PANDIT LAKHMI CHAND STATE UNIVERSITY OF PERFORMING AND VISUAL ARTS, ROHTAK (A State University established under Haryana Act No. 24 of 2014)



FACULTY OF URBAN PLANNING & ARCHITECTURE BACHELOR OF ARCHITECTURE FOUNDATION COURSE SCHEME OF EXAMINATION AND SYLLABUS Programme Code: AR Duration -01 Year Full Time CHOICE BASED CREDIT SYSTEM ACADEMIC SESSION 2019-20 ONWARDS

SCHEME OF EXAMINATION

| SEMESTER – I | | | | | | | | | | | | |
|---------------|---------------------------|---------------------|--|-------------------|---|-----|-------------------|--------------------------|----------------|-------|---------|--------------------------------|
| Paper Code | Category as per COA | Subject Category | Course Title | Periods / Week | L | S | Internal Marks | ternal Marks External | | Total | Course | Duration |
| | | | | | | | Sessional | Portfolio/ Viva-Voce | Theory Exam | Marks | Credits | (hrs.) |
| AR/101/D | PC | Core | Architectural Design – I (Spatial Exploration-I) | 8 | | 8 | 100 | 100 | | 200 | 8 | |
| AR/102/D | BS & AE | Core | Building Construction & Material – I (Bricks and Stone) | 6 | | 6 | 75 | 75 | | 150 | 6 | |
| AR/103/D | BS & AE | Core | Structural Design – I (Mechanics) | 2 | 2 | | 25 | | 25 | 50 | 2 | 2 |
| AR/104/D | PC | Core | Architectural Drawing – I (2D Drafting) | 6 | | 6 | 75 | 75 | | 150 | 6 | |
| AR/105/D | PC | Core | Graphics – I | 4 | | 4 | 50 | 50 | | 100 | 4 | |
| AR/106/D | PE | DSE | Theory of Design – I | 2 | 2 | | 25 | | 25 | 50 | 2 | 2 |
| BFC/109 | SEC | SEC | Soft Skills – I | 2 | 2 | | 15 | | 35 | 50 | 2 | 2 |
| BFC/110 | PAEC | OE | Computer Applications – I | 2 | | 2 | 15 | 15 | 20 | 50 | 2 | 01 hour each of Th. & PR |
| BFC/111 | BS & AE | SEC | Environmental Studies | 2 | 2 | | 15 | | 35 | 50 | 2 | Internal Theory |
| Total | | | 32 | | | 380 | 300 | 120 | 800 | 32 | | |

| SEMESTER – II | | | | | | | | | | | | |
|---------------|---------------------------|---------------------|---|------------------|---|---|-------------------|-----------------------------|----------------|-------|---------|--------------------------------|
| Paper Code | Category as per COA | Subject Category | Course Title | Periods/ Week | L | S | Internal Marks | nternal Marks External M | | Total | Credito | Duration |
| | | | | | | | Sessional | Portfolio/ Viva-Voce | Theory Exam | Marks | Credits | of Exam |
| AR/201/D | РС | Core | Architectural Design – II (Spatial Exploration-II) | 6 | | 6 | 75 | 75 | | 150 | 6 | |
| AR/202/D | BS&AE | Core | Building Construction & Materials – II (Wood) | 6 | | 6 | 75 | 75 | | 150 | 6 | |
| AR/203/D | BS&AE | Core | Structural Design – II (Timber/Brick) | 2 | 2 | | 25 | | 25 | 50 | 2 | 2 |
| AR/204/D | РС | Core | Architectural Drawing – II (Solids) | 4 | | 4 | 75 | 75 | | 150 | 4 | |
| AR/205/D | PC | Core | Graphics – II | 4 | | 4 | 50 | 50 | | 100 | 4 | |
| AR/206/D | BS&AE | DSE | Building Services - II (Climatology) | 2 | 2 | | 25 | | 25 | 50 | 2 | 2 |
| AR/207/D | BS&AE | SEC | Surveying – II | 2 | 2 | | 25 | | 25 | 50 | 2 | 2 |
| BFC/209 | SEC | SEC | Soft Skills – II | 2 | 2 | | 15 | | 35 | 50 | 2 | 2 |
| BFC/210 | PAEC | OE | Computer Applications – II | 2 | | 2 | 15 | 15 | 20 | 50 | 2 | 01 hour each of Th. & PR |
| | | | Total | 32 | | | 380 | 275 | 145 | 800 | 32 | |

Abbreviations:

| COA | : Council of Architecture |
|---------|--|
| PC | : Professional Core |
| BS & AE | : Building Science and Applied Engineering |
| PE | : Professional Elective |
| OE | : Open Elective |
| DSE | : Discipline Specific Elective |
| SEC | : Skill Enhancement Course |
| PAEC: | Professional Ability Enhancement Course |
| PAECC | : Professional Ability Enhancement Compulsory Course |

SYLLABUS FOR SEMESTER – I & II

Page **6** of **32**

SEMESTER-I

Paper-1 : Architectural Design-I (Spatial Exploration-I)

Paper Code : AR/101/D

Course Credits : 08

Course Objective:

• Introduce in to the mathematical mind set of the students from the science stream an aesthetic line of thinking. Inculcating a sense of joy in 'design' and its process.

Course Content:

Unit I

Potential of a line, composition using lines. Exercise in 2 And 3-dimensional composition to Achieve Harmony, Balance, Contrast, Rhythm, Etc. Geometrical Analysis of forms and Patterns in Architecture, Objects of everyday use and other forms.

Unit II

Study of Anthropometrics and its application in Design exercises. Simple Imaginative Problems for Example Pedestal, Basic Shelter, Street Furniture, Memorials, etc.

Unit III

2D compositions with basic geometric shapes, color, texture and pattern, Door elevation, Carpet design, Backdrop of stage, Mural with geometrical shape, Floor tile design & paving patterns, Sky line of city/village,

Unit IV

Experience in 3D Design, compositions with simple forms like cube, cuboids, cylinder, cone, prism etc.8 Compositions with 3-D Objects.

1 no. Time problem of 6-12 hours

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. At least 12 exercises must be attempted.

- 1. Broomer, F. Gerald (1974). Elements of Design: Space. Worcester: Davis Publications.
- 2. Gordon, Bob and Gordon Maggic (2002). Complete Guide to Digital Graphic Design. London: Thames and Hudson.
- 3. Grillo, Paul Jacques (1960). Form, function and design. New York: Dover Publications.
- 4. Item, Johanes (1973). The Art of Colour. New York: Van Nostrand Reinhold.
- 5. Maier, Manfired (1977). Basic Principles of Design. Vol.1-4. New York: Van Nostrand Reinhold.
- 6. Sausmarez, Maurice De (1987). Basic Design: The dynamics of Visual Design. London: Herbert Press.
- 7. Watson, Donald et al (1997). Time Saver Standards for Architectural Design Data (CDROM). New York: McGraw Hill..
- 8. Wong, Wucius (1977). Principles of three-dimensional Design. New York: Van Nostrand Reinhold.
- 9. Wong, Wucius (1977). Principles of two-dimensional Design. New York: Van Nostrand Reinhold.

Paper-2: Building Construction & Materials-I (Bricks & Stones)

Paper Code : AR/102/D

Course Credits : 06

Course Objectives:

• To introduce the students to the dynamics of the construction of buildings and an appreciation of the use of building materials in architecture as an integral component of the conversion of Architectural Concepts into tangible reality.

Course Content:

Unit I

Basic components of a "building" Role of Construction in Architecture Brick as a building material

Unit II

Study of manufacturing process, structural, visual and textural properties, varieties and applications of brick and stone.

Construction principles and details in brick and stone. Masonry work – bonding details in walls and piers.

Unit III

Brick Masonry tools Brick Jaalies Brick Arches Brick Bonds & Brick Wall Junctions

Unit IV

Stone as a building material Stone Masonry Tools Construction principles and details in stone. Stone Masonry

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. This course will be supported by site visits. At least 12 sheets must be prepared in the Studio.

- 1. Barry, R (1986). Construction of Buildings. Vol. 1-5. London.
- 2. BIS (2011). National Building Code, SP 7. New Delhi: Bureau of Indian Standards.
- 3. Foster, Stroud (1963). Mitchell's Advanced Building Construction, Mumbai: Allied Publishers.
- 4. McKay, W. B. (1972). Building Construction (Metric). Vol. 1-5. London: Longman.
- 5. Prabhu, Balagopal T. S. (1987). Building Drawing and Detailing. Calicut: Spades Publishers.
- 6. Punmia, B. C. (1993). Building Construction. Delhi.
- 7. Singh, Gurucharan (1981). Building Construction Engineering. New Delhi: Standard Book House.
- 8. Relevant IS codes

Paper-3 : Structural Design-I (Mechanics)

Paper Code : AR/103/D

Course Credits : 02

Course Objectives:

• To inculcate the understanding of the basic principles of structural mechanics for understanding of Structural Systems and basic analysis of structures.

Course Content:

Basic Structural Mechanics & Analysis of Structures

Unit I

Force and its Units, Laws of forces, Resultant of a Force System, Law of Inertia, Law of action and reaction, Free body diagram, Static equilibrium & conditions of equilibrium, conditions of statically determinacy, Degree of Indeterminacy.

Types of supports and support reactions, Determination of support reactions for statically determinate structures, Analysis of forces, moments and couples in structures.

Unit II

Analysis of a perfect truss by met chairperson of joints and met chairperson of sections.

Simple stress and strains, elastic constants, stress strain curves, relationship among elastic constants. Study of beams with different types of support conditions and different types of loadings. BIS 875 code for estimation of design loads in a building.

Unit III

Shear force and shear force diagrams, bending moment & Bending moment diagrams for determinate beams, Sagging and Hogging Bending Moments, Sign Convention, Point of contra-flexure and determination of its location. Flexural and shear stresses under bending, Determination of deflection in the beams (only formulae to be told, no derivation) Deflected shapes of the beams.

Unit IV

Centre of Gravity and Centroid and its determination for a plane lamina. Moment of Inertia and its determination for a plane lamina, Parallel Axis theorem and Perpendicular Axis theorem.

Note:

- Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester.
- Appropriate standards must be explained and used
- Exercises must be done in each class
- Examiner will set seven questions in total, covering the whole syllabus. Students will have to attempt 4 Questions in all. 60% Theory based and 40% numerical based questions to be given. All the questions carry equal marks [6.25 X 4 = 25]

- 1. Beer, F. P. and Johnston, R. E. Jr (1962). Mechanics for Engineers, Statics and dynamics. New York: McGraw Hill.
- 2. BIS (1987). Code for the Estimation of Design Loads in a Building, IS 875. New Delhi: Bureau of Indian Standards.
- 3. Punmia, B.C. & Jain, A. K. (2002). Mechanics of Materials. New Delhi: Laxmi Publications.
- 4. Ramamrutham, S. and Narayan, R. (2008). Strength of Materials. New Delhi: Dhanpat Rai.

Paper-4 : Architectural Drawing-I (2D Drafting)

Paper Code : AR/104/D

Course Objectives:

• To familiarize the students with basic knowledge of good drafting and lettering techniques and architectural drawing i.e. orthographic projections of simple geometrical forms.

Course Content:

Unit-I

Drawing Instruments and their uses. Sheet layout and sketching. Drafting Technique&, Principles of Drafting, Lettering: - Exercises in drafted and freehand architectural lettering. Lines: Concept and types of lines. Line thickness. Dimension lines.

Unit-II

Scales: Engineers scale, Graphical scale and Representation factor (R.F.) Scales on drawings. Types of scales: Plain scale and Diagonal scale.

Unit-III

Orthographic Projections Definition, Meaning & concept. Principles and Methods of projection. Orthographic projection. Planes of projection. Four Quadrants. First angle projection. Third angle projection. Projection of points, lines & planes.

Unit-IV

Projections of solids: Axis perpendicular to the H.P., Axis perpendicular to the V.P. Axis parallel to both the H.P. & V.P. Projections of solids with axis inclined to H.P. and V.P.

Unit-V

Architectural Graphic Symbols, measured drawing of a simple object **Note:**

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. At least 12 exercises must be prepared in the studio under supervision.

Reading List (To be elaborated by subject teacher)

- 1. Bhat, N D (1995). Engineering Drawing. Bangalore: Charotar Publishing House.
- 2. Gopalakrishna, K R (2001). Engineering Graphics. Bangalore: Subhas Publications.

Paper-5 : Graphics-I

Paper Code : AR/105/D

Course Objectives:

• To develop the skill of using the pencil in free hand drawing and rendering to support Architectural Design and Drawing.

Course Content:

Use of Pencil Drawing Instruments and their uses. Sheet layout and sketching. Lines: Concept and types of lines. Line thickness and grading using different grades of pencil

Unit-II

Sketching Technique&, Principles of Sketching,Scales: Understanding scales according to sketching techniquesScales on drawings. Drawing objects on scale in different sizes of paper.Still Life: Drawing objects proportionately on given paper size in appropriate scale.

Unit-III

Definition, Meaning & concept of shades. Principles and methods of shading. Understanding shades according to shading techniques. Still Life: Drawing objects proportionately on given paper size in appropriate scale with application of shading techniques.

Unit-IV

Definition, Meaning & concept of shadows. Principles and methods of showing shadows.

Understanding shadows according to shadowing techniques.

Still Life: Drawing objects proportionately on given paper size in appropriate scale with application of shades and shadows.

Unit-V

Introduction to colours and types of colours.

Still life: Drawing objects proportionately on given paper size in appropriate scale with application of shades and shadows in pencil colours.

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. At least 12 exercises must be prepared in the studio under supervision.

Reading List (To be elaborated by subject teacher)

- 1. Pipes, Alan (1990). Drawing for 3D Designs. London: Thames & Hudson.
- 2. Dale, Russell (1990). Pastels Book. Cincinnati : North Light Books.
- 3. Jacqueline (19991). Graphic Illustration in Black and White. New York: Design Press.
- 4. Philip, Crowe (1991). Architectural Rendering. Switzerland: Rofovision.
- 5. Gill, Robert W. (2008). Rendering with Pen & Ink. London: Thames & Hudson.

Course Credits : 04

Unit-I

Paper-6: Theory of Design-I

Paper Code : AR/106/D

Course Objectives:

• The courses in Design theory aims to evolve a conceptual framework for intelligent appreciation of Architecture and to develop a vocabulary for discussing design ideas.

Course Content:

Unit-I

Role of an Architect in an Architectural Project and in Society Through History; Disciplines and Skills to be Learnt by an Architect; Factors Influencing Architecture of a Place, Climate, Materials, Socio Cultural, Technological, Etc.; Introduction to Old and New Architectural Works; Understanding the Terms Such as Vernacular, Traditional, Classical, Modern, Post Modern and Neo Modern Renaissance, European, Oriental.

Unit-II

Meaning of design Appreciation of beautiful objects Design in everyday life. Logic in design. Geometry in design

Unit-III

Elements of Design-Line, form, color texture Principles of Design-Unity, variety, hierarchy, Scale and proportions Balance, emphasis, Focus, fashion, decoration.

Unit-IV

Basic Design and Architectural Design- Elemental Differentiation Perception and Experience Tangible and Intangible in Architecture Function, Structure and Form Space, Space Usage and Interrelationship of spaces

Unit-V

Circulation within Spatial Units Horizontal Circulation Vertical Circulation Circulation and Spaces Between buildings Relationship of plan, Section and Elevation Architectural Scale

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. Examiner will set seven questions in total, covering the whole syllabus. Students will have to attempt 4 Questions in all. All the questions carry equal marks [6.25 X 4 = 25]

Reading List (To be elaborated by subject teacher):

- 1. Ching, Francis D. K. (1979) Architecture-Form, Space and Order. London: Van Nostrand Reinhold.
- 2. Norberg-Schulz, Christian (1971). Existence, Space and Architecture. London: Studio Vista.
- 3. Pandya, Yatin (2007). Elements of Space Making. Ahmedabad: Mapin Publications.
- 4. Pandya, Yatin, (2005). Concepts of Space in Traditional Indian Architecture, Ahmedabad: Mapin Publications.
- 5. Parmar, V.S. (1990) Design Fundamentals. New Delhi: Somaiya Publications.
- 6. Walsh, Margaret (1971). The colour Source Book. London: Thames & Hudson.

Paper-9 : Soft Skills-I

Paper Code : BFC/109

Course Credits : 02

Course Objective:

• To inculcate soft skills among students so that they may carry themselves comfortably in all walks of life, as a student and as an individual in society. The major emphasis shall be on effective communication skills (verbal &non-verbal), to plan a career, interviewing and other assessment procedures, enhancing employability as per aptitudes and interests. The course shall also focus on self-management and leading a good life. The pedagogy shall be transactional as an admixture of lecture, demonstration, practicum, feedback and situational exercises.

Course Content :

Personality Development:

- Understanding the Self: Carrying the self, Personal Grooming, Dressing- dress as Nonverbal text, Greetings and Etiquette
- Communication Skills: Language Etiquette, Listening & Hearing, Speaking and Audibility, Storytelling & Narration
- Study of the Self and the Other: Physical Self- Body image, Body Language and Para-Language. Psychological Self- Joharry Window, Ethics and Ethical Conduct- Gender sensitization, Tolerance and inclusiveness
- Developing and Maintaining Relationships: Ice breaking, Social inhibitions
- Managing activities of daily living
- Time perspective- Living in the present and Goal setting
- SWOT Analysis: Strengths and weaknesses

Career Planning and Development:

- ICT enabled Communication Skills
- Interests and Vocational Choices
- Basic Interviewing
- Employability: Understanding Career Objectives
- Problem solving and Critical Thinking

Paper-10 : Computer Applications-I

Paper Code : BFC/110

Course Credits : 02

Course content:

- 1. **Knowing computer:** What is Computer, Basic Applications of Computer; Components of Computer System, Concepts of Hardware and Software;
- 2. **Operating Computer using GUI Based Operating System:** What is an Operating System; Basics of Popular Operating Systems; The User Interface; Use of Common Icons, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help;
- 3. **Word Processing:** Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.
- 4. Using Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.
- 5. Making Small Presentation: Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.
- 6. AutoCAD: Introduction to AutoCAD (Computer Aided Drafting & Designing) as drafting tool. Function keys, Shortcut keys, Different sizes of paper as drafting tool, Navigating the Working Environment Learning Drawing Elementary CADD command Line, Polyline, Polygon, Circle, arc, ellipse, Text Single Text, Multitext, Dtext, Dimensioning. Implementing basic commands of 2D in AutoCAD and making simple figures in 2D..
- 7. AutoCAD : Working with Files, Displaying Objects, , Creating Basic Objects Selecting Objects in the Drawing Changing an Object's Position.

Suggested Books:

- 1. Sinha, P.K. : Computer Fundamentals, New Delhi: BPB Publications.
- 2. Clifton, H.D. Business Data Systems. 3rd ed. New Delhi: Prentice Hall of India.
- 3. Sandler, Corey et al. Teach Yourself Office-97 for Windows. New Delhi: BPB Publications.
- 4. Courter, Gini et al. MS-Office User Certification Study Guide. New Delhi: BPB Publications.
- 5. CADfolk (2018). AutoCAD 2019 for Beginners.
- 6. Omura, George and Benton, Brian C. (2018). Mastering AutoCAD 2019 and AutoCAD LT 2019.

Note:

- The paper setter will set questions in two parts (A & B).
- In part A, the paper setter will set 15 objective type questions carrying 2 mark each.
- In Part B, the paper setter will set 02 descriptive type questions out of which students shall attempt any 1 questions carrying 5 marks each.

PAPER-11 : ENVIRONMENTAL STUDIES

Paper Code : BFC/111

Course Credits : 02

Course Overview:

• Course intends to acquaint the students with issues related to environmental problems and train the students to locate and comprehend environmental issues.

Course objective :

• To develop an awareness about environmental issues to create cognitive capacity and resourcefulness in students.

Course content:

Unit 1: Environmental Awareness

Unit Overview :

- Introduction to environmental Science. It's Definition, scope, importance and need for public awareness.
- To develop understanding of multidisciplinary nature of environmental science

Lesson Plan:

• Week 1 – Day 1 : Environment and Natural Processes

Theoretical inputs :

• Introductory lecture on environmental science. Detail discussion on the environment and natural processes like weather (e.g. storms), geological (e.g., earthquakes) and hydrological events (e.g., floods). Practical Exercises/Assignments: Week 2 - Day 1 : Environmental issues. Theoretical inputs : Concept of Sustainable Development, Issues affecting future development Practical Exercises/Assignments: Week 3 - Day 1 : Importance and need for public awareness. Theoretical inputs : Discussion on various awareness programs, Case studies Practical Exercises/Assignments:

Unit 2 : Natural Resources & Biodiversity

Unit Overview :

• To introduce the Renewable and non -renewable resources, Forest resource, consequences of deforestation, floods and draughts, equitable use of resources for sustainable development, Dams benefits and problems.

Learning Objectives :

• To develop understanding on availability of Natural Resources and their status.

Lesson Plan : Week 4 – Day1 : Natural Resources

Theoretical inputs :

- Types of Renewable and non -renewable resources Practical Exercises/Assignments: Week 5 Day 1 : Forest resource, consequences of deforestation, floods and draughts, equitable use of resources for sustainable development, Dams benefits and problems.
- Theoretical inputs : Practical Exercises/Assignments: Week 6 Day 1 : Biodiversity: ecosystem diversity, threats to biodiversity, conservation of biodiversity. Theoretical inputs: EPPractical Exercises/Assignments:

Unit 3 : Ecosystem

Unit Overview : Related theories.

Learning Objectives : How it functions.

Lesson Plan :

Week 7 – Day 1 : To introduce concept of an ecosystem and various ; To develop understanding of an ecosystem and Concept of an ecosystem, structure and function of an ecosystem. Theoretical inputs Practical Exercises/Assignments: Week 8 - Day 1 : Producer, consumer and decomposer, energy and nutrient flow biogeochemical cycles. Theoretical inputs : Practical Exercises/Assignments: Week 9 - Day 1 : Food chain, food web, ecological pyramid Theoretical inputs : Practical Exercises/Assignments:

Unit 4 : Environmental Pollution & Social Issues

Unit Overview :

• To introduce the Renewable and non -renewable resources, Forest resource, consequences of deforestation, floods and draughts, equitable use of resources for sustainable development, Dams benefits and problems.

Learning Objectives :

• To develop environmental sensitivity in students.

Lesson Plan:

• Week 10 – Day 1 : Segments of environment, sources, pathways and fate of environmental pollutants, causes of environmental pollution, physical, chemical and biological transformation of pollutants, population explosion, environment and human health, human rights, value education, women and child welfare.

Theoretical inputs :

- Practical Exercises/Assignments : Week 11 Day 1 : Air Pollution Theoretical inputs : Various segments of atmosphere and their significance, classification of air pollutants, toxic effects, sampling and analysis, stationary and mobile emission, sources and their control.
- Photochemical smog, sulphurous smog, greenhouse effect, global warming, ozone depletion, Air (prevention and control of pollution) Act (10). Practical Exercises/Assignments: Week 12 - Day 1 : Water Pollution. Theoretical inputs : Water resources, sources of water pollution, various pollutants, their toxic effect, portability of water, municipal water supply, disinfection, characteristics of waste water, primary and secondary waste water treatment, BOD and COD measurement and their significance, rain water harvesting ,water shed management, Water (pollution and control) Act.(12) Practical Exercises/Assignments:

Unit 5 : Human Population & Environment

Concept of sustainable development; Issues affecting future development (population, urbanization, health, water scarcity, energy, climate change, toxic chemicals, finite resources etc.); Environmental units.

Textbooks & References:

- Sharma and Kaur. Environmental Pollution.
- De. Environmental Chemistry.
- Davis M. L. and Cornwell D. A. Introduction to Environmental Engineering. 4th ed. New York : McGraw Hill.
- Masters G. M., Joseph K. and Nagendran R. Introduction to Environmental Engineering and Science. 2nd ed. New Delhi: Pearson Education.

SEMESTER-II

Paper-1 : Architectural Design-II (Spatial Exploration-II)

Paper Code : AR/201/D

Course Credits : 06

Course Objectives:

• To appreciate the constraints in the Architectural design of a small building with reference to function, form and structures.

Course Content:

- Importance of physical factors in Architectural design e.g. orientation, ventilation, adequate protection from rain, dust, insects etc. and human dimensions in various postures (in applied form), their relation to everyday utilities like the table, chair, bed, sink etc. Understanding measured drawing of an existing small Unit.
- Basic human functions and their implications for spatial planning through Anthropometric study. Minimum and optimum areas for various functions. Activity space analysis of individual spaces like Bed room, drawing room, Kitchen, Bath room etc. including, the furniture layout, circulation, clearances, lighting and ventilation, etc. of existing house and re-design of these spaces. Preparing user profile, bubble and circulation diagrams.
- Introduction of physical factors / geographical aspects for basic design.
- The exercise shall be followed by design problem based on the basic climatic aspects and to understand the function of a single Unit. Design of small buildings involving functional, structure system & construction details e.g. Milk booths, Kiosks, Bus stop, Cafes, Drinking water fountains, Canopy, Cycle stand, Security Check post, Installations for Circulation etc. All buildings should have accessibility to the physically challenged persons.
- Measured Drawing of a heritage building complex to be done. A study tour may be conducted to study the heritage building complex to document current conditions. A studio exercise to be conducted in groups for detailed and through documentation of the heritage building complex.

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester.

- 1.Baker, Geoffrey H. (1996). Design Strategies in Architecture: An Approach to the Analysis of Form. Taylor & Francis.
- Burden, Ernest (1987). Design Communication. New Yoork: McGraw Hill.
- Chiara, Joseph De and Crosbie, Michael J (2001). Time Saver Standards for Building Types. New York: McGraw Hill.
- Chiara, Joseph De, Panero, Julius and Zelnik, Martin (2001). Time Saver Standards for Interior Design and Space Planning. New York: McGraw Hill.
- Ching, Francis D. K. (1996) Architecture: Form, Space, and Order. 2nd ed. New York: Van Nostrand Reinhold.
- Habraken, N. John, Mignucci, Andrés and Teicher, Jonathan (2014). Conversations With Form: A Workbook for Students of Architecture. London: Routledge.
- Wagenknecht, Kay and Herte (1989). Site Sculpture: A collaborated design Process. New Yoork: Van Nostrand Reinhold.

Paper-2 : Building Construction & Materials-II (Wood)

Paper Code : AR/202/D

Course Objectives:

• The intention of the course is to familiarize the student with the various aspects of building construction with the basic material as wood.

Course Content:

Timber as a building material Carpentry tools

Unit-II

Unit-I

Plywood and boards – types and qualities Types of Doors and their details

Unit-III

Types of Windows, Ventilators, and their details Types of wooden staircase and their details

Unit-IV

Moldings, architrave Substitute of wood products

1 no. Time problem of 6-12 hours

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester.

- 1. Foster, Stroud (1963). Mitchell's Advanced Building Construction. Mumbai: Allied Publishers.
- 2. Singh, Gurucharan (1981). Building Construction Engineering. New Delhi: Standard Book House.
- 3. McKay, W. B. (1972). Building Construction (Metric). Vol. 1-5. London: Longman.
- 4. Prabhu, Balagopal T. S. (1987). Building Drawing and Detailing. Calicut: Spades Publishers.
- 5. Barry, R (1986). Construction of Buildings. Vol. 1-5. London,
- 6. Punmia, B. C. (1993). Building Construction. Delhi.
- 7. BIS (2011). National Building Code, SP 7. New Delhi: Bureau of Indian Standards.
- 8. Relevant IS codes.

Paper-3 : Structural Design-I (Timber/ Brick)

Paper Code : AR/203/D

Course Credits : 02

Course Objectives:

• To develop an understanding of simple timber (monolith material) and brick masonry (composite material) structural elements.

Course Contents:

Unit-I

Stress, Strain and Modulus of elasticity; Stress diagram, Strain diagram, Bending Stresses and Shear Stresses.

Study of a section subjected to pure bending; Neutral Axis, Moment of Resistance and Section Modulus.

Unit-II

Timber as a structural material

Design of simple timber beams

Design of simple timber short and long columns.

Unit-III

Design of simple trusses and their members

Unit-IV

Brick as a structural material Design of load bearing brick walls Design of brick wall footings.

Note:

- Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester.
- Appropriate standards must be explained and used
- Exercises must be done in each class
- Examiner will set seven questions in total, covering the whole syllabus. Students will have to attempt 4 Questions in all. 60% Theory based and 40% numerical based questions to be given. All the questions carry equal marks [6.25 X 4 = 25]

- 1. BIS (1984, reaffirmed 2005). Code of Practice for Design of Structural Timber in Buildings. IS: 883. New Delhi: Bureau of Indian Standards.
- 2. BIS (1987, reaffirmed 2002). Code of Practice for Structural Use of Un-reinforced Masonry. New Delhi: Bureau of Indian Standards.
- 3. BIS (1991) Handbook on Masonry Design and Construction, SP 20(S & T). New Delhi: Bureau of Indian Standards.
- 4. Kazimi, M. A. and Jindal, R. S. (1985). Design of Steel Structures. New Delhi: Prentice Hall of India.
- 5. Newman, M. (1995). Design and Construction of Wood Framed Buildings. New York: McGraw Hill.
- 6. Punmia, B. C. and Jain, A. K. (1998). Comprehensive Design of Steel Structures. New Delhi: Laxmi Publications.

Paper-4 : Architectural Drawing - II (Solids)

Paper Code : AR/204/D

Course Objectives:

• To develop in the students the capability of understanding and drawing three dimensional solids and their various complex sections to finally make drawings required in the representation of architectural design.

Unit-I

Course Content:

Section of Solids: Section plans, Sections, True shape of a section.

Section of solids (Prisms, Pyramids, Cylinders, Cones, Spheres.) Sections of single/two storey building

Unit-II

Development of Surfaces:

Introduction and Methods of development of surfaces. Development of lateral surfaces of right solids Lik e Cubes, Prisms, Cylinders. Method of drawing the development of the lateral surface of a pyramid & Co ne.

Unit-III

Intersection of Surfaces

Introduction and Methods of intersection of surfaces. Intersection of Prisms. Intersection of Prism and Pyramid. Intersection of cylinders. Intersection of cone and cylinder. Intersection of cone and prism. Intersection of cone and cone.

Unit-IV

Isometric View of Solids Axonometric View of Solids Oblique View of Solids

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. At least 12 sheets to be prepared in the studio under supervision.

- Reading List (To be elaborated by subject teacher):
 Bhatt, N.D. (1995). Engineering Drawing. Bangalore: Charotar Publishing House.
 Gopalakrishna, K.R. (2001). Engineering Graphics. Bangalore: Subhas Publications.

Paper-5 : Graphics-II

Paper Code : AR/205/D

Course Objectives:

• To develop the skill of using the pencil in free hand drawing and rendering to support Architectural Design and Drawing.

Unit-I

Course Content:

Colour Theory

Colour Wheel, Primary, Secondary and Tertiary colours Tint, Hue and shades in colour.

Unit--II

Use of Poster Colours Painting Technique&, Principles of painting in poster colour, Still Life: Drawing objects proportionately on given paper size in appropriate scale using Poster colour.

Unit-III

Use of Water Colours Painting Technique&, Principles of painting in poster colour, Still Life: Drawing objects proportionately on given paper size in appropriate scale using water colour.

Unit-IV

Use of Pastel Colours Painting Technique&, Principles of painting in pastel colour, Still Life: Drawing objects proportionately on given paper size in appropriate scale using pastel colour.

Unit-V

Use of Dry Pastel Colours Painting Technique&, Principles of painting in dry pastel colour, Still Life: Drawing objects proportionately on given paper size in appropriate scale using dry pastel colour.

Note:

• Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. At least 12 exercises must be prepared in the studio under supervision.

- 1. Pipes, Alan (1990). Drawing for 3D Designs. London: Thames & Hudson.
- 2. Dale, Russell (1990). Pastels Book. Cincinnati: North Light Books.
- 3. Jacqueline (1991). Graphic Illustration in Black and White. New York: Design Press.
- 4. Philip, Crowe (1991). Architectural Rendering. Switzerland: Rofovision.
- 5. Gill, Robert W. (2008). Rendering with Pen & Ink. London: Thames & Hudson.

Paper-6 : Building Services-II (Climatology)

Paper Code : AR/206/D

Course Objective:

• Appreciate the concepts of climatology that are used in Architecture.

Course Content:

Unit I

Traditional use of material and shelter design Climate and its elements

Classifications of various climatic zones and their characteristics

Unit II

Human Comfort design guidelines Micro climate Thermal comfort factors

Unit III

Solar position, shadow angles, shading devices Architectural climatic control devices

Ventilation and air movement and their architectural implications

Unit IV

Climate design rules affecting settlement planning and architecture Design methodology

Note:

- Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester.
- Examiner will set seven questions in total, covering the whole syllabus. Students will have to attempt 4 Questions in all. All the questions carry equal marks [6.25 X 4 = 25]

- 1. BEE (2007). Energy Conservation Building Code. New Delhi: India, Ministry of Power, Bureau of Energy Efficiency. BIS (1987). Handbook of Functional Requirements of Buildings (other than industrial buildings) SP:41 (S&T). New Delhi: Bureau of Indian Standards.
- 2. Koeningsberger, et. al. (1975). Manual of Tropical Housing and Building. Part II Climate Design. New Delhi: Orient Longman.
- 3. Szokolay, S. V. (2008). Introduction to Architectural Science. Architectural Press.
- 4. Watson, Donald et al, ed. (1997). Time saver standards for architectural design data. 7th ed. New York: McGraw-Hill. Ch. 3-6.
- 5. LEED: http://www.igbc.in/site/mmbase/attachments/48344/LEED.Abrid_Ver.pdf-India
- 6. GRIHA: http://www.grihaindia.org/index.php.

Paper-7 : Surveying-II

Paper Code : AR/207/D

Course Credits : 02

Course Objective:

• Introduction to the Tools and equipment for Land Surveying to illustrate the role of Surveying and levelling in Architecture

Content:

Unit I : Introduction

Introduction to surveying and its relevance in Architecture. Types of surveys in practice. Introduction to survey equipment. Reading of survey Maps, understanding of features and undulations of Ground. Scales used in Plotting. Study of land forms, topography and contours, slope analysis, grading process; graphic representations of landforms. Principles, definitions, units, scales, symbols and instruments used in Surveying, common errors in surveying and their corrections.

Unit II : Linear Measurements

Measurements in horizontal plane, linear measurements with chain & tape, setting-out & survey stations, survey accessories, survey lines, open & closed traverse, chaining & offsetting, direct & indirect ranging, log-books, field boundaries, field area estimation. Compass survey, bearings & angles, local attractions, errors in compass survey.

Unit III : Contours in Landforms

Characteristics, contour intervals, direct & indirect methods of contouring, block contour surveys, profile levelling, longitudinal & traverse cross sections, gradients, contouring methods & equipment, plane- table, plotting contours & profiles, estimating areas & volumes.

Unit IV : Sloping Landforms and Levelling

Measurements along sloping landforms, principles, definitions, methods, instruments, & staff required for levelling, simple & differential levelling, dumpy level, adjustments, hand signals, reduced levels, rise & fall methods, errors in levelling, level tube & barometric levelling.

Unit V : Precision methods in Landforms Survey & Measurement

Theodolite surveying, temporary adjustments, horizontal & vertical angles, closing errors and balancing traverse, automated & digital surveying, Total station, G.P.S, Aerial Photography, digital levels, auto-levels.

Practical Exercises:

• **Chaining** station points, offsets, field-book entry, single & double line entry, Triangulation, Traversing, Plotting, Calculation of Areas.

- **Compass Surveying** Traversing, balancing, closing errors, plotting, calculating areas.
- Plane Table Surveying, Two & Three Point Problems.
- **Theodolite**, measuring angles, Theodolite Traversing and Plotting, balancing closing errors. Demonstration of Surveying with Total Station equipment.
- Levelling Level book entry, Preparation of contour Map.

Note:

- Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester. Exercises must be done at the end of each lecture.
- Examiner will set Seven questions in total, covering the whole syllabus. Students will have to attempt4 Questions in all. All the questions carry equal marks $[6.25 \times 4 = 25]$

- 1. Punmia, B.C. (1983). Surveying. V. I. New Delhi: Standard Book House.
- 2 Shahani, P.B. (1980). Textbook of surveying. V.I. New Delhi: Oxford and IBH Publishing.

Paper-9 : Soft Skills-II

Paper Code : BFC/209

Course Credits : 02

(Interdisciplinary Subject as per the parent Department)

Course Objectives:

• To inculcate soft skills among students so that they may carry themselves comfortably in all walks of life, as a student and as an individual in society. The major emphasis shall be on effective communication skills (verbal &non-verbal), to plan a career, interviewing and other assessment procedures, enhancing employability as per aptitudes and interests. The course shall also focus on self-management and leading a good life. The pedagogy shall be transactional as an admixture of lecture, demonstration, practicum, feedback and situational exercises.

A. Personality Development

- 1. Communication Skills: Speaking in a Pier group, Formal group & Public Speaking. Case studies, Thematic appreciation
- 2. Study of Self: Personal regard and Mutual regard
- 3. Empathy- A trait and a Skill, Observational Skills
- 4. Emotional Intelligence: Understanding the emotions of Self and the Other & Emotional Self- regulation
- 5. Managing Common stresses and anxieties- Preparedness and Planned Behavior
- 6. SWOT Analysis: Opportunities and Threats

B. Career Planning and Development

- 1. Career Specific Communication Skills
- 2. Using ICT enabled communication skills for the presentation of Self and one's potentialities.CV/Resume, Personal Profiling, Personal Dossier etc.
- 3. Advanced Interviewing: Facing an interview board
- 4. Presentation and Persuasion
- 5. Employability: Goal Setting
- 6. Event Management & Resource Management
- 7. Analytical Skills and Rational Thinking

C. Communication Lab

A dedicated space with mirrors, round table, audio video facilities, projectors, Wi-Fi facility and a workstation for implementing above topics of basic and advanced courses. The tasks and exercises relevant to A& B above will be conducted in the communication lab through real, mock, virtual, and simulated situations. Some psychological tests and apparatuses would also be acquired for this laboratory.

D. Evaluation

The courses shall be transacted in lecture-demonstration pedagogy where the students shall be engaged in exercises with participation in small groups. The objective shall be to develop independent learning through dedicated learning outcomes during modules. The level of all these skills, at the time of joining, mid-semester and at the end of the semester of the group shall be monitored and evaluated as per the standard procedures shall make the learning outcome. The evaluation of outcomes shall be through various modes such as personal and pier feedback, jury adjudication in a continuous assessment format. Incentives to motivate the participants shall be included within the pedagogy and the slow learners shall be counselled with individualized training procedures. A standardized practical manual for the communication lab shall be prepared and used as a study material and guide.

Note:

1. Detailed teaching programme to be made before the commencement of the semester and circulated to the students at the commencement of the semester.

- 2. Examiner will set seven questions in total, covering the whole syllabus. Students will have to attempt 4 Questions in all.
- **3.** All the questions carry equal marks $[6.25 \times 4 = 25]$

Paper-8 : Computer Applications-II

Paper Code : BFC/210

Course Credits : 02

- 1. Introduction to Internet, WWW and Web Browsers: Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Knowing the Internet; Basics of internet connectivity related troubleshooting, World Wide Web; Web Browsing softwares, Search Engines; Understanding URL; Domain name; IP Address;
- 2. Basic principles involved in developing a web site ; HTML Documents; Basic structure of an HTML document ; Creating an HTML document ; Mark up Tags ; Heading-Paragraphs ;Line Breaks ; HTML Tags.
- **3.** Communications and collaboration: Basics of electronic mail; Getting an email account; Sending and receiving emails, Google Maps etc. Brief Discussion about online courses like Moocs and their platforms.
- 4. **Information Security Concepts**: Information Security Overview; Types of Attacks; Goals of Security; Overview of Security Threats; Weak/ Strong Password Connections; Cyber Crime; Introduction to Cryptography/Encryption.
- 5. **Photoshop introduction:** Theory on graphic designing, Toolbar, Menu Bar, Options Bar, Toolbox All New, Opening an Existing File, Screen Modes, Standard Screen Mode, Full Screen Mode with Menu Bar, Creating a New Document, Saving Files, Reverting Files, Closing Files and Quitting Photoshop.
- 6. **Coral Draw:** Learning Coral draw: Getting Started with Corel Draw, Understanding the Color Palette Letterhead, Working with the Objects, Understanding other controls (Layers and Tables)

Suggested Books:

- 1. Internet and World Wide Programming, Deitel, Deitel and Nieto, 2012, Pearson Education
- 2. Greenlaw, Raymond and Hepp, Ellen. Fundamentals of the Internet and the World Wide Web. New Delhi: Tata McGraw-Hill, 2012.
- **3.** Greenlaw, Raymond. Inline/Online: Fundamentals of the Internet and the World Wide Web. New Delhi: Tata McGraw-Hill.
- 4. Bangia, Ramesh. Learning Desk Top Publishing (DTP).
- 5. Andrew Faulkner, Andrew and Chavez, Conrad. Adobe Photoshop CC Classroom in a book. 2019.
- 6. Jain, Satish. Coreldraw Training Guide.