

B. ARCHITECTURE (1st YEAR)

Total Contact Hours = 28

Total Marks = 800

Total Credits = 25

1 st SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-101	Architectural Design-I	2	4	-	-	40	60	100	6	3
BARC1-102	Building Construction-I	2	3	-	-	40	60	100	5	3
BARC1-103	Architectural Drawing - I	2	3	-	-	40	60	100	5	3
BARC1-104	History of Architecture - I	2	-	-	-	40	60	100	2	3
BARC1-105	Visual Communication - I	2	-	-	2	40	60	100	3	3
BARC1-106	Architectural Communication-I	1	-	-	2	40	60	100	2	3
BARC1-107	Building Sciences & Technology - I	1	-	-	-	40	60	100	1	3
BARC1-108	Model Making - I	-	-	-	2	60	40	100	1	No Exam (External Viva-voce)
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 may be undertaken

B. ARCHITECTURE (1st YEAR)

Total Contact Hours = 26

Total Marks = 800

Total Credits = 25

2 nd SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-209	Architectural Design - II	2	4	-	-	40	60	100	6	6 (Evaluation by External Viva-voce)
BARC1-210	Building Construction - II	2	3	-	-	40	60	100	5	3
BARC1-211	Architectural Drawing – II	2	3	-	-	40	60	100	5	3
BARC1-212	Visual communication-II	2	-	-	2	40	60	100	3	3
BARC1-213	Theory of Design	2	-	-	-	40	60	100	2	3
BARC1-214	Structure Design-I	1	-	1	-	40	60	100	2	3
BARC1-215	Building Sciences & Technology-II	1	-	-	-	40	60	100	1	3
BARC1-216	Structure System-I	1	-	-	-	60	40	100	1	No Exam (External Viva-voce)
Total	Theory = 8 Labs = 1 Studio = 3	13	10	1	2	340	460	800	25	

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

**After the completion of 2nd semester, the students shall have to undergo soft skill development of three weeks duration which shall be evaluated in 3rd semester.

B. ARCHITECTURE (2nd YEAR)

Total Contact Hours = 25

Total Marks = 800

Total Credits = 24

3 rd SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-317	Architectural Design-III	2	4	-	-	40	60	100	6	12 (Evaluation by External Viva-voce)
BARC1-318	Building Construction-III	2	3	-	-	40	60	100	5	3
BARC1-319	Visual Communication - III	1	-	-	4	40	60	100	3	No Exam (External Viva-voce)
BARC1-320	History of Architecture-II	2	-	-	-	40	60	100	2	3
BARC1-321	Structure Design-II	1	-	1	-	40	60	100	2	3
BARC1-322	Surveying & Levelling-I	1	-	-	2	40	60	100	2	3
BARC1-323	Building Science & Tech. - III	2	-	-	-	40	60	100	2	3
BARC1-324	Soft Skill Development	-	-	-	-	100	-	100	2	No Exam (Internal Viva-voce)
Total	Theory = 7 Labs = 2 Studio = 2	11	7	1	6	380	420	800	24	

*Educational Tour of duration up to 06 days during the semester may be undertaken

B. ARCHITECTURE (2nd YEAR)

Total Contact Hours = 23

Total Marks = 800

Total Credits = 21

4 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-425	Architectural Design-IV	2	3	-	2	40	60	100	6	12 (Evaluation by External Viva-voce)
BARC1-426	Building Construction-IV	2	2	-	2	40	60	100	5	3
BARC1-427	Building Sciences & Technology-IV	2	-	-	-	40	60	100	2	3
BARC1-428	Visual Communication - IV	1	-	-	2	60	40	100	2	No Exam (External Viva-voce)
BARC1-429	Structure Design-III	1	-	1	-	40	60	100	2	3
BARC1-430	Design Philosophies-I	1	-	1	-	40	60	100	2	3 hours
BARC1-431	Structure System - II	1	-	-	-	60	40	100	1	No Exam (External Viva-voce)
BARC1-432	Educational Tour-I	-	-	-	-	100	-	100	1	No Exam (Internal Viva-voce)
Total	Theory = 7 Labs = 3 Studio = 2	10	5	2	6	420	380	800	21	

*Educational Tour-I (BARC1-432) of duration up to 06 days during the semester shall be undertaken and evaluated

**After the completion of 4th semester, the students shall have to undergo on site construction training of five weeks duration which shall be evaluated in 5th semester

B. ARCHITECTURE (3rd YEAR)

Total Contact Hours = 23

Total Marks = 800

Total Credits = 24

5 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-533	Architectural Design-V	2	3	-	2	60	40	100	6	18 (Evaluation by External Viva-voce)
BARC1-534	Building Construction-V	2	2	-	2	40	60	100	5	3
BARC1-535	On site construction Training	-	-	-	-	100	-	100	3	No Exam (Internal Viva-voce)
BARC1-536	Landscape Architecture	2	-	-	-	40	60	100	2	3
BARC1-537	Building Sciences &Technology-V	2	-	-	-	40	60	100	2	3
BARC1-538	History of Architecture-III	2	-	-	-	40	60	100	2	3
BARC1-539	Tall Buildings	1	-	1	-	40	60	100	2	3
BARC1-540	Design Philosophies-II	1	-	1	-	40	60	100	2	3
Total	Theory = 7 Labs = 2 Studio = 2	12	5	2	4	400	400	800	24	

* Educational Tour of duration up to 08 days during the semester may be undertaken

B. ARCHITECTURE (3rd YEAR)

Total Contact Hours = 25

Total Marks = 800

Total Credits = 21

6 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-641	Architectural Design-VI	2	3	-	2	60	40	100	6	18 (Evaluation by External Viva-voce)
BARC1-642	Building Construction-VI	2	2	-	2	40	60	100	5	3
BARC1-643	Building Sciences &Technology-VI	2	-	-	-	40	60	100	2	3
BARC1-644	Interior Design	1	-	-	2	40	60	100	2	3
BARC1-645	Estimating & Costing	1	-	-	2	40	60	100	2	3
BARC1-646	Design Philosophies-III	1	-	1	-	40	60	100	2	3
BARC1-647	Architectural Legislation	2	-	-	-	40	60	100	2	3
Total	Theory = 7 Labs = 4 Studio = 2	11	5	1	8	400	400	800	21	

* Educational Tour of duration up to 08 days during the semester may be undertaken

B. ARCHITECTURE (4th YEAR)

Total Contact Hours = 26

Total Marks = 900

Total Credits = 25

7 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-748	Architectural Design-VII	2	5	-	2	60	40	100	8	No Exam (External Viva on Portfolio)
BARC1-749	Building Construction-VII	2	2	-	2	40	60	100	5	No Exam (External Viva on Portfolio)
BARC1-750	Housing	2	-	-	-	40	60	100	2	3
BARC1-751	Construction Management	2	-	-	-	40	60	100	2	3
BARC1-752	Town Planning	2	-	-	-	40	60	100	2	3
BARC1-753	Educational Tour-II	-	-	-	-	100	-	100	1	No Exam (Internal Viva-voce)
BARC1-754	Personality Development	1	-	-	-	100	-	100	1	No Exam (Internal Viva-voce)
Department Elective – I (Select any one)		1	-	1	-	40	60	100	2	
BARC1-761	Lighting & Illumination									3
BARC1-762	Disaster Management for Buildings									3
Open Elective – I (Select any one)		1	-	1	-	40	60	100	2	3
Total	Theory = 8, Labs = 2, Studio =2	13	7	2	4	500	400	900	25	

* **Educational Tour-II (BARC1-753)** of duration up to 08 days during the semester shall be undertaken and evaluated

*After the completion of 7th semester, the students shall have to undergo Practical training of 20 weeks' duration (Full semester) which shall be evaluated at the end of 8th semester

B. ARCHITECTURE (4th YEAR)

Total marks = 100

Total Credits = 20

8 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-855	Practical training of 24 weeks duration	-	-	-	-	40	60	100	20	No Exam (External Viva by Jury)
Total		-	-	-	-	40	60	100	20	

B. ARCHITECTURE (5th YEAR)

Total Contact Hours = 26

Total Marks = 600

Total Credits = 19

9 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-956	Architectural Design-VIII	2	4	-	4	60	40	100	8	No Exam (External Viva on Portfolio)
BARC1-957	Research Methods & Dissertation Writing	1	1	-	2	40	60	100	3	3
BARC1-958	Urban Design	1	-	-	2	40	60	100	2	3
Department Elective – II (Select any one)		1	-	-	2	2	60	100	2	
BARC1 - 963	Landscape Design									3
BARC1 - 964	Building Maintenance									3
Department Elective – III (Select any one)		1	-	-	2	2	60	100	2	
BARC1- 965	Architectural Building Services									3
BARC1-966	Sikh Architecture									3
Department Elective – IV (Select any one)		1	-	-	2	2	60	100	2	
BARC1-967	Architecture Model Making									No Exam (External Viva on Portfolio)
BARC1-968	Vernacular Architecture									Duration of Exam
Total		7	5	-	14	260	340	600	19	

* Educational Tour of duration up to 15 days during the semester may be undertaken

* The students must acquaint themselves with the planning and scheduling of Thesis project to be taken up in 10th Semester

B. ARCHITECTURE (5th YEAR)

Total Contact Hours = 30

Total Marks = 600

Total Credits = 21

10 th SEMESTER		Contact Hrs				Marks			Credits	Duration of Exam Hrs.
Subject Code	Subject Name	L	S	T	P	Int.	Ext.	Total		
BARC1-X59	Architectural Design-IX (Thesis Project)	10	-	-	10	60	40	100	15	No Exam (External Viva by Jury)
BARC1-X60	Professional Practice	1	-	1	-	40	60	100	2	3
Department Elective – V (Select any one)		2	-	-	2	40	60	100	2	
BARC1 – X69	Energy Efficient Buildings and Building Automation									3
BARC1 – X70	Advanced Construction									3
BARC1- X71	Architectural Journalism									3
Department Elective – VI (Select any one)		2	-	-	2	40	60	100	2	
BARC1-X72	Advanced Building Materials									3
BARC1-X73	Sustainable Architecture									3
BARC1- X74	Architectural Conservation									3
Total	Theory = 4, Labs = 3, Studio = NIL	15	-	1	14	140	160	300	21	

Overall

Semester	Marks	Credits
1 st	800	25
2 nd	800	25
3 rd	800	24
4 th	800	21
5 th	800	24
6 th	700	21
7 th	900	25
8 th	100	20
9 th	600	19
10 th	300	21
Total	6600	225

MRSPTU

ARCHITECTURAL DESIGN-I

Subject Code: BARC1-101

**L S T P C
2 4 0 0 6**

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

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.

EXPECTED OUTCOMES: 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.

RECOMMENDED 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', Wiley Publications, 3rd Edn.
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, 'Color 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**

COURSE PREREQUISITES: No Course Prerequisites

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

EXPECTED OUTCOMES: 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.

RECOMMENDED 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

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

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.

EXPECTED OUTCOMES: 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 2**

COURSE PREREQUISITES: No prerequisites.

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.

EXPECTED 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.

REFERENCE 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

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

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.

EXPECTED 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

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

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.

EXPECTED 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.
- 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, 'Business Communication and Communicative 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 1

COURSE PREREQUISITES: No Course Prerequisites

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

EXPECTED OUTCOMES: 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.
- 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. S.C. Rangwala, '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

EXAM DURATION: NO EXAM (External Viva Voce only)

COURSE PREREQUISITES: No Course Prerequisites

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.

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.

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, mountboard, 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

UNI. EXAM. DURATION: 6 Hrs. (3 + 3 Hrs.)

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

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.

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.

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

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

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

EXPECTED 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

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

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.

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 form 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

COURSE PREREQUISITES: 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.

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

EXPECTED 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 0 2**

COURSE PREREQUISITES: Students should have understanding of parameters of design.

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

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.
- 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 1 0 2

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

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

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 0 1

COURSE PREREQUISITES: No Course Prerequisites.

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.

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 Shamsheer, '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 1

UNI. EXAM. DURATION: NO EXAM (EXT. VIVA-VOCE)

COURSE PREREQUISITES: No Course Prerequisites

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.

EXPECTED 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'.

ARCHITECTURAL DESIGN–III

Subject Code: BARC1-317

**L S T P C
2 4 0 0 6**

UNI. EXAM. DURATION: 12 HRS (2 DAYS) (6 + 6 Hrs. WITH 1 Hr. BREAK ON BOTH DAYS) (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: The students should have knowledge of relationship of forms, space, function and order.

COURSE OBJECTIVES: To make students understand the design process of small scale building projects with special emphasis on site analysis and site planning.

EXPECTED OUTCOME: Students should be able to understand and appreciate the constraints of the site in the evolution of design for small building projects.

CONTENTS

- Design of primary school, guest house, convenience shopping, dispensary, Road side restaurant/Dhaba without urban regulatory controls with emphasis on climatic aspects.
- Introduction to barrier free buildings/ Universal Design.
- Site analysis and site planning.
- Space planning and design development.
- Minimum two projects/Assignments should be handled individually by all students.

NOTE: All Assignments to be prepared manually and no computer aided design/ Presentation/Documentations should be accepted.

TEACHING METHODOLOGY

For all assignments the following methodology should be followed and all stages should be attempted individually.

- Library and Proto type Studies
- Site analysis and site planning
- Space planning
- Design development and volumetric studies (model)
- Preliminary design and volumetric study
- Final design with detailed volumetric study, (Detailed Model) and visual communications (3D Visualizations)

GUIDELINES FOR PAPER SETTER

1. One compulsory question is to be set from the syllabus and covering the entire content.
2. Evaluation is to be done through viva voce by external jury comprising of two examiners appointed by the University at college and answer sheets should be retained at college level.
3. The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

RECOMMENDED BOOKS:

1. Ching, Frank (Francis D.K.), 'Architecture: Form, Space & Order', Publisher John Wiley, Hoboken, 2007.
2. V.S. Parmar, 'Design Fundamentals', Somaiya Publisher Pvt. Ltd, Mumbai, 1997.
3. Donald Watson, Michael J. Crosbie, 'Time Saver Standard', 8th Edn., NBC (National Building Code).
4. Site planning and landscape, Symonds.
5. Francis D.K. Ching, Site Planning.

BUILDING CONSTRUCTION -III

Subject Code: BARC1-318

**L S T P C
2 3 0 0 5**

COURSE PREREQUISITES: Students should have the knowledge of various components of a Building.

COURSE OBJECTIVES: To acquaint students about the handling of R.C.C. and familiarize the student with the working and details of the R.C.C. construction.

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

CONTENTS

Unit-I

- R.C.C. Construction- Frame construction, advantages over load bearing construction, study of column grid, detailing of R.C.C. work with reinforcement for slabs, beams, columns, footing, staircases.
- Various types of Foundations in R.C.C.

Unit – II

- R.C.C. frame structure with infill walls of brick and various cement concrete products, such as hollow blocks, light weight concrete blocks, fly ash bricks etc.
- Introduction to various types of staircase and vocabulary related to construction details with special emphasis on RCC Staircase- Dog logged, open well, Cantilever Staircase.

Unit – III

- Section through R.C.C. framed double storied building through toilet and staircase showing the details of Foundation, Floor, Window, Lintel, Chajja, Roof, Terrace, Parapet and Coping.
- Types of formwork (shuttering) for concrete, scaffolding, shoring, etc.
- R.C.C. Form work and Shuttering details for-
 - Column (square and round)
 - Slab and Beam
 - Retaining Wall

Note: Field/Project visits to study the uses of R.C.C. materials in construction at various stages for better understanding, students must be taken to the under construction Site.

RECOMMENDED TEXT AND REFERENCE BOOKS

RECOMMENDED TEXT BOOKS

1. W.B. McKay, 'Building Construction'.
2. S.C. Rangwala, 'Engineering Materials'.
3. B.C. Punmia, 'Building Construction'.
4. P.N. Khanna, 'Oractical Civil Engineer's Handbook'.

RECOMMENDED REFERENCE BOOKS

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

INSTRUCTIONS TO THE PAPER SETTER

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

VISUAL COMMUNICATION-III

Subject Code: BARC1-319

**L S T P C
1 0 0 4 3**

UNI. EXAM. DURATION: NO EXAM (EXTERNAL VIVA VOCE ONLY)

COURSE PREREQUISITES: The students should have cleared Soft Skill Development course.

COURSE OBJECTIVES: The students should be made aware of the role and importance of Computers in the field of Architecture.

EXPECTED OUTCOMES: Student shall be able to understand the use of Computer as an aid to drafting and presentation of architectural design projects.

CONTENTS

1. Advanced Introduction to Auto Cad, and Introduction to Auto Cad Revit
2. Advanced commands like layers, viewports, layer-iso and other 2D commands.
3. Drafting the complex and multi storied Plans, Sections, and Elevations.
4. Text writing and dimensioning of the Plans, Elevation and Sections
5. Advanced rendering in the Auto Cad, Photoshop and in other 2D Software.
6. 3-D Modelling on Auto cad of Single Storey and Multi Storey Buildings,
7. 3-D Modelling of Multiple Building in a Single Site, Camera View of the Buildings,

INSTRUCTIONS TO THE PAPER SETTER

The evaluation of student shall be based on the written questions to be set from the course and the practical conducted based on a specific problem given to assess and evaluate the knowledge of students related to course contents defined above.

HISTORY OF ARCHITECTURE – II

Subject Code: BARC1-320

**L S T P C
2 0 0 0 2**

COURSE PREREQUISITES: Should have studied History of Architecture - I.

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.

EXPECTED OUTCOMES:

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

Unit – I

EARLY CHRISTIAN, BYZANTINE, ROMANESQUE & GOTHIC ARCHITECTURE

- Early Christian Architecture: Evolution of church forms – Outline of Architectural character – Example – Basilica of St. Peter's, Rome and Bastistry of Constantine, Rome
- Byzantine Architecture - Development of the dome on pendentives in Byzantine Architecture. Example - St. Sophia, Constantinople
- Romanesque Architecture - Outline of architectural character in Italy, Examples: Pisa group, Italy; Abbaye aux Hommes, Caen

- Gothic Architecture- Religious and social influences - Evolution of vaulting and development of structural systems - Outline of Architectural character - Examples: Notre Dame, Paris, Reims Cathedral and Amiens Cathedral.

Unit – II

RENAISSANCE ARCHITECTURE IN ITALY

- Early Renaissance, High Renaissance, Mannerism, Baroque, Rococo Italian Renaissance - The idea of rebirth and revival of art - Outline of the Architecture during the early Renaissance, High Renaissance and Baroque Periods - Features of typical Renaissance palaces designed by Renaissance Architects, Study of the contribution of the following architects: Brunelleschi, Alberti, Bramante, Michaelangelo, Raphael Santi, Palladio, Bernini, Borromini.

Unit – III

ISLAMIC ARCHITECTURE – IMPERIAL & PROVINCIAL STYLES, MUGHAL ARCHITECTURE

- Influences on Islamic Architecture - Evolution of the Islamic Arch – Salient features of an Indian mosque. Development of the Imperial style by the kings of the Slave Dynasty- Example – Qutab Minar Complex, Varieties of squinches, Arches and Domes
- Development of the provincial styles in different regions – Punjab, Bengal, Jaunpur, Gujarat, Deccan
- Mughal Architecture- Development of the Mughal style under the different rulers - Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb - Important examples –Humayuns Tomb, Delhi, Fatehpur Sikhri (layout, Buland Darwaza, Diwan-i-Khas, Tomb of Salim Chisti & Jami masjid), The Taj Mahal, Agra

RECOMMENDED TEXT AND REFERENCE BOOKS

RECOMMENDED TEXT BOOKS

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

RECOMMENDED REFERENCE 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.
4. Mark M. Jarzombek, Vikramaditya Prakash, Francis D.K. Ching, 'A Global History of Architecture', John Wiley & Sons, New Jersey, 2011.
5. Subhash Parihar, 'Islamic Architecture of Punjab (1206-1707)', Aryan Books International, 2015.

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 DESIGN-II

Subject Code: BARC1-321

**L S T P C
1 0 1 0 2**

COURSE PREREQUISITES: The student should have studied Structure Design-I

COURSE OBJECTIVES: To acquaint the students about the strength, stability, stresses and behaviour of concrete structures

EXPECTED OUTCOMES: Students shall be able to analyse and design concrete structure

CONTENTS

UNIT-I

Basic Design Concepts

- Design Philosophies,
- Partial safety factors for materials,
- Characteristics strength, load, design load and factored load,
- Basic assumption in analysis,
- Under, Over and Balanced section.

Columns

- Classification of columns
- Short and slender columns
- IS 456:2000 code provisions
- Slenderness ratio, reinforcement
- Design of short columns under axial loading
- Compression and uniaxial eccentricity

UNIT-II

Beam

- Types of beams
- Deep and Slender beams
- Guidelines for selecting member sizes
- IS 456 code provisions sections
- Design of singly and doubly-reinforced beams

Slab

- Slab systems with uses
- One-way slab and Two-way slab (Theory only)
- Reinforcement detailing
- IS 456: 2000 code provisions
- Curtailment of bars

UNIT-III

Staircase

- Types of staircase
- Different types of effects of loading
- IS 456:2000 code provisions
- Waist slab

RECOMMENDED TEXT AND REFERENCE BOOKS

1. M.L. Gambhir 'Concrete Technology'. Tata McGraw Hill.
2. Pillai Menon, 'Design of Concrete Structure', Tata McGraw Hill.
3. S.S. Bhavikatti, 'Design of Concrete Structure'.

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).

Note: Indian Code of Practice IS: 456-2000 is permitted in examination.

SURVEYING AND LEVELLING-I

Subject Code: BARC1-322

L S T P C

1 0 0 2 2

COURSE PREREQUISITES: No Prerequisite

COURSE OBJECTIVES: To acquaint the students about the basics of surveying.

EXPECTED OUTCOMES: Students shall be able to draw Map, Plan and calculate area, volume and earthwork.

CONTENTS

UNIT-I

Introduction: -Definition, Basic Principle of surveying, Scale, Map, Errors.

Chain and Compass Survey: Principle of chain surveying, Measurement of distance with chain and tape, Direct & Indirect Ranging, offsets, selection of base line and stations, Tape corrections, obstacles in chaining, Bearing and its measurement with Prismatic & surveyors compass, Calculation of angles from bearings, local attractions and its elimination, adjustment of closing error by graphical method.

UNIT-II

Theodolite & Plane Table survey: - Temporary & permanent Adjustment, Measurement of horizontal and vertical angle, Adjustment of closing error by Bowditch and Transit rules, different equipment in plane tabling, different methods of plane tabling, Strength of Fix, Two and three point problems.

UNIT-III

Levelling & Contouring: - Types of levels, methods of levelling, Sensitivity of bubble tube, setting out grade lines, Temporary & permanent Adjustment, different method of contouring, Setting out contour gradient, Simple earthwork, calculations of areas and volumes.

Minor Instruments: - Box sextant, Hand level, Abney level, Plane meter, Ghat tracer, Tangent Clinometers, etc.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. S.K. Duggal, 'Surveying', Vol. I & II, Tata McGraw Hill.
2. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Surveying Vol. I and II, Laxmi Publications.
3. R. Agor, 'Surveying', Khanna Publishers.
4. S.S. Bhavi Katti, 'Surveying & Levelling', Volume I & II.

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 (at least one from each unit), out of which the students are required to attempt any four questions (selecting at least one from each unit).

BUILDING SCIENCE AND TECHNOLOGY - III

Subject Code: BARC1-323

L S T P C

2 0 0 2

COURSE PREREQUISITES: Nil.

COURSE OBJECTIVES: To expose the students to the elements of climate and related design principles so as to achieve energy conservation in buildings through passive techniques.

EXPECTED OUTCOMES: The student shall be able to apply the concepts of climatology in architectural design projects.

CONTENTS

Unit-I

- **Climatology:** Tropics, Climatic zones and their classification, Concept of macro & macro climate, Elements of climate, Climatology data needed for designing of buildings.
- **Thermal Comfort:** Concept of thermal comfort, Human heat balance and comfort, Relationship of climatic elements with thermal comfort, Heat stress index, Effective temperature and Bio-climatic chart.

Unit-II

- **Heat flow through buildings:** Concept of U- value, Heat balance equation of buildings, Convection, Conduction, Radiation, Conductance, Resistance, Transmittance etc.
- **Solar Radiation:** Solar radiation, Position of sun and methods of recording it, Solar penetration inside buildings, Solar charts, Design of shading devices, Solar azimuth angle, Solar altitude angle, Shadow angle protector.

Unit-III

- **Wind:** Study of diurnal and seasonal variations, Ventilation – Introduction and its mechanism, Air movement within and around buildings, Wind direction, speed and its impact on design of window openings, Effect of wind on design and siting of buildings.
- **Orientation:** Importance of orientation, Site selection and site planning, Application of climatic factors on design of indigenous shelters for various climatic zones.

RECOMMENDED TEXT AND REFERENCE BOOKS

RECOMMENDED TEXT BOOKS

1. Koensberger, Ingersoll, Mayhew, Szokolay, 'Manual of Tropical Housing & Building', 1974.
2. Krishan A. Baker, 'Climate Responsive Architecture', McGraw Hill Education (Asia) Co. and China Architecture & Building Press, 2004/2005.
3. 'Energy Efficient Building in India', TERI.

RECOMMENDED REFERENCE BOOKS

1. Lippsmeier, Georg, 'Building in the Tropics', Callwey Verlag, Munchen, 1980.
2. Gideon S. Golany, 'Design for Arid Regions', Publication Van Nostrand Reinhold, New York, 1983.
3. B. Givoni, 'Man, Climate & Architecture', Von Nostrand Reinhold Company New York, 1981.
4. 'Research Notes on Climate', C.B.R.I., Roorkee.
5. C.P. Kukreja, 'Tropical Architecture', Tata McGraw Hill Publishing Company, 1978.
6. Martin Evans, 'Housing, Climate & Comfort', Architectural Press, 1980.

INSTRUCTIONS TO THE PAPER SETTER

1. One compulsory question is 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).

SOFT SKILL DEVELOPMENT

Subject Code: BARC1-324

L S T P C

0 0 0 0 2

UNI. EXAM. DURATION: NO EXAM (INTERNAL VIVA VOCE)

COURSE PREREQUISITES: The students should have a basic understanding of computer.

COURSE OBJECTIVES: The students should utilize their semester break to make themselves aware of the role and importance of Computers in the field of Architecture.

EXPECTED OUTCOME: Student shall be able to understand the Auto Cad as a Computer Aided Drafting Technique.

CONTENTS

1. Introduction to Auto Cad and Units.
2. Basic commands like copy, paste, stretch, offset, move fillet, extend, trim and other 2D commands.
3. Drawing the basic Plans, Sections, and Elevations.
4. Basic Text writing and dimensioning of the Plans, Elevation and Sections.
5. Basic hatching of the elements in the Plans, Elevations and Sections.
6. Introduction to Layers and line type settings.

NOTE:

The small building plans which have been prepared by the student during this training period shall be evaluated by the subject teacher in the start of semester.

RECOMMENDED REFERENCE BOOKS

1. AutoDesk , 'Auto Cad Manual 2012'.

ARCHITECTURAL DESIGN-IV

Subject Code: BARC1- 425

L S T P C

3 2 0 2 6

UNI. EXAM. DURATION: 12 Hrs. (2 DAYS) (6 + 6 Hrs. WITH 1 Hr. BREAK ON BOTH DAYS) (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: The students should have knowledge of climate of the region.

COURSE OBJECTIVES: To make students appreciate the elements of vernacular/rural Architecture of states of Punjab, Himachal Pradesh, Jammu & Kashmir and Rajasthan with respect to the climatic conditions.

- To understand significance and documentation of measured drawings.

EXPECTED OUTCOME: Students should be able to learn the significance of contextual factors in architecture through design of climate responsive architecture.

CONTENTS

- Study of relationship between Climate and Regional Architecture.
- Study of the Social and Physical environment and methods of construction in Vernacular/Rural Architecture, emerging out of the traditional way of life of the people in a given place with emphasis on topography.

- Study of Historical Settlements/buildings of distinct Architectural characteristics including detailing with physical planning and other geomorphic factors, local materials, construction techniques, spatial analysis etc.
- Design exercises based on the detailed study of a vernacular settlement as above with documentation of measured drawings.
- Minimum two projects/assignments should be handled by students during the semester including detailed study of a representative settlement.

NOTES:

- All buildings should have accessibility to the physically challenged persons.
- All Assignments to be prepared manually and no computer aided design/ Presentation/ Documentations should be accepted.
- The students may undertake a tour of max. 7 days for conducting Study/ Documentation.

TEACHING METHODOLOGY

Study shall be done in groups to clearly bring out the existing settlement pattern, socio-economic conditions, pattern of life, building typology, materials/building technology used and important architectural features. The end product shall be a well-documented report and drawings.

- Selection of relevant site.
- Study and documentation including measured drawings.
- Site and climatic analysis for design projects.
- Library and case studies
- Design development and volumetric studies (model)
- Preliminary design and volumetric study.
- Final design with detailed volumetric study and visual communications (3D Visualizations)

GUIDELINES FOR PAPER SETTER

1. One compulsory question is to be set from the syllabus and covering the entire content.
2. Evaluation is to be done through viva voce by external jury comprising of two examiners appointed by the University at college and answer sheets should be retained at college level.
3. The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

RECOMMENDED REFERENCE BOOKS:

1. Ching, Frank Francis D.K., 'Architecture: Form, Space & Order', John Wiley, Hoboken, 2007.
2. V.S. Parmar, 'Design Fundamentals', Somaiya Publisher Pvt. Ltd, Mumbai, 1997.
3. Scott Van Dyke, 'Form, Line to Design', Van Nostrand Reinhold, 1990.
4. R. Scott, 'Design Fundamentals', Robert E. Krieger Publishing Company E & OE-Architects Hand Book and Planning.
5. Donald Watson, Michael J. Crosbie, 'Time Saver Standard', 8th Edn.

BUILDING CONSTRUCTION -IV

Subject Code: BARC1- 426

L S T P C

2 2 0 2 5

UNI. EXAM. DURATION: 12 HRS. (2 DAYS) (6 + 6 HRS. WITH 1 HR. BREAK ON BOTH DAYS) (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: Students should have the basic knowledge of Timber/Wood and its use in Building.

COURSE OBJECTIVES:

1. To acquaint students about the details of Timber in Construction.
2. To familiarize the students with traditional/Contemporary construction methods of a single storied building in timber.

EXPECTED OUTCOMES: The students shall be able to understand Timber construction details and components of a building.

CONTENTS

Unit-I

- Introduction to the nature and characteristics of Timber construction, its advantages and limitations.
- Walls in timber: Various types of timber frame walls, with details of joints and cladding, Dhajji walls construction.
- Cladding with Timber and Timber products in Interior and Exterior (Wall paneling, Timber partitions, counters etc.)
- Sliding and sliding-folding Doors.

Unit-II

Floors and Staircases

- Timber/Wood/Purpuquet flooring construction
- Wooden Staircases construction

Unit-III

Roofs and Trusses

- Introduction to different types of timber Roofs e.g. Flat, Couple, Close Couple, Collar, Lean to roof and Double Lean-to roofs, mansard roof.
- Principles of Construction and Details of King Post and Queen Post Trusses with Gutters, Eaves and Ridge Details (with / without Soffit) and Roof Coverings.
- North Light truss in Timber

Note: Field/ Project visits to study the uses of Timber in construction at various stages for better understanding, students must be taken to the under construction Site.

RECOMMENDED TEXT AND REFERENCE BOOKS

RECOMMENDED TEXT BOOKS

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

RECOMMENDED REFERENCE BOOKS

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

INSTRUCTIONS TO THE PAPER SETTER

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

BUILDING SCIENCE AND TECHNOLOGY - IV

Subject: BARC1- 427

L S T P C

2 0 0 0 2

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To provide a basic understanding of water supply, sanitation, waste water, and solid waste management system in buildings.

EXPECTED OUTCOME: Teaching of the subject shall help students to understand the importance and role of water supply and sanitation services in Buildings.

CONTENTS

Unit-I

WATER SUPPLY

- Role, Importance, Necessity, Sources of Water supply (Flow Diagram).
- **Quantity of Water:** Types of demands, domestic, commercial, industrial water demand, fire demand, per capita demand, prediction of population, hydrological cycle, rainfall and run off, rainfall measurement.
- **Quality of Water:** Impurities in water, Hardness in water, Standards of water quality, Methods of treatment (Sedimentation, Filtration, Coagulation etc).
- **Collection/ Storage of Water:** Different types of intakes, conveyance of water, capacity and location of Reservoirs.
- **Pipes and Fittings:** Types of pipe material, Sizes and their jointing details, water supply fittings like Ferrule, Stopcock, Bibcock etc.
- **Water Distribution System:** Classification of distribution, pressure in distribution systems, storage and distribution resources, layout of distribution system, appurtenances, water supply plumbing- Individual building, fixtures and water storage in building. Hot and Cold water supply in multistoried buildings with special reference to National Building Code.

Unit -II

SANITATION

- **Sewerage and Sewage Disposal:**
Basic definitions, methods of Sewage Collection, types of sewers and their layout, classification of sewerage system, sewer sections, sewer materials and joints, sewer appurtenances, Storm water drainage.
- **Drainage of Buildings:**
Principles of Building drainage, Different types of pipes, traps, sanitary fittings, plumbing systems of drainage: single stack system, one pipe system, two pipe system, pipe sizes and gradients. Complete layout of Water supply and sanitary system in a building.
- **Disposal in Unsewered Areas:**
Different types of pits, septic tank, design of septic tank, disposal of septic tank effluent. Brief description and analysis of sewage, Oxygen demand and Natural methods of sewage disposal.

Unit-III

LAYOUT PLAN showing Water Supply and Sanitation

A complete layout of Water supply (Hot and Cold) and sanitation system of a double storeyed residential building having minimum plot area of 500 Sq. yards.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. R. Birdi, 'Water Supply and Sanitation'.
2. R. Barry, 'Building Services', John Wiley and Sons Ltd., 1998.
3. G.S. Bindra, J.S. Bindra, 'Water Supply and Sanitation'.
4. Shah S. Charanjit, 'Water Supply and Sanitation', Galgotia Publishing, New Delhi, 2008.
5. National Building Code 2005.

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 four questions (two each from Unit I and Unit-II), out of which the students are required to attempt any three questions (selecting at least one from each unit).
3. Two questions should be set from Unit-III with attached sketch plans.

VISUAL COMMUNICATION-IV

Subject Code: BARC1-428

L S T P C

1 0 0 2 2

UNI. EXAM. DURATION: NO EXAM (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: Student should have cleared the course of Visual Communications-III.

COURSE OBJECTIVES: The students should be able to visualize, draft and render his/her small design projects into 3-D forms.

EXPECTED OUTCOME: The students shall be able to draw perspectives of small design projects and show sciography through Computer Aided Techniques.

CONTENTS

UNIT-I

- 3-D Modelling on 3-D Max.
- 3-D Modelling on Google Sketch Up

UNIT-II

Rendering of the View on any of the following Software:

- 3D- Max,
- Photoshop,
- V-ray and
- Any other Software.

INSTRUCTIONS TO THE PAPER SETTER

The evaluation of student shall be based on the written questions to be set from the course and the practical conducted based on a specific problem given to assess and evaluate the knowledge of students related to course contents defined above.

STRUCTURE DESIGN-III

Subject Code: BARC1-429

L S T P C

1 0 1 0 2

COURSE PREREQUISITES: The student should have studied Structure Design-I.

COURSE OBJECTIVES: To acquaint the students about the strength, stability, stresses and behaviour of steel structures.

EXPECTED OUTCOMES: Students shall be able to analyse and design steel structures

CONTENTS

Unit-I

CONNECTIONS

- Types of Connections
- Types of Rivets
- Types of Riveted Joints
- Failures of Riveted Joints
- Types of welds
- Failure of welds
- Comparison between riveted and welded connections

STEEL FOUNDATIONS (Theory Only)

- Slab Base
- Gusset Base
- Grillage Foundation

Unit-II

STEEL BEAMS

- Types of sections
- Laterally supported and un-supported beams
- Design of steel beams
- Web buckling and web crippling

Unit-III

TENSION AND COMPRESSION MEMBERS

- Types of Tension members
- Failures in Tension members
- Lug Angle, Splices and gusset plate (Theory Only)
- Types of sections in compression
- Length and slenderness ratio
- Encased column
- Built-up Column (Theory Only)

RECOMMENDED TEXT AND REFERENCE BOOKS

1. S.K Duggal, 'Design of Steel Structure', Tata McGraw Hill.
2. Ram Chandra, 'Design of Steel Structure', Standard Book House.
3. S.S. Bhavikatti, 'Design of Steel Structure', I.K. International Publishing House Pvt. Ltd.

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).

Note: Indian Code of Practice IS: 800-2007 is permitted in examination.

DESIGN PHILOSOPHIES-I

Subject Code: BARC1-430

**L S T P C
1 0 1 0 2**

COURSE PREREQUISITES: The student should have studied the concept of Form and Space.

COURSE OBJECTIVES: To develop conceptual and perceptual skills of students to appreciate the basic principles / philosophy of design used in 20th century movements and assess their contributions.

EXPECTED OUTCOME: Student shall be able to understand the basic concepts of designing the buildings done in 20th-Century Architecture.

CONTENTS

Unit –I

- Chicago School of Architecture (1880-1910)- Dankmar Adler and Louis Sullivan
- Art Nouveau Architecture (1890-1920) - Antoni Gaudi, Joseph Maria Olbrich
- New York School of Skyscraper Architecture (1900-30) - Famous New York Skyscrapers

Unit –II

- Early Modernist Architecture (1900-30)
- Expressionist Architecture (1910-25)
- Social Housing Architecture (1918-30)
- Art Deco Architecture (1925-1940)
- International Style of Modern Architecture (1940-70)

Unit –III

Great masters

- Louis Sullivan
- Walter Gropius
- Frank Lloyd Wright
- Le- Corbusier
- Ludwig Mies van der Rohe

RECOMMENDED TEXT AND REFERENCE BOOKS

1. '20th Century World Architecture', Phaidon Publication.
2. Jean-Louis Cohen, 'The Future of Architecture Since 1889', Phaidon Publication.
3. Peter Gössel, Gabriele Leuthäuser, 'Architecture in the 20th Century', Taschen Publications.
4. Klaus-Jürgen Sembach, Art Nouveau, Taschen Publications.
5. Magdalena Droste, 'Bauhaus', Taschen Publications.

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-II

Subject Code: BARC1-431

L S T P C

1 0 0 0 1

UNI. EXAM. DURATION: NO EXAM (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: The student should have an understanding of the mechanism of forces through Cellular Structure System, Bulk Active Structure System & Vector Active Structure System.

COURSE OBJECTIVES: The teaching of this subject shall help the students:

- To learn about basic principles applicable in various structural systems.
- To understand the Role and Importance of Structure in Built Environment.
- To apply the knowledge gained in an applied project and to make buildings structurally safe.

EXPECTED OUTCOMES: Emphasis shall be laid on learning by doing by making of 3-D models to give the students an idea of different spatial experience.

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

Form Active Structure System:

- Cable Structures (Roofs, Bridges etc.)
- Tents Structures
- Pneumatic Structure

Unit-II

Surface active Structure System:

- Shells
- Folded Plates

Unit-III

- Biomimicry

RECOMMENDED REFERENCE BOOKS:

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

EDUCATIONAL TOUR-I

Subject Code: BARC1- 432

L S T P C

0 0 0 0 1

UNI. EXAM. DURATION: NO EXAM (INTERNAL VIVA-VOCE)

OBJECTIVES: The main aim is to explore, study, analyse and understand the contemporary/traditional/historical architectural characteristics and details of areas, places relevant to the syllabi. The duration of tour shall be up to 06 days.

GENERAL GUIDELINES FOR THE TEACHER

Study of building materials and details through sketches and photographs to be made as an individual student activity and is to be submitted in a report form. Study of concepts/ construction techniques and architectural characters for different sites/ buildings visited to be submitted in groups of students. Viva voce of individual student for both the submissions will be conducted by the teacher in-charge, who accompanied the tour, as part of the internal assessment.

NOTE: The Evaluation shall be done on the work done by the students in the form of handmade Sketches and Report of the Tour.

ARCHITECTURAL DESIGN – V

Subject: BARC1-533

L S T P C

2 3 0 2 6

UNI. EXAM. DURATION: 18 Hrs. (3 DAYS) (6 + 6 + 6 Hrs. WITH 1 Hr. BREAK ON ALL DAYS) (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: The student should have the knowledge of Design fundamentals and spatial organisation

COURSE OBJECTIVES: To understand the constraints of designing multi use buildings in an urban setting with respect to building norms, climate and client's expectations.

- To understand design limitations due to building bye laws and site conditions.

- To understand the limitations of designing for Hilly Areas.
- To integrate services and structure system in the design project.
- To understand the importance and role of design elements in evolving architectural character.

EXPECTED OUTCOMES: Student shall be able to understand and appreciate the concept of Structure and services in the Architectural design of a medium scale building with reference to function, form and site.

CONTENTS

1. Design of multi storied residential and commercial buildings upto max. 5 stories integrating architecture, structure, form and building services along with urban context of site. e.g. Hotels, Hostels, Resorts etc.
2. Areas of concern/ focus:
 - Behavioral aspects and user satisfaction
 - Socio cultural aspects
 - Designing for the differently abled
 - Building byelaws and rules including fire safety provisions as per NBC.
 - Appropriate structural systems and constructional techniques
 - Climate responsive design
 - Site Planning and Urban Context

NOTE:

1. At least one design project shall have parking facility in Basement/Stilt.
2. All Assignments to be prepared manually and no computer aided design/ Presentation/Documentations should be accepted.

METHODOLOGY

For all assignments the following methodology should be followed and all stages should be attempted individually.

- Library and Proto type Studies
- Site analysis and site planning
- Space planning
- Design development and volumetric studies (model)
- Preliminary design and volumetric study (model)
- Final design with detailed volumetric study, (Detailed model) and visual communications (3D Visualizations)

GUIDELINES FOR PAPER SETTER

1. One compulsory question is to be set from the syllabus and covering the entire content.
2. Evaluation is to be done through viva voce by external jury comprising of two examiners appointed by the University at college and answer sheets should be retained at college level.
3. The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

RECOMMENDED TEXT AND REFERNCE BOOKS

1. Joseph De Chiara, Michael J. Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.
2. Julius Panero, Martin Zelnik, 'Human Dimension and Interior Space', Whitney Library of Design, 1975.
3. Joseph De Chiara, Julius Panero, Martin Zelnik, 'Time Saver Standards for Interior Design and Space Planning', McGraw Hill, 2001.
4. Ernst Neuferts, 'Architects Data', Blackwell, 2002.
5. Ramsey et. al, 'Architectural Graphic Standards', Wiley, 2000.

6. Sam F. Miller, 'Design Process: A Primer for Architectural and Interior Design', Van Nostrand Reinhold, 1995.
7. NBC (National Building Code).

BUILDING CONSTRUCTION-V

Subject Code: BARC1-534

L S T P C

2 2 0 2 5

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To make students understand various construction details in metals i.e. Steel, Aluminum.

EXPECTED OUTCOMES: Teaching of the subject shall help students to draw the construction details of structural Steel, Aluminium in their uses in various building elements including industrial buildings

CONTENTS

Unit-I

- Introduction to framed construction in steel, characteristics of steel sections, methods of jointing. Applications in various types of structures and different parts of buildings components.
- Details of Steel floorings in industrial buildings.
- Mezzanine floors.
- Steel stairs – straight flight and spiral.

Unit-II

- Trusses in steel. - Constructional details of Simple Truss, North Light Truss, tubular truss, lattice girder, etc.
- Fixing details of various roof coverings at valleys & gutters etc.
- False ceilings, incorporating services such as air conditioning, lighting, etc.

Unit-III

- Construction of various types of doors & windows in Steel & Aluminium
- Lightweight partitions in Steel and Aluminum. Thermal and Acoustic insulation of spaces and metal cladding for facades.
- Metal and gypsum false ceiling.

TEACHING METHODOLOGY

- Field visits to study the uses of metals in construction industry and process of laying of Steel Trusses.
- Study of Joinery of metals in workshop.
- Preparing Construction plates on above topics.
- Market study of the products available under different trade names with details of their manufacture, specification and performance.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Don A. Watson, 'Construction Materials and Processes', McGraw Hill Co., University of Michigan, 1972.
2. W.B. McKay, 'Building Construction', Vol. 1, 2, 3, 4, Longmans, U.K., 1981.
3. Alanwerth, 'Materials', The Mitchell Pub. Co., Ltd. London, 1986.
4. R. Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
5. R. Barry, 'Building Construction', East West Press, New Delhi, 1999.

INSTRUCTIONS TO THE PAPER SETTER

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

ON SITE CONSTRUCTION TRAINING

Subject Code: BARC1- 535

L S T P C
0 0 0 0 3

UNI. EXAM. DURATION: NO EXAM (INTERNAL VIVA VOCE)

COURSE PREREQUISITES: Students should have knowledge of building and structural components, materials and basic construction techniques.

COURSE OBJECTIVES: To make student understand, analyse and appreciate the entire context and intricacies of construction of buildings at site.

EXPECTED OUTCOME: Students should be able to understand process of planning, progress and management of construction process.

CONTENTS

GUIDELINES FOR TRAINING

- All the students of the fourth Semester of B. Arch course, after appearing in the annual exam shall be required to undergo on site construction training for a period of **five weeks**. On Site Training is compulsory and all students shall be required to complete it during the vacation. Training shall be on an actual site/ a live project where construction is already in process.
- Before completion of the fourth Semester student is required to select the Architect/ Construction Company/ Builder / Developers / Contractor, where he intends to undergo onsite training. The consent, in writing of the concerned shall be obtained prior to going for training and submitted to the Training Co-ordinator appointed by the HOD of the Department of Architecture.
- Training primarily shall focus on giving student firsthand experience of what actually happens on the site of construction after Architect has prepared and issued the drawings.

During the training students should learn/ understand the following:

- Drawings required for construction
- Planning and management of Construction
- Interpretation of drawings, specifications etc.
- Materials Used along with specification
- Structure and structural drawings
- Services and Service drawings
- Construction Technologies Used
- Interpretation of working drawings at site
- Material and store Management
- Recording of Progress of work
- Machinery and manpower used
- Role of Architect, Client and Contractor
- Anything special and specific to the project related to construction

Evaluation

- At the end of the training, student shall be required to submit two copies (one colored and one black and white) of the Reports containing his/her work during training. Report shall explain, illustrate and showcase the project, brief write up of the project detailing out

scope, site, design and other essential/salient features, diary of what work done during the training, working drawings and details of construction, materials, building technologies, planning and management of construction and manpower, process of managing ,materials, machinery and construction, management of stores and materials, anything special to the project etc. as detailed out in the objectives given above etc.

- Report shall be submitted at the start of the next semester and shall be evaluated by an external jury comprising of minimum two experts appointed by the University. The evaluation shall be coordinated by the Training Coordinator who shall also be internal examiner. Student would be required to make a presentation of the report and the work done during training.
- Evaluation shall be done in the start of this semester and made on the basis of work done, understanding developed, learning made, recording of various aspects of construction etc in the following manner:
 - i. Attendance- 15 % marks
 - ii. Progress Record by Training Co-ordinator- 15 %
 - iii. Evaluation made by Site In-charge -20%
 - iv. Report- Contents and Quality by External/Internal Experts- 30%
 - v. Presentation made and Viva- Voce by External Experts- 20%

NOTE:

- One faculty member shall be appointed as Training Co-ordinator who shall be responsible for managing the entire context of training.
- Before proceeding for the OST, students shall be briefed by the Training coordinator about the manner they should undergo training at site in order to understand, analyze and appreciate the entire context and intricacies of construction of buildings.

LANDSCAPE ARCHITECTURE

Subject Code: BARC1-536

**L S T P C
2 0 0 0 2**

COURSE PREREQUISITES: NIL

COURSE OBJECTIVES: To acquaint students with the uses and Importance of landscape design in architecture.

EXPECTED OUTCOMES: To make students understand the elements of Landscape Design and its application in Architectural Design solutions.

CONTENTS

Unit-I

- Introduction to landscape architecture.
- Elements of Landscape design and its relation to the built environment.
- Plant characteristics, plant propagation and impact of climate, soil and manure.
- Structure, Color, Form, Foliage of various types of Trees, Shrubs, Cacti Bushes and Creepers etc.
- Identification and study of a few Indian plants and trees.

Unit – II

Study on comparative basis of development of landscape design through:

- **Garden styles** – formal and informal; History of garden styles viz. Italian, French, Mughal and Japanese, Chinese, English.
- **Site Planning:** meaning, purpose and methodology; site surveys: types, relevance, components; Functional and technical factors in site planning; Principles and goals of landscape design; types of landscape styles – hard and soft landscape, wet and dry

landscape. Landscape design elements: types, materials, use and relevance. Hard and soft landscape, water as an important element

Unit-III

- Detailed study of water and vegetation as elements of landscape in nature and in landscape design.
- Preparation of a landscape scheme, landscape project at house level, neighborhood level etc.

NOTE: Study of Indian plants and trees should be done in detail and the Scrap book must be prepared.

RECOMMENDED REFERENCE BOOKS:

1. W. Reid Grant, 'Landscape Graphics'.
2. Littlewood Michael, 'Landscape Detailing'.
3. Harris and Dines, 'Time Saver Standard for Landscape Architecture' - Plants of India.
4. Tony Russel & Catherine Cutler, 'Trees-An Illustrated Identifier and Encyclopedia'.
5. Simonds, 'Landscape Architecture'.
6. Laurie Michael, 'Introduction to Landscape Architecture'.
7. Watts Rajnish, Dhillon Harjit, Chhattar Singh, 'Trees of Chandigarh'.
8. Krishan Pradip, 'Trees of Delhi'.
9. D.K. Bose, S.P. Sharma, B. Chaudhary, 'Tropical Garden Plants in Colors'.
10. M.S. Randhawa, 'Flowering Trees and Shrubs of India'.
11. M.S. Randhawa, 'Beautifying India'.

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 AND TECHNOLOGY-V

Subject Code: BARC1-537

L S T P C
2 0 0 2

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To provide the basic understanding of Electrical Layout, Fire Safety and Acoustics for different volumes of buildings

EXPECTED OUTCOMES: Teaching of the subject shall help students to understand the importance and role of Electrical Layouts, Fire Safety and Acoustics in Buildings.

CONTENTS

Unit -I

ELECTRICAL SERVICES

- Electricity- Basic principles of Electrical Circuits; Ohm's and Kirchhoff's laws.
- Design of simple electrical circuits – Series and Parallel.
- Wires – Specifications, Current carrying capacity; fittings and conduits.
- Wiring systems- Materials, Types/Methods of wiring, their advantages and disadvantages, safety and precautions.
- Electrical equipment used in buildings; Electrical meters, main switch box, distribution boards, Circuit breakers, fuses etc. and their layout.
- Types of Switches, Sockets and Fixtures.

- Protection against Earth leakage, Overload, Short circuit, Lightening and other safety measures for buildings.

Unit –II

ACCOUSTICS

- Introduction to acoustics, basic principles and concepts for design.
- Fundamentals of sound- terminology, basic principles governing transmission, reverberation, absorption, reflection etc., behavior of sound with respect to various surfaces in an enclosed space.
- Factors influencing hearing conditions- shapes, layouts, sitting arrangements of auditoriums, lecture halls, multipurpose halls.
- Acoustic materials, applications, advantages and disadvantages.
- Sound absorbing materials, single and in combination for various frequencies of sound.
- Reverberation time, sound levels and their calculations.
- Construction and planning measures for good acoustical design.
- Acoustical defects and remedies.
- Design considerations for various buildings including Class Room, Lecture Theatre, Auditorium, OAT, etc.

Unit–III

FIRE SAFETY

- Fire- Classification of fire, classification of building according to the fire load, Causes and Spread of fire as per NBC.
- Fire Detection/Warning – Equipment including Smoke detectors, heat detectors, Alarm systems, fire dampers, fire doors and means of escape etc.
- Firefighting equipment and types of fire extinguishers.

Exercise: Incorporating layouts of relevant services in a multipurpose hall showing Electrical Layout, Fire Safety Plan and Acoustical details.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. R. Barry, 'Building Services', John Wiley and Sons Ltd., 1998.
2. 'Time Saver Standards – Building Service', McGraw Hill, New York, 2001.
3. National Building Code 2005.
4. Edward, 'Lighting Design'.
5. J.B. Gupta, 'Electrical Installation, Estimating and Costing', S.K. Kataria & Sons, New Delhi, 2002.

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).

HISTORY OF ARCHITECTURE-III

Subject Code: BARC1-538

L S T P C

2 0 0 0 2

COURSE PREREQUISITES: Should have studied the course of History of Architecture - II.

COURSE OBJECTIVES: The course is designed to introduce students to the cross currents between theory and practice in different cultures.

1. To understand the political, social, geological and intellectual influences in Architecture and to study the evolution of city planning through time.
2. To inculcate in the students, the importance of the development of world Architecture from Neo classical style up to Industrial revolution and Rajput and Sikh Architecture in India.

EXPECTED OUTCOMES

- The student shall be able to understand basic chronology of historical development as per the contents of syllabus.
- Students shall be able to acquaint themselves with the key historical buildings of various periods of Architectural history and their characteristic features.

CONTENTS

Unit-I

Neoclassic Architecture

- Developments and building examples from Italy

Industrial Revolution

Industrial Revolution and its impact on the development of new towns. e.g. Tony Garnier's Industrial city.

- Influence of new construction materials, industrial techniques and functional needs on building typology and architectural form through building examples.
- Advances in steel construction like the Great Exhibition.
- Development of the high-rise building.

Unit- II

Sikh Architecture

- Introduction to elements of Sikh Architecture with special reference to Gurudwaras, Palaces, Forts & other Secular structure.
- Building Examples: Golden Temple Amritsar, and other prominent structure of Punjab, Khalsa college Amritsar, Gobindgarh Fort, Qila Mubarak Patiala.
- Traditional Planning of Sikh towns.

Unit-III

Rajput Architecture

- Introduction to elements of Rajput Architecture with special reference to Forts and palaces of Jaipur, Jodhpur, Jaisalmer, Orchha, Datia, etc.

Colonial architecture

- Influence of climate and materials on architectural expression.
- Introduction to colonial Architecture and town planning in India with special reference to Planning of New Delhi by Edwin Lutyens.
- Examples of Colonial buildings in Calcutta, Bombay, Madras and New Delhi.

RECOMMENDED TEXT AND REFERENCE BOOKS

RECOMMENDED TEXT BOOKS

1. B. Fletcher, 'History of Architecture', CBS Publishers & Distributors, Delhi, 1986.
2. J. Ferguson, 'History of Indian and Eastern Architecture', John Murray Albemarle Street. W. London, 1910.
3. P.S. Arshi, 'Sikh Architecture in Punjab', Intellectual Publishing House. New Delhi, 1985.
4. G.S. Ghurye, 'Rajput Architecture'.

RECOMMENDED REFERENCE 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. Ramesh Chander Dogra, Urmila Dogra, 'The Sikh World—An Encyclopedia Survey of

- Sikh Religion and Culture’, UBSPD Publishers, 2006.
4. Robert Tavernor, ‘Palladio and Palladianism’.
 5. Andrea Palladio, Adolph Placzek, ‘The Four Books of Architecture’.
 6. David Watkin, ‘A History of Western Architecture. London: Laurence King’, **1996.** ISBN 1856690822

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).

TALL BUILDINGS

Subject Code: BARC1-539

**L S T P C
1 0 1 0 2**

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To make students understand the technology, environment, infrastructural, economic, social and ecological aspects of high rise construction

EXPECTED OUTCOME: Teaching of the subject shall enable students to understand and appreciate the context of planning, designing, construction and services in high rise buildings.

CONTENTS

Unit-I

- High rise buildings – Definitions, Need, Role and Importance in the urban Context.
– Approach, Planning and Designing.
– Siting and its impact in the Urban Context.
– Advantages and Disadvantages

Unit-II

- High rise buildings – Materials, Construction and Structural Systems.
– Provision related to fire safety
– Horizontal and vertical circulation
– Services and service core.

Unit- III

- High rise buildings – Norms and Standards as per NBC/ Bye-Laws.
– Study of selective iconic building in the World.
– Study of selective iconic building in the India.
– Energy Efficiency and sustainability.

NOTE: The above course contents should be supported with built examples.

RECOMMENDED TEXT AND REFERENCE BOOKS

RECOMMENDED TEXT BOOKS

1. ‘Structural Analysis and Design of Tall Buildings/Taranath’, Bungale S – 1st. New Delhi, Tata McGraw Hill Education Limited, 1988.
2. D.K. Ching, ‘Building Construction Illustrative’.
3. Engels, ‘Structure System’.
4. Jashwant B. Mehta, ‘Tall Buildings’.

RECOMMENDED REFERENCE BOOKS

1. ‘Advances in Tall Buildings/Beedle’, Lynn S – 1st. New York, Van Nostrand Reinhold, 1987.

2. Cost in place concrete in tall buildings/Council of Tall Buildings-1st. New Delhi: Tata Mcgraw Hill Education Limited, 1991.
3. William, 'Tall Buildings: Museum of the Modern Art/Rily'.

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).

DESIGN PHILOSOPHIES-II

Subject: BARC1-540

L S T P C

1 0 1 0 2

COURSE PREREQUISITES: The student should have studied Design Philosophies-I

COURSE OBJECTIVES: To develop conceptual and perceptual skills of students to appreciate the basic principles / philosophy of design used in contemporary Indian architecture so as to assess their contributions in modern, regional, cost effective and technological approach towards building.

EXPECTED OUTCOME: Teaching of the subject shall help students to understand the approach of master architects towards design of buildings in India.

CONTENTS

Unit-I

Post-Independence influence of Modern Masters in India

- Le- Corbusier
- Louis I. Kahn

Unit-II

Indian Modern Architects- philosophy and works in India and abroad

- A.P. Kanvinde
- B.V. Doshi
- C.M. Correa
- Joseph Allen Stein

Unit-III

Architects who incorporated Regionalism, Technological advancements and Cost Effectiveness in Indian Architecture

- Laurie Baker
- U.C. Jain
- Raj Rewal
- Hafeez Contractor

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Bhatt, Vikram and Peter Seriver, 'Contemporary Indian Architecture', After the Masters, Ahmedabad, 1990.
2. Charles M. Correa, 'The New Landscape', Bombay Strand Books, 1985.
3. Frampton, Kenneth, 'Modern Architecture: A Critical History', Thames & Hudson, U.K., 2007.
4. Giedion Sigfried, 'Space, Time and Architecture', Harvard University Press, 2009.

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).

ARCHITECTURAL DESIGN – VI

Subject Code: **BARC1-641**

L S T P C

2 3 0 2 6

UNI. EXAM. DURATION: 18 HRS (3 DAYS) (6 + 6 + 6 HRS. WITH 1 HR. BREAK ON ALL DAYS) (EXTERNAL VIVA VOCE)

COURSE PREREQUISITES: The student should have the knowledge of Design fundamentals, spatial organisation, structure and services

COURSE OBJECTIVES

- To understand the constraints of designing recreational buildings in an urban or rural setting with respect to socio-cultural, climate and development norms.
- To emphasize the role of design in evolving expression. To focus on design detail as vital part of architectural expression.
- To understand design limitations due to site surroundings and local bye laws.
- To explore computer aided presentation techniques involving 2D and 3D drawings and models as required.

EXPECTED OUTCOME

- Students should be able to understand and appreciate the constraints of combining varying structural spans in complex building typologies and interweaving them with structure, site and architectural form and expressions.
- Students should be able understand and appreciate the interrelationship between form and scale.

CONTENTS

Design of mixed use and large span structures such as Art and crafts centres, Performing arts centre, Cultural centre, Museum and exhibition centre in urban areas, etc.

METHODOLOGY

For all assignments the following methodology should be followed and all stages should be attempted individually.

- Library and Proto type Studies
- Site analysis and site planning
- Space planning
- Design development and volumetric studies (model)
- Preliminary design and volumetric study (model)
- Final design with detailed volumetric study, (Detailed model) and visual communications (3D Visualizations)

GUIDELINES FOR PAPER SETTER

1. One compulsory question is to be set from the syllabus and covering the entire content.
2. Evaluation is to be done through viva voce by external jury comprising of two examiners appointed by the University at college and answer sheets should be retained at college level.
3. The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Joseph De Chiara, Michael J. Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.

2. Julius Panero, Martin Zelnik, 'Human Dimension and Interior Space', Whitney Library of Design, **1975**.
3. Joseph De Chiara, Julius Panero, Martin Zelnik, 'Time Saver Standards for Interior Design and Space Planning', McGraw Hill, **2001**.
4. Ernst Neuferts, 'Architects Data', Blackwell, **2002**.
5. Ramsey et al, 'Architectural Graphic Standards', Wiley, **2000**.
6. Sam F. Miller, 'Design Process: A Primer for Architectural and Interior Design', Van Nostrand Reinhold, **1995**.
7. Rewal, Raj, 'Humane Habitat at Low Cost', Architectural Research Cell, **2000**.
8. Steele, James, 'The Complete Works of Balakrishna Doshi: Rethinking Modernism for the Developing World', Super Book House, Mumbai, **1990**.

BUILDING CONSTRUCTION-VI

Subject Code: BARC1-642

L S T P C
2 2 0 2 5

COURSE PREREQUISITES: Students should have knowledge of drawings for construction and proficiency in 2D CAD Software.

COURSE OBJECTIVES: To acquaint students about the role of working drawings in execution of the building.

EXPECTED OUTCOMES: The student shall be able to draw the drawing good for construction.

CONTENTS

Unit-I

- Working Drawings of previous semester design project incorporating the following details:
 - Demarcation plan/ Excavation Plan
 - Grid and Foundation Plan/ details
 - All floor Plans/ details
 - Terrace plan
 - Elevation/ Sections
 - Joinery Details (Door/Windows schedule and Detail)

Unit-II

- Detailed Working Drawings of following utilities and service areas:
 - Toilet Details
 - Kitchen Details
 - Staircase details
 - Plumbing/ Sanitary layout
 - Fire Fighting Plan
 - Electrical layout

Unit-III

- Construction details of Basement and its treatment
- Extension, Expansion and Construction Joints, their details and treatments
- Commercial Kitchen- Study
- Case studies/detailing of Public Toilets

NOTE:

Site visits to construction sites

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Don A, Watson, 'Construction Materials and Processes', McGraw Hill Co., University of Michigan, **1972**.
2. W.B. McKay, 'Building Construction', Vol. 1, 2, 3, 4, Longmans, U.K., **1981**.
3. Alanwerth, 'Materials', The Mitchell Pub. Co., Ltd. London, **1986**.
4. R. Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, **1990**.
5. R. Barry, 'Building Construction', East West Press, New Delhi, **1999**.

INSTRUCTIONS TO THE PAPER SETTER

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

BUILDING SCIENCE & TECHNOLOGY-VI

Subject Code: BARC1-643

**L S T P C
2 0 0 0 2**

COURSE PREREQUISITES: The student should have the basic knowledge of elementary building services

COURSE OBJECTIVES: To develop an understanding of the advanced building services such as HVAC, lifts, escalators, Building automation systems, BIM and their application in the design proposals of multi-storeyed buildings.

- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

EXPECTED OUTCOMES: Student shall be able to understand the use and application of various advanced building services for the design assignments.

CONTENTS

Unit-I

Heating, Ventilation and Air-conditioning Systems

- Introduction & Principles Fundamentals of Air Conditioning System Design, Refrigeration Cycle
- Comfort cooling systems & their working- Unitary air conditioning- Window ac & Split ac., Package ac system, Evaporative cooling systems, Cooling load for air conditioning
- Central air conditioning their parts - A.H.U., Cooling plant, Cooling tower
- Air Distribution Systems - fans, filters, fan coil units, ductwork, outlets, dampers
- Methods of Heating and Cooling
- Natural and Artificial Ventilation

Unit-II

Mechanical Transportation Systems

- Horizontal and vertical mechanical transportation system in building - Lifts (Elevators), Escalators, Vehicular elevators and Walkways
- Design Standards – Lifts Lobby, Lift Cards etc.
- Elevators (Lifts) – Types, Control and operation, Carrying Capacity, Rated Load, Rated Speed, RTT etc., Principles of functioning, control and operation of lifts. Machine room and its equipment, lift well and pit
- Escalators and Conveyers – Functioning, Installation, Suitability and Planning requirements

Unit-III

Intelligent Buildings

Introduction to Intelligent Buildings - definitions, building elements, descriptions, definitions and components, historical overview

Energy and Intelligent Buildings - Energy consumption in buildings, micro climate, human comfort in buildings, energy conservation in buildings, active and passive systems, advanced building energy management systems

Building Automation - Intelligent control of building components, automating building services, system integration and optimization with building envelope

Communication systems, safety and security systems

Performance Evaluation and Standards - Building performance evaluation and intelligent building standards

TEACHING METHODOLOGY

•Site visits of buildings where various systems related to the syllabus have been installed, their working and merits and demerits of the system.

•Specialized lectures from technical people in the field.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Peter Burberry, 'Mitchell's Building Construction: Environment & Services', 8th Edn., Longman, 1997.

2. B. Stein and J. Reynolds, 'Mechanical and Electrical Equipment for Buildings', 10th Edn., Wiley & Sons Inc., 2005.

3. R Rush, 'The Building Systems Integration Handbook', American Institute of Architects, 1991.

4. R.P. Parlour, 'Building Services: A Guide to Integrated Design: Engineering for Architect', Integral Publishing, 2008.

5. E. Reid, 'Understanding Buildings: A Multi-Disciplinary Approach', MIT.

6. William H. Severns and Julian R. Fellows, 'Air-conditioning and Refrigeration', John Wiley and Sons, London, 1988.

7. A.F.C. Sherratt, 'Air-conditioning and Energy Conservation', The Architectural Press, London, 1980.

8. ASHRAE Publications.

9. National Building Code of India (Latest Edition), Bureau of Indian Standards.

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).

INTERIOR DESIGN

Subject Code: BARC1-644

L S T P C

1 0 2 2

COURSE PREREQUISITES: The student should have the basic knowledge of Design principles and elements

COURSE OBJECTIVES: To introduce the students to the discipline of Interior Design and to develop basic skills required for handling simple interior design projects

EXPECTED OUTCOMES: Student shall be able to understand and appreciate the discipline of Interior design and its relation with Architectural Design.

CONTENTS

Unit-I

- Objectives, Purpose, Role and Importance of Interior Design
- Elements of Interior Design, Role in interiors
- Aesthetic Order, functional Value and Psychological impact of various elements of Interior Design
- Principles of Interior Design and their application in the context of buildings

Unit-II

- Application of Colour, Texture, Landscaping, Artificial and Natural Lighting in the Building interiors
- Furniture, Furnishings, Fabrics, Murals, Paintings, Sculpture, Lighting Fixtures, Floor coverings, Wall coverings and related materials
- Study of furniture and ergonomics

Unit-III

Design exercises with simple spatial layouts of furniture, wall panelling, flooring, illumination, ceiling details and air conditioning features in buildings

Note: Studio exercises shall be supplemented with workshops and site-visits.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. M. Pratap Rao, 'Interior Design: Principles and Practice', 3rd Edn., Standard Pub., 2004.
2. Francis D.K. Ching, 'Interior Design Illustrated', V.N.R. Pub., NY, 1987.
3. Yatin Pandya, 'Elements of Spacemaking'.
4. Massey, Anne, 'Interior Design', 1900.
5. Litchfield, Fredrick, 'Illustrated History of Furniture from the earliest to the present time'.
6. Arnold Friedmann and Others, 'Interior Design: An Int. to Architectural Interiors', Elsevier, New York, 1979.
7. E. William Miller, 'Basic Drafting for Interior Designers', Van Nostrand Reinhold, New York, 1981.
8. John Kurtich and Garret Eakin, 'Interior Architecture', Van Nostrand Reinhold, New York, 1993.

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).

ESTIMATING AND COSTING

Subject Code: BARC1 – 645

L S T P C

1 0 0 2 2

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To make the students understand the factors affecting cost of buildings and methods of preparing estimates of architectural projects.

EXPECTED OUTCOME: Students shall be able to understand the process of preparing estimates, tenders and other activities related execution.

CONTENTS

UNIT-I

Estimating & Costing

- Estimate & Types of Estimate.

- Methods of Estimates--Approximate & detailed methods of Estimate including Plinth area method, Carpet/Floor Area method, Cubic Content method.
- Preparing estimates of quantities of materials for various items of work e.g. earthwork, brickwork, flooring, roofing etc. - units of measurements and payments.
- Analysis of rates of material and labour required for various items of work.
- Bill of Quantities-Methods of taking out the quantities of R.C.C. construction.
- Case study/practical exercise in preparing a detailed estimate of a two storeyed residential building with respect to the quantities of material and labour required as well as analysis of rates for material and labour.

UNIT-II

Specifications

- Introduction, importance, Role, Functions and Types of Specifications
- Detailed Specifications for various basic building materials.
- Studio exercise related to specifications for small building project, standard P.W.D. specifications.
- Writing specifications for civil works as:
 - Damp Proof Course
 - Brick Masonry
 - Concreting
 - Flooring
 - Plastering & Pointing
 - Timber Doors & Windows
 - Steel Doors & Windows
 - Painting and Varnishing
 - Services, Sanitary Fixtures & Electric Wiring
- Tenders- Type, Process, Scrutiny and Selection of Contractor, Pre-Qualification and Registration of Contractor.
- Valuation - Purpose, Objective, Types and Method of valuation.
- Arbitration and Reconciliation Act.

UNIT- III

RECOMMENDED TEXT AND REFERENCE BOOKS

1. P.W.D. Specifications.
2. B.N. Dutta, 'Estimating & Costing in Civil Engineering'.
3. A. Agarwal, A.K. Upadhyay, 'Civil Estimating, Costing and Valuation', S.K. Kataria Sons, 2009.
4. Nanavati Roshan, 'Estimating, Costing and Valuation', U.B.S. Publishers, Distributers Pvt. Ltd. New Delhi.
5. Indian Arbitration Act.
6. M. Chakraborty, 'Estimating, Costing & Specification and Valuation in Civil Engineering and Service Tax Manual'.

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).

DESIGN PHILOSOPHIES-III

Subject Code: BARC1-646

**L S T P C
1 0 1 0 2**

COURSE PREREQUISITES: The student should have studied the course of Design Philosophies-II.

COURSE OBJECTIVES: To develop conceptual and perceptual skills of students to appreciate the theories of Program, Function and Philosophies used in Contemporary architecture

EXPECTED OUTCOME: Teaching of the subject shall help students to understand the approach of eminent architects towards designing of buildings.

CONTENTS

Unit –I

- Theoretical issues in contemporary architecture through, Seminars on any one work of practicing Indian and International architects.
- Structural Expressionism (High-Tech Architecture)
 - Renzo Piano
 - Richard Rogers

Unit –II

Deconstructivism

- Frank O. Gehry
- Rem Koolhaas
- Zaha Hadid

Unit –III

Neo Futurism

- Santiago Calatrava Valls
- Norman Foster
- Tadao Ando

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Philip Johnson, 'Deconstructivist Architecture, Museum of Modern Art'.
2. Colin Davies, 'High Tech Architecture', Rizzoli.
3. Zaha Hadid, Aaron Betsky, 'Zaha Hadid: Complete Works', Rizzoli.
4. Alexander Tzonis, 'Santiago Calatrava: Complete Works', Rizzoli.

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).

ARCHITECTURAL LEGISLATION

Subject Code: BARC1-647

**L S T P C
2 0 0 2**

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To make students familiar with the role and importance of Legal Framework in designing the Built Environment for orderly growth of Human Settlements.

EXPECTED OUTCOMES: Student will be able to understand the Legal Framework in Architectural Practice.

CONTENTS

Unit- I

- Architectural Legislation – Introduction, Need, Role and Importance.
- Punjab Municipal bye-laws – Introduction, Contents related to Site planning, architectural design and services.
- PUDA bye-laws – Introduction, Contents related to Site planning, architectural design and services.

Unit- II

- Development Controls, need, importance, typologies
- Development Controls – Chandigarh Capital City
- Submission Drawings - Documents, Drawings and procedure for approval.
- Completion/ Occupation Certificate for Buildings - Documents, Drawings and procedure
- Chandigarh Periphery Control Act- Intent, Content and important provisions.

Unit- III

- National Building Code - Definitions, architectural controls, zoning, parking etc.
- National Building Code – Provisions related to multi-storied buildings.
- Disability Act
- Preservation and Conservation of Heritage Buildings, Heritage Regulations

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Building Bye Laws - Chandigarh Administration
2. Town Planning – Rangwala
3. Building Bye Laws- PUDA
4. Municipal Building Bye Laws
5. National Building Code
6. Readers Volume in Town planning by Institute of Town Planners, INDIA

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).

ARCHITECTURAL DESIGN – VII

Subject Code: BARC1-748

L S T P C

2 5 0 2 8

UNI. EXAM. DURATION: NO EXAM (VIVA VOCE BY EXTERNAL JURY ON PORTFOLIO)

COURSE PREREQUISITES: The student should have the knowledge of Codes for Transportation/Building and Safety codes besides understanding of the fundamentals of architecture, space planning, services and structure.

COURSE OBJECTIVES: To students understand the design of large building/urban projects involving complex circulations and circulatory system specific safety standards (structural system and building services to evolve iconic architecture.

EXPECTED OUTCOMES:

- Students should be able to understand and appreciate the with complex functional, circulation and safety requirements.

CONTENTS

1. Planning and designing of large Complexes such as Hospitals, Healthcare Buildings

2. Planning and designing of Traffic Nodes- Bus Terminal, Railway Station, Airport
3. Light Industrial Buildings involving manufacturing display etc.

TEACHING METHODOLOGY:

Minimum Two projects should be done by the student. The Projects selected should be based on realistic contexts.

For all assignments the following methodology should be followed and all stages should be attempted individually.

- Library and Proto type Studies
- Site analysis and site planning
- Space planning
- Design development and volumetric studies (model)
- Preliminary design and volumetric study.
- Final design with detailed volumetric study and visual communications (3D Visualizations)

NOTE:

1. All Building should have safety design features as per norms.
2. Evaluation is to be done through viva voce by external jury comprising of two examiners appointed by the University at college and answer sheets should be retained at college level

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Ching, Frank (Francis D.K.), 'Architecture: Form, Space & Order', John Wiley, Hoboken, 2007.
2. V.S. Parmar, 'Design Fundamentals', Somaiya Publisher Pvt. Ltd., Mumbai, 1997.
3. Scott Van Dyke, 'Form, Line to Design', Van Nostrand Reinhold, 1990.
4. R Scott, 'Design Fundamentals', Robert E. Krieger Publishing Company, E & OE-Architects Hand Book and Planning.
5. Donald Watson, Michael J. Crosbie, 'Time Saver Standard, 8th Edn.

BUILDING CONSTRUCTION-VII

Subject Code: BARC1-749

L S T P C

2 2 0 2 5

UNI. EXAM. DURATION: NO EXAM (EXTERNAL VIVA ON PORTFOLIO)

COURSE PREREQUISITES: Students should have studied the methodology of Construction for different types of buildings.

COURSE OBJECTIVES: To acquaint the students with advanced building construction technology.

EXPECTED OUTCOME: Students shall be able to know the latest trends/ methods of construction.

CONTENTS

Unit-I

- Prefabricated and precast building construction and details.
- Modular Construction- Objectives, basic principles, planning and structural modules.
- Tubular construction system and details.

Unit-II

- Design and Construction details in interior such as show room/shops, Banks, Hotels, Offices, Public buildings, restaurants, etc.
- Construction of structural & non-structural cladding & curtain wall.

- Materials and Construction details of Wall Paneling, False Ceiling including Thermal and Acoustics treatments.

Unit-III

- Construction details for earth quake resistant structures (Low rise)
- Construction details of passive methods of environment control in buildings
- Construction details of swimming pool/ Terrace Garden.

NOTE: Evaluation is to be done through viva voce by external examiner appointed by the University at college level.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Don A. Watson, 'Construction Materials and Processes', McGraw Hill Co., University of Michigan, 1972.
2. W.B. McKay, 'Building Construction', Vol. 1, 2, 3, Longmans, U.K., 1981.
3. 'Practice of Architectural Working Drawings', John Wiley & Sons Publication.
4. R. Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
5. R. Barry, 'Building Construction', East West Press, New Delhi, 1999.

HOUSING

Subject Code: BARC1-750

L S T P C

2 0 0 2

COURSE PREREQUISITES: The student should have the basic understanding of Housing in India.

COURSE OBJECTIVES: To create awareness about the salient features of Housing, issues, causes and consequences of housing problems and to impart knowledge about the possible solutions.

EXPECTED OUTCOMES: The students will be able to understand various aspects, issues and considerations affecting housing problems and their solutions in today's context.

Unit-I

- Introduction, Role and Importance in the context of social and economic context
- Typologies, Comparative Advantages and Disadvantages
- Need and Demand
- Shortage, Problems and solutions in the Indian Context
- Housing Cost, Components and Strategies for minimizing Cost.

Unit-II

- Institutions involved in Providing Housing in India
- Housing Finance and Institutions involved in Financing Housing in India
- Affordable Housing
- Land, its role and importance in Housing
- Slums – Definition, Characteristics, Causes and solutions in the Indian Context.

Unit-III

- Housing policies in India.
- Housing through Five year plans.
- Role of private Sector in Housing.
- Low Cost Housing.
- Housing Survey

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Babur Mumtaz and Patweikly, 'Urban Housing Strategies', Pitman Publishing, London, 1976.
2. Geoffrey K. Payne, 'Low Income Housing in the Development World', John Wiley and Sons, Chichester, 1984.
3. John F.C. Turner, 'Housing by People', Marison Boyars, London, 1976.
4. Martin Evans, 'Housing, Climate and Comfort', Architectural Press, London, 1980.
5. Forbes Davidson and Geoff Payne, 'Urban Projects Manual', Liverpool University Press, Liverpool, 1983. Patrik Schumacher: 2004, Digital Hadid.
6. O.P. Miglani, 'Urban Housing in Developing Economy'.
7. A.K. Jain, 'Urban Housing and Slums'.
8. Thomas Poulouse, 'Innovative Approaches to Housing for the Poor'.
9. 'Five Year Plans', Government of India Publications.
10. 'Readers Volume on Housing', of Institute of Town Planning.
11. S.C. Rangwala, 'Town Planning'.
12. Laurie Baker, 'The Manual of cost cuts for strong acceptable Housing'.

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).

CONSTRUCTION MANAGEMENT

Subject Code: **BARC1-751**

L S T P C
2 0 0 0 2

COURSE PREREQUISITES: The students should have knowledge about the different stages of construction activities

COURSE OBJECTIVES: To make student understand and appreciate the role and importance of management in building construction.

EXPECTED OUTCOME: The students shall be able to handle and manage the project efficiently

Unit-I

- **Project Management-** Concept, Background, Purpose, Aim, Objectives, Scope and its Significance
- **Traditional Management Systems-** Advantages and limitations
- **Role of Architect** in Construction/Project Management
- **Resources** of Construction Industry.
- **Construction** stages, Construction team, Equipment Management

Unit-II

- **Project Management Techniques-** Network, CPM, PERT
- **CPM Analysis-** Critical Path, Float Computation Result Sheet etc.
- **PERT-** Introduction, Theory and Network analysis
- **Cost Time** analysis in Network Planning
- **Financing of Project,** Depreciation and Break even Cost analysis
- **Cost Control-** Budget, Accounting System, Problems

Unit-III

- **Quality and Safety-** Objectives, Issues, Organizing for Quality and Safety

- **Stages of Inspection** and Quality control
- **Planning of Temporary Services** at the site.
- **Security of Materials** and Manpower at building site.
- **Computer Application** in Construction Management

TEACHING METHODOLOGY

Teaching in the subject will be a combination of Expert lectures and visits to Construction /Project Sites and discussions with Project Managers

Students would be required to do a case study of an ongoing construction project

RECOMMENDED TEXT AND REFERENCE BOOKS

1. R.L. Peurify, 'Construction Planning, Equipment and Methods', International Book Company.
2. L.S. Srinath, 'PERT & CPM Principles and Applications', EWP Limited New Delhi.
3. B.C. Punmia & K.K. Khandelwal, 'Project Planning and Control with PERT\CPM', Laxmi Publications, New Delhi, 2009.
4. Mukhopadyay, S.P. 'Project Management for Architects and Civil Engineers', IIT, Kharagpur, 1974.
5. P.S Gahlot & B.M. Dhir, 'Construction Planning & Management'.
6. P.N. Modi, 'PERT and CPM', Standard Book House, New Delhi, 2009.

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).

TOWN PLANNING

Subject Code: BARC1- 752

L S T P C

1 0 2 0 3

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To make students understand the role and importance of Town Planning in the Evolution of Human Settlements and Urban Forms in the Historical and Modern Context.

EXPECTED OUTCOMES: Teaching of the subject shall help students to understand the importance and role of Town Planning in the Historical and Modern Context.

CONTENTS

Unit-I

- Town Planning - Introduction, Role, Importance and Scope.
- Planning Principals - Nile Valley, Greek and Roman Periods.
- Town Planning in India - Indus Valley (Mohenjedaro), Islamic (Fatehpur Sikri), Medieval (Jaipur) and Colonial Period (New Delhi).
- Human Settlements - Classification based on Road Pattern, Form, space, use & Population.

Unit- II

- Towns and Cities in India – Issues, Problems and strategies for development.
- Urbanization – Introduction, Definition, pattern, causes and effect in India.
- Master Plan – Objectives, Contents, Role, Importance, Methodology and critical evaluation.

- Regional Plan - Objectives, Contents, Role, Importance, Methodology and critical evaluation.
- Smart Cities – Intent, Content, Scope, Approach, Methodology and critical Appraisal.

Unit- III

- Planning Concepts- Garden City, Linear City, Industrial City and Sustainable City, Compact city and TOD.
- Study of New Towns in India – Chandigarh, Gandhi Nagar, Bhubaneswar and Raipur.
- Development Authorities – Role and Importance in Urban Development.
- Neighborhood – Introduction, Concept, Objective, Principle and case study.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. S.C. Rangwala, 'Town Planning'.
2. Paul D. Spreiregan, 'Urban Design: The Architecture of Towns and Cities'.
3. Arthur B. Gallion, 'The Urban Pattern: City Planning and Design'.
4. S.P. Gupta, 'The Chandigarh: An Overview'.
5. S.C. Agarwal, 'Architecture and Town Planning'.
6. 'Report of National Commission on Urbanization', Govt. of India.
7. 'The Punjab Regional and Town Planning and Development Act', **1995**.
8. 'Senses of India', **2011**.
9. 'Readers Volume in Town planning by Institute of Town Planners, INDIA'.

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).

EDUCATIONAL TOUR-II

Subject Code: BARC1- 753

L S T P C

0 0 0 0 1

UNI. EXAM. DURATION : NO EXAM (INTERNAL VIVA VOCE)

OBJECTIVES

The main aim is to explore, study, analyse and understand the contemporary / traditional / historical architectural characteristics and details of areas, places, buildings in different parts of India and abroad. The duration of tour shall be up to 08 days.

GENERAL GUIDELINES FOR THE TEACHER

Study of building materials and details through sketches and photographs to be made as an individual student activity and is to be submitted in a report form. Study of concepts/ construction techniques and architectural characters for different sites/ buildings visited to be submitted in groups of students. Viva voce of individual student for both the submissions will be conducted by the teacher in-charge, who accompanied the tour, as part of the internal assessment.

NOTE:

The Evaluation shall be done on the work done by the students in the form of handmade Sketches and Report of the Tour.

PERSONALITY DEVELOPMENT

Subject Code: BARC1-754

L S T P C

1 0 0 0 1

UNI. EXAM. DURATION: NO EXAM (INTERNAL VIVA VOCE ONLY)

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential.

EXPECTED OUTCOME: Student shall be able to convey his/her ideas through oral/ visual presentations

CONTENTS

1. Self-analysis SWOT
2. Time management
3. Creative chain story telling
4. Vocabulary games
5. Attitude assessment
6. Goal Setting
7. Problem Solving
8. Motivation
9. Article review
10. Team building exercise
11. Critical Thinking
12. Event Management
13. Business situation handling
14. Leadership Qualities
15. Reviews
16. Public Speaking/Presentation

METHODOLOGY

The entire program is designed in such a way that every student will participate in the class room activities. The activities shall be planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

NOTE:

The students should be evaluated through various assignments prepared and related to the following:

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Covey Sean, 'Seven Habits of Highly Effective Teens', Fireside Publishers, New York, 1998.
2. Carnegie Dale, 'How to Win Friends and Influence People', Simon & Schuster, New York, 1998.
3. Thomas A. Harris, 'I am ok, You are ok', Harper and Row, New York, 1972
4. Daniel Coleman, 'Emotional Intelligence', Bantam Book, 2006.
5. D.K. Kansal, 'Holistic Personality Development', Sports & Spiritual Science Publication, New Delhi, 2011.
6. S. Vivekananda, 'Personality Development', Advaita Ashrama Publications, Kolkata, India, 2007.

7. Nirali Prakashan, 'Communication Skills & Personality Development'.

LIGHTING AND ILLUMINATION

Subject Code: BARC1- 761

L S T P C

1 0 1 0 2

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To introduce methods of determining qualitative & quantitative lighting requirements both for interiors and exteriors

EXPECTED OUTCOME: Teaching of the subject shall help students to understand the importance and role of Lighting and its uses in various architectural projects.

CONTENTS

Unit- I

- Basic anatomy and functions of the eye. Adjustments made by the eye, Age-related defects and their design implications.
- Visual arc, Visual acuity, resolution angle, Contrast, Colour Contrast, Colour Adaptation, Visual performance and its relationship to Contrast, Size of task and Illuminance. Central and peripheral vision.
- Photometric terms used in the lighting industry and their interrelationship. Measurement of these terms.
- Colour Specification with Munsel and CIE system, Additive and Subtractive colour mixing.

Unit-II

- Lamp Properties; Effect of voltage & Temperature fluctuation on functioning of lamps, lamp cost, Lumen Loss, Lamp photo metrics, etc. Brief history of lamps.
- Lamps – Incandescent, Discharge sources. High intensity discharge sources. Fiber optics, Induction Lamps, LED lamps. Recent developments in lamp technology.
- Luminaire properties like intensity distribution for ceiling luminaires & floodlights, LOR, ULOR, DLOR, IP rating, Glare control methods, Aesthetics and applications.

Unit- III

- Quantitative lighting design of a simple space manually using lumen methods. Lighting design-using computers.
- Design principles used for lighting of various types of internal spaces. Design principles used for lighting of various external situations.
- Day lighting, Importance and method to calculate illumination due to daylight using daylight factor, day lighting practices. Integration with electric lighting.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. R. Barry, 'Building Services', John Wiley and Sons Ltd., **1998**.
2. 'Time Saver Standards – Building Service', McGraw- Hill, New York, **2001**.
3. National Building Code, **2005**.
4. Edward, 'Lighting Design'.

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).

DISASTER MANAGEMENT FOR BUILDINGS

Subject Code: BARC1-762

**L S T P C
1 0 1 0 2**

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: The course would focus on natural and man-made hazards, Disasters Reduction and Management.

EXPECTED OUTCOMES: To make the students understand the various Pre and Post-disaster design and management measures to make buildings safe against Earthquakes.

CONTENTS

Unit –I

- Disasters: Introduction, Typologies, Causes, Effects and prevention.
- Pre- disaster and Post- disaster management- problems, issues and options
- Disaster mitigation, Need, importance and strategies
- Role of Architects and Planners in creating Safe Buildings/Cities

Unit-II

- Earthquake: Causes, Effects, Problems & design issues
- General Principles of designing RCC & Masonry buildings against Earthquake
- Special construction techniques to make buildings safe against Earthquake
- Study of Earthquake Zones in India-- features and Design/ construction requirements

Unit –III

- Introduction, Causes, Effects of Fire, Floods, Cyclones, Landslide, Tsunami, Avalanche etc.
- General requirements, principles and measures for making safe building design against Fire, Floods, Cyclones, Landslide, Tsunami Avalanche, etc.
- Special Technique for constructing safe buildings for above mentioned disasters

RECOMMENDED TEXT AND REFERENCE BOOKS

1. H.N. Srivastava & G.D. Gupta, 'Management of Natural Disasters in Developing Countries', Daya Publishing House, New Delhi, 2006.
2. Lusted, Marcia Amidon, 'Natural Disasters', ABDO Publishing Company, U.S.A., 2011.
3. Roxanna Mcdonald; Introduction to Man-made and Natural Disasters and Their Effects on Buildings, Taylor & Francis, 2003.
4. Ramroth, William G. Jr.; Planning for Disaster – How Natural & Man-made Disasters Shape The Built Environment; Kaplan Publishing, USA, 2007.
5. Donovan, Jenny; Designing to Heal: Planning and Urban Designing Response to Disaster and Conflict; CSIRO Publishing, Australia, 2013.
6. Pauw, C. De & Lauritzen, E.K.; Disaster Planning, Structural Assessment, Demolition and Recycling, Taylor & Francis, UK, 2005.

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).

PRACTICAL TRAINING

Subject Code: BARC1- 855

L S T P C

0 0 0 0 20

UNI. EXAM. DURATION : NO EXAM (VIVA VOCE BY EXTERNAL JURY)

COURSE PREREQUISITES: The student should have knowledge of designing, drafting and detailing.

COURSE OBJECTIVES: To make student learn the intricacies of Architectural Profession by joining and working with practicing Architects/Architectural firms for one complete semester.

EXPECTED OUTCOMES: Practical Training Programme shall help students to understand the practical approach of towards designing of buildings.

CONTENTS

Practical Training Manual:

- The total marks shall be suitably apportioned to assess on regular basis the monthly reports, office work and work done outside office hours.
- Students are required to send/ submit monthly progress reports of work done by them in the office in which they are working according to a prescribed schedule. These reports shall be assessed/ marked regularly by the Practical Training Coordinator (PTC).
- On the conclusion of training, the work done by the student shall be examined and evaluated through a viva- voce to be conducted jointly by the HOD, PTC and External Jury (min. 2 members), who will be appointed by the University.

Work to be done by the student:

During training, students are required to do two distinct types of work in order to make optimum utilization of the period of training.

1. Work to be done during office hours:

- The work to be done during office hours will include:
 - Drafting, Tracing, Sketch designs, Presentation drawing, Perspectives, Models, documentation etc.
 - Working Drawing and details

2. Work to be done during extra - office hours:

- The work to be done during extra - office hours will include:
 - Preparing a study report on Building design, Analysis incorporating Site visits, recording Observations etc.

Distribution of Marks

1. Internal Assessment: (40 Marks)

Internal Assessment shall consist of periodical reports as given below:

- Joining Report and Monthly Progress reports (5 nos.)

2. University Examination (60 Marks)

University examination shall consist of Final Viva-Voce on the best of their training work including:

• **Building Study Report (30 marks)**

This includes a building design analysis for a study report which the students are required to do in extra office hours. The study should comprise of multifaceted aspects of any building or a complex in the final stage of construction.

This shall put under following heads:

- Design Concept
- Space Usage
- Circulation

- Climate responsiveness
- Façade Treatment & Architectural Expression
- Built in Furniture
- Services
- Construction Techniques
- Materials used etc.
- Conclusions

Format for the Building Study Report should be:

- Size of report – A4, Portrait format
- No. of Pages – 40-60 approx.
- Color of Page - White or light colored
- Mode of Presentation - Hand written or Typed in Times New Roman, Headings – 14, Body Text – 12, line spacing 1.5; margin 4 cm on left and 2.5 cm on the other sides.
- **Prints (30 marks)**

The number of prints to be submitted should be 15 to 20. The prints should cover the important projects done during the training.

NOTE:

1. Each print will be accepted for evaluation only if signed by the trainee in the appropriate column, and duly attested by the employer.
2. Evaluation is to be done through viva voce by external jury comprising of two examiners appointed by the University at college level.

INSTRUCTIONS TO THE PRACTICAL TRAINING COORDINATOR

Based on the above guidelines a detailed program shall be drawn each year by the Practical Training Coordinator, which shall be approved by the HOD before it is implemented. The intention will be to update the program on regular basis, incorporating new details, with focus on making continuous qualitative improvement of the practical training.

ARCHITECTURAL DESIGN – VII

Subject Code: BARC1-956

L S T P C

2 4 0 4 8

UNI. EXAM. DURATION: NO EXAM (VIVA VOCE BY EXTERNAL JURY ON PORTFOLIO)

COURSE PREREQUISITES: The student should have the knowledge of Design fundamentals and spatial organisation.

COURSE OBJECTIVES: To make students aware and understand the complexity and methodology to handle large projects involving urban environment and prevailing building regulations.

EXPECTED OUTCOMES: Student shall be able to understand and appreciate the concept of Planning and other allied services required in the large scale building.

CONTENTS

The design problems will include Public Buildings with diverse activities involving:

- **Urban Design Studio** dealing with issues such as campus planning/designing buildings in Historic context, related to urban development and renewal/design or ecologically sensitive control. This project will be dealt in two parts:
 - (a) Study of an existing urban environment to identify its typical characteristics and problems.
 - (b) Design solution to issues/problems identified above.
- **Campus designing** - University, Professional Institutes, Integrated Campus etc.

- **Capital Complex**-Secretariat, High Court, Assembly.

TEACHING METHODOLOGY

Minimum Two projects should be done by the student. The Projects selected should be based on realistic contexts.

- Library and Proto type Studies
- Site analysis and site planning
- Space planning
- Design development and volumetric studies (model)
- Preliminary design and volumetric study.
- Final design with detailed volumetric study and visual communications (3D Visualizations)

The design submitted shall include complete project drawings, perspective, models and details. Teaching focus will be to promote design concept based on Site, Urban design, Landscaping, Traffic and Transportation, Climate, Energy, Services, Safety and compliance with Building Regulations etc. All buildings should have accessibility to the physically challenged persons

NOTE: External marks shall be awarded through viva- voce conducted by the External Jury appointed by the University of the Work done by the student during the semester.

Special lectures to be conducted on urban morphology and issues of urban renewal, as well as social & economic aspects of housing in urban areas. Concerned specialists to be involved in each of the two studio exercises.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Ching, Frank Francis D.K., 'Architecture: Form, Space & Order', John Wiley, Hoboken, 2007.
2. V.S. Parmar, 'Design Fundamentals', Somaiya Publisher Pvt. Ltd, Mumbai, 1997.
3. Scott Van Dyke, 'Form, Line to Design', Van Nostrand Reinhold, 1990.
4. R. Scott, 'Design Fundamentals', Robert E. Krieger Publishing Company E & OE-Architects Hand Book and Planning.
5. Donald Watson, Michael J. Crosbie, 'Time Saver Standard', 8th Edn.
6. Neufert, Ernst; 'Architect's Data', 3rd Edn., Wiley-Blackwell, U.K., 2002.
7. 'National Building Code of India', Bureau of Indian Standards, New Delhi, 2005.

RESEARCH METHODS & DISSERTATION WRITING

Subject Code: **BARC1-957**

L S T P C

1 1 0 2 3

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: To enable the student to analyze and evaluate architectural projects etc. and also understand architectural research with special emphasis on India.

EXPECTED OUTCOMES: The student shall be able to analyze and write reports on architectural projects.

CONTENTS

Unit -I

- **Introduction:** An introduction to architectural evaluation in general and definition, purpose, scope and its applications to Architecture, fine arts literature etc.
- **Techniques:** Techniques of analysis and evaluation employed in buildings, projects competitions etc. methods of appraisal / evaluation of building complexes and exhibitions.

Unit - II

- **Appraisal / evaluation:** Value of appraisal / evaluation reports and reviews in the field of architecture fine-arts, literature, their scope and merits.
- **Report and review writing:** Techniques of report and review writing, their application to architectural publications.

Unit –III

- **Architectural Research:** An introduction to Architectural Research in general and in profession, its purpose and scope. Architectural research in India from earliest time to the present era. Research methods, evaluation of results and its application.

TEACHING METHODOLOGY

Students are expected to complete sufficient number of projects related to this course, with regular critical remarks and assessment from the teacher and peer students, during the semester. Group Discussions between the students must be given due credit.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Lean Van Schaik, 'Research in Architecture by Architects'.
2. Eugene Raskin, 'Architecture and People'.
3. Attoe Wayne, 'Architecture and Critical Imaginations'.
4. Collin Peters, 'Architecture Judgement'.

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).

URBAN DESIGN

Subject Code: BARC1- 958

L S T P C

1 0 0 2 2

COURSE PREREQUISITES: No Prerequisites

COURSE OBJECTIVES: To create awareness and promote understanding of the nature, role and importance of Urban Design in the making of quality Built Environment and Human Settlements

EXPECTED OUTCOMES: Teaching of the subject shall help students to understand the importance and role of Urban Design in the Historical and Modern Context.

CONTENTS

Unit-I

- Introduction, Role, Scope and Importance of **Urban Design**
- Distinction between **Urban Design, Architecture and Town Planning**
- **Elements of Urban Design-** Pattern, Grains, Texture, Density etc, their role and importance.
- **Determinants of Urban Form** – Landform, Climate, Symbolism, Activity Pattern,
- Socio-cultural Factors, Materials, Techniques etc. and their role and importance.
- **Imagability** - Elements their role and importance including Paths, Nodes, Landmarks, Edges, Districts etc.
- **Designing Cities-** Role and importance of Communication, Utilities, Landscape
- Features, Transport, Visual Expression, Size, Contrast, Urban Character etc.

Unit- II

- **Shapes of the Cities-** Comparative advantages and Disadvantages

- **Urban Spaces**-Typology including Street, Square, Precinct, Piazza, Mall etc
- **Urban Spaces**- Elements, identification, characteristics and role in shaping the spaces
- Changing Role, Importance and Pattern of **Urban Spaces** in historical perspective-
- **Greek, Romans, Medieval and Contemporary cities.**
- **Design Principles** involving Scale and Enclosures

Unit-III

- **Development Controls**- Role and Importance in Urban Design.
- **Urban Design study of selected Capital Cities**- Chandigarh, Delhi, Jaipur, Raipur & Gandhi Nagar
- **Design Concept of Sustainable & Green City in modern context**
- **Legal and Institutional framework** for Urban Design including Delhi Urban Art
- Commission- Objectives, Constitution, Role, Importance, Impact etc

TEACHING METHODOLOGY

- Emphasis shall be laid on understanding of evolution of Cities and Buildings.
- Continuous evaluation shall be made of student's work based on various assignments and sketching.
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits of historical and contemporary cities.
- Students would be required to do, in groups, a case study of a city to make them understand the various aspects of urban design.
- The study will be illustrated with maps, visuals, photographs and sketches.

GUIDELINES FOR 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).

RECOMMENDED BOOKS:

1. Spreiregan Paul D., 'Urban Design: The Architecture of Towns and Cities'.
2. Gallion Arthur B, 'The Urban Pattern: City Planning and Design'.
3. S.P. Gupta, 'The Chandigarh: An Overview'.
4. S.C. Agarwal, 'Architecture and Town Planning'.
5. 'Institute of Town Planner (India)', – Readers Volume.

LANDSCAPE DESIGN

Subject Code: **BARC1-963**

L S T P C

1 0 0 2 2

COURSE PREREQUISITE: Nil

COURSE OBJECTIVES: To enable the student to analyze and understand various landscape design projects, understand the concepts of Ecology, Site-structure relationship, and contemporary Landscape work in India.

EXPECTED OUTCOMES: The student shall be able to understand the process of Landscape Design and its application in Architectural Design solutions.

CONTENTS

Unit –I

- Introduction and historical backdrop of the evolution of landscape design as a process of interface between Man and Nature.
- Introduction to ecology and its importance to Landscape Designers.

- A brief history of gardens world over – and their relevance in their time, context and social needs.
- Advanced knowledge of basic elements of landscape such as earth, rock, water and vegetation, in the context of their environmental aspects and concerns.

Unit II

- Site analysis and site- structure unity.
- Environmental Impact Assessment techniques.
- National environmental policy and Bio-diversity significance in urban areas.
- Basic knowledge of contour/mapping and various methods of documentation of physical features, topography and landscape elements.

Unit –III

- Contemporary landscape design work/projects in India.
- Case studies of varied urban situations with typical different landscape characters in and around Chandigarh region to analyze and assess their present landscape status by applying knowledge and techniques acquired as above.

NOTE:

- Landscape Design proposal based on above-mentioned analysis as a studio exercise.
- Related expert lectures/workshops should be organized.

TEACHING METHODOLOGY

Students are expected to complete sufficient number of projects related to this course, with regular critical remarks and assessment from the teacher and peer students, during the semester. Group Discussions between the students must be given due credit.

RECOMMENDED REFERENCE AND TEXT BOOKS:

1. Reid Grant W., 'Landscape Graphics'.
2. Littlewood Michael, 'Landscape Detailing'.
3. Harris and Dines, 'Time Saver Standard for Landscape Architecture'- Plants of India.
4. Tony Russel & Catherine Cutler, 'Trees- An Illustrated Identifier and Encyclopedia'.
5. Simonds, 'Landscape Architecture'.
6. Laurie Michael, 'Introduction to Landscape Architecture'.
7. Watts Rajnish/Dhillon Harjit/Chhattar Singh, 'Trees of Chandigarh'.
8. Krishan Pradip, 'Trees of Delhi'.
9. D.K. Bose, S.P. Sharma, B. Chaudhary, 'Tropical garden plants in colors'.
10. M.S. Randhawa, 'Flowering Trees and Shrubs of India'.
11. M.S. Randhawa, 'Beautifying India'.

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 MAINTENANCE

Subject Code: BARC1-964

L S T P C
2 0 0 0 2

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: Students should know the role of maintenance in buildings

EXPECTED OUTCOMES: The students shall be able to understand the Role and importance of the building maintenance in built environment.

CONTENTS

Unit-I

- Maintenance- Introduction, Need, Scope, Importance & Role of an Architect.
- Maintenance-Economic and Social significance
- Distress in structures
- Causes of distress, defects and decay
- Role of climatic elements
- Classification of maintenance works

Unit – II

- Various defects in Buildings (Masonry, Load bearing and Framed structure) from foundation to parapet level including services
- Diagnostic Techniques

Unit – III

- Prevention measures/Defects due to poor design and construction
- Treatment methods/Repair materials
- Retrofitting

NOTE: Teaching will be a combination of Case studies and field visits to buildings in deteriorating conditions.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. A.C. Panchdhari, 'Maintenance of buildings', New Age International (P) Limited, Publishers, New Delhi, 2003.
2. 'Maintenance Manual of CPWD', Director General (Works) CPWD, Nirman Bhawan, New Delhi, 2003.
3. R. Chudley, 'The Maintenance and Adaptation of Buildings', Longman Technical Services, London, 1981.
4. W.H. Ransom 'Building Failures: Diagnosis and Avoidance', E. & F.N. Spon, London, 1987.
5. A.C. Panchdhari, 'Water & Sanitary Installation', New Age International (P) Limited, Publishers, New Delhi, 2005.
6. Hutchinson, Barton and Ellis, 'Maintenance & Repair of Buildings', Butterworth & Co. (Publishers) Ltd., UK, 1975.
8. P.S. Gahlot and Sanjay Sharma, 'Building Repair and Maintenance Management'.

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).

LOW COST BUILDING DESIGN AND CONSTRUCTION

Subject Code: BARC1-965

**L S T P C
1 0 2 0 3**

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: To make the student aware of the use of conventional and non-conventional resources for low-cost construction

EXPECTED OUTCOMES: The student shall be able to understand the Low Cost Building Techniques in architecture.

CONTENTS

Unit –I

- An introduction to the building designs adopted in different climatic zones of the country, resulting in varied vernacular expressions.
- Use of cost- effective technologies by using local materials, up gradation of traditional technologies, prefabrication etc.

Unit II

- Need for low cost construction in rural and urban sectors
- Innovations of building techniques for low cost construction.
- Analysis of space norms for low cost buildings.

Unit –III

- Study of usage pattern of low cost buildings adopted by the habitants.
- Comparative analysis of building materials and costing.
- Achieving Economy through Planning & Design.

TEACHING METHODOLOGY

Teaching in this subject shall be a combination of Expert lectures from architects practicing/having experience in designing buildings in hill areas. The students should visit any hill settlement.

RECOMMENDED REFERENCE AND TEXT BOOKS:

1. Timothy J. Waite, 'Cost-Effective Home Building: A Design and Construction Handbook', Nahb Research Center.
2. A.K. Lal, 'Handbook of Low Cost Housing'.
3. Gautam Bhatia, 'Laurie Baker- Life, Works and Writing'.

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).

SIKH ARCHITECTURE

Subject Code: BARC1-966

L S T P C

1 0 2 0 3

COURSE PREREQUISITES: The student should have the knowledge of terminology and contents of Sikh architecture as studied in the course of History of Architecture-III.

COURSE OBJECTIVES:

- To understand the development of Sikh Architecture in Historical, Religious, social and environmental context
- To understand the secular buildings related to Sikh rulers such as Forts, palaces, institutions and their landscape elements

EXPECTED OUTCOMES: The student shall be able to understand the development of Sikh architecture in the form of Gurdwaras, Forts and Palaces in various regions of Punjab.

CONTENTS

Unit –I

- Evolution of Sacred Sikh Architecture – Salient features of a Gurdwara
- Varieties of Arches, Domes, Capitals and other building elements
- Building examples: Golden Temple, Amritsar, 5 Takhts of Sikhism and other historical Gurdwaras of India

Unit –II

- Forts, Palaces, Institutions and Landscape elements developed under Sikh rulers in prominent cities like Amritsar, Patiala, Nabha, Kapurthala, Gobindgarh, Anandpur Sahib

Unit –III

- Contemporary examples of Sikh Gurdwaras built in late 20th and 21st Century
- Study of design of Khalsa Heritage Memorial complex at Anandpur Sahib

TEACHING METHODOLOGY

Teaching in this subject should be a combination of Lectures and visits to few prominent Historical Gurdwaras, Forts and palaces of the region.

RECOMMENDED REFERENCE AND TEXT BOOKS:

1. Arshi, Pardeep Singh, 'Sikh Architecture in the Punjab', Intellectual Pub. House, 1986.
2. Mehar Singh, 'Sikh Shrines in India', Publications Division, Government of India, New Delhi, 1974.
3. Madanjit Kaur, 'The Golden Temple: Past and Present, Amritsar', **1983.**
4. Brown, Percy, 'Indian Architecture (Islamic Period)', 5th Edn., Bombay, **1965.**
5. V.N. Datta, 'Amritsar: Past and Present. Amritsar', **1967.**
6. Edwardes, Michael, 'Indian Temples and Palaces', London, 1969.
7. Darshan Singh, 'The Sikh Art and Architecture', Department of Guru Nanak Sikh Studies, Panjab University, 1987.
8. W.G. Archer, 'Paintings of the Sikhs', London, 1966.
9. Kanwarjit Singh Kang, 'Mural Paintings in the Nineteenth Century, Punjab', Ph.D. Thesis, Panjab University, Chandigarh, 1978.

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).

ARCHITECTURE MODEL MAKING

Subject Code: BARCI- 967

L S T P C

1 0 2 0 3

UNI. EXAM. DURATION : NO EXAM (VIVA VOCE BY EXTERNAL EXAMINER)

COURSE PRE REQUISITES: The student should have studied Model Making-I (BARCI-108).

COURSE OBJECTIVES: The teaching of this subject shall help the students to learn different materials used in models.

COURSE OUTCOMES: The student shall be able to prepare models of Architectural projects and develop their own preferred technique for the same.

CONTENTS

Unit –I

Study and practice of various methods and materials used in the preparation of models for the following purposes:

- a) Quick study models for developing a design idea.
- b) Block models for study and development of site plans and layouts.
- c) Presentation models of single building or group of buildings.

Unit-II

- a) Detailed models showing various features of architectural design such as doors, windows, projections, structures etc.
- b) Detailed models of buildings, with removable roof-tops, showing interior layout, furniture, fittings etc.

Unit-III

- a) Detailed models of site plans showing:

- roads
- contours
- landscape elements
- lamp-posts
- human figures etc

TEACHING METHODOLOGY

- Students should be shown the work and techniques of professional model makers through slides as well as site visits.
- Models should be made of existing buildings/complexes as well as design projects. More emphasis should be laid on the demonstration and practice of various skills/methods/techniques/systems rather their theoretical aspect.

NOTE: Evaluation shall be done through viva- voce conducted by the External Examiner appointed by the University of the Work done by the student during the semester.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. 'Architectural Model Making', Nick Dum Laurence King Publishing, 2010.
2. Megan Werner, 'Model Making', Princeton Architectural Press, 2011.

VERNACULAR ARCHITECTURE

Subject Code: BARC1- 968

L S T P C
1 0 2 0 3

COURSE PRE REQUISITES: Students should have the knowledge of elements of vernacular/rural architecture of state of Punjab, Himachal Pradesh, Jammu & Kashmir, Rajasthan with respect to climatic conditions.

COURSE OBJECTIVES: To understand the importance of the instinctive attitude of vernacular design and embody the sustainable and creative aspect in contemporary design.

EXPECTED OUTCOMES:

- The student shall be able to understand basic vernacular settlement development as per the contents of syllabus.
- Students shall be able to acquaint themselves with the various vernacular settlements in different parts of India as well as abroad.

CONTENTS

Unit- I

- **Vernacular Architecture-** Meaning, Role, Importance & basic Theories.
- **Determinants of Vernacular Architecture-** Role and importance of social, cultural, political, economic, climatic, technological factors.

Unit- II

- **Vernacular Architecture in the Plains of Northern India:** Building typologies, construction materials and techniques, architectural elements and art forms, functional and aesthetic aspects of vernacular dwellings and the settlement pattern in the plains of Punjab and Rajasthan.

- **Vernacular Architecture in the Hills of Northern India:** Building typologies, construction materials and techniques, architectural elements and art forms, functional and aesthetic aspects of vernacular dwellings and the settlement pattern in the Hills of Northern India.

Unit- III

- Relevance and interpretation of vernacular architecture in today's context. Approach and works of architects Laurie Baker, Hassan Fathy.
- Settlement pattern, building material/ technology and socio-economic structure in a village of Punjab, Study and analysis of spatial organization, building material/technology, public places, housing, aesthetics of a village in Punjab.
- **Illustrated Case studies** - Vernacular settlements/Building typology from various regions in India and abroad.

RECOMMENDED REFERENCE AND TEXT BOOKS:

1. Langenbach, Randolph & Yang, Minja, 'Don't Tear It Down! Preserving the Earthquake Resistant Vernacular Architecture of Kashmir', Oinfoin Media, 2009.
2. Schoenauer, Norbert, '6000 Thousand Years of Housing', W.W. Norton, New York, 2000.
3. Thomas Carter, Elizabeth Collins Cromle, 'Invitation to Vernacular Architecture: A Guide to the Study of Ordinary Buildings and Landscapes', University of Tennessee Press, 2005.
4. Oliver, Paul, 'Dwellings: The Vernacular House World Wide', Phaidon Press, 2003.
5. Sanjay Udumale, 'Architecture for Kutch', English Edition, Mumbai, 2003.
6. L. Asquith, Lindsay Asquith (Editor), Marcel Vellinga (Editor), 'Vernacular Architecture in the 21st Century: Theory, Education and Practice', Taylor & Francis Group, UK, 2006.
7. Oliver, Paul, 'Built to Needs', Architectural Press, 2006.
8. Kulbushan Jain & Meenakshi Jain, 'Architecture of the Indian Desert', Aadi Centre, Ahmedabad, 2000.
9. Oliver, Paul, 'Encyclopedia of Vernacular Architecture of the World', Cambridge University Press, 1997.
10. Pramari, V.S. Haveli, 'Wooden Houses & Mansions of Gujarat', Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
11. G.H.R. Tillotsum, 'The Tradition of Indian Architecture - Continuity & Controversy – Change since 1850', Oxford University Press.
12. Kagal, Carmen, 'Vistara – The Architecture of India', The Festival of India, 1986.
13. Rappoport, Amos, 'House, Form & Culture', Prentice Hall Inc, University of Michigan, 1989.
14. James Steele, 'Fathy- Architectural Monographs', St. Martin's Press, 1988.
15. Gautam Bhatia, Laurie Baker, 'Life, Work, Writings, New Delhi, India', Penguin Books, 1994, ISBN 0-14-015460-4.

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).

ARCHITECTURAL DESIGN -IX (THESIS PROJECT)

Subject Code: BARC1- X59

**L S T P C
10 0 0 10 15**

Uni. Exam. Duration: NO EXAM (Viva Voce by External Jury)

COURSE PREREQUISITES: Students should have knowledge about design development and other intricacies of complete project

COURSE OBJECTIVES: To make student synthesis and use knowledge of various disciplines gained during entire study in an architectural project of his choice.

EXPECTED OUTCOMES: Students should be able to handle projects of any scale independently.

CONTENTS

Thesis project will comprise of the following:

- An Illustrated Report-which will include the validity and scope of the chosen project, methodology, prototype studies, site analysis, client's and architect's briefs, delineation of programme and design criteria.
- A fully worked-out Design Proposal-including consideration of site planning, structure, services, and any other aspect/specific to the project.

A. Stages of Work:

1. Approval of Project:

- The intent of the thesis project as well as the criteria for selection of the project will be introduced to the students around the 10th week of the previous semester, i.e. 9th Semester B.Arch.
- Before the closing of the 9th Semester, students will be required to submit brief write-up on three projects out of which one will be approved.

2. Rough Report comprising of all analytical aspects of the project including Synopsis, Library studies, Prototype studies, Site analysis, Delineation of Building Program, etc.

3. Evolution of Design: Shall be worked out in minimum of four stages. Viva Voce shall be conducted by the external examiners for each stage.

4. Final Report including Evolution of Design, Final Report, Drawings and Model, to be evaluated by jury comprising of H.O.D, Thesis Co-ordinator, External examiners (min. two) and Thesis Guide through a University Examination.

NOTE:

- Students will be required to submit two identical copies of the final report along with a soft copy, on a standard format prescribed in the thesis programme issued by the Thesis Coordinator.
- The report must also include A-3 size copies of all final drawings and at least two photographs of the final model/models.
- The original copy of the report, the final drawings and models will be returned to the student after the declaration of the result. The photocopy along with the soft copy of the report and drawings will be retained for reference in the college library.

B. SCHEDULE OF SUBMISSIONS/EXAMINATION

(Note: Commencement of the semester is considered as 0 week)

Stages of Work		Time allocated
1.	Sessional Work	
(a)	<u>Rough Report</u>	
	i) Introduction & topic finalization	1 week
	ii) Synopsis	2 weeks

	iii)	Preliminary Library studies	2 weeks
	iv)	Site analysis, Prototypes additional library studies	2 weeks

(b)	<u>Evolution of Design</u>		
	i)	Design Criteria and Concept	2 weeks
	ii)	Design Proposal Stage-I	2 weeks
	iii)	Design Proposal Stage-2 (incorporating structures & services)	2 weeks
	iv)	Pre-final Design	2 weeks
(c)	<u>Draft Final report</u> (Incorporating improvements suggested in Rough Report, Design Criteria and explanatory sketches of Evolution of Design).		1 week
2.	External Examination		4 weeks

NOTE:

- Students are required to submit the Final Report, all final drawings and model/s in the standard format prescribed in the Thesis Programme.
- Submission will be made one day before the date of examination.

D. Teaching and Evaluation System:

1. The thesis studio will be conducted under the overall coordination of the Thesis Coordinator. Each student will be assigned a Thesis Guide (from amongst the faculty) who will supervise the progress of the student's work on a regular basis.
2. The H.O.D, the Thesis Coordinator and the concerned Thesis Guide will do approval of the thesis project/topic.
3.
 - i. All stages of sessional work will be evaluated jointly by the H.O.D., External examiner/s, Thesis Coordinator and the concerned Thesis Guide.
 - ii. Jury for the External Examination will comprise the H.O.D, Thesis Coordinator, the concerned Thesis Guide and two External Examiners appointed by the University.
 - iii. Marks awarded at each stage will be based on the average of those awarded by all jury members. The decision of the H.O.D. will be final in case of dispute/discrepancy.
 - iv. Students will be required to attend weekly reviews for their sessional and attendance.
 - v. In view of the practical and creative nature of the thesis projects, the presence of the candidate at the viva voce examinations at all the prescribed stages shall be mandatory. If candidate fails to appear in the viva voce examination at any stage, the thesis project submitted by him/her shall not be accepted.
 - vi. Candidate who fails to clear the thesis examination either in the periodic assessment or in the final examination can only be allowed to reappear with the regular batch of thesis students in the next academic year.

ENERGY EFFICIENT BUILDINGS AND BUILDING AUTOMATION

Subject Code: BARC1-X69

L S T P C

1 0 2 0 3

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES:

- After successful completion of this course, student should be able to understand global issues related to the use and consumption of fossil fuel energy and applications of renewable and nonrenewable energy resources, provide efficient lighting systems, design passive architecture and evaluate overall performance improvement of buildings.

- Understand Building automation and the issues related to the control system in a building.
- EXPECTED OUTCOMES:** The student shall be able to comprehend issues and concerns related to Energy efficient building design and its automation.

CONTENTS

Unit –I

- **Energy Sources:** Introduction to renewable & non- renewable energy sources
- **Global Scenario:** Global availability of renewable & non- renewable energy sources
- **Energy Consumption in various building typologies:** Analysis of energy consumption in terms of energy load through heating/ cooling/ventilation/ lighting & other loads

Unit-II

- **Energy efficient measures:** Study of different energy-efficient principles of a building and their various application techniques in different climatic zones prevailing in India including solar active and passive features.

Unit –III

- Introduction to Building automation in general and understanding the issues related to the control system in a building.
- Basic concept of computerized control systems, network designed to monitor and control various systems for lighting, ventilation, alarms & security, communication, etc.
- Issues related to illumination and lighting. Systems to allow / control Natural light. Aperture/openings and shading devices control systems based on automated systems.
- Issues related to ventilation air handling with automated systems of control of apertures and artificial ventilation-air conditioning.
- Issues related to systems of communication (mechanical systems),

NOTE: The students have to take individual or group design projects dealing with at least one or more than one of the above studied technique/s.

RECOMMENDED REFERENCE AND TEXT BOOKS:

1. Seymour Jarmal, 'The Architects Guide to Energy Conservation'.
2. R.G. Stein, 'Architecture and Energy'.
3. David Anink, Chiel Boonstra, John Mak, 'Handbook of Sustainable Building'.
4. Peter F. Smith, 'Eco- refurbishment'.
5. Arvind Krishan, Simos Yanas, Nick Baker, S.V. Szokolay, 'Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings', Edn., Tata McGraw Hill, 2001
6. Roy McAlister, 'The Solar Hydrogen Civilization', American Hydrogen Association, 2003.
7. Reinhold A. Carlson, Robert A. Di Giandomenico, 'Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs)'.
8. 'Building Automation: Control Devices and Applications', In Partnership with NJATC, 2008.
9. 'Building Control Systems, Applications Guide (CIBSE Guide)', The CIBSE, 2000.
10. McGowan, McGowan, J. John, 'Building Automation Online'.
11. John E. Traister, 'Security/Fire Alarm Systems: Design, Installation, and Maintenance'. **1995.**

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 ECONOMICS

Subject Code: BARC1-X70

L S T P C
2 0 2 0 4

Duration: 24 Weeks

COURSE PREREQUISITES: Students to have knowledge and understanding of the building anatomy and its context in Architecture

COURSE OBJECTIVES: To make students understand and appreciate the role and importance of economy in the built environment

EXPECTED OUTCOMES: Students to have skill and capability to design cost effective buildings

Unit-I

- Building Economics-Introduction, Definition, Role, Scope, Importance and Principles
- Cost of Building- Components and their impact on Cost
- Cost of Building- Typologies including Life Cycle Cost, Construction Cost, Maintenance
- Cost Management- Aims, Objectives, Need, Principles, Procedure, Cost Analysis.

Unit-II

- Cost Reduction -Using Site Planning and Architectural Design
- Cost Reduction –Using Specification, Space optimization and Structural Innovations
- Space Norms- Role, importance, Principles involved in defining Space Norms with special reference to National Building Code.
- Cost Analysis- Low Rise and High Rise Buildings

Unit-III

- Technology – Role, Importance, Use in making buildings cost- effective
- Building Technologies – Typologies including Modular construction, Pre- Engineered Buildings etc. their merits and demerits
- Mass Production and Standardization- Need, Principles, Role and Importance in promoting cost effectiveness
- Materials- Role, Importance, Analysis, Innovation/ up-gradation in making buildings cost- effective
- Construction Techniques- Principles involved, Impact on building cost with specific reference to few innovative techniques with comparative merits and Demerits

RECOMMENDED TEXT AND REFERENCE BOOKS

1. TERI, 'Sustainable Buildings- Design Manual', Vol- I & II.
2. National Building Code, 2005.
3. A.K. Lal 'Hand book of Low Cost of Housing', New Age Publishers.
4. 'Readers Volume on Housing' – Institute of Town Planners, India.
5. 'Report of Govt. of India on Housing Shortage'.
6. Journal of IIA, 2013.

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).

ARCHITECTURAL JOURNALISM

Subject Code: BARC1- X71

**L S T P C
1 0 2 0 2**

COURSE PREREQUISITES: No Prerequisites.

COURSE OBJECTIVES:

- To develop the skill of students who have an inclination towards writing
- To enable the students to record, report, analyze and Evaluate architecture in its Theoretical and Practical form.

EXPECTED OUTCOMES: Teaching of the subject shall help students to Record, Report, Analyse and Evaluate an architectural project.

CONTENTS

Unit-I

- Introduction of Journalism in general
- Theories of journalism, Techniques and processes
- Contemporary Architectural journalism, Digital Journalism, Architecture, Arts and Journalism / Media

Unit- II

- Phrasing and summarizing a given report
- Editing given material
- Writing original reports on design projects
- Writing Editorials for Magazines and Journals
- Reporting activities like seminars, Panel discussions, Conferences etc.
- Thesis or Research Report writing
- Writing Captions for Pictures, Programmes and Events
- Organizing material for publication in Newspapers, magazines etc.

Unit-III

TEACHING METHODOLOGY

- The students should be exposed to the work of professional Art and Architecture critics/journalists.
- Various forms of architectural journalism should be studied from Architecture Magazines.
- Report writing should be presented to a panel to be chaired by the teacher for Discussion, criticism and consequential changes.

RECOMMENDED BOOKS:

1. Joseph Wilkes, 'Encyclopedia of Architecture, Design, Engineering & Construction', John Wiley & Sons, New York, 1988.
2. 'Architectural Press, U.S.,' vol.1.
3. 'Criticism, Architectural', vol. 2.
4. 'The Architecture Critic; A Survey of Newspaper Architecture Critics in America. New York', Columbia University, 2001.
5. Bender, Thomas, 'Architecture and the Journalism of Ideas'.
6. Morrone, Francis, 'Do Architecture Critics Matter?'.
7. Ockman, Joan, 'Current Criticism', The Architect's Newspaper issue 19.
8. Majd Musa, 'Architectural Criticism and Journalism', **2007.**

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).

HILL ARCHITECTURE

Subject Code: BARC1-X72

L S T P C

1 0 2 0 3

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: The objective of this course is to impart a comprehensive knowledge of historical aspects and present day concerns related to Hill Architecture.

EXPECTED OUTCOMES: The student shall be able to comprehend issues and concerns related to hill architecture.

CONTENTS

Unit –I

- Historical perspective of hill architecture and its unique attributes and concerns.
- Major hill settlements in various regions of the world.
- A broad view of traditional hill architecture of medieval European settlements and other places.

Unit -II

- Traditional hill settlements of India.
- An overview of vernacular hill architecture of Himachal Pradesh.
- Building types, techniques and materials of vernacular architecture of Himachal Pradesh.
- Lessons from vernacular architecture and their time tested indigenous technology.

Unit –III

- Modern buildings on the hills in India.
- Constraints of climate, topography and availability of materials.
- Design factors such as access, circulation and gradients.
- Structural aspects of modern buildings and necessary safeguards.
- Environmental and ecological concerns and safeguards.

TEACHING METHODOLOGY

Teaching in this subject shall be a combination of Expert lectures from architects practicing/having experience in designing buildings in hill areas. The students should visit any hill settlement.

RECOMMENDED REFERENCE AND TEXT BOOKS:

1. Oliver, Paul, 'Built to Needs', Architectural Press, 2006.
2. Oliver, Paul, 'Encyclopedia of Vernacular Architecture of the World', Cambridge University Press, 1997.
3. Oliver, Paul, 'Dwellings: The Vernacular House World Wide', Phaidon Press, 2003.
4. Jay Thakkar, 'Matra: Ways of measuring built form of Himachal Pardesh', CEPT University.

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).

SUSTAINABLE ARCHITECTURE

Subject Code: BARC1-X73

**L S T P C
1 0 2 0 3**

COURSE PREREQUISITES: Nil

COURSE OBJECTIVES: The course would focus on Sustainable Issues, Concept & design Strategies to be followed.

EXPECTED OUTCOMES: To make the students understand about Principles and Concepts of Sustainable Architecture for the built environment.

CONTENTS

Unit – I

INTRODUCTION

1. Sustainable Development - Introduction, definitions, objectives and scope
2. Man & Environment - Introduction, issues and options
3. Human settlements - Planning, Growth, Development, Problems
4. Global warming - Introduction, Causes, Effects and Remedies, Carbon Credits.
5. Sustainable Design - Concept, Objectives, Principles, Approach to Sustainable Design
6. Architect - Role in Sustainable Development.

Unit – II

ISSUES IN SUSTAINABLE DEVELOPMENT

- Energy - Role, Importance in buildings
- Sources of Energy- Non-renewable and renewable – Role and Importance
- Site (Topography / Air – Condition / Surrounding)
- Sustainable Materials – Production and use
- Quality of indoor/outdoor environment

Unit – III

Concept & Design strategies in Sustainable Development

- Built Environment- Sustainable Construction, Ecological Buildings, Green Building
- Building Rating System
- ECBC Code
- Sustainability Assessment - LEED, Life Cycle Assessment, GRIHA
- Climate responsive and Solar Passive Strategies in Indian Climates
- Recycling/Reuse
- India's approach to sustainable Development.

RECOMMENDED TEXT AND REFERENCE BOOKS

1. Koensberger, Ingersoll, Mayhew, Szokolay, 'Manual of Tropical Housing & Building, 1974.
2. C.P. Kukreja, 'Tropical Architecture', Tata McGraw-Hill Publishing Company, 1978.
3. Martin Evans, 'Housing, Climate & Comfort', Architectural Press, 1980.
4. Georg Lippsmeier, 'Building in the Tropics', Callwey Verlag, Munchen, 1980.
5. Gideon S. Golany, 'Design for Arid Regions', Van Nostrand Reinhold, New York, 1983.
6. B. Givoni, 'Man, Climate & Architecture', Von Nostrand Reinhold Company, New York, 1981.
7. 'Reserch Notes on Climate', C.B.R.I, Roorkee.
8. Krishan A, Baker, 'Climate Responsive Architecture', McGraw-Hill Education (Asia) Co. and China Architecture & Building Press, 2004/2005.
9. 'Energy Efficient Buildings in India', TERI.

INSTRUCTIONS TO THE PAPER SETTER

1. One compulsory question is 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).

ARCHITECTURAL CONSERVATION

Subject Code: BARC1-X74

L S T P C

1 0 2 0 3

COURSE PREREQUISITES: The student should have studied vernacular Architecture and history of Architecture.

COURSE OBJECTIVES: To promote understanding and importance of the Historical buildings and their Preservation and conservation.

EXPECTED OUTCOMES: Student shall be able to understand the principle, objective, role of conservation and prepare the methodology to execute the conservation work.

CONTENTS

Unit-I

- Heritage- Introduction, Definition, Role, Importance, Scope and Limitations
- Study of basic historical styles in Indian Architecture.
- Study of ornamentation and detailing in historical buildings in various styles.
- Study of construction methods and structural analysis of various historical building styles e.g. Arches Domes, Vaults and Shikharas etc.

Unit-II

- Study of finishes in historical buildings.
- Effects of weathering/ pollution on historical buildings.
- Study of landscaping style/ Plantation around historical buildings.
- Knowledge of plantation/ water features in Mughal Garden and Hindu Temples.

Unit-III

- Methods of studying and documenting historical monuments in the context of guidelines issued by UNESCO, INTACH.
- Methods of saving monuments from vandalism.
- Institutional framework to protect Heritage
- **Role of Historic Building/Area/City in Present Context:**

Understanding Historic City/complex by doing a study of its Heritage Components, various aspects for spatial Planning, the role of conservation and relevance of historic buildings/areas in present context.

TEACHING METHODOLOGY

- Emphasis shall be laid on understanding of Architectural Conservation. Continuous evaluation shall be made of student's work based on various assignments and sketching.
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits of historical and contemporary buildings/complexes.
- Students would be required to do, in groups, a case study of a historical building to make them understand the various aspects of Architectural Conservation. The study will be illustrated with maps, visuals, photographs and sketches.

RECOMMENDED REFERENCE BOOKS:

1. Oliver Paul, 'Encyclopaedia of Vernacular Architecture of world'.

2. Jay Thakkar, 'Matra: Ways of measuring Built form of Himachal Pradesh', CEPT University.
3. Bernard M. Feilden, 'Conservation of Historic Buildings', 3rd Edn., Architectural Press, **2003**.
4. Latham, Derek, 'Creative Re-use of Buildings', Donhead, **2007**.
5. A.G.K. Menon & B.K. Thapar, 'Historic Towns and Heritage Zones', INTACH.
6. 'International Charters for Conservation and Restoration', ICOMOS.
7. Yogeshwar K. Parajuli, 'Bhaktapur Development Project – Experience in Preservation and Restoration in a Medieval Town', **1974-85**.
8. Divay Gupta, 'Identification and Documentation of Built Heritage in India', INTACH, **2007**.
9. Petruccioli, Attilio, 'After Amnesia – Learning from The Islamic Mediterranean Urban Fabric', ICAR, **2009**.

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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).

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