC1701 Paper I Building Services III (Mechanical Services)

Unit I

Basic principles of refrigeration, refrigeration cycle and system components Unit II

Air cooling and air conditioning, planning and design considerations, psychometric chart and its use.

Unit III

lifts, grouping of lifts, return time, design of lift banks for carrying capacity and travel time, installation requirements, escalators.

Unit IV

Fire extinguishing systems, warning systems, fire resistant doors, planning of buildings for fire escapes,

Unit V

Solar Energy: water heating systems

Exercises: *Preparation of reports, visit to construction site and documentation. Market survey to study mechanical products*

OPBRC1702 Paper II Building Science II (Acoustics and illumination)

Unit I

Basic Terminology and definitions, Physics of sound, Behavior of sound in an enclosed space, Criteria for acoustic environment location of building, geometry and shape, echo, reverberation time, sound absorption coefficient, noise rating curves.

Unit II

Predictions of acoustical conditions and approach to designing enclosure for predetermined acoustical responses, corrective of existing deficient enclosures. Introduction to sound reinforcing system-amphtication and distribution, Selection of acoustic materials, construction details and fixing;

Unit III

Noise - physiological and psychological effects, transmission loss, flanking of sound, structure borne sound and noise from different mechanical equipment's. Noise control techniques and their applications;

Unit IV

Introduction to illumination, Laws of illumination,

Unit V

Design for lighting, classification of lighting system - direct, diffused, indirect etc.

Artificial light sources, types and their use limitations. Use of artificial lighting as an element in architectural scheme particularly exhibitions, theatres, offices and stores etc., lighting for road traffic, decorative and floodlighting.

Exercises: Medium size acoustical design supplemented with drawing and calculations. *Qualitative and quantitative aspects of lighting supported by actual exercises;*

OPBRC1703 Paper III Architectural Structure VI

Unit I

Connection: riveted and bolted joints; design of fillet, butt, plug and slot welds; design of riveted, bolted and welded joints for axially loaded member, eccentric connection

Unit II

Design of tension member Design of compression member; built up column, design of lacing and battering.

Unit III

Column base; introduction to grillage foundation

Unit IV

Design of laterally restrained beams; simple and built up sections.

Unit V

Roof trusses; generally arrangement of trusses, spacing of trusses, design loads, design of purlin and simple roof trusses.

OPBRC1704 Paper IV Construction Management

Unit I Role of Architect in Construction Management; CPM, PERT Unit II Scheduling of construction. Unit III Planning of construction site. Unit IV Inventory, liasoning with different authority, Unit V Arbitration, payment, legal implications, etc.-

OPBRC1705 Paper V Architectural Design VI (With Field Trip)

Resolution of project to integrate complexity of urban dimensions and architectural language

Design of complex and large scale projects in urban context;

Design must establish linkages with urban structure, urban continuity, movement structure, landscaping, people and vehicular movements' system design, economics, architectural aesthetics and details.

Project: Railway Station, Inter State Bus Terminus, Airport or Sports Stadium.

OPBRC1706 Paper VI Working Drawings

Understanding of scale, dimensioning, texture and symbols for making constructions drawings

Preparation of working drawings - plan, elevations, section, foundation layout and section, shuttering plan, electrical and sanitary details

Detail drawings of toilets, kitchen & staircase

Preparation of drawings for municipal approval showing area statement, FAR calculations using local Bye-laws

Exercises: Drawings based on above topics of simple buildings

OPBRC1707 Paper VII Elective III a. Alternate Energy System in Architecture b. Vernacular Architecture

Contents:

1. Alternate Energy Systems in Architecture:

Energy crunch, a global scenario. Problem of energy shortage with reference to buildings and settlement Energy demand of a building, during construction and operation, Principles and application of energy conscious architecture, Alternative energy systems for buildings: passivesolar techniques for heating and cooling of buildings solar water heating. Energy from waste: Bio gas technology and its application, Energy from urban sanitary landfills etc. Traditional settlement pattern and Vernacular construction techniques for energy efficiency and water conservation

2. Vernacular Architecture:

Sources of vernacular architecture, settlement forms architectural types, building materials and techniques, symbolism and decoration environmental consciousness. North West India - Gujrat and Rajasthan, Bikaner, Bishnoi Bohras, Dang Bhils, Gurjrati and Rajasthanl Rural & Urban. Goa, Daman Portugese, Kashmir Valley, Gujjar, Pandit, ladakhi and Garhwalis. Sourth India - Tamilnadhu- Irula, Kota, Kuromba, Toda, Kerla- Nair, Maharashtra- Konkani, Karnataka- Tuluvas, Andhra Pradesh- Gond. Eastand Noth-East India Bengali Rural, Bankura, Assam, Mishing, Nagaland, Arunachal,-Monpa, Khampati, Adi, Manlpur, Orrisa- Khond. Andmanese, Nlcobaris

Exercise: Class work on above, detailed study of one community with reference to architecture, settlement pattern, techniques, materials, symbolism and rituals.

OPBRC1708

Paper VIII Introduction to planning

Unit I

Definition, planning as an architectural expression and form of developing a human settlement; History of city planning. Unit II Theories of city planning, new towns and cities, urban and rural housing; Unit III Concepts of urban space, survey, techniques; Unit IV Zoning and land use, neighborhood concepts, central business district, site planning; Unit V Urban transportation, urban renewal and redevelopment, present day planning in India

Exercises: Paper presentation; Site visit to various areas of the city.

Semester VIII

OPBRC1801

Paper I Practical Training (140 Days)

- a. Monthly work report from architect's office
- b. Critical appraisal of build projects
- c. Field documentation of architectural details
- d. Case studies of build projects
- e. Training report in beginning of IX semester

Fifth Year

Semester IX

OPBRC1901 Paper I Professional Practice and Management

Unit I

The architect and his office, relationship with clients, consultants, contractors, legal responsibilities of Architects, code of professional practice, fees

Unit II

Architectural Competitions And Architects Registration Act 1972.

Unit III

Tender and tendering procedures, principle of contract and agreements. Control of constructional operations. Arbitration and its proceedings and awards.

Unit IV

Introduction to principles of business management, project programming and monitoring PERT and CPM network and their analysis.

Unit V

Human relation and personnel management. Brief idea about accounting and book keeping, business oorrespondence, information storage and retrieval systems.

Exercises: *Preparing a report of a study of an Architect's office.*

OPBRC1902 Paper II Housing

Unit I

Housing systems - housing need and options available, National Housing

Unit II

Policy, Housing Agencies and their contribution to housing development, housing finance.

Unit III

Social factors influencing design, affordability, economics factors and housing concepts, slum up-gradation, site and services, housing surveys and neighborhood analysis.

Unit IV

Different type of housing and housing standards, methodology of formulation standards, relevance of standard in housing development, services efficiency and user satisfaction.

Unit V

Housing Design process - different stages in project development layout design including utilities and common facilities, design as a result of bye-laws. Development of technology and community interest.

Exercise: *Paper presentation. Site visit to housing areas*

OPBRC1903 Paper III Building Economics and Legislation

Building economics in general as relevant to Architects;

Creative economics as relevant to creative design and creative building

Emerging concepts in building economics e.g. life Cycle Costing (ICC), Net Benefit (NB), Net Saving(NS), Benefit- to-Cost Ratio (BCR), Saving-to Investment Ratio (SIR), Internal Rate of Return (IRR), Overall Rate of Return (ORR), Payback(PB), using interest and discounting tables.

Formulating Projects, Estimating Costs and Benefits, Selecting a discount rate of Minimum Acceptable Rate of Return (MARR)

Exercise: Presentation and report preparation on the above topic

OPBRC1904 Paper IV Architectural Design VII (With Field trip)

Design of complex and large scale projects in urban context; Design must establish linkages with urban structure, urban continuity, movement structure, landscaping, people and vehicular movement system design, economics, architectural aesthetics and details.

Project: Railway Station, Inter State Bus Terminus, Airport or Sports Stadium.

OPBRC1905 Paper V Practical Training and Presentation

To review the skills and knowledge acquired during practical training on VIII semester

Exercise: Students need to present the work done during their practical training and submission of Report

OPBRC1906 Paper VI Dissertation

Each student is required to conduct a non-design study on topic selected by the student and approved by the department. The study shall be conducted under the guidance of teacher or external expert in the department. This Dissertation should lead to a design problem to be taken up as a Thesis Topic.

OPBRC1907	Paper VII Elective IV
	a. Urban Conservation
	b. Urban Design and Earth quake resistance

a. Urban Conservation

Values, Ethics and Theories of Conservation, preparatory procedures for Consolidation, Restoration, Rehabilitation, Reproduction, Reconstruction etc.-

Role of Conservation Architects

Introduction to various charters like: Venice Charter, Burra Charter, COMOS Charter.

Urban Conservation: Planning & Management.

Exercises: Case studies of Buildings, Sites, Precincts, Stretches etc. of Historic and Cultural Significance. Report on Heritage/Conservation area.

b. Urban Design

Historical perspective on civic design, Forces/Factors governing city design Elements and principles of city design, Urban Services

Exercises: Urban 'Space Activity' studies and seminars / reports on seminars

OPBRC11001 Paper I Thesis Project

Large scale project having complexity of urban and architectural resolutions. Culmination of all the skills acquired in architecture. Individual understanding of architectural theory, philosophy and architectural style.

Note: Student shall engage in study, documentation, analysis and design process of the project. The theoretical part to be put together in the form of a report and the design solution to be presented in hard/soft copy with a model.

Project: Selected by student and approved by department.

OPBRC11002 Paper II Elective V Related to advanced objective in Thesis project

The student will undertake study guided by thesis guide in subject area of the topic selected for the thesis project.

OPBRC11003

Paper III Elective V a. Disaster Resistant b. Structure Architecture Development and Legislation

- a. Architectural development and legislation.
 - Significance of law and its relationship to the profession of Architecture & allied fields, Sources of law constitution, Acts of Central/state legislature, procedures, Law jurisprudence & Sources of law.
 - An overview of laws related to the profession of Architecture and Physical Development
 - The Architects Act 1972, The Law of Contract, The Partnership Act, The Law of Easements, The Arbitration Law and law related to different building types.
 - Introduction to land Acquisition Acts. Municipal Corporation Law & Law related to legislation monuments & Architectural Sites.
 - Study of Building Bye-laWSand related provisions for National Building Code (NBC).
- b. Disaster Resistant structures
 - Comprehension of technical term, related to seismic design.
 - Seismic zones in India.
 - Seismic forces, behavior of structure under seismic forces, failure patterns.
 - Design Considerations: form, materials, and structural system and construction techniques.
 - Study of IS codes and local building by laws related to seismic design.