Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

BACHELOR OF ARCHITECTURE I Semester (CBGS)

S.No	Subject Code	Subject Name	Maximum Marks Allotted					Teaching Hours per Week			Total credits
			Theory			Practical		Lectures (L)	Tutorials (T)	Practical/Studios (P/S)	
			End Sem	Mid Sem Test	Assignment / Quiz	End Sem	Lab/ Studio Work				
1	**AR 111**	**Design-I**	**100**	**30**	**20**	**50**	**100**	**2**	**-**	**6**	**8**

FIRST YEAR – FIRST SEMESTER

1. The aim of the subject is to introduce to the students the design fundamentals, design vocabulary and order of form and space.
2. Primary elements: Point, line, plane, volumetric elements.
   Form: Properties of form (two dimensional) primary solids, variations in forms. Surface articulation including importance of colour theories, textures and relationship.
3. Form and space: Space defining elements, organization of form and space.
4. Circulation elements, proportion and scale, ordering principles.
5. Application of these above to two and three dimensional compositions.
6. Indoor and outdoor sketching exercises to develop the skill and understanding of shades, shadows etc. in the nature and man-made objects with the use of different models.
7. Study through models of different materials viz paper, clay wax, soap, wires etc. The idea is to learn mass and space handling with importance of form, colour and texture.
8. Minimum one time problem of 6 hours duration is to be conducted in class other than regular design problems.

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Note: The sessionals shall be in the form of drawings, and models along with report. The evaluation will be through review system presented before the Jury.

LIST OF TEXT AND REFERENCE BOOKS:

AR111 - Design-I

1. FRANCIS D.K. CHING, "Form, Space and Order", Van Nosttrand Reinhold Co. Canada.
2. V.S. PARMAR, "Design Fundamentals in Architecture", Somayya Publications Pvt. New Delhi 1973.
3. EDWARD D. MILLS, "Planning, The Architects Handbook", Butterworth, London 1905.
4. MAITLAND, GRAVES, "The Art of Colour in Design", McGraw Hill Book Co. 1951.
5. SCOTT. "Design Fundamentals".
6. G. BROND BENT, "Design in Architecture".
7. FRANCIS D.K. CHING, " Architectural Graphics".

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2	**AR 112**	**Graphics-I**	**100**	**30**	**20**	**50**	**100**	**2**	**-**	**5**	**7**

1. a) Free hand drawing: Techniques and principles of free hand drawing through sketching various elements of nature and man made objects through various mediums like pencil , pen and ink and colour etc.
   b) Graphic codes and symbols for various building elements, Architectural lettering.
2. Scales: Construction of architectural scales and their application to real objects and drawings.
3. Orthographic Projections: From simple point line to simple regular solids to complex solids or hollow objects /geometric objects.
4. Complex Projections: Interpenetration of solids, development of surfaces with or without sections.
5. Angular Projections: Isometric, axonometric and oblique projections.

Note: The sessional is to be done in the form of drawing sheets and sketches on above topics.

LIST OF TEXT AND REFERENCE BOOKS:

AR112 - Graphics- I

1. N.D. BHATT, “Engineering Drawing”, Charotar Publishing house.
2. NARAYANAN, “Engineering Drawing”.
3. I.H. MORRIS, “Geometrical Drawing”. Orient Longman

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3	**AR 113**	**Materials Science**	**50**	**30**	**20**	**-**	**20**	**2**	**-**	**1**	**3**

1. Clay and clay products (bricks, tiles), stones.
2. Cement, lime, sand, aggregate mortar and concrete blocks.
3. Timber types, qualities and defects in timber seasoning etc. complete.
4. Metals- ferrous and non ferrous, glass.
5. Especial functional need and category of building materials abrasives, adhesives, asbestos, asphalt, bitumns, cork, electrical insulators, fuels, gypsum, heat insulation materials, lubricants, rubber sheets, roof coverings, solders, sound absorb materials, tar, turpentine etc.
6. Proprietary building materials:- Paints, Varnishes, distempers wall paper, floor coverings, tiles, vinyl's, polyesters, fittings, furnishing materials for interiors & exteriors polymers, plastics resins etc. processed materials- plywood, laminates, fiberboards, light weight boards, panels etc. & clay products.
7. Prefabricated and pre-stressed building component: roof slabs, wall units, beams, columns, lintels, shelve etc. of different types, their specification & technique of construction and use in architecture. Low-cost construction techniques and materials, combinations in mud, terra- cotta, bamboo construction etc. Termite protection, sewage protection, fire protection materials etc. of special need.
8. Industrial, agricultural and mineral wastes and their utilization as building materials: Flyash, blast furnace slag, calcium carbonate, lime kiln rejects, by- product, gypsum, red mud, throw-away packages, rice husk, saw dust, wooden chips, choir waste, wood wool, tailings etc. Their application in components of different types of buildings.

9. Analytical, evaluative comparative and selective techniques for finalising specific building materials for different types of buildings and its influence on prevailing architectural styles.

Note: Sessional should be in the form of small reports, seminars and notes on above mentioned topics. The works of CBRI, NBO, HUDCO and other related institutions be referred and discussed.

LIST OF TEXT AND REFERENCE BOOKS:

AR113 - Material Science

1. S.C RANGWALA, " Engineering Materials", Charotar Publishing House 1989.
2. JACK M. LAUNDERS, " Construction Materials", Methods, Carries South Holland.
3. SURINDER SINGH, "Building Materials".

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4	**AR 114**	**Humanities (Communication)**	**50**	**20**	**10**	**-**	**20**	**2**	**1**	**1**	**4**

HUMANITIES

1. Grammar- Tenses, Types of sentences, clause analysis, reported speech, models, punctuation with emphasis on spoken expression with proper language command.
2. Precise, essay and paragraph writing.
3. Technical report and letter writing.
4. Aesthetic and critical writing.
5. Communication skills in architecture through write up and graphics, graphs, sketches audio presentation supplemented by drawings, transparencies, photographs, epidioscope, slides, video presentation, script writing dubbing, que sheet, ending vision mixing.

SOCIOLOGY

1 . Introduction: Man, his social and physical environment, social groups and social structure and problems, cultural heritage, ritiuals and community gatherings etc.
2. Urbanisation: Trends and characteristics, dynamics of urban growth and social changes, urban attitudes, values and behaviour, review of commission's report etc.

Note: Sessional work shall include assignments/tests on the above related topics.

LIST OF TEXT AND REFERENCE BOOKS:

AR114 - Humanities

1. WREN & MARTIN, “English Grammar”.
2. KRISHNA MOHAN, “Developing Communication Skills” Macmillan India Ltd.

SOCIOLOGY

1. MACIVER & PAGE, “Society”.
2. K.DAVIS, “Human Society”.
3. A. R. DESIA, “Introduction to rural sociology in India”.
4. E.E. BERGAL, “Urban Sociology”.

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5	**AR 115**	**Structure - I**	**50**	**20**	**10**	**-**	**20**	**2**	**1**	**1**	**4**

1. Statics of a particle, composition and resolution of forces, moment of a force, parallel forces,couples,general conditions of equilibrium.
2. Center of gravity and moment of inertia of composition and cut out sections, parallel and perpendicular axes theorem, stability of equilibrium.
3. Simple stresses and strains, direct stresses, compound stresses.
4. Shear force and bending moments for strained beams subjected to concentrated load and distributed loadings (Simply supported and cantilever only) support reactions.
5. Stress in beams: Direct, bending and shearing stress in beams.

Note: Sessional work should include design and analysis of simple elements as stated above with drawings.

LIST OF TEXT AND REFERENCE BOOKS:

AR115 - Structure-I

1. S.B. JUNNARKAR, “Applied Mechanics”, Charotar Publications Ananad.
2. RAMAMURTHAM, “Applied Mechanics”, Dhanpat Rai & Sons.
3. S.B. JUNNARKAR/H.J. SHAH, “Mechanics of Structure Vol.1”, Charotar Pub.
4. DR. B.C. PUNAMIA, “Strength of Materials”, Laxmi Pub.

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6	**AR116**	**Workshop-I**	**-**	**-**	**-**	**30**	**20**	**-**	**-**	**3**	**3**

The aim of the subject is to introduce to the students to the various tools used in carpentry, metal work, masonry painting etc. and get a reasonable skill in handling the materials and tools there off.

1. BRICKS: Bonds, ends and junctions, attached or detached pier, jointing, pointing, cavity walls.
2. STONE: Types and dressing, walling and joints, facing of brick or stone or brick work.
3. CARPENTARY: Understanding the structure of timber, varieties of Indian timber, commercial boards, handling different carpentry tools, carpentry process, carpentry joints and wood working machines.
4. SHEET METAL WORK: Cutting, bending and jointing of (ferrous / non ferrous metals) sheets, flats, bars, wires etc. Exercises in simple welding of angles, pipes sheets, flats.
5. PLUMBING: Introduction to various pipes and fittings screwed joints, threads bending and plumbers tools.
6. MASONARY: Handling the bricks, mixing the mortar, bond work of bricks, stones and masonry tools
7. PAINTING & POLISHING: Preparation of timber and metal surfaces, priming, painting by brush, spray guns, polishing of timber surfaces, lamination to timber surfaces.

Note: The sessionals will be in the form of different job works and sheet works in each trade and models prepared by using the above methods. An internal viva at the end on all the job works or practicals may be carried out.

LIST OF TEXT AND REFERENCE BOOKS:
AR116 - Work Shop-I

1. W.B. MCKAY, "Building Construction Vol.1, Orient Longman.

2. R. CHUDLEY, :Building Construction Handbook Vol. 1 to 4 "British Library Catalouging in Publication Data 1990.

3. DR. B.C. PUNAMIA, "Building Construction", A. Sauraby & Co. Pvt. Ltd.

4. R. BERRY, "Construction of Buildings". The English Language Book Society London 1976.

5. MITCHEL, " Advance Building Construction", Allied Publishers Pvt. Ltd.

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7	**AR117**	**Computer Programming**	**-**	**-**	**-**	**-**	**30**	**-**	**-**	**3**	**3**

AIM: The basic concepts of programming are introduced, starting with the notion of an algorithm. The emphasis of this course is on developing the ability to write correct programs/solutions to solve practical computational problems. The main topics along with their sub-topics covered in this course are:

1 Procedures , Programs, and Computers Computational procedures, Details of computations, Computer architecture, Integer representation, Elementary graphics, Coordinate-based graphics.

2 Sequential and Conditional Execution of Programs Representing oating point numbers, Representing characters, Strings, Booleans, Structure of a simple C++ program, Names and type declarations iC++ Assignment statement and arithmetic expressions, Assignment statement and logical expressions, Sequential execution in C++ programs, Conditional execution in C++ programs

3. Iterative Solutions and Functions: Iteration idioms, While and do while statements in C++, For statement in C++, Loops and assignment expressions, Iterative programs: putting it all together, Reasoning about loops, Introduction to functions in programming, Flow of control in function call, Parameter passing in function calls, Recursive functions

4 Arrays and Matrices: Need for arrays, Arrays in C++, Using arrays for solving computational problems, Solving simultaneous equations, Gaussian elimination, More matrix applications, Digital images and histograms, Associative arrays for histogram equalization, Histogram equalization program

5 Sorting and Searching: Sorting: some motivation, Selection sort, Analyzing selection sort, Merge sort intuition, Merge sort in C++ and its analysis, Sorting strings and other data types, Searching

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6 Strings, Pointers, Software Engineering Character strings, More on strings, Separating multiple words in a line, Introduction to pointers, Use of pointers in C++ programs, Pointers in function calls Pointers and dynamic memory, Introduction to software engineering, Basic principles of software engineering

7 Structures: Introduction to object-oriented programming structures, Simple operations on structures, Programming using structures, More on structures and pointers, Programming using structures

8 File Processing: Introduction to files, Opening files in C++ program, Function for processing data in files, Handling input output using files, Handling text data using 'scanf' and 'printf', Handling data in text files, Creating a binary file, Directly accessing files, Updating records in a file.