LIST OF SUBJECTS

& SYLLABUS

FOR SEMESTER I & II OF B. ARCH PROGRAM

DEPARTMENT OF ARCHITECTURE

SCHOOL OF ARCHITECTURE & PLANNING

IUST, AWANTIPORA

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LIST OF SUBJECTS:

SEMESTER I:

S.No	Subject Code	Subject Title	Credits
1.	ARC101C	Architectural Design Studio - I	8
2.	ARC102C	Building Construction & Materials - I	6
3.	ARC103C	Architectural Drawing - I	4
4.	ARC104C	Humanities & History of Architecture - I	4
5.	ARC105C	Theory of Structures - I	3
6.	ARC106C	Art & Graphics - I	3
7.	ARC107F	Environmental Studies -I	2
8.	ARC108C	Project – I	2

Total Credits for Semester I: 32

1 Credit = 50 Marks

Total Marks for Semester I = 1600

SEMESTER II:

S.No	Subject Code	Subject Title	Credits
1.	ARC151C	Architectural Design Studio - II	8
2.	ARC152C	Building Construction & Materials - II	6
3.	ARC153C	Architectural Drawing - II	4
4.	ARC154C	Humanities & History of Architecture - II	4
5.	ARC155C	Theory of Structures - II	3
6.	ARC156C	Art & Graphics – II: Computer Aided	3
7.	ARC159C	Surveying and Levelling	2
8.	ARC160C	Workshop	2

Total Credits for Semester II: 32

1 Credit = 50 Marks

Total Marks for Semester II = 1600

Note: 1 lecture/tutorial/studio period or hour shall have 1 credit.

MARKS DISTRIBUTION:

1) INTERNAL ASSESSMENT (IA)
2) WRITTEN EXAM (WE)
3) VIVA (VV)

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ARC101C: ARCHITECTURAL DESIGN STUDIO – I

Credits-8

Teaching Hours: 8 hours per week

IA: 200

VV: 200

COURSE CONTENT:

1) Element & Principles of Design: Explorations in elements and principles, explorations in form, studies in 2D & 3D compositions, transformation of a cube, study in volumes, study of gestalt and figure-ground relationship.
2) Developing a vocabulary of visual practices and visual field.
3) Abstraction in art: exercises in abstraction.
4) Anthropometry: Understanding the human body in space.
5) 9 Square Grid Exercise: framing space, thinking place.
6) Exposure to architecture, Exposure to architects and their works: Group presentations

REFRENCES:

1) Francis DK Ching: Form, Space & Order
2) Anthony Di Mari & Nora Yoo: Operative Design – A Catalogue of Spatial Verbs
3) Anthony Di Mari: Conditional Design - An Introduction to Elemental Architecture
4) Ernst Neufert: Architect's Data
5) Rob Krier: Architectural Compositions

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ARC102C: BUILDING CONSTRUCTION & MATERIALS – I

Credits-6

Teaching Hours: 5 hours per week

IA: 125

WE: 75

VV: 100

COURSE CONTENT:

1) Building Construction: Elements of buildings -Substructure/ Superstructure
2) Introduction to building construction, understanding building components (Foundation, plinth, wall, sill, lintel, roof, doors, windows, ventilators, staircases, sunshades etc.) along with the building materials.
3) Paradigms: load bearing structures, frame structures
4) Building construction drawing practices and conventions
5) Different types of Brick and Stone Masonry
6) Drawings related to brick masonry and stone masonry
7) Introduction to Building Materials Sand, Clay, Stone, Brick, Lime, Metal, Glass, etc.)
8) Source of the material, classification, tests and various grades available and their uses, physical and chemical properties. Introduction to ferrous and non-ferrous metals-their properties, types and application in building components.
9) The study shall strongly emphasize the 'Selection Criteria' comprising various aspects viz. Technology, Aesthetic, Socio-Cultural, Socio-Economic, Ecology (green materials), etc.

REFERENCES:

1) Willian Bar McKay: Building Construction
2) Robin Barry: The Construction of Buildings
3) Roy Chudley: Building Construction Handbook
4) Sushil Kumar: Building Construction

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ARC103C: ARCHITECTURAL DRAWING – I

Credits-4

Teaching Hours: 4 hours per week

IA: 100

WE: 100

COURSE CONTENT:

1) Studio work culture, pencils, instruments, table, etc
2) Drawing formats, guidelines, etc.
3) Line weight and Line intensity exercises
4) Grids
5) Lettering
6) Measurements, scales & units
7) Measured drawing of an object/structure: exercise in taking measurements, drafting, dimensioning and labelling.
8) Introduction to Projections: Concept, Principle and Methods of Projections
9) Types used & advantage: Isometric, Axonometric & Oblique view
10) Orthographic Projections of Point, Line and Plane
11) Introduction to AutoCAD.

REFERENCES:

1) Francis DK Ching: Architectural Graphics
2) N. D. Bhatt: Engineering Drawing

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ARC104C: HUMANITIES & HISTORY OF ARCHITECTURE – I

Credits-4

Teaching Hours: 4 hours per week

IA: 100

WE: 100

COURSE CONTENT:

1) History as knowledge
2) Basic Definitions: History, Historiography and Historicism
3) Culture, Society and Sociology: Introduction
4) History of culture: understanding human cultural development, products of culture
5) Art and aesthetics: origins
6) Socio-cultural context and architecture
7) Theories of beginnings in architecture: In Vitruvius, In Old Testament, etc.
8) Chronology: Overview of World history
9) Prehistory, Palaeolithic and Neolithic Cultures
10) Burzahom archaeological site
11) River Valley Civilizations: Indus Valley, Mesopotamia, Nile Valley, China

REFERENCES:

1) Sir Banister Fletcher: A History of Architecture
2) Francis DK Ching & V. Prakash: A Global History of Architecture

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ARC105C: THEORY OF STRUCTURES – I

Credits-3

Teaching Hours: 3 hours per week

IA: 75

WE: 75

COURSE CONTENT:

1) History of structural design in the pre- and post-industrial era
2) Physical properties of basic building materials
3) Characteristics and strength of natural and manmade building materials like stone, clay, brick, terracotta, cement and aggregate.
4) Introduction to forces and moments
5) Introduction of forces, composition, resolution, moments and couples, Resultant of forces, Lami's theorem, principle of moments, Vargion's theorem. Principle of equilibrium. Simple problems. Concurrent and non-concurrent co-planar force systems, resultant and equilibrate analytical and graphical solutions
6) Mechanical properties of building materials
7) Simple stresses and strains, elasticity. Stress, strain, types of stresses, elastic limit, modulus of elasticity, composite sections. Stresses due to change in temperature. Elastic constants, linear strain, lateral strain, Poisson's ratio, volumetric strain, relation between E, N, and K
8) Analysis of trusses and frames
9) Introduction to trusses, Elements of truss, Assumptions for truss analysis, structural Determinacy, methods of analysis of trusses.

TESTS:

1) Compression test on Bricks and Solid Blocks.
2) Water absorption test on Bricks and pressed tiles.
3) Flexure test on Tiles.
4) Fineness test of cement and other mineral admixtures
5) Determination of bulking characteristics of the given sand sample.
6) Study of UTM, Torsion testing machine, Hardness testing Machine, Compression testing Machine etc. understanding operation and application.
7) Demonstration of Strain gauges and Strain indicators
8) Study of Strain Recording Instruments.

REFERENCES:

1) Strength of Materials by Dr. R.K. Bansal
2) Strength of Materials by R.S. Khurmi
3) Engineering Mechanics by R.S. Khurmi
4) Structure II by Bhavikutti.
5) IS 465: 2000; SP-16; SP-34

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ARC106C: ARTS & GRAPHICS – I

Credits-3

Teaching Hours: 3 hours per week

IA: 100

VA: 50

COURSE CONTENT:

1) Introduction to art, graphics and visual communication.
2) Drawing as representation and drawing as exploration.
3) Freehand Sketching
4) Life Drawing, Art Lettering
5) Rendering and shading in pencil, pen and ink.
6) Theory of Colour: Goethe, Newton and Wittgenstein on Colour
7) Monochrome and coloured compositions
8) (Re)Presenting Architecture in Colour
9) Architectural Rendering
10) Abstraction in art
11) Introduction to Kashmiri crafts

REFERENCES:

1) Arthur L. Guptill: Rendering in Pen and Ink
2) Francis DK Ching: Architectural Graphics

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ARC107F: ENVIRONMENTAL STUDIES - I

Credits-2

Teaching Hours: 2 hours per week

IA: 50

WE: 50

COURSE CONTENT:

1) Understanding Natural resources: Forest resources, Water resources, Mineral resources, Food resources, Energy resources, Land resources
2) Natural Environment, Ecology and ecosystems, Bio diversity and co-existence
3) Relationship and co-existence of Built & Natural Environments
4) Introducing Anthropocene
5) Urbanization, Environment & Disasters
6) Habitats: sustainable and unsustainable
7) Building Types & Lifestyles in different geographic zones and climatic zones

REFERENCES:

1) Benny, J. (2005). Environmental Studies.
2) Bharucha, E. (2005). Text book of environmental studies for undergraduate courses.
3) Kaushik, A. and Kaushik, C. P. (2010). Basics of Environment and Ecology.

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ARC108C: PROJECT - I

Credits-2

Teaching Hours: 2 hours per week

IA: 50

VA: 50

COURSE CONTENT:

1) Seminars, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.
2) The course coordinator will decide on the theme of the course and nature of the project assignments.
3) Focus on developing different types of research skills
4) Design as research.

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ARC151C: ARCHITECTURAL DESIGN STUDIO – II

Credits-8

Teaching Hours: 8 hours per week

IA: 200

VV: 200

COURSE CONTENT:

1) Understanding of definite, enclosed spaces.
2) Enclosure as architecture: studying basic enclosed configurations in everyday life.
3) Inside – Outside: Understanding the relations between interior and exterior, building and the site
4) Function and utility: Architecture as a diagram (flowcharts, bubble diagrams, etc.).
5) Form and structure: Architecture as an object.
6) Introduction to small scale built-form typologies like living rooms, bus stops, kiosks, etc.
7) Studio exercise with emphasis on studying and designing interior layouts.
8) Studio exercise with emphasis on studying and conceiving the form.
9) One small design exercise as a time-problem of a limited duration.

REFRENCES:

1) Francis DK Ching: Form, Space & Order
2) Anthony Di Mari & Nora Yoo: Operative Design – A Catalogue of Spatial Verbs
3) Anthony Di Mari: Conditional Design - An Introduction to Elemental Architecture
4) Ernst Neufert: Architect's Data
5) Rob Krier: Architectural Compositions

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ARC152C: BUILDING CONSTRUCTION & MATERIALS – II

Credits-6

Teaching Hours: 5 hours per week

IA: 125

WE: 75

VV: 100

COURSE CONTENT:

1) Foundations: Definitions, Purpose of foundation, types of foundations.
2) Shallow & Deep foundations and their types.
3) Selection criteria for foundation, based on soil conditions, physical properties and behaviour of various types of soil, bearing capacity, methods of site exploration and testing of soil.
4) Strip foundation, Isolated footing, combined footing, strap foundation, grillage foundation, raft, etc.
5) Pile foundation, Caissons, etc.
6) Doors and Fenestrations: Access and Ventilation.
7) Study of Doors and Windows in Timber: classification and types.
8) Doors: Panelled, Ledged and Battened, Ledged-Braced & Battened, Framed-Ledged-Braced & Battened, Flush, etc.
9) Casement Windows.
10) Joinery and construction details of Timber doors and Windows.
11) Study of Timber as a building material: Types, seasoning, storage, preservation, defects, decay, etc.
12) Manufactured and Finished timber products: blockboards, fibreboards, ply wood, veneers, etc.
13) Timber joinery: Different types of joints in timber: Tongue and grove joint, tenon and mortise joint, lap joint, dovetail joint, finger joint, etc. and their use in different contexts.
14) Study of masonry arches, resolution of forces in an arch.
15) Classification of arches based on their geometrical shape and centring. Comparison with their corresponding cultural and historical types.

REFERENCES:

5) Willian Bar McKay: Building Construction
6) Robin Barry: The Construction of Buildings
7) Roy Chudley: Building Construction Handbook
8) Sushil Kumar: Building Construction

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ARC153C: ARCHITECTURAL DRAWING – II

Credits-4

Teaching Hours: 4 hours per week

IA: 100

WE: 100

COURSE CONTENT:

1) Axonometric and Oblique Projections of Solids in different positions
2) Section of solids and development of surfaces
3) Section of solids such as prisms, pyramids, cylinders, cones and spheres etc., Development of surfaces of solids, Intersection of surfaces
4) Basics of perspective drawings: Anatomy of perspective: Station point, Eye level, Cone of vision, Picture plane, Horizon line, Ground line, Vanishing points
5) Types of perspectives: One-point, Two-point, Three-point
6) AutoCAD

REFERENCES:

1) Francis DK Ching: Architectural Graphics
2) Engineering Drawing by B.V.R. Gupta
3) N. D. Bhatt: Engineering Drawing

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ARC154C: HUMANITIES & HISTORY OF ARCHITECTURE – II

Credits-4

Teaching Hours: 4 hours per week

IA: 100

WE: 100

COURSE CONTENT:

1) Classical Period: Greek and Roman Architecture
2) Origins of Temple Architecture: North & South India
3) Classification of Temple Architecture
4) Difference & Continuity with Greece and Rome
5) Jain & Buddhist Architecture: Typologies
6) Hellenistic influences on Buddhism and Jainism
7) Ancient Architecture of Hinduism & Buddhism in Kashmir: Parihaspora, Awantipora, Martand, etc.

REFERENCES:

1) Sir Banister Fletcher: A History of Architecture
2) Francis DK Ching & V. Prakash: A Global History of Architecture
3) Indian Architecture (Buddhist Hindu) Vol. 1 by P. Brown
3) The Architecture Of India, Buddhist & Hindu by S. Grover

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ARC-155C: THEORY OF STRUCTURES – II

Credits-3

Teaching Hours: 3 hours per week

IA: 75

WE: 75

COURSE CONTENT:

1) Geometric properties of sections: Centre of gravity, Moment of inertia and section modulus for various structural shapes.
2) Beams: Types & Properties, Types of beams and their behaviour, types of supports and reactions, bending moment and shear forces; simply supported, cantilever and overhanging beams, relation between bending moment and shear force.
3) Theory of Simple Bending: Theory of simple bending and assumptions. M/I=f/y=E/R applications. Flexural formula. Determination of different types of stresses induced in beams and shafts due to bending and twisting moments respectively.
4) Bending and Shear Stresses: Bending stresses and Shearing stresses in beams, distribution of shear stress over different sections like, rectangular, circular, triangular, I and T-sections.
5) Forces in Arches: Determination of horizontal thrust, radial shear & normal force, axial thrust, bending moment & shear force for three-hinged arch. Structural concepts in post & lintel, arch, dome, & vault construction. Concept of behaviour of heterogeneous materials in direct force and bending.

TESTS:

1) Tension test on mild steel and deformed steel bars.
2) Deflection test on Simply Supported / cantilever Beams of (a) wood and (b) steel to find Young's modulus.
3) Torsion test on mild steel bar to determine the Modulus of Rigid
4) Determination of the fineness of cement (Blains Permeability apparatus).
5) Determination of normal consistency of cement by Vicat's Apparatus.
6) Initial and final setting time of cement with Vicat's Apparatus.
7) Soundness test on cement by Autoclave method.

REFERENCES:

1) Strength of Materials by Dr. R.K. Bansal
2) Strength of Materials by R.S. Khurmi
3) Engineering Mechanics by R.S. Khurmi
4) Structure II by Bhavikutti.

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ARC156C: ARTS & GRAPHICS – II: Computer Aided

Credits-3

Teaching Hours: 3 hours per week

IA: 100

VV: 50

COURSE CONTENT:

1) Architectural Presentation Techniques using Microsoft Office
2) Advanced Presentation Techniques:
3) Multi-media presentation: architectural photography, Audio-visual projection, Graphics appropriate for illustration of reports and as accompaniments for seminars.
4) Softwares: Photoshop, Sketchup, InDesign, Illustrator, etc.

REFERENCES:

1) Arthur L. Guptill: Rendering in Pen and Ink
2) Francis DK Ching: Architectural Graphics
3) Bark, S. (2012). An Introduction to Adobe Photoshop

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ARC-159C: SURVEYING & LEVELLING

Credits-2

Teaching Hours: 2 hours per week

IA: 50

WE: 50

COURSE CONTENT:

1) Understand land topography and its connection with surveying & levelling exercises.
2) Types of surveys in practice and overview of various survey techniques & equipment.
3) Concept of surveying & levelling and its tactical importance for Architecture profession
4) Overview and classification of various survey techniques & equipment
5) Scaling of survey measurements and Errors in Surveying
6) Concept of Trigonometry, Traversing & Tacheometry in Surveying
7) Chain Surveying: Principles of survey, equipment required selection of station, methods of taking offsets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging.
8) Compass Surveying: The prismatic compass, its construction and uses. Other types of compasses. Reduced and whole circle bearing, magnetic declamation, effects of local attraction. Compass traverse and balancing the closing error.
9) Plane Table Surveying: Equipment, methods, advantage & disadvantage, errors etc.
10) Theodolite Surveying: Theodolite's temporary & permanent adjustment, measuring of magnetic bearings, horizontal & vertical angles. Theodolite traverse & balancing closing error.
11) Tachometric Surveying: General instruments, different systems of tachometric measurements, stadia method, Subtense method.
12) Levelling: Different types of levels, their temporary and permanent adjustment, levelling staff. Book of the readings and reduction of levels. Errors in levelling. Curvature and refraction reciprocal levelling profile, levelling cross sections.
13) Contouring: Characteristics of contour lines, direct and indirect methods of contouring and interpolation of contours. Interpretation and preparation of contour maps.
14) Total Station Survey

REFERENCES:

1) Surveying And Surveying (Volume I & II) by Dr. B. C. Punmia, Ashok Jain, Arun K. Jain
2) Elementary Engineering Surveying by J. K. Ghosh

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ARC160C: WORKSHOP

Credits-2

Teaching Hours: 2 hours per week

INTERNAL: 50

VIVA: 50

COURSE CONTENT:

1) Model Making in different media: Cutting, joining, shaping & surface development
2) Exercise: Building Model using above media
3) Wooden Joinery: various joinery details to be learned in workshop
4) Metal Workshop
5) Installation Art

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