

MRSPTU B.ARCH. SYLLABUS 2016 BATCH ONWARDS
(Approved in 1st MRSPTU Standing Committee of Academic Council on 20.12.2016)

B. ARCHITECTURE (1st YEAR)

Total Contact Hours = 28

Total Marks = 800

Total Credits = 25

SEMESTER 1 st		Contact Hrs				Marks			Credits
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total	
BARC1-101	Architectural Design-I	2	4	-	-	40	60	100	6
BARC1-102	Building Construction-I	2	3	-	-	40	60	100	5
BARC1-103	Architectural Drawing - I	2	3	-	-	40	60	100	5
BARC1-104	History of Architecture - I	2	-	-	-	40	60	100	2
BARC1-105	Visual Communication - I	2	-	-	2	40	60	100	3
BARC1-106	Architectural Communication-I	1	-	-	2	40	60	100	2
BARC1-107	Building Sciences & Technology - I	1	-	-	-	40	60	100	1
BARC1-108	Model Making - I	-	-	-	2	60	40	100	1
Total	Theory = 7 Labs = 3 Studio = 3	12	10	-	6	340	460	800	25

*Educational Tour of duration up to 04 days during the semester shall be undertaken

B. ARCHITECTURE (1st YEAR)

Total Contact Hours = 27

Total Marks = 800

Total Credits = 25

SEMESTER 2 nd		Contact Hrs				Marks			Credits
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total	
BARC1-209	Architectural Design - II	2	4	-	-	40	60	100	6
BARC1-210	Building Construction - II	2	3	-	-	40	60	100	5
BARC1-211	Architectural Drawing – II	2	3	-	-	40	60	100	5
BARC1-212	Visual communication-II	2	-	-	2	40	60	100	3
BARC1-213	Theory of Design	2	-	-	-	40	60	100	2
BARC1-214	Structure Design-I	1	-	2	-	40	60	100	2
BARC1-215	Building Sciences & Technology-II	1	-	-	-	40	60	100	1
BARC1-216	Structure System-I	1	-	-	-	60	40	100	1
Total	Theory = 8 Labs = 1 Studio = 3	13	10	2	2	340	460	800	25

Overall

Semester	Marks	Credits
1 st	800	25
2 nd	800	25
Total	1600	50

ARCHITECTURAL DESIGN-I

Subject Code: BARC1-101

L S T P C

2 4 0 0 6

1. COURSE PREREQUISITES

The student should have an aptitude to visualize 2-D and 3-D objects.

2. COURSE OBJECTIVES

- The student shall be able to learn the relationship between form and space.
- The student should be oriented towards development of visualization and expressional skills.

3. EXPECTED OUTCOME

Student shall able to understand basic form and elements of Architectural Design,

CONTENTS

Unit-I (20 Marks)

- Parameters of Design Elements, Principles, Scale and Proportion
- Anthropometry and its application in design.
- Interrelationship of Architectural Form and Space

Unit-II (40 Marks)

- Synthesis of observations in design of an architectural form with a specific function.
Exercise may include design like 2D Composition, Exhibition stall/Kiosk, Mural Seating Design, Roundabout Design Plaza Design including Soft-scape, Hard-scape, Furniture, Water body & small structure etc.

SUGGESTED TEXT AND REFERENCE BOOKS

RECOMMENDED BOOKS

1. V.S. Pramar, 'Design Fundamentals in Architecture', Somaiya Publications, **1973**.
2. Francis D.K. Ching, 'Architecture: Form, Space, and Order', 3rd Edn., Wiley Publications.
3. Pandya Yatin, 'Elements of Space-Making, Mapin Publishing Pvt.'
4. Chiara, Joseph De, 'Time Saver Standards for Building Types', McGraw-Hill Professional Publishing, **2001**.
5. K.W. Smithies, 'Principals of Design in Architecture', Chapman & Hall, **1983**.
6. Ching, Francis D.K., 'Architectural Form, Space and Order', Van Nostrand Reinhold International Thomson Publishing, Inc.: New York, **1996**.
7. Harry N. Abrams, Rompilla, Ethel, 'Colour for Interior Design'.

INSTRUCTIONS TO THE PAPER SETTER

1. Three questions are to be set from Unit-I and students are required to attempt any two questions.
2. Two questions are to be set from Unit-II and students are required to attempt any one question.

BUILDING CONSTRUCTION-I

Subject Code: BARC1-102

L S T P C

2 3 0 0 5

1. COURSE PRE-REQUISITES

No Course Prerequisites

2. COURSE OBJECTIVES

To acquaint students about the handling and construction details of building materials.

3. EXPECTED OUTCOME

The students shall be able to understand the process of building construction, the components of a building, skills and equipment used in shaping them with the help of basic construction details.

CONTENTS

Unit-I (20 Marks)

- Type of Bats and closers of Brick Masonry.
- Bonds in Brick work (English, Flemish, Rattrap Bond) – 4 ½”, 9”, 13 ½” Thick.
- L-Junction, T-Junction in Brick Masonry (4 ½”, 9”, 13 ½” Thick.)
- Attached and Detached piers in Bricks

Unit – II (20 Marks)

- Components of Arches, Types of Arches, Arches in Brick work (Flat, Segmental and Semi-Circular).
- Stone wall (Rubble & Ashlar)
- Construction of Brick Jalli wall

Unit – III (20 Marks)

- Lintels, Sills, Coping, Threshold details, Stepped brick foundation, Plinth detail and D.P.C. details.
- Section through a Single storey load bearing structure.

RECOMMENDEDE BOOKS

1. W.B. Mckay, ‘Building Construction’.
2. S.C. Rangwala, ‘Engineering Materials’.
3. B.C. Punmia, ‘Building Construction’.

REFERENCE BOOKS

1. Ching, D.K. Francis, ‘Building Construction Illustrated’.
2. Chudley, ‘Construction Technology’.
3. R. BARC1ry, ‘Construction of Buildings’.

INSTRUCTIONS TO THE PAPER SETTER

The examiner is required to set a total of six questions with two questions from each UNIT. The student is required to attempt any one question from each UNIT making a total of three questions.

ARCHITECTURAL DRAWING – I

Subject Code: BARC1-103

L S T P C

2 3 0 0 5

1. COURSE PREREQUISITES

The students should have an aptitude to visualize 2D and 3D objects.

2. COURSE OBJECTIVES

The students should be able to learn the basics of good drafting, lettering techniques and visualization of geometrical forms through plan, elevations and sections.

3. EXPECTED OUTCOME

The students shall be able to understand and draft 2-D and 3-D objects.

CONTENTS

Unit – I (10 Marks)

- Various types of lines used in Architectural Drawing.
- Lettering Techniques (Single and Double)
- Types of construction of plain and diagonal scales

Unit – II (30 Marks)

- Orthographic projections of point, line, planes and solids in various positions in first Quadrant.
- Sections of solids example Cube, cuboids, cone, cylinder, pyramid, prism etc.
- Interpenetration of simple platonic solids.

Unit – III (20 Marks)

- Isometric views of simple and complex forms.
- Axonometric views of simple forms.

RECOMMENDED BOOKS

1. N.D. Bhatt, 'Engineering Drawing'.
2. R.K. Dhawan, 'Engineering Drawing'.
3. P.S. Gill, 'Engineering Drawing'.

REFERENCE BOOKS

1. Ching Franc D.K., 'Architectural Graphics'.

INSTRUCTIONS TO PAPER SETTER

1. Two questions are to be set from Unit-I & III and students will be required to attempt one question from each unit.
2. Three questions are to be set from Unit-II, students have to attempt two questions.

HISTORY OF ARCHITECTURE – I

Subject Code: BARC1-104

L S T P C

2 0 0 0 2

1. COURSE PRE-REQUISITES

No prerequisites.

2. COURSE OBJECTIVES

The course is designed to arouse in the student a sense of curiosity and to sharpen his/her powers of observation. The importance of the timelessness of architecture shall be emphasized. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc. the course shall include sketching and understanding of historical buildings, historical analyses and measured drawings. One/Two representative examples of each type must be covered during the class.

3. LEARNING OUTCOMES

- The student shall be able to understand basic chronology of historical development in the field of Architecture and civilization.
- Students should be able to acquaint themselves with the key historical buildings and their characteristic features.

CONTENTS

Unit – I

- A brief reference to the shelters of prehistoric times.
- River valley civilizations: Development of Architecture in Indus Valley, Nile Valley and plains of Tigris & Euphrates.
- Development of Architecture in Greek Civilization: Greek Orders, Temples, Optical Corrections, Theatres, Agora, Acropolis, etc.

Unit – II

- Development of Architecture during Roman period: Roman Orders, Temples, forums, basilicas, thermae, amphitheatres, etc.
- An overview of developments during the Vedic period
- Development of Buddhist Architecture: Ashokan pillars/ stambhas, Development of stupas, Development of rock cut architecture through the Hinayana & the Mahayana phase (chaityas & viharas).

Unit – III

- Genesis of Hindu Architecture during the Gupta & the Chalukyan period
- Development of Dravidian Architecture through different phases: Pallavas, Cholas, Pandyas, Vijainagar & Madura
- Indo–Aryan Architecture: Orissa, Khajuraho & Gujarat
- Jain Architecture.

RECOMMENDED BOOKS

1. B. Fletcher, 'History of Architecture', CBS Publishers & Distributors, Delhi, 1986.
2. P. Brown, 'Indian Architecture (Buddhist and Hindu Periods)', DB Taraporevala Sons & Co. Private Ltd., Bombay, 1971.
3. J. Ferguson, 'History of Indian and Eastern Architecture', John Murray Ibemarle Street, W. London, 1910.
4. S. Grover, 'Buddhist and Hindu Architecture in India', CBS Publishers & Distributors, Delhi, 2003.

RECOMMENDED BOOKS

1. M. Moffett, 'A World History of Architecture, Laurence King Publishing', **2003.**
2. C. Tadgill, 'The History of Architecture in India', Architecture Design & Technology Press, London, 1990.
3. P.K. Acharya, 'Hindu Architecture in India and Abroad', Oriental, New Delhi, 1979.

INSTRUCTIONS TO THE PAPER SETTER

1. **One compulsory question** containing 6 questions of 2 marks (12 marks), each requiring short answers, are to be set from the entire syllabus.
2. The examiner is required to set another six questions (two from each unit), out of which the students are required to attempt any four questions (selecting at least one from each unit).

VISUAL COMMUNICATION-I

Subject Code: BARC1-105

L S T P C
2 0 0 2 3

1. COURSE PRE-REQUISITES

The student should have an aptitude of using pencil and draw freehand 2-D and 3D objects/forms.

2. COURSE OBJECTIVES

The student shall be able to learn the fundamental use and role of pencil and colour as a medium of rendering 2D & 3D forms.

3. LEARNING OUTCOMES

The student shall be able to learn the art of using the potential of pencil and colour as a tool of graphic communication.

CONTENTS

Unit –I (10 Marks)

- Different stroke as in pencil using various grades (HB, B, 2B, 3B, 4B, 5B, 6B, Charcoal pencil).
- Rendering of textures of different building materials in pencil.

Unit –II (20 Marks)

- Free hand still life sketching in pencil of compositions of solids, cubes, cylinders and spheres showing the effect of light and shade on them.
- Free hands sketching in pencil, of scale elements like trees, shrubs, human figures, vehicles, lampposts etc.

Unit –III (20 marks)

- Introduction to colour theories and colour wheel.
- Various colour schemes, tints and shades.

RECOMMENDED BOOKS

1. Robert W. Gill, 'Rendering with Pen and Ink', Thames & Hudson London, 2008.
2. Jaxtheimer, 'How to paint and Draw'.

REFERENCE BOOKS

1. Jaccuelina, 'Graphic Illustrations in Black and White', Design Press, New York, 1991.
2. Crowne Philip, 'Architectural Rendering', Rofovision S.A Switzerland, 1991.

INSTRUCTIONS TO THE PAPER SETTER

The examiner is required to set a total of six questions with two questions from each UNIT. The student is required to attempt any one question from each UNIT making a total of three questions.

ARCHITECTURAL COMMUNICATION – I

Subject Code: BARC1-106

L S T P C
1 0 0 2 2

1. COURSE PRE-REQUISITES

Basic knowledge of English as a language up to 12th standard.

2. COURSE OBJECTIVES

The objective is to help the students to become independent users of English language. Students should be able to understand spoken and written English language of varied complexity on most including some abstract topics; particularly for preparing

Architectural reports. They must show awareness in the field and must be able to explain their views in a rational manner.

3. LEARNING OUTCOMES

The students shall be able to converse fluently, without strain with international speakers of English in an accent and lexis that is widely understood across the globe. They will be able to prepare Architectural reports and texts on their own and shall be able to communicate in a professional manner.

- **Reading:**
Reading texts of varied complexity; speed reading for global and detailed meaning; processing factual and implied meanings
- **Vocabulary:**
Building up and expansion of vocabulary; active use of Architectural vocabulary
- **Grammar:** Revising and practicing a prescribed set of grammar items; using grammar actively while processing or producing language
- **Writing:** The qualities of good writing; Learning the prescribed written expressions of conventional use; writing business letters, emails; Architectural reports, summaries and various forms of descriptive and argumentative essays related to buildings; poetry and prose

CONTENTS

Unit –I (Reading)

The students will go through the reading texts themselves with the help of a dictionary or word power as given at the end of books. As they progress from one reading to another they should learn to read fast with greater degree of understanding of both concrete and abstract topics. While taking up the textbook lessons in the classroom, the teacher shall ensure that students can do the following:

- Identify the significant points and conclusions as given in the text.
- Handle large texts (even outside the prescribed book) with overall comprehension of the links between arguments and the finer distinction between stated and implied meanings.
- Generally, read the stance or the point of view of the writer and present it in the form of a summary
- Use the vocabulary learnt in the lessons (especially given in “word power”) productively in various writing tasks as suggested at the end of each lesson.
- Profitably use the grammatical items as discussed at the end of each lesson while producing language for communication.
- Besides the textbook, the teacher must insist that students extend their reading by taking up additional texts of their own choice

Unit –II (Writing)

The students must learn the language that expresses various cognitive functions that are frequently used in writing. With the help of the teacher who will give them adequate practice, the students should be able to:

- Convey information on concrete or abstract topics with clarity and precision.
- Write about objects or events with appropriate detail in both descriptive and narrative form.
- Explain ideas and build up arguments with adequate support in a convincing manner.
- Use language with some degree of flexibility in consideration to the reader.
- Produce effectively such forms of professional writing as business letter, emails, notes, memos, reports summaries etc.

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- While teaching, the teacher must inculcate in students the habit of revising their writing. The teacher can also use and recommend the relevant sections of the following books for developing writing skills in students.

Unit –III (Architectural Reporting)

- The students must visit places of Architectural importance, buildings, gardens, monuments etc. and prepare visit reports. The parameters to be considered for report writing shall be location, history, concept and key elements of design
- Basic understanding and vocabulary of Architectural terms and features.
- Presentation of various site reports, case studies and methods of holding meetings.
- Preparation of press note of Architectural reports and events.

RECOMMENDED BOOKS

1. Vandana R. Singh, 'The Written Word', Oxford University Press, New Delhi.
2. K.K. Ramchandran, et al, 'Business Communication', Macmillan, New Delhi.
3. Swati Samantaray, 'Busines Commnication and Commnicative English', Sultan Chand, New Delhi.
4. S.P. Dhanavel, 'English and Communication Skills for Students of Science and Engineering (with audio CD)'.

INSTRUCTIONS TO THE PAPER SETTER

1. One compulsory question containing 6 questions of 2 marks (12 marks), each requiring short answers, are to be set from the entire syllabus
2. The examiner is required to set another six questions (two from each unit), out of which the students are required to attempt any four questions (selecting at least one from each unit).

BUILDING SCIENCE & TECHNOLOGY-I

Subject Code: BARC1-107

L S T P C

1 0 0 0 1

1. COURSE PRE-REQUISITES

No Course Prerequisites

2. COURSE OBJECTIVES

To make students aware about the importance of Building Science & Materials in Architecture.

3. LEARNING OUTCOME

The students shall be able to understand the various building materials used in construction of a building with study of their Constituents, Properties, Types, Uses & Market rates.

CONTENTS

Unit-I

- Introduction to building science, Relevance of Building science in Architecture, General Geology of Earth's crust, Mode of Rock formation.
- Geological criteria governing selection of sites.
- Introduction to Natural calamities – Earthquakes, Tsunami, Landslides, Floods, Volcanoes, Cyclones, Hurricanes etc.

Unit-II

- Terminology and tools used in Brick Masonry.

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- Study of Properties, Types, Available market forms and uses of Bricks (Manmade & Machine made), Stones, Cement, Lime, Sand, Aggregates and Surkhi.
- Study of Structure and characteristics of timber, defects, seasoning, various uses and market forms of timber.

Unit – III

- Study of Properties and uses of Mortar (Lime mortar, Cement mortar, Mud mortar), Lean concrete, P.C.C. & D.P.C.
- Surface finishes – Pointing, Plastering (Brick masonry & Stone masonry),
- Market survey of Building materials mentioned above.

RECOMMENDED BOOKS

1. W.B. McKay, 'Building Construction'.
2. Rangwala, S.C., 'Engineering Materials'.
3. B.C. Punmia, 'Building Construction'.

REFERENCE BOOKS

1. Ching, D.K. Francis, 'Building Construction Illustrated'.
2. Michell, 'Elementary Building Construction'.
3. National Building Code – 2005.

INSTRUCTIONS TO THE PAPER SETTER

- **One compulsory question** containing 6 questions of 2 marks (12 marks), each requiring short answers, are to be set from the entire syllabus
- The examiner is required to set another six questions (two from each unit), out of which the students are required to attempt any four questions (selecting at least one from each unit).

MODEL MAKING-I

Subject Code: BARC1-108

L S T P C

0 0 0 2 1

1. COURSE PRE-REQUISITES

No Course Prerequisites

2. COURSE OBJECTIVES

To acquaint the students with the knowledge of carpentry and joinery.

To make the students aware of various model making techniques using different materials.

3. LEARNING OUTCOMES

Students should be able to understand carpentry and joinery techniques and various model making methods using different materials.

CONTENTS

Unit I

Introduction to Carpentry Joints:

- Measuring, cutting and sawing of natural wood in workshop.
- Tools used in carpentry.
- Different types of joints in carpentry and their models in wood.

Unit-II

Preparations of Model:

Introduction to various materials used in making Architectural models.

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Exercise shall be based on preparation of block models and a detailed model of a small structure including Hardscape and Softscape and scale elements like lamp posts, trees, street furniture etc.

Unit-III

Development of Surfaces:

Methods for development of surfaces of solids and other forms in different materials (like clay, thermocole, mount board, paper, acrylic sheet, ivory sheet etc. Sculpture making with **Plaster of Paris** using casting and carving and **Clay** using pinching coiling and slab techniques.

RECOMMENDED BOOKS

1. H.S. Bawa, 'Carpentry- A Complete Guide',
2. Miller, 'Carpentry and Construction'.

REFERENCE BOOKS

1. W.B. McKay, 'Building Construction', Volume 3.

ARCHITECTURAL DESIGN-II

Subject Code: BARC1-209

L S T P C

2 4 0 0 6

1. COURSE PRE-REQUISITES

The student should have the basic knowledge of anthropometric data and the relationship of form, space and function.

2. COURSE OBJECTIVES

- They should be able to understand the design process of small scale buildings, function and standards.
- The student must be able to understand relationship between site and built form.

3. LEARNING OUTCOMES

Student shall be able to understand and appreciate the constraints in the Architectural design of a small scale building with reference to function, form and site.

CONTENTS

- Study and design of small scale buildings based on space standards like circulation, furniture-size, clearances, heights, light, ventilation etc.
- Systematic introduction and study of issues related to function and physical form in relation to site and surroundings. The design exercises may include:
 - Study of habitable space / house
 - Design of studio apartments or house
 - Highway side/ roadside café/fast food outlets with landscape and parking.

RECOMMENDED/REFERENCE BOOKS

1. Chiara, Joseph De, 'Time Saver Standards for Building Types', McGraw-Hill Professional Publishing, 2001.
2. Ching, D.K. Francis, 'Architectural Form, Space and Order', Van Nostrand Reinhold International Thomson Publishing, Inc.: New York, 1996.
3. R. Scott, 'Design Fundamentals', Publisher-RoBARC1t E. Krieger Publishing Company.
4. E & OE- 'Architects Hand Book and Planning'.

INSTRUCTIONS TO THE PAPER SETTER

1. One compulsory question is to be set from the entire syllabus.
2. The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

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NOTE:

Evaluation is to be done through viva voce by external examiner appointed by the university at college level. Answer sheets after the university exam shall be retained at college level for the viva-voce.

BUILDING CONSTRUCTION – II

Subject Code: BARC1-210

L S T P C

2 3 0 0 5

1. COURSE PRE-REQUISITES

Students should have knowledge of Basic Materials and their application in building construction.

2. COURSE OBJECTIVES

To acquaint the students with building components and their construction methods.

3. LEARNING OUTCOMES

Students shall be able to know the detailing and sequence of activities for the execution of a building.

CONTENTS

Unit –I (20 Marks)

FOUNDATION AND DAMP PROOF COURSE

- Type of foundations and its important details.
- Application of Damp Proof Course, its material and laying methods.
- Detailing of Horizontal and Vertical D.P.C.

Unit –II (20 Marks)

DOORS AND WINDOWS

- Types of Doors, Design and Construction details of Framed, Ledged, Braced and Battened Door, Flush Door, Wire Mesh Door, Paneled Door.
- Types of Windows in Timber, Design and Construction Details of Casement, Bay, Clear storey, Corner window etc.

Unit – III (20 Marks)

TYPES OF ROOFS AND FLOORS

- R.C.C, R.B.C Roof, Jack Arch Roof.
- Concepts of Water Proofing and Thermal Insulation of Roofs.
- Types of Floors.
- Section through double storey of load bearing and framed structure including stairs.

Note: Field visits to study the complete process of laying of foundation, D.P.C, construction details of Doors, Windows, Roofs and Floors to understand them in detail.

RECOMMENDED BOOKS

1. S.C. Rangwala, 'Engineering Materials'.
2. B.C. Punmia, 'Building Construction'.
3. W.B. McKay, 'Building Construction'.
4. Watson, Don A., 'Construction Materials and Process', McGraw Hill.

REFERENCE BOOKS

1. Ching, D.K. Francis, 'Building Construction Illustrated'.
2. Chudley, 'Construction Technology'.
3. R. BARC1ry, 'Construction of Buildings'.

INSTRUCTIONS TO THE PAPER SETTER

The examiner is required to set a total of six questions with two questions from each unit. The student is required to attempt any one question from each unit making a total of three questions.

ARCHITECTURAL DRAWING- II

Subject Code: BARC1-211

L S T P C
2 3 0 0 5

1. COURSE PRE-REQUISITES

The students should have a basic understanding of Orthographic projections and isometric views.

2. COURSE OBJECTIVES

- The students should be able to visualize and convert his/her thoughts and ideas of design into 3-D forms.
- The students should be able to construct Perspective views from plan and elevations and show sciography in plan and elevations only.

3. LEARNING OUTCOMES

The students shall be able to draw perspectives of various forms and show sciography in plans and elevations.

CONTENTS

Unit – I (40 Marks)

PERSPECTIVE

1. Introduction to basic concepts of perspective making.
2. Construction of one-point perspective of simple and complex objects.
3. Construction of two-point perspective of simple and complex objects.
4. Construction of interior perspectives (one point).

Unit – II (20 Marks)

SCIOGRAPHY

1. Basics of sciography and its application in the field of architecture.
2. Construction of sciography (shades and shadows) in plan and elevation only.

RECOMMENDED BOOKS

1. Ching, D.K. Franc, 'Architectural Graphics'.
2. Robert W. Gill, 'Rendering with Pen and Ink'.

INSTRUCTIONS TO THE PAPER SETTER

1. Three questions are to be set from Unit-I and students shall be required to attempt any two questions.

Two questions are to be set from Unit-II and students shall have to attempt any one question.

VISUAL COMMUNICATION-II

Subject Code: BARC1-212

L S T P C
2 0 0 2 3

1. COURSE PRE-REQUISITES

The student should have an ability to draw and render freehand 2-D and 3D objects/forms in pencil and should be able to understand colour theories.

2. COURSE OBJECTIVES

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To develop conceptual and perceptual skills of students in different colour media and techniques.

3. LEARNING OUTCOMES

Teaching of the subject shall help students to understand the fundamental use of colour mediums to add realism in sketches and perspectives.

CONTENTS

Unit –I (40 Marks)

- Use of various colouring mediums i.e., pencil colours, oil pastels, crayons and water colours etc.
- Outdoor free hand sketching of trees, shrubs, simple buildings, human figures, automobiles etc. in colour (water colours, pencil colours and poster colours).
- Sketching and rendering of various scenes such as milk booth, bus stop, cafeteria, petrol pump, village, and garden and like scene.

Unit –II (20 Marks)

- Writing styles in calligraphy.
- Rendering of plan, elevations and sections in any colour medium.
- Rendering of perspective views in all colour mediums.

RECOMMENDED BOOKS

1. Robert W. Gill, 'Rendering with Pen and Ink', Thames & Hudson London, 2008.
2. Jaxtheimer, 'How to Paint and Draw'.

REFERENCE BOOKS

1. Ching, D.K. Frank Francis, 'Architectural Graphics', 5th Edn., Van Nostrand Runhold, 2009.
2. Crowne Philip, 'Architectural Rendering', Rofovision S.A. Switzerland, 1991.

INSTRUCTIONS TO THE PAPER SETTER

The examiners are required to set five questions, three from UNIT-I and two from UNIT-II. The students are required to attempt two questions from UNIT-I and one question from UNIT-II making a total of three questions.

THEORY OF DESIGN

Subject Code: BARC1-213

L S T P C

2 0 0 2

1. COURSE PRE-REQUISITES

Students should have understanding of parameters of design.

2. COURSE OBJECTIVES

The student should be able to understand the role and importance of spatial organization and its implementation in Architectural Design.

3. LEARNING OUTCOMES

Student shall be able to understand the relationship and configuration of form and space.

CONTENTS

UNIT-I

- Study of forms
- Visual Properties of Forms.
- Regular and Irregular Forms.
- Transformation of Forms.

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- Formal Collision of Geometry.
- Articulation of Forms

UNIT-II

- Study of spaces defining Space with Horizontal and Vertical Elements.
- Organization of Form and Space, Spatial Organization.
- Circulation elements its function and Configuration,
- Relationship of openings with space and surroundings.
- Quality of Architectural Space.

RECOMMENDED/REFERENCE BOOKS

1. Geoffery H. Baker, 'Design Strategies in Architecture- (An approach to the analysis of Form)', Taylor & Francis.
2. Ching, D.K. Francis, 'Architecture: Form, Space, and Order', Wiley Publications.
3. Pandya Yatin, 'Elements of Space-Making', 3rd Edn., Mapin Publishing Pvt.

INSTRUCTIONS TO THE PAPER SETTER

- **One compulsory question** containing 6 questions of 2 marks (12 marks), each requiring short answers, are to be set from the entire syllabus
- The examiner is required to set another six questions (three from each unit), out of which the students are required to attempt any four questions (selecting at least two from each unit).

STRUCTURE DESIGN-I

Subject Code: BARC1-214

L S T P C

1 0 2 0 3

1. COURSE PREREQUISITES

- Understanding of basic masonry structural members
- Understanding of the materials used in the masonry construction
- Understanding of the basic terms used in analyze and design of masonry structures

2. COURSE OBJECTIVES

- Understanding about the strength and behavior of masonry structures
- Understanding the concept of stability of masonry structures
- To understand the concept of loading, supports, reactions, stresses and their role in design
- Understanding the design concept of various members of the masonry structures

3. LEARNING OUTCOMES

- An ability to get confidence to analyze and design masonry structures
- An ability to apply theoretical knowledge to solve practical problems
- An ability to understand the analyze and design concepts

CONTENTS

UNIT – I

Concept of Stresses and strains; Simple stresses & strains, bending stresses, shear stresses etc, stress strain curves of ductile and brittle materials, Hooke's law, elastic constants, numerical problems.

UNIT – II

Types of loads, supports and reactions, concept of shear force & bending moment, sign conventions, shear force & bending moment diagrams for various types of beams and loading conditions.

UNIT – III

Types of walls, design of columns and walls in masonry, allowable stresses, area factor, shape factor, slenderness ratio, effective height & length, effective thickness, load factor, design examples.

UNIT – IV

Design of foundation in masonry work, loads on foundation, bearing capacity, depth of foundation, Rankine's formula, footing sections, design examples.

UNIT – V

Design of retaining walls in masonry, loads, resultant pressure, stability, middle third rule, design examples.

RECOMMENDED BOOKS

1. R.K. Bansal, 'Engineering Mechanics & Strength of Material', Laxmi Publishers Pvt. Limited, 1998.
2. Sadhu Singh, 'Strength of Materials'.
3. Anand S. Arya, 'Masonry and Timber Structures', Nem Chand and Brothers, 2006.
4. Frederick Putnam Spalding, 'Masonry Structures', Bibliolife, 2008.

INSTRUCTIONS TO THE PAPER SETTER

- Eight questions of equal marks are to be set from the entire syllabus
- Students are required to attempt in all five questions
- Question paper is to be set covering entire syllabus by making parts may be from different UNITS

BUILDING SCIENCES AND TECHNOLOGY -II

Subject Code: BARC1-215

L S T P C

1 0 0 1

1. COURSE PRE-REQUISITES

No Course Prerequisites.

2. COURSE OBJECTIVES

To make the students aware about the basic types and characteristics of soil and also to acquaint them about various surface finishes applied to a building.

3. LEARNING OUTCOMES

Students shall be able to understand basic behaviour of soil w.r.t, foundations. The students shall also achieve the knowledge of various finishes to be applied to building surface.

CONTENTS

UNIT –I (Soil)

- **Type and characteristics of Soil:** Classification of soils: as per particle size, texture.
- **Bearing capacity of soil** – basic definitions, factors affecting bearing capacity of soils, different methods of calculation of bearing capacity of soil.
- Suitability of soil for foundations.

UNIT –II (Iron, Steel, Aluminium, Glass, Plastics)

- Classification, Composition, Properties, Applications and Market form of all the building materials.

UNIT –III (Water Proofing)

- **Water Proofing:** Water Proofing materials (liquid, semi-liquid and solid) – Composition, Properties, Applications.
- **Surface Finishes:** White wash, Distemper, Paints and Varnishes – Types, Applications, Suitability, Advantages and Disadvantages.

Note: Market surveys shall be done by the students for the complete range of Materials and finishes available in the market under different trade names to study their properties, uses etc.

RECOMMENDED BOOKS

1. K.R. Arora, ‘Soil Mechanics and foundation Engineering’.
2. S.C. Rangwala, ‘Engineering Materials’.

REFERENCE BOOKS

1. Singh Bharat and Parkash Shamsher, ‘Soil Mechanics and Foundation Engineering’.
2. Parbin Singh, ‘Engineering and Geology’, S.K. Kataria and Sons.

INSTRUCTIONS TO THE PAPER SETTER

1. **One compulsory question** containing 6 questions of 2 marks (12 marks), each requiring short answers, are to be set from the entire syllabus
2. The examiner is required to set another six questions (two from each UNIT), out of which the students are required to attempt any four questions (selecting at least one from each UNIT).

STRUCTURE SYSTEM-I

Subject Code: BARC1- 216

L S T P C
1 0 0 0 1

1. COURSE PRE-REQUISITES

No Course Prerequisites

2. COURSE OBJECTIVES

The teaching of this subject shall help the students:

- To be aware of basic principles applicable in various structural systems
- To understand the Role and Importance of Structures in a Built Environment.
- To create skill of applying the knowledge gained in building projects.

3. LEARNING OUTCOMES

The student shall be able to learn:

- The predominantly pictorial nature of an Architect's language.
- The physical-mechanical essence of the subject matter.
- The orientation of all Architectural efforts to Form and Space.

CONTENTS

UNIT –I

CELLULAR SYSTEM

1. Cell as a natural UNIT of space.
2. Cell transformation.
3. Polygonal Cellular Systems leading to evolution of Geodesic Domes
4. Applications of Cellular System in Building

UNIT –II

BULK ACTIVE STRUCTURE SYSTEM

Structure acting mainly through material bulk and continuity i.e. Bulk active structure system / Section active structure systems:

1. Slabs (One way & Two way)

2. Beams (Simply supported, Cantilever, Continuous, Vierendale Girders)
3. Grid (Skew & Square Grid)
4. Columns

UNIT –III

VECTOR-ACTIVE STRUCTURE SYSTEM

Structures acting mainly through Composition of Compression and Tension members such as Vector-active structure system /Co-active structure system:

1. Space frames
2. Trusses (Timber & Steel)
3. Domes (Ribbed & Geodesic)

RECOMMENDED BOOKS

1. H. Engel, 'Structure Systems'.
2. Salvadori Mario, 'Building of Building'.
3. Butler Robert B., 'Architectural Engineering Design: Structural Systems'.
4. G.G. Schierle, 'Architectural Structure'.
5. Moore Fuller, 'Understanding Structure'.

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