

**RIMT UNIVERSITY MANDIGOBINDGARH  
PUNJAB**



**RIMT  
UNIVERSITY**



**STUDY SCHEME & SYLLABUS**  
For  
**B.ARCHITECTURE**  
(FIRST to TENTH Semester)  
education for life

**Program Code: BAR**

**Syllabus Applicable For Admission in 2018**

# TABLE OF CONTENTS

S No.	Content	Page No.
1	<b>Section 1:</b> Vision and Mission of the University	--
2	<b>Section 2:</b> Vision and Mission of the Department	--
3	<b>Section 3:</b> About the Program	--
4	<b>Section 4:</b> Program Educational Objectives (PEOs) , Program Outcomes (POs) and Program Specific Outcomes (PSOs)	--
5	<b>Section 5:</b> Curriculum / Scheme with Examination Scheme	--
6	<b>Section 6:</b> Detailed Syllabus with Course Outcomes	--



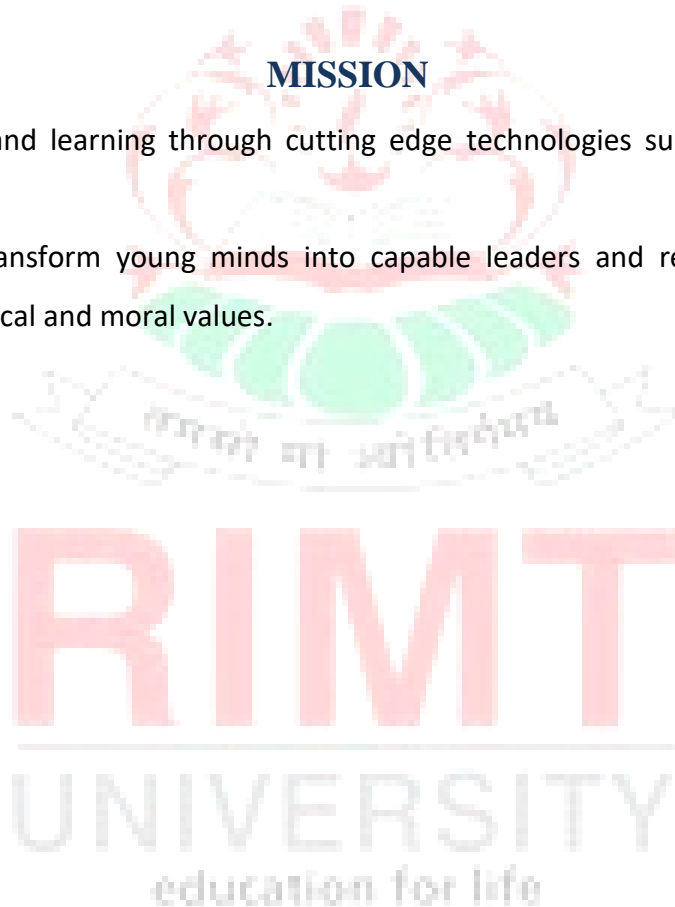
## Vision & Mission of the University

### VISION

To become one of the most preferred learning places a center of excellence to promote and nurture future leaders who would facilitate in desired change in the society.

### MISSION

- M1: To impart teaching and learning through cutting edge technologies supported by the world class infrastructure.
- M2: To empower and transform young minds into capable leaders and responsible citizens of India instilled with high ethical and moral values.



## **Vision and Mission of the Department**

### **VISION**

To contribute to the society through excellence in scientific and technical education and research. To contribute the country by providing globally competent Architects capable of working in an interdisciplinary environment which foster spirits of innovation, entrepreneurship and leadership. To support industry for growth, being the valuable resource for them, and remain a role model for others in the field of Architecture.

### **MISSION**

M1: To provide a high-quality educational experience for undergraduate students that enables them to become leaders in their chosen professions and to make them globally competitive Architects.

M2: To create, explore, and develop innovations in Architecture through undergraduate and graduate research. To develop linkages with world class organizations and educational institutions in India and abroad for excellence in teaching, research and consultancy practices.



## About the Program

Architecture Department was established in 2004 with the inception of the institute to produce high quality Architects. The programme entails the designing and planning of residences, factories, office buildings, and other constructions. It requires a solid understanding of key concepts including building science. Architects apply these and other ideas in the design and analysis of a site.



## SECTION 4

# Program Educational Objectives (PEOs), Program Outcomes (POs) and Program Specific Outcomes (PSOs)

The PEOs are **broad statements** that describe the career and professional accomplishments that the program is preparing its graduates to achieve in two years subsequent to receiving the degree. The PEOs of the 'Bachelor of Architecture' program are as follows:

**PEO1** To prepare graduates for employment in the architectural profession at career-entry levels; leading to licensure as an architect.

**PEO2** To prepare graduates to continue their education in a postgraduate, Master of Architecture program.

**PEO3** To be able to work with, lead & engage big and small teams comprising diverse people in terms of gender, nationality, region, language, culture & beliefs. To understand stated and unstated differences of views, beliefs & customs in diverse & inter disciplinary team settings.

**PEO4** To be able to continuously learn and update one's knowledge, engage in lifelong learning habits and acquire latest knowledge to perform in current work settings.

**PEO5** To continuously strive for justice, ethics, equality, honesty, and integrity both in personal and professional pursuits. Able to understand and conduct in a way that is responsible and respectful.

**Programme Specific Objectives (PSOs)** are **specific statements** that describe the professional career accomplishments that the program is designed for. The PSOs of the 'Bachelor of Architecture' are as follows:

PSO1- Identify, analyze, design and develop solutions to Architectural design problems of practical importance to society.

PSO2- Our graduates will have incremental skills to enhance employability in Architecture and other allied professions.

PSO3- Demonstrate practices learned through internship and solve the problem using technical knowhow acquired and research.

**Programme Outcomes (POs)** are **attributes of the post-graduates** of the programme that are indicative of the graduates' ability and competence to work as a business professional upon post-graduation. Program Outcomes are statements that describe what students are expected to know or be able to do by the time of post-graduation. They must relate to knowledge and skills that the students acquire from the programme. The achievement of all outcomes indicates that the student is well prepared to achieve the program educational objectives down the road. POs designed for 'Bachelor of Architecture' are as follows:

**PO1 Architectural Knowledge:** Acquire a wide range of Professional architectural knowledge which will help them to practice as an architect. Students will be equipped with gaining knowledge of architecture as well as allied fields like environmental science, landscape design, Photography, architectural writing which can be further enhanced by doing specialization.

**PO2 Problem Solving:** Through education, we emphasize the power of discovery and the foundation of critical and analytic thinking. We foster creativity, challenge the boundaries of knowledge and cultivate independence of mind through unique interdisciplinary partnerships. Ours is a proud culture of innovation, collaboration and discovery that has transformational impact on the society.

**PO3 Design development:** Systematic exploration of architectural design through sequential development in the complexity of design issues. Systematically Integration of all other allied subjects at different levels depending upon the objectives to be achieved. Identify, formulate, precedent studies in form of case studies, literature study for analysis and inferences to reach conceptualization for particular design project. Considerations of climatic studies, sustainability, environmental issues, structural detailing, byelaws and norm etc. to develop a design solution. Holistic development of students in terms of Architectural design, required skills (communication skills, presentation skills, model making skills) and professional capabilities and discipline.

**PO4 Conduct Investigations:** RIMT College of architecture endeavours to integrate education, research and service so that each enriches and extends the others. This integration promotes academic excellence and nurtures innovation and scholarly development in our students. We are committed to overall academic excellence through exploration of diverse contexts and innovations through collaborative research. Use research-based knowledge and research methods including experiments, analysis and interpretation of data and synthesis of information to arrive at a conclusion. Respect for cultural and social diversities is linked to academic excellence. We hold ourselves to the highest standards of ethics, as a beacon for our community and the world.

**PO5 Use of Modern tool:** Application of appropriate techniques, resources and modern tools including prediction and modelling to derive at solutions, Use of various presentation techniques to explain the solutions.

**PO6 Socially Responsible Architects:** RIMT College of architecture advances knowledge, addresses pressing societal needs and creates an academic environment enriched through diverse perspectives where all individuals can flourish. We seek to serve society through our students by educating and passing on to students a renewable set of skills and commitment to social engagement being an architect.

**PO7 Environment and Sustainability:** Making students sensitive towards varied aspects of Built Environment. Understand impact of the professional architectural design solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

**PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the architectural professional practice.

**PO9 Individual and teamwork:** Function effectively as an individual and as member or leader in diverse teams and in multidisciplinary settings.

**PO10 Communication:** Communicate effectively on architectural issues with the architectural fraternity, community and society at large, able to write effective reports, design documentation, make effective presentations, give and receive instructions.

**PO11 Project management and Finance:** Demonstrate knowledge and understanding of architectural design management principles and apply these in individual work, as a member and leader in team, to manage projects and in multidisciplinary environment.

**PO12 Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

The following sections describe the requirements for earning a Post-graduate degree in Architecture and its breakdown in terms of University Core courses, Program Core courses and electives at both the University and the Program levels.





## SECTION 5

# Curriculum / Scheme with Examination Grading Scheme

### EXAMINATION GRADING SCHEME

Marks Percentage	Grade	Grade Point	Qualitative Meaning
80-100	O	10	Outstanding
70-79	A <sup>+</sup>	9	Excellent
60-69	A	8	Very Good
55-59	B <sup>+</sup>	7	Good
50-54	B	6	Above Average
45-49	C	5	Average
40-44	P	4	Fail
0-39	F	0	Fail
ABSENT	AB	0	Fail

Percentage Calculation: CGPA \*10

## B. ARCHITECTURE(1<sup>st</sup>YEAR)

1 <sup>ST</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC101	Architectural Design-I	1	0	2	4	150	150	300	6	6Hrs (Evaluation by External Viva -voce)
BARC102	Building Construction & Materials-I	1	0	2	2	100	100	200	4	4Hrs
BARC103	Visual Arts & Graphics-I	0	1	3	0	50	50	100	2	4Hrs
BARC104	Structures in Architecture-I	1	2	0	0	50	50	100	2	3Hrs
BARC105	History of Architecture-I	2	0	0	0	50	50	100	2	3Hrs
BARC106	Workshop	0	0	2	0	25	25	50	1	No Exam (Evaluation by External Viva -voce)
BARC107	Architectural Communication	2	0	0	0	50	50	100	2	3Hrs.
BARC108	Architectural Drawing-I	0	2	0	2	75	75	150	3	4Hrs
BARC109	Computer Applications	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
<b>TOTAL</b>	<b>Contact Hrs.=32</b>	<b>8</b>	<b>5</b>	<b>11</b>	<b>8</b>	<b>600</b>	<b>600</b>	<b>1200</b>	<b>24</b>	

2 <sup>ND</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC201	Architectural Design-II	1	0	2	4	150	150	300	6	6Hrs (Evaluation by External Viva -voce)
BARC202	Building Construction&Materials-II	1	0	2	2	100	100	200	4	4Hrs
BARC203	Visual Arts&Graphics-II	0	1	3	0	50	50	100	2	4Hrs
BARC204	Structures in Architecture-II	1	2	0	0	50	50	100	2	3Hrs
BARC205	History of Architecture-II	2	0	0	0	50	50	100	2	3Hrs
BARC206	Building Science-I	2	0	0	0	50	50	100	2	3Hrs
BARC207	Building Technology-I	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
BARC208	Architectural Drawing-II	0	2	0	2	75	75	150	3	4Hrs
BARC209	Parametric Architecture-I	0	0	2	0	50	0	50	1	No Exam (only internal Viva -voce)
<b>TOTAL</b>	<b>Contact Hrs.=32</b>	<b>8</b>	<b>5</b>	<b>11</b>	<b>8</b>	<b>625</b>	<b>575</b>	<b>1200</b>	<b>24</b>	

## B. ARCHITECTURE(2<sup>nd</sup> YEAR)

3 <sup>RD</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC301	Architectural Design-III	1	0	2	4	150	150	300	6	12Hrs (Evaluation by External Viva -voce)
BARC302	Building Construction & Materials-III	1	0	2	2	100	100	200	4	4Hrs
BARC303	Computer Graphic Skills-I	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
BARC304	Structures in Architecture-III	1	2	0	0	50	50	100	2	3Hrs
BARC305	History of Architecture-III	2	0	0	0	50	50	100	2	3Hrs
BARC306	Building Science-II	2	0	0	0	50	50	100	2	3Hrs
BARC307	Building Technology-II	2	0	0	0	50	50	100	2	3Hrs
BARC308	Architectural Drawing-III	0	2	0	2	75	75	150	3	4Hrs
BARC309	Parametric Architecture-II	0	0	2	0	50	0	50	1	No Exam (only internal Viva -voce)
<b>TOTAL</b>	<b>Contact Hrs.=30</b>	<b>10</b>	<b>4</b>	<b>8</b>	<b>8</b>	<b>625</b>	<b>575</b>	<b>1200</b>	<b>24</b>	

4 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC401	Architectural Design-IV	1	0	2	4	150	150	300	6	12Hrs (Evaluation by External Viva - voce)
BARC402	Building Construction&Materials-IV	1	0	2	2	100	100	200	4	4Hrs
BARC403	Computer Graphic Skills-II	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva - voce)
BARC404	Structures in Architecture-IV	1	2	0	0	50	50	100	2	3Hrs
BARC405	History of Architecture-IV	2	0	0	0	50	50	100	2	3Hrs
BARC406	Building Science-III	2	0	0	0	50	50	100	2	3Hrs
BARC407	Building Technology-III	2	0	0	0	50	50	100	2	3Hrs
BARC408	Measured Drawing	0	2	0	2	75	75	150	3	No Exam (Evaluation by External Viva - voce)
BARC409	Parametric Architecture-III	0	0	2	0	50	0	50	1	No Exam (only internal Viva - voce)
<b>TOTAL</b>	<b>Contact Hrs.=30</b>	<b>10</b>	<b>4</b>	<b>8</b>	<b>8</b>	<b>625</b>	<b>575</b>	<b>1200</b>	<b>24</b>	

## B. ARCHITECTURE (3<sup>rd</sup> YEAR)

5 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC501	Architectural Design-V	1	0	4	3	150	150	300	6	18Hrs (Evaluation by External Viva -voce)
BARC502	Building Construction & Materials-V	1	0	2	2	100	100	200	4	4Hrs
BARC503	Computer Graphic Skills-III	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
BARC504	Structures in Architecture-V	1	2	0	0	50	50	100	2	3Hrs
BARC505	History of Architecture-V	2	0	0	0	50	50	100	2	3Hrs
BARC506	Building Science-IV	2	0	0	0	50	50	100	2	3Hrs
BARC507	Building Technology-IV	2	0	0	0	50	50	100	2	3Hrs
BARC508	Working Drawing	0	2	0	2	75	75	150	3	No Exam (Evaluation by External Viva -voce)
BARC509	Parametric Architecture-IV	0	0	2	0	50	0	50	1	No Exam (only internal Viva -voce)
<b>TOTAL</b>	<b>Contact Hrs.=31</b>	<b>10</b>	<b>4</b>	<b>10</b>	<b>7</b>	<b>625</b>	<b>575</b>	<b>1200</b>	<b>24</b>	

6 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC601	Architectural Design-VI	1	0	4	3	150	150	300	6	18Hrs (Evaluation by External Viva -voce)
BARC602	Building Construction & Materials-VI	1	0	2	2	100	100	200	4	4Hrs
BARC603	Computer Graphic Skills-IV	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
BARC604	Structures in Architecture-VI	1	2	0	0	50	50	100	2	3Hrs
BARC605	History of Architecture-VI	2	0	0	0	50	50	100	2	3Hrs
BARC606	Urban & Regional Planning	2	0	0	0	50	50	100	2	3Hrs
BARC607	Building Technology-V	2	0	0	0	50	50	100	2	3Hrs
BARC608	Building Byelaws	2	0	0	0	50	50	100	2	3Hrs
BARC609	Parametric Architecture-V	0	0	2	0	50	0	50	1	No Exam (only internal Viva -voce)
<b>TOTAL</b>	<b>Contact Hrs.=29</b>	<b>12</b>	<b>2</b>	<b>10</b>	<b>5</b>	<b>600</b>	<b>550</b>	<b>1150</b>	<b>23</b>	

## B. ARCHITECTURE (4<sup>th</sup>YEAR)

7 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC701	Architectural Design-VII	1	0	4	3	150	150	300	6	18Hrs (Evaluation by External Viva -voce)
BARC702	Building Construction & Materials-VII	1	0	2	2	100	100	200	4	4Hrs
BARC703	Computer Graphic Skills-V	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
BARC704	Estimating & Costing	1	2	0	0	50	50	100	2	3Hrs
BARC705	Interior Design	2	0	0	0	50	50	100	2	3Hrs
BARC706	Urban Design	2	0	0	0	50	50	100	2	3Hrs
BARC707	Model Making	1	0	2	0	50	50	100	2	No Exam (Evaluation by External Viva -voce)
BARC708	Disaster Management	2	0	0	0	50	50	100	2	3Hrs
BARC709	Parametric Architecture-VI	1	0	2	0	100	0	100	2	No Exam (only Internal Viva -voce)
<b>TOTAL</b>	<b>Contact Hrs.=31</b>	<b>12</b>	<b>2</b>	<b>12</b>	<b>5</b>	<b>650</b>	<b>550</b>	<b>1200</b>	<b>24</b>	

8 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC801	Practical Training (of24weeksDuration)	-	-	-	-	540	360	900	18	No Exam (Evaluation by External Viva -voce)
BARC802	Project Report	-	-	-	-	120	80	200	4	No Exam (Evaluation by External Viva -voce)
<b>TOTAL</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>660</b>	<b>440</b>	<b>1100</b>	<b>22</b>	

## B. ARCHITECTURE (5<sup>th</sup>YEAR)

9 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC901	Architectural Design-VIII	2	0	2	7	250	250	500	10	No Exam (Evaluation by External Viva - voce)
BARC902	Research Methodology	2	0	0	0	50	50	100	2	3Hrs
BARC903	Construction Management	1	2	0	0	50	50	100	2	3Hrs
BARC904	Contemporary Theories in Architecture	2	0	0	0	50	50	100	2	3Hrs
BARC905	Professional Practice	2	0	0	0	50	50	100	2	3Hrs
BARC906 A/B	Elective I Product Design/ Furniture-design	1	0	2	0	50	50	100	2	3Hrs
BARC907 A/B/C	Elective II Housing/ Traffic & Transport Planning/ Town Planning	1	0	2	0	50	50	100	2	3Hrs
BARC908 A/B	Elective III Sikh Architecture/ Hill Architecture	2	0	0	0	50	50	100	2	3Hrs
<b>TOTAL</b>	<b>Contact Hrs.=28</b>	<b>13</b>	<b>2</b>	<b>6</b>	<b>7</b>	<b>600</b>	<b>600</b>	<b>1200</b>	<b>24</b>	

10 <sup>TH</sup> SEMESTER		Hrs.				Marks			Credits	External Exam Remarks/ Duration
Subject Code	Subject Name	L	T	P	S	Int	Ext	Total		
BARC1001	Architectural Design-IX (Thesis Project)	4	0	4	12	450	450	900	18	No Exam (External Viva by Jury)
BARC1002 A/B	Elective I Real estate Management/ Architectural Journalism	2	0	0	0	50	50	100	2	3Hrs
BARC1003 A/B	Elective II Building Maintenance/ Architectural Conservation	2	0	0	0	50	50	100	2	3Hrs
BARC1004 A/B	Elective III Energy Efficient Buildings and Building Automation/ Advanced Construction & Materials	2	0	0	0	50	50	100	2	3Hrs
<b>TOTAL</b>	<b>Contact Hrs.=26</b>	<b>10</b>	<b>0</b>	<b>4</b>	<b>12</b>	<b>600</b>	<b>600</b>	<b>1200</b>	<b>24</b>	

B. ARCH. SEMESTER-I					BARC 101			ARCHITECTURAL DESIGN - I		
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Examination</b>		<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>6 Hours</b>		<b>6</b>
<b>1</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>(Evaluation by External Viva - voce)</b>		

**Objectives:** - To make the students familiar with the Mental and Visual 3D perception. The students will develop skills to identify and utilize simple geometric shapes for various 2D and 3D compositions.

**Methodology:-** Orientation about the profession with the help of Audio/Video presentation, Studio Lecture & individual/Group studio exercises.

Unit	Hours/Periods	Contents
I.	14	Elements of Design: It will include understanding role of the following basic elements like Point, Lines, Planes, Patterns, Shapes, Forms, Spaces, Color, and Texture.
II.	28	Principles of Design: It will include understanding and using basic principles like Repetition, Rhythm, Symmetry, Unity, Harmony, Balance Contrast etc. Synthesis of observations in design of an architectural form with a specific function. Exercise may include design like 2D Composition, Mural.
III.	28	Design of public service zone: Any One - Exhibition stall /Milk Booth/ Snack Bar /Security Check Post /Kiosk/Gardener's Hut / Roundabout Design Plaza Design including Soft-scape, Hard-scape, Furniture, Water body & small structure etc.
IV.	14	Anthropometric Application Study of human dimensions and proportions as applied to designing spaces with furniture layout. Human dimensions: Anthropometrics in design including provisions for the physically challenged. Idea of human scale and proportion.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC101.1	Students will be able to understand basic form and elements of Architectural Design.
BARC101.2	Orientation towards development of 2D & 3D composition by understanding the basic principles of design and utilize simple geometric shapes.
BARC101.3	Design the public service zone through detailed measured drawings & sketches.
BARC101.4	Design the space with furniture layout by understanding & learning the proportion of human body parts, activities.

**Reference / Textbooks:**

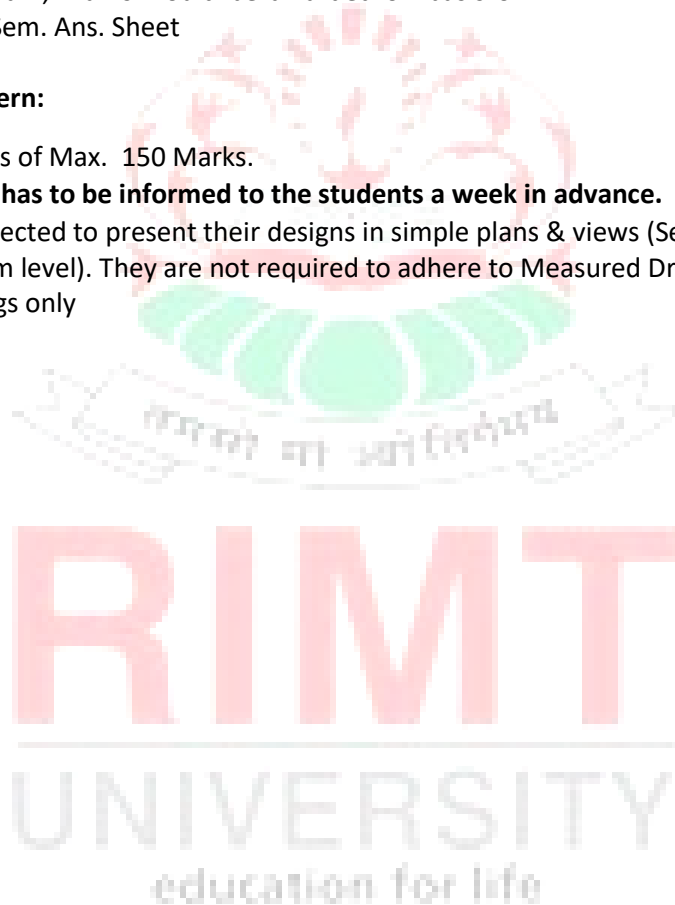
- Times Saver Standard for Architectural Design Data- John Hancock Callender
- Francis D.K. Ching, ' Architecture Form, Space and Order', Van Nostrand Reinhold Company, New York, 1979.
- V.S. Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt.Ltd., New Delhi, 1973.
- Structure in Nature- Strategy for Design – Peter Pearce
- Interior design-Ahmed A kasu

**Guidelines to teacher: -**

1. Case study and library study should be conducted as and when required.
2. Provision for physically challenged persons should be incorporated in design solutions.
3. Exercises to be taken up to emphasis the significance of the user in the process of design.
4. For end semester exam, marks would be awarded on basis of EXTERNAL VIVA-VOCE of both the Design Portfolio & the End-Sem. Ans. Sheet

**University examination pattern:**

- The Question Paper is of Max. 150 Marks.
- **The Design Problem has to be informed to the students a week in advance.**
- The students are expected to present their designs in simple plans & views (Sections & Elevations are not compulsory at 1st Sem level). They are not required to adhere to Measured Drawings; i.e.; they will make presentation drawings only





B. ARCH. SEMESTER-I					BARC102			BUILDING CONSTRUCTION & MATERIALS -I	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	4
1	0	2	2	5	100	100	200		

**Objectives:** - To familiarize the properties of brick and stones as building materials

**Methodology:** -

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	15	Mud: Stabilization and use for walling and terracing. Types of Mud Bricks
II.	15	Introduction to Brick, Composition and properties of brick, manufacturing of various types of bricks. Brick Bonds – English Flemish (Single and Double) Rat Trap
III.	15	Wall Junctions (English & Flemish bonds): L, Tee, & Cross Junctions; Construction of brick jaalis
IV.	15	Stones – Building stones, types, properties of good stone, natural bed, Dressing, Laying and Bonding in Stone Masonry (a) Random Rubble, (b) Coursed Rubble, (c) Ashlar

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC102.1	To introduce students to primary building materials and simple construction techniques as applicable to a low-rise building-three to four storied contemporary building. Also, to introduce students to primary building materials for contemporary building.
BARC102.2	To educate the students with construction details of various components of a small single storied building & to educate the students with application techniques of the material.
BARC102.3	The students will apply the construction techniques involved in masonry work with different materials like brick, stone and composite materials in different locations like T- junctions, independent piers and corner junctions.
BARC102.4	Students will understand the importance of various bonds through brick models and the assembling of these brick models in the form of courses and bonds. The subject will also introduce spread and stepped foundations in a building and their construction techniques. Students will understand the importance building material t be used in construction

**Reference / Textbooks:**

- R Barry, Building Construction, East West Press, New Delhi, 1999.
- Sushil Kumar, Building Construction
- Don A. Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- W.B. McKay, 'Building Construction', Vol.1, 2, 3, Longmans, U.K. 1981.
- R. Chudley, 'Building Construction Handbook', British Library Cataloguing in publication data, London, 1990.

**General guidelines for the teacher:**

- To introduce the students to primary building materials and their applications in building construction.
- To cultivate personal observation and self-learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.
- The paper will be set by the external expert.
- The external experts for both the above activities will be two separate individuals.
- For end semester exam, marks would be awarded on basis of EXTERNAL VIVA-VOCE **and the evaluation of the End-Sem. Ans. Sheet by the External expert.**

**University Examination Pattern:**

The Question Paper is of Max. 100 Marks.

- Part A -10 short type questions of 4 Marks, covering entire syllabus.
- Part B -4 Questions of 15 marks each to be attempted out of a total of 8 questions set from all the four units.
- The answer sheets will be marked on the basis of external viva-voce.



B. ARCH. SEMESTER –I					BARC103			VISUAL ARTS & GRAPHICS-I	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	2
0	1	3	0	4	50	50	100		

**Objectives:** Familiarization with principles and theories in graphics and architectural composition vis the development of art in Pencil.

**Methodology:**

- Studio assignments and lectures.
- Representation of 3D Geometrical objects on sheets.
- Exercises in 3-D with simple blocks, composition of basic geometrical forms etc.

Unit	Hours/Periods	Contents
I.	12	<ul style="list-style-type: none"> <li>• Pencil as an effective presentation tool.</li> <li>• Free hand line work, compositions and patterns with different strokes/grades in pencil.</li> </ul>
II.	12	<ul style="list-style-type: none"> <li>• Calligraphy-lettering, writing styles, developing Architectural hand.</li> <li>• Exercises in graffiti/ posters/ murals etc.</li> <li>• Logo compositions</li> <li>• Cover page designing for various printed materials</li> </ul>
III.	12	<ul style="list-style-type: none"> <li>• Understanding Architectural Connotations in freehand sketching</li> <li>• Representing 2-D drawings of simple landscape features in pencil. Vis-crowns of trees, shapes of trees, textures of grass, rocks, tiles, cladding materials.</li> <li>• Depicting scale with the use of human figures in the sketches</li> </ul>
IV.	12	<ul style="list-style-type: none"> <li>• Effect of light and shade &amp; textures on simple geometrical solids-shapes and forms; human figures, trees and vehicles</li> <li>• Outdoor sketching of simple building forms.</li> <li>• Sketches of scenes and activities from memory involving public spaces like markets, festivals, recreational spaces</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC103.1	Control over the pencil & technical pen's strokes. Able to draw freehand for quickly present an idea in a graphical form to non-technical peoples. it is a universal language; Architects use to communicate with other participants of a project.
BARC103.2	Understand the Graffiti, Poster, Mural, Logo, Composition & Calligraphy writing for developing Architectural hand.
BARC103.3	To understand the fundamentals of design as a basic creative activity, & the basics of architectural aesthetics. Representation 2D drawing of simple landscape features. Get awareness to produce creative thoughts that remain logical. Also get understanding Architectural Connotation in freehand sketching.
BARC103.4	A Comprehensive knowledge & understanding of the shading pattern of the object. light, exposure & color & their application in architecture. Also get understanding of outdoor free hand sketching which helps the architects to gain knowledge of insight & inspiration to express their observation, thoughts & feelings. Sketching of public spaces from memory stimulates creativity.

**Textbooks:**

1. Sketching-Pratap Mulick
2. Rendering with pen & ink-Gill Robert W.

**Reference Books:**

- Hand building Techniques – Joaquim Chavarria.
- Drawing with Pencil & Pastels-Hazel Harrison

**Guidelines for the teachers:**

- Knowledge of techniques of pencil rendering and their applications.
- Site visits to Art Exhibitions & tri-city colleges, museums shall be conducted.
- Teacher shall impart training in observation measurement & sketching at the site.
- The paper will be set by the external expert.

**University Examination Pattern**

- The Question Paper is of maximum 50 marks.
- 3 questions of 25 marks each out of which 2 must be attempted.



B.ARCH. SEMESTER-I					BARC104			STRUCTURES IN ARCHITECTURE - I	
Scheme of Teaching					Scheme of Examination = Marks			Duration of Examination	Credits
L	T	P	S	Total	Internal	External	Total	3 Hours	2
1	2	0	0	3	50	50	100		

**Objectives:**

Behavior of materials and basic structural systems

**Methodology:**

Through class lectures, Presentations, site visits, case studies and making models & testing them. Study of behavior of structures through models and testing them for given load

Unit	Hours/Periods	Contents
I.	9	Cellular System
II.	9	Bulk Active Structure
III.	9	Concept of direct force mechanism in structure, tension & compression. Equilibrium of force and resolution of force. Study of Moments, Moments of forces, Moments of couples.
IV.	9	Introduction to type of Load & Supports Determination of centre of gravity, Moment of Inertia of square, Rectangle & I shaped cross-section

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC104.1	Student should have knowledge of domes design.
BARC104.2	Students have knowledge of Polygonal Cellular Systems leading to evolution of Geodesic Domes
BARC104.3	Students have knowledge of structural analysis of any building structure.
BARC104.4	Form active Structures. – Tensile structures

**Textbooks:**

1. Structure and Design by G G Schierle, PhD, FAIA
2. Structures by Harbhajan Singh

**Reference Books:**

1. Structure in Architecture - Mario Salvadori
2. Building Structure Primer - James E Ambrose
3. Structures - Schodeck
4. Structural Concepts and Systems for Architecture & Engineers - T. Y. Lin.
5. Elements of Structure – Morgan

**General guidelines for the teacher:**

- To introduce the students to the global building environment and the inherent design features
- Students will learn through models & case studies of structural systems.
- The paper will be set by the external expert.

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER-I					BARC105			HISTORY OF ARCHITECTURE -I	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam.	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** Understanding the early cultures in the periods from 3500BCE to 400BCE in context of location, climate as well as the socio-economic, historical, and cultural influences of the time.

**Methodology:** Visually intensive lectures using power point presentations to acquaint the students with historic sites and buildings. Site studies, seminar presentations and model making to be inculcated in the course.

Unit.	Hours/Periods	Contents	
I.	6	3500-2500 BCE	<ul style="list-style-type: none"> <li>• Beginning of Chinese Civilization,</li> <li>• Early Mesopotamian &amp; Indus settlements,</li> <li>• Pre-dynastic Egypt &amp; European developments.</li> </ul>
II.	6	2500-1500 BCE	<ul style="list-style-type: none"> <li>• Harappa &amp; Mohenjo-Daro in Indus Valley</li> <li>• Mesopotamian Ziggurat at Ur</li> <li>• Egyptian pyramids at Giza</li> <li>• Stonehenge at England</li> </ul>
III.	6	1500-0800 BCE	<ul style="list-style-type: none"> <li>• Egyptian temple Architecture at Karnak</li> <li>• The Greek city of Mycenae</li> <li>• Mississippi cultures at Mexico</li> </ul>
IV.	6	0800-0400 BCE	<ul style="list-style-type: none"> <li>• Ritual complex of Chinese Zhou dynasty</li> <li>• The rise of Varanasi</li> <li>• Iron Age &amp; Etruscan's Arch</li> <li>• The Summer palace &amp; Hanging Gardens of Babylon</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC105.1	The student will be able to understand impact of different civilizations during 3500-2500 BCE
BARC105.2	The student will be able to understand the development of type of Architecture during 2500-1500 BCE
BARC105.3	The student will be able to understand the temple Architecture between 1500-0800 BCE
BARC105.4	The student will be able to understand the influence different dynasties.

**Reference / Textbooks:**

- Francis D. K. Ching , Mark M. Jarzombek , Vikramaditya Prakash . A Global History of Architecture 3rd Edition
- Brown, Percy, Indian Architecture (Buddhist and Hindu Periods)
- Fletcher, Banister Sir, History of Architecture
- Grover, Satish, Buddhist and Hindu Architecture in India
- Hiraskar G K, The Great Ages of World Architecture
- Merklinger, Elisabeth S., Sultanate Architecture of Pre-Mughal India- Eastern Book Company

**Guidelines for the teachers:**

The study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc.

**University examination pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B. ARCH. SEMESTER –I					BARC106			WORKSHOP	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva –voce )	1
0	0	2	0	2	25	25	50		

**Objectives:** - To train the students in basic skills of carpentry & Scrap Models.

**Methodology:** Through demonstrations and live workshops under the guidance of expert model makers.

Unit	Hours/Periods	Contents
I.	6	Carpentry – Introduction to the use of different types of tools used in carpentry/ scrap modeling.
II.	6	Joints – Different types of joints, joinery details (which are commonly used in timber construction and interiors).
III.	6	Soap carving to create sculptural forms
IV.	6	Scaled live examples in construction courtyard- brick and stone masonry

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC106.1	Introducing students to different carpentry tools and their use, also polishing the skills to create the scrap models.
BARC106.2	Give the knowledge of different type of joints so that they can apply in their professional practice
BARC106.3	Get awareness to produce creative thoughts to create the different forms, sculpture through soap carving
BARC106.4	Introduction to the basics of building construction through live construction in brick and stone masonry

**Reference Books:**

1. Dr. S.P Bindra Arora, Textbooks on Building Construction Don A. Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
2. Sushil Kumar Building Construction

**University Examination Pattern**

- The External jury will be of 25 Marks, i.e. 15 marks for the portfolio/projects submitted & 10 marks for the final Viva.
- Viva will be conducted in the workshop so as to assess the students' familiarity with the tools, their applications and usage in model making.

B. ARCH. SEMESTER-I					BARC107			ARCHITECTURAL COMMUNICATIONS	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	3Hours.	2
2	0	0	0	2	50	50	100		

**Objectives:** - To Introduce students in a graded manner to the vocabulary of Architecture.

**Methodology:** - Lectures & exercises

Unit	Hours/Periods	Contents
I.	6	<ul style="list-style-type: none"> <li>Agreement of verb and subject, articles, prepositions, punctuation, change of voice, narration, common errors in English.</li> <li>Vocabulary of Architecture,</li> <li>Effective speaking, practice in speaking fluently</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>Writing pertaining to events/activities.</li> <li>Paper presentation</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Technical composition (e.g., reports, papers essays) writing. Writing reports on Design projects/complexes</li> <li>Presenting architectural concepts and proposals with the help of text, images, slides, video, photographs, models etc.</li> </ul>
IV.	6	<ul style="list-style-type: none"> <li>Article reviews, Presentations and Seminars to be done in individual and group work on selected themes.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC107.1	The course intends to build the required communication skills of the students having limited communicative abilities, so that they may communicate effectively in real-life situations
BARC107.2	This will help the students to equip themselves for better performance in all subjects that require verbal communication and written explanations.
BARC107.3	Introduce basis language skills for oral professional communication that enables effective conversation in the classroom and courteous but forceful participation in conferences and seminars, both as audience and for diverse audiences.

Note: -

- Students are expected to read from short and long writings about architecture and communicate their comprehension in writing and discussions /presentation in class.
- It is suggested that texts from the following authors be used to build up a body of knowledge about architecture. E.g., Vitruvius, Andrea Palladio, John Ruskin, Louis Sullivan, Adolf Loos, Le Corbusier, writings from the Bauhaus, Peter Blake, Philip Johnson, Charles Jencks, Robert Venturi, Adrian Forty, Christopher Alexander, Leon Krier, Kevin Lynch, Rem Koolhaas, Bjark Engels, Charles Correa, Romi Khosla.

**Text /Reference Books: -**

- Effective technical communication – M.ashraf rizvi , McGraw Hill.
- Professional communication skills by Prof. Bhagwat S Goyal, Ms Vineeta Tyagi, publisher-Srijan Prakashan Ghaziabad.
- Bikram K. Das, Kalyani Samantray, Rath Nayak. **An Introduction to Professional English and Soft Skills.** New Delhi: Cambridge University Press, 2009.
- Wren, Martin & NDV Prasada Rao. **High School English Grammar and Composition.** Delhi: S. Chand Publishing, 1995
- F.T. Wood. **A Remedial English Grammar for Foreign Students.** Delhi: Macmillan, 2010.
- Berry Thomas Elliott. **The Most Common Mistakes in English Usage.** New Delhi: Tata McGraw Hill Publishing Company, 1971.
- T.J. Fitikides. **Common Mistakes in English.** London: Orient Longman, 1984.
- R.C. Sharma & Krishna Mohan. **Business Correspondence and Report Writing.** 4<sup>th</sup> ed. New Delhi: Tata McGraw Hill, 2010.

**General guidelines for the teacher:**

- The students shall be exposed to works of professional art and architecture.
- Various forms of architectural journalism shall be studied from magazines and journals.

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER- I					BARC108			ARCHITECTURAL DRAWING- I	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	3
0	2	0	2	4	75	75	150		

**Objectives:** To give a basic knowledge of good drafting and lettering techniques

**Methodology:** Studio assignments & lectures. Demonstration of 3D geometrical objects & their 2d representation on sheet.

Unit	Hours/Periods	Contents
I.	15	<ul style="list-style-type: none"> <li>Drawing tools and Accessories: Introduction to the subject and drawing equipment. Setting of drawing equipment.</li> <li>Lettering (free hand &amp; block lettering).</li> <li>Scales &amp; its Use in the Architectural Drawing.</li> <li>Basic technical drawing: Concept and types of lines. Dimensioning and types of Lines.</li> <li>Drawing polygons. Inscribing and circumscribing circles in polygons.</li> </ul>
II.	15	<u>Orthographic Projections</u> <ul style="list-style-type: none"> <li>Projection of points lines and planes.</li> <li>Projection of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in 1st Quarter.</li> </ul>
III.	15	<u>Orthographic Projections</u> Sections of regular rectilinear and circular solids (prisms, pyramids, Cones, cylinders, spheres etc.)
IV.	15	<u>Development of Surfaces:</u> <ul style="list-style-type: none"> <li>Simple Geometrical Solids e.g. Cube, Cuboids, Cone, Cylinder, Pyramid, Prism etc.</li> <li>Interpenetration of Solids.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC108.1	Learning Architectural Drawing Development of Drafting skills for architectural drawings.
BARC108.2	Study of reference planes, projectors, orthographic projections of objects in different positions & method of drawing the same.
BARC108.3	Angular Projections: - Isometric and Axonometric fixing details.
BARC108.4	Development of solids with voids, Interpenetration of solids, solids & voids, development of surface & section at a junction.

**Reference /Textbooks: -**

- Engineering Drawing – N.D. Bhatt
- Engineering Drawing – R.K. Dhawan
- Engineering Graphics – K.R. Mohan
- **General guidelines for the teacher:**
- Maximum drafting work will be done in the studio.
- Models of solids & PPTS will be used as teaching aids.

**University Examination Pattern:**

- The Question Paper is of maximum 75 marks.
- 3 marks are reserved for neat drawings.
- 8 questions of 18 marks each, 2 from each unit, with a choice to answer one from each unit, thus total four questions must be attempted.



B. ARCH. SEMESTER-I					BARC109	COMPUTER APPLICATIONS			
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva –voce )	2
1	0	2	0	3	50	50	100		

**Objectives:** - To Introduce students to MS Office tools- M S Word, MS Excel 7 MS PowerPoint

**Methodology:** - Lectures & exercises to enable the students to prepare well- formatted documents of different nature and extension types.

Unit	Hours/Periods	Contents
I.	9	<ul style="list-style-type: none"> <li>Understanding the basic commands &amp; Formulae of MS Office Tools like Word &amp; Excel;</li> <li>Application of Standard, Formatting Tool Bars &amp; Status Bar</li> <li>Saving and Publishing documents/spreadsheets.</li> </ul>
II.	9	<ul style="list-style-type: none"> <li>Presenting concepts and proposals with the help of Text, Images &amp; Drawing Tool Bars.</li> <li>Inserting tables, Pie charts &amp; drawings and animating them.</li> <li>Creating Macros &amp; Hyperlinks</li> </ul>
III.	9	<ul style="list-style-type: none"> <li>Understanding the basic commands of MS Power Point.</li> <li>Importing spreadsheets or documents with other extension types.</li> </ul>
IV.	9	<ul style="list-style-type: none"> <li>Preparing simple and interactive slide shows and presentations to present papers/ Seminars</li> <li>Page Setup &amp; Print Command.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC109.1	Introduction to the basic computer application like MS Office, basic formatting of tool bar etc.
BARC109.2	Office management such as word processing, info
BARC109.3	Spreadsheets, presentation skills and data base.
BARC109.4	Employ this learning in all their future studies, as well as in their professional life too.

**Text /Reference Books: -**

- Sinha & Sinha; Foundations of Computing, BPB
- Office 2013 in Easy Steps; McGraw Hill Education

**General guidelines for the teacher:**

The teacher shall make live demonstrations in the computer lab on the small-scale projects.

**University Examination Pattern:**

- External Viva-voce will be conducted.
- The External jury will be of 50 Marks.
- For computation of marks in final viva, 25 marks for practical file 25 marks for viva voce shall be considered.



B.ARCH. SEMESTER-II					BARC 201			ARCHITECTURAL DESIGN -II	
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Examination</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>6 Hours</b> <b>(Evaluation</b> <b>by External</b> <b>Viva –voce)</b>	<b>6</b>
<b>1</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>150</b>	<b>150</b>	<b>300</b>		

**Objectives: -** To develop the design of single storeyed structure laying the emphasis on form, function and structure systems. The design presentation will be focused on space analysis with sectional details. The students should be sensitized to design for physically challenged also.

**Methodology: -**

- Site Analysis with the help of Audio/Video presentations.
- Studio lectures.
- Individual / Group studio exercises leading to design development.

Unit	Hours/Periods	Contents
I.	14	Highway side/ roadside café/fast food outlets with landscape and parking.
II.	28	Designing a cellular unit: Studio cum Office for Bachelor Professionals
III.	28	Designing a Cottage for elderly while keeping in view the provisions for physically challenged person.
IV.	14	Designing of Terrace Garden / Kitchen Garden for urban residential small spaces

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC201.1	Simplicity to Complexity Learning of aesthetic qualities but with more emphasis architectural and functional aspects.
BARC201.2	Understanding interrelationship of different activities on basis of the nature, proximity, circulation & their compatibility.
BARC201.3	Dealing with composite activity as major design project for understanding of architectural design. Understanding Complexity in circulation- and pattern of horizontals as well as vertical movement.
BARC201.4	Learning Integration in terms of facilitation, plan form, volume, concept and space organization. Understanding Climatic consideration for the design, orientation of building on site, simple concepts of sun shading devices, and their application in elevations as functional / aesthetic solutions.



**Note:** Anthropometry as related to physically handicapped and elderly persons are required to be studied. A student should be able to present manually and graphically, the detailed components of a building and make simple models of a building.

**Textbooks**

- Ching, F.D.K., Design Drawing, Van Nostrand Reinhold.
- Neufert, P., Architects Data, 3rd Ed., Blackwell Science.
- Watson, D. (Editor), Time-saver Standards for Architectural Design:
- Technical Data for Professional Practice, 8th Ed., McGraw-Hill.

**Guideline for the Teachers:**

- Case study and library study should be conducted as and when required.
- Provision for physically challenged persons should be incorporated in design solutions.
- Exercises to be taken up to emphasis the significance of the user in the process of design.
- For end semester exam, marks would be awarded on basis of **EXTERNAL VIVA-VOCE** of both the Design Portfolio & the End-Sem. Ans. Sheet
- The external experts for Internal & External jury will be two separate individuals.

**University examination pattern:**

- The Question Paper is of Max. 150 Marks.
- The Design Problem has to be informed to the students a week in advance.
- The students are expected to present their designs in simple plans & views (Sections & Elevations are not compulsory at Ist Sem level). They are not required to adhere to Measured Drawings; i.e.; they will make presentation drawings only
- The answer sheets will be marked on the basis of external viva-voce.



B.ARCH. SEMESTER-II					BARC202			BUILDING CONSTRUCTION & MATERIALS-II	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	4
1	0	2	2	5	100	100	200		

**Objectives: -**

To familiarize the students with detail of various components,  
To introduce the building materials, their properties and application in construction.

**Methodology:**

- Introduction to materials and construction through lectures and studio
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	15	Lime, Cement & Aggregate- sources , classification , properties and method of manufacturing , testing , mixing and uses, , applications & functions of Good Mortars/ Concrete  Damp proofing
II.	15	Foundations- Types, and Designs.
III.	15	Pile Foundations, & their components.
IV.	15	Cutting a section through the wall- single storey building showing various components of building including kitchen, toilet and stairs

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC202.1	Upon completion of the curriculum, the student shall have acquired the concept of various components of buildings & materials used and methods of construction. The student shall acquire knowledge in both conventional as well as contemporary building practices.
BARC202.2	To learn properties of various construction materials like waterproofing materials, clay used as flooring materials and timber used in the building industry.
BARC202.3	Students will also learn about water proofing methods and techniques at all building levels and a detailed study of construction building materials like concrete, clay used for flooring materials and timber.
BARC202.4	The subject will act as direct aid for Design exercises which involves requirement of knowledge of architectural drawings for small projects in the current semester.

## Textbooks

1. **Dr. S.P Bindra Arora**, Textbooks on Building Construction **Don A. Watson**, Construction Materials and Processes, **McGraw Hill Co., 1972.**
2. **W.B. McKay**, 'Building Construction', **Vol.1, 2, 3 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.**
6. **Er. M. K. Gupta**, Practical Handbook on BUILDING CONSTRUCTION Paperback – 2014
7. **T. D. Ahuja, G. S. Birdie**, A Textbooks of Building Construction and Construction Materials 4th Edition

## General guidelines for the Teacher:

- To cultivate personal observation and self-learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.
- The external experts for both the above activities will be two separate individuals.

## University Examination Pattern

The Question Paper is of Max. 100 Marks.

- Part A -10 short type questions of 4 Marks, covering entire syllabus.
- Part B -4 Questions of 15 marks each to be attempted out of a total of 8 questions set from all the four units.
- The answer sheets will be marked on the basis of external viva-voce.



B.ARCH. SEMESTER-II					BARC203			VISUAL ARTS & GRAPHICS-II	
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Examination</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>4 Hours</b>	<b>2</b>
<b>0</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>50</b>	<b>50</b>	<b>100</b>		

**Objectives:** The objective of the course is to enable the students in developing appropriate manual skills for visualization and representation of built forms in different types of drawings. The course also acts as a bridge to understand basics of computer aided drafting and architectural graphics.

**Methodology:** Studio assignments and lectures.

Visualization of 3-D Geometrical objects and their 2-D representation on sheets.

Unit	Hours/Periods	Contents
I.	12	Color Wheel and Color Schemes
II.	12	Pencil Crayons and Oil Pastels as presentation medium: Rendering of various surfaces such as brick, stone, grass, timber etc. Trees, Human figures, Automobiles, Lamp Posts, Street furniture in Plan, Elevation and Perspective in Crayons and Oil Pastels
III.	12	Watercolor Rendering: Outdoor free hand sketching and Color rendering of Trees, Shrubs, Vegetation, buildings, Vehicles etc. Color Rendering of various scenes such as Garden scene, Street Scene, Lake scene, Village scene, etc.
IV.	12	Photography: Learning the basics of Architectural Photography: Capturing vistas, & framed views.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC203.1	Understand about Color wheel. Different Color schemes & their implement in Architecture to embellish, highlight, illuminate & separate spaces & also to transmit sensation & comfort.
BARC203.2	Understand the rendering of different textures with different medium. It can help to decide them for structural development & create connection between various elements. Learn Sketching & Rendering of different elements of Street furniture made from different angles-Plan, elevation, Perspective.
BARC203.3	Get awareness to produce creative thoughts that remain logical. Free hand sketching helps the architects to gain understanding, insight & inspiration to express their observation, thoughts & feelings .it stimulate creativity & open-ended thoughts, making the mind think in a different manner, forcing it to problem solve.
BARC203.4	A Comprehensive knowledge & understanding of light, exposure & color & their application in architectural lighting. Develop critical understanding of documenting & capturing architecture through photography. Also create an awareness regarding the effectiveness of photography in design communication.

**Reference /Textbooks: -**

- Sketching-Pratap Mulick
- Wanderings of a Brush-M.K.Kelkar
- Rendering with pen & ink-Gill Robert W.
- Watercolor Technique –Million Mulick
- Drawing with Pencil & Pastels-Hazel Harrison
- Watercolor Technique –Million Mulick

**Guidelines for the teachers:**

- To appreciate the role of colors and develop control of brush for Poster colours, water colours and pen & Ink.
- Knowledge of modern media, techniques and their applications.
- Students shall observe and sketch/draw/render/photograph what they see at site.
- The paper will be set by the external expert.

**University Examination Pattern**

- The Question Paper is of maximum 50 marks.
- 3 questions of 25 marks each out of which 2 must be attempted.



B.ARCH. SEMESTER-II					BARC204			STRUCTURES IN ARCHITECTURE - II	
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Examination</b>	<b>Credits</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>3 Hours</b>	<b>2</b>
<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>50</b>	<b>50</b>	<b>100</b>		

**Objectives:**

To create awareness of concepts of Static Analysis, Strength of materials, their behavior & Structural analysis leading to application-based learning as required for Architectural Design.

**Methodology:**

Through class lectures, Presentations, site visits, case studies and making models & testing them. Study of behavior of structures through models and testing them for given load.

Unit	Hours/periods	Content
I.	9	Design for 4S: Synergy, Strength, stiffness & Stability. Stress & Strain - Stress, strain, Hooke's law, Stress strain Curve, stresses in simple & composite section
II.	9	Temporary Stresses, Poisson's ratio, state of simple shear, shear strain
III.	9	Bending Moment & shear force- Basic concepts, B.M. & S.F. Diagram for simple beam & frames for various type of Loading & support condition Bending stress in beams- Theory of simple bending, section Modulus, design criterion,
IV.	9	Bending stresses in symmetrical & asymmetrical section, strength of sections. Shear stress in beams in symmetrical structure. Fixed & continuous Beams Working out structure systems for Layout of a small building

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC204.1	Student will learn how the forces affect the building.
BARC204.2	How to calculate the permanent and temporary forces on building
BARC204.3	Student will learn the basis of Bending Moment & shear force- Basic concepts, B.M. & S. F
BARC204.4	They will get the idea of how the different structural components of building works and they are interrelated to each other.

**Text books:**

1. Structure and Design by G G Schierle, PhD, FAIA
2. Structures by Harbhajan Singh

**Reference Books:**

1. Structure in Architecture - Mario Salvadori
2. Building Structure Primer - James E Ambrose
3. Structures - Schodeck
4. Structural Concepts and Systems for Architecture & Engineers - T.Y. Lin.
5. Elements of Structure – Morga

**General guidelines for the teacher:**

- To introduce the students to the global building environment and the inherent design features
- Students will learn through models & case studies of structural systems.
- The paper will be set by the external expert.

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER-II					BARC205			HISTORY OF ARCHITECTURE-II	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam.	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** Understanding the early cultures in the periods from 3500BCE to 400BCE in context of location, climate as well as the socio-economic, historical, and cultural influences of the time.

**Methodology:** Visually intensive lectures using power point presentations to acquaint the students with historic sites and buildings. Site studies, seminar presentations and model making to be inculcated in the course.

Unit	Hours/Periods	Contents	
I.	6	0400-0000 CE	<ul style="list-style-type: none"> <li>Persepolis- Capital city of Persian Empire,</li> <li>Development of Greek Architecture- Doric order, Temenos at Delphi, Ionic Order &amp; The Parthenon</li> <li>Hellenistic Developments: Ptolemis</li> <li>Mauryan Kings &amp; Rise of Buddhism in Pataliputra</li> </ul>
II.	6	0000-0200 CE	<ul style="list-style-type: none"> <li>Founding of Rome; Pompeii colonies</li> <li>Mausoleum of Augustus</li> <li>Vitruvius &amp; Corinthian Order; The Colosseum</li> <li>Mahayana Buddhism &amp; Sanchi Stupa at India</li> <li>Qin &amp; Han dynasty; The Great wall of China</li> </ul>
III.	6	0200-0400 CE	<ul style="list-style-type: none"> <li>Rise of theaters; The Pantheon &amp; Roman Baths of Caracalla</li> <li>Chaitya Hall at Karli</li> <li>Han dynasty's Mingtang –Biyong ritual complex in China</li> <li>Mayan Civilization: The City of Teotihuacan</li> </ul>
IV.	6	0400-0600 CE	<ul style="list-style-type: none"> <li>Zoroastrian Fire temples</li> <li>Gupta Period in India: Ajanta Caves &amp; Chaitya Halls</li> <li>Hindu renaissance: Temple 17 at Sanchi</li> <li>Emergence of Christianity; St. Peter's Rome &amp; Rise of Baptisteries</li> <li>Zapotechs of Mexico: Plaza of Monte Alban</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC205.1	The student will be able to understand impact of different empires during 0400-0000 CE
BARC205.2	The student will be able to understand the development of colonial Architecture during 0000-0200 CE
BARC205.3	The student will be able to understand the chinies dynasties between 0200-0400 CE
BARC205.4	The student will be able to understand the architecture of temples from different parts of world during 0400-0600 CE.



**Reference/Textbooks:**

1. Francis D K Ching and Vikramaditya Prakash, A Global History of Architecture
2. Brown, Percy, Indian Architecture (Buddhist and Hindu Periods)
3. Fletcher, Banister Sir, History of Architecture
4. Grover, Satish, Buddhist and Hindu Architecture in India
5. Hiraskar G K, The Great Ages of World Architecture
6. Merklinger, Elisabeth S., Sultanate Architecture of Pre-Mughal India- Eastern Book Company

**Guidelines for the teachers:**

The study is to be linked with the social developments of civilizations, geographical and Geological factors, materials and structures etc.

**University examination pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER-II					BARC206			BUILDING SCIENCE- I	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** To familiarize the students with the design of ambient spaces and their surroundings. The factors affecting the design and the use of optimum devices for creating comfort.

Unit	Hours/Periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• Introduction Definition, Scope and importance, Need for awareness.</li> <li>• Natural Resources Renewable and Non-Renewable Resources.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Eco System Concept, Structure &amp; Function of an Eco System, Flow of Energy, Types of Eco Systems</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Environmental Pollution Definition, Causes, Effects, Types of Pollution, Control Measures to check different pollution.</li> <li>• Social Issues, Wasteland Reclamation, Environmental Protection Act</li> </ul>
IV.	6	<ul style="list-style-type: none"> <li>• Environmental Impact Assessment: Introduction, Need and importance of EIA study, Process</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC206.1	To design building without harming our ecosystem.
BARC206.2	To make students aware of ozone depletion and greenhouse effect.
BARC206.3	Students shall maintain the inter-relationship between development and ecosystem.
BARC206.4	Understanding of Physical Geography, characteristic of land.

**Text /Reference Books:**

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Down to Earth, Centre for Science and Environment
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.

B.ARCH. SEMESTER –II					BARC207			BUILDING TECHNOLOGY-I	
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Examination</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>No Exam (Evaluation by External Viva –voce )</b>	<b>2</b>
<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>50</b>	<b>50</b>	<b>100</b>		

**Objective:** To provide the knowledge of the basics of surveying and leveling and its applications in the field of building construction.

**Methodology:** -Demonstrations & lectures explaining the uses and application of Surveying instruments.

Unit	Hours/Periods	Contents
I.	9	<ul style="list-style-type: none"> <li>• Introduction: - Different types of surveys.</li> <li>• Chain Surveying: -Principal of chain surveying description of different equipments, Methods of chaining and booking, selection of base line and stations, obstacles in chaining. Location of inaccessible points by chain, Ranging rods.</li> <li>• Prismatic Compass survey: -Description of Prismatic &amp; surveyors compass methods of traversing, local attractions and its elimination, adjustment of closing error by graphical method.</li> </ul>
II.	9	<ul style="list-style-type: none"> <li>• Plane Table survey: - Description of different equipment, different methods of plane tabling, Strength of Fix, Two point and three-point problems and their solutions</li> <li>• Theodolite Survey: Types of angular measurements, heights and distance ranges</li> </ul>
III.	9	<ul style="list-style-type: none"> <li>• Leveling: -Description of dumpy and tilting levels &amp; leveling staves, methods of leveling, Sensitivity of bubble tube, setting out grade lines, permanent adjustment of leveling instruments.</li> <li>• Contouring: -Setting out contour gradient, different method of contouring. Simple earthwork calculations of areas and volumes</li> </ul>
IV.	9	<ul style="list-style-type: none"> <li>• Minor Instruments: - Box sextant, Hand level, Abney level, Plane meter, Ghat tracer etc.</li> <li>• Total Station - Introduction, Various components, Operation, Advantages/ Disadvantages</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC207.1	Interact technically with surveyors, be able to prepare and interpret survey drawings
BARC207.2	Gain a broad understanding of Land Survey, Get accustomed with the angular and linear measurements
BARC207.3	Trained with recording the field information and necessary plot
BARC207.4	Contemporary issues and developments

**Reference/ Textbooks:**

- Punmia B C, "Surveying & leveling".
- Singh Narinder, "Surveying & leveling"
- T.P.Kanetkar Surveying & leveling:-
- Kuchhar C L, "Surveying & leveling"
- Kanetkar & Kulkarni, "Surveying & leveling"
- Sawhney P B, "Surveying & leveling"

**Guidelines for the teachers:**

The teachers should illustrate the instruments, survey layouts and various techniques of contouring & mapping an area.

**University exam. Pattern:**

The External jury will be of 50 Marks, i.e. 25 marks for the portfolio/ projects submitted & 25 marks for the final Viva.



B.ARCH. SEMESTER-II					BARC208			ARCHITECTURAL DRAWING –II	
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Exam</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>4 Hours</b>	<b>3</b>
<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>75</b>	<b>75</b>	<b>150</b>		

**Objectives:** To enable the students to draw 3D drawings manually and develop the understanding of types and methods of perspective drawings.

**Methodology:** Studio assignments & lectures. Demonstration of 3D geometrical objects & their representation on sheet.

Unit	Hours/Periods	Contents
I.	15	Isometric projections: <b>Isometric of simple forms.</b>
II.	15	Axonometric projections: <b>Axonometric of simple forms.</b>
III.	15	Perspective Drawing: - <b>Introduction to theory of Geometrical Perspective Drawing.</b> <b>Perspective by Side Elevation Method.</b> <b>Angular (Two Point Perspective)</b>
IV.	15	<b>Parallel (One Point perspective)</b> <b>Perspective of different Solids and Building elements</b>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC208.1	Learning Architectural Drawing Development of Drafting skills for architectural drawings.
BARC208.2	Students will understand the concepts of different perspective
BARC208.3	Study of perspective views: interiors views (one point), different type of objects (two point).
BARC208.4	Development of sciography and its application in the field of architecture (shades and shadows)

**Textbooks:**

1. Architectural Graphics- D K Ching
2. Perspective: From Basic to Creative- Robert W Gill
3. Perspective Drawing - Ernest Norling, Walter Foster Art Books, California
4. Architectural Rendering - Bernard Alkins Walter Foster Art Books

**General guidelines for the teacher:**

- Maximum drafting work will be done in the studio.
- Models of solids will be used as teaching aids.
- The paper will be set by the external expert

**University examination pattern**

- The Question Paper is of maximum 75 marks.
- 3 questions of 25 marks each must be attempted out of 5 in all.



B. ARCH. SEMESTER-II					BARC209			PARAMETRIC ARCHITECTURE-I	
<b>Scheme of Teaching</b>					<b>Scheme of Examination (Marks)</b>			<b>Duration of Exam</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>No Exam,</b>	<b>1</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>	<b>00</b>	<b>50</b>	<b>only Internals</b>	

**Objectives:** - Familiarizing the use of multimedia, AI and web applications.

**Methodology:** - Lectures & exercises to enable the students to prepare well- formatted sketches, models and documents of different nature and extension types.

Unit	Hours/Periods	Contents
I.	9	<ul style="list-style-type: none"> <li>Use of Internet, various search engines, Applications and plug-ins for Architectural Research.</li> </ul>
II.	9	<ul style="list-style-type: none"> <li>Introduction to computation, parametric modeling, algorithms, scripting, coding and open-source Modeling languages viz. 'Processing'</li> <li>Sketching apps: free hand strokes with stylus</li> </ul>
III.	9	<ul style="list-style-type: none"> <li>Exercises to understand scale in digital media. Restraining Images</li> <li>Introduction to tablets: Bamboo- slate/ iPad sketch etc.</li> <li>Developing views and vistas for architectural design</li> </ul>
IV.	9	<ul style="list-style-type: none"> <li>The concept of Artificial Intelligence (AI),</li> <li>Role of AI and its applications in Architectural industry</li> <li>Robotics and 3D printing</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC209.1	To Introduce students into practice of Computer Applications in Architecture.
BARC209.2	To familiarize Advanced learning of software available for architectural applications and familiarize the students with the concepts of 3D modeling.
BARC209.3	To enable them to experiment with forms, mapping, rendering and presentation techniques.
BARC209.4	To make students create integrated design documents by taking full advantage of the building model. Integration of practical exercises along with the design studio projects.

**Text /Reference Books: -**

- Sinha & Sinha; Foundations of Computing, BPB
- Flash Web Design, The Art of Motion Graph, Curtis Hillman, New Riders Publishing, Indianapolis, IN. U.S.A, 2000
- M.E. Morris, and R.J. Hinrichs, Web Page Design, Prentice Hall, 1996.

**General guidelines for the teacher:**

The teacher shall make live demonstrations in the computer lab on the small-scale project.

B. ARCH. SEMESTER-III					BARC 301			ARCHITECTURE DESIGN - III		
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination		Credit
L	T	P	S	Total	Internal	External	Total	6 Hours (Evaluation by External Viva –voce)		6
1	0	2	4	7	150	150	300			

**Objectives:** - To develop the design of small buildings with respect to site, landscape, climate and Socio-economic conditions in urban context & the application of anthropometrics.

**Methodology:** Any design competition relevant to the course and announced in the prevailing semester may be introduced as a design problem.  
Site Analysis to be done with the help of Audio/Video presentations & Studio lectures. Designs may be developed individually or in groups.

Unit	Hours/Periods	Contents
I.	21	Design of a small House (up to 3 storeys) considering site orientation, prevailing wind direction and the use of local building materials Integration of form & function
II.	21	Design of public place like Exhibition Centre cum Artisan Haat.
III.	21	Design of public place like Post Office / Bank- Extension counters
IV.	21	Design of Nursery / Primary School (Playway to UKG)

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC301.1	To Use basic architectural principles of design of buildings, interior spaces, etc. where the use of structural technologies (developed in other fields) is a starting point.
BARC301.2	Get a knowledge of gather, assess, record, and apply relevant information in Design of an architectural project
BARC301.3	Explore the relationship between the human behavior and the physical environment in buildings which are heavily serviced.
BARC301.4	Ability to design both site and building to accommodate individuals with varying physical abilities

**NOTE:** -

- Design should be urban in cont External
- Method of construction includes Data collection and analysis, Site conditions, Form based, Climatic conditions, User requirements



## Reference / Textbooks:

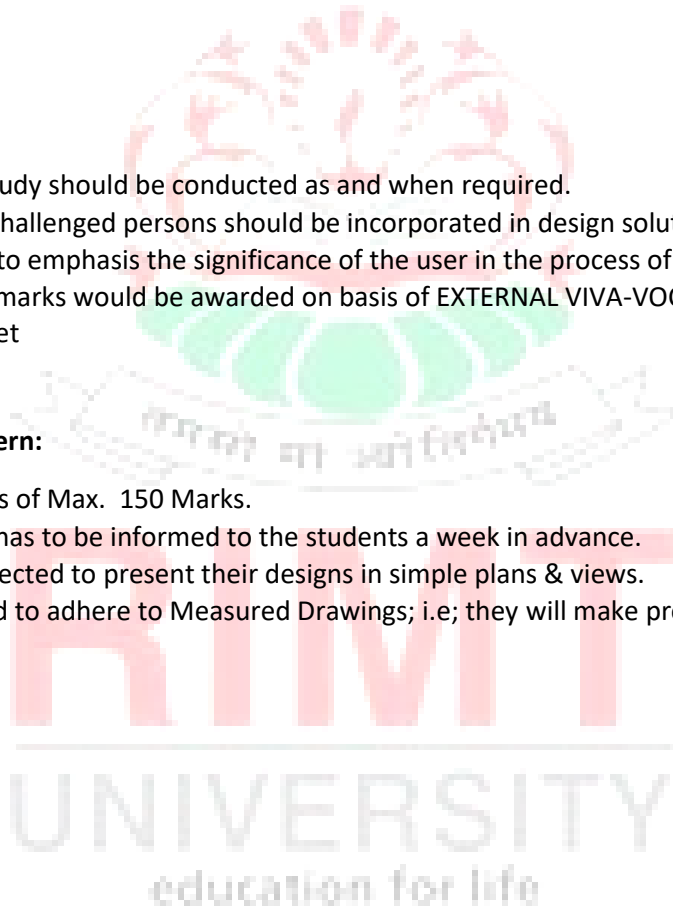
- Time Saver Standards for Architectural Design Data – John Hancock Callender.
- Ching, F.D.K., “Design Drawing”, Van Nostrand Reinhold. 2.
- V.S. Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
- Neufert, P., “Architects Data”, 3rd Ed., Blackwell Science.
- Watson, D. (Editor), “Time-saver Standards for Architectural Design: Technical Data for Professional Practice”, 8th Ed., McGraw-Hill.
- Francis D.K.Ching, Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York, 1979.
- Structure in Nature- Strategy for Design – Peter Pearce
- Patterns in Nature- Peter Streens.
- Lidwell, William, Holden, Kestina, Butler, Jill,” Universal Principles Of Design”, Rockport-Publications, Massachusetts.

## Guidelines to teacher: -

- Case study and library study should be conducted as and when required.
- Provision for physically challenged persons should be incorporated in design solutions.
- Exercises to be taken up to emphasis the significance of the user in the process of design.
- For end semester exam, marks would be awarded on basis of EXTERNAL VIVA-VOCE of both the Design Portfolio & the End-Sem. Ans. Sheet

## University examination pattern:

- The Question Paper is of Max. 150 Marks.
- The Design Problem has to be informed to the students a week in advance.
- The students are expected to present their designs in simple plans & views.
- They are not required to adhere to Measured Drawings; i.e; they will make presentation drawings only.



B. ARCH. SEMESTER-III					BARC302			BUILDING CONSTRUCTION & MATERIALS - III	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	4
1	0	2	2	5	100	100	200		

**Objectives: -**

- To introduce and familiarize the students with constituents, manufacturing process/ availability/ properties/characteristics/defects/ classifications and usage of traditional building materials and their use in simple building work.
- To make students understand and appreciate the various methods of building construction in coordination with the building materials and science related to them.

**Methodology: -**

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	15	<ul style="list-style-type: none"> <li>• Timber: Manufacturing process and qualities of Decorative &amp; commercial Plywood including Ply-Board, Block Boards, Particle Boards, Wood Wool, Cement Board, Gypsum Board, Fiber Board Compressed Straw Board, Veneers, Laminates, Cement Fiber Board.</li> <li>• Glass as a building material. Classification, Composition, Properties and Use of Glass. Character and uses of various types of Glass - Plate Glass, Wired Glass, Foam Glass, Laminated Glass, Tinted Glass, Glass Wool, Glass Block, Fiber Glass, Crinkle Glass, Toughened Glass, Obscured Glass</li> </ul>
II.	15	<ul style="list-style-type: none"> <li>• Joinery details in wood – Doors and windows</li> <li>• Detailing of log huts</li> </ul>
III.	15	<ul style="list-style-type: none"> <li>• Staircase: Types and Designs + details of wooden stairs</li> </ul>
IV.	15	<ul style="list-style-type: none"> <li>• Section of a Double Storied Building: Through toilet and staircase showing the details of foundation, Floor, Window, Lintel, Chajja, RCC Roof, and Parapet.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC302.1	Various market forms of material like wood/Timber etc.
BARC302.2	Properties of material and their use in building.
BARC302.3	Knowledge of manufacturing process of different types of material used in building construction.
BARC302.4	Usage, advantages and disadvantages can be learned.

**Textbooks:**

1. R Barry, Building Construction, East West Press, New Delhi, 1999.
2. Er. M.K. Gupta, Practical Handbook on BUILDING CONSTRUCTION Paperback – 2014
3. T. D. Ahuja, G. S. Birdie, A Textbooks of Building Construction and Construction Materials 4th Edition.

**Reference Books:**

1. Don A. Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
2. W.B. Mckay, 'Building Construction', Vol.1, 2, 3, Longmans, U.K. 1981.
3. R. Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
4. Dr S P Bindra Arora, Textbooks on Building Construction
5. Sushil Kumar, Building Construction.

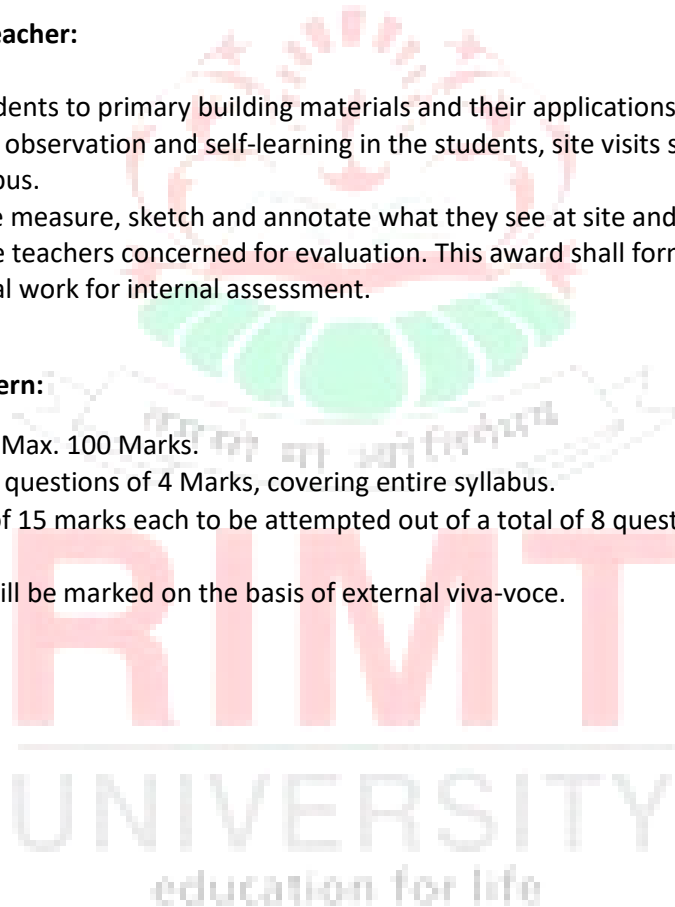
**General guidelines for the teacher:**

- To introduce the students to primary building materials and their applications in building construction.
- To cultivate personal observation and self-learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.

**University Examination Pattern:**

The Question Paper is of Max. 100 Marks.

- Part A -10 short type questions of 4 Marks, covering entire syllabus.
- Part B -4 Questions of 15 marks each to be attempted out of a total of 8 questions set from all the four units.
- The answer sheets will be marked on the basis of external viva-voce.



B.ARCH. SEM-III					BARC303			COMP. GRAPHIC SKILLS-I	
Scheme of Teaching					Scheme of Examination			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva –voce)	2
1	0	2	0	3	50	50	100		

**Objectives:** Introduction and the use of software available for architectural applications.

**Methodology:** Integration of practical exercises along with the design studio project.

Unit	Hours/Periods	Contents
I.	12	<ul style="list-style-type: none"> <li>Basic commands like copy, paste, stretch, offset, move fillet, extend, trim and other useful 2D commands.</li> <li>Basic Text writing and dimensioning of the Plans,</li> </ul>
II.	12	<ul style="list-style-type: none"> <li>2D drafting in Auto Cad</li> <li>Drawing the basic Plans, Sections, and Elevations.</li> </ul>
III.	12	<ul style="list-style-type: none"> <li>Elevation and Sections</li> <li>Hatching and filling of the Walls in the Plans, Elevations and Sections.</li> <li>Basic rendering in the Auto Cad and in other Software in 2D.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC303.1	Visualize building / transform sketches and 2-dimensional CAD drawings to 3 d render. Dimensional building models and walkthrough.
BARC303.2	Execute photo realistic rendering of the building project.
BARC303.3	Prepare walkthroughs.
BARC303.4	Students also learn working with plan, elevation, sections.

**Text /Reference Books:**

- Goldenberg, Joseph, AutoCAD Architecture 2008 – Comprehensive Tutorial Autodesk 2008
- AutoDesk, “Auto Cad Manual 2012”
- Google, “Google Sketch up Manual”
- Aubin, Paul F, Mastering Auto CAD Architecture 2008.
- Elise, Moss, AutoCAD Architecture 2008 Fundamentals Autodesk 2008.

**Guidelines for the teachers:** The teacher should demonstrate the commands.

**University Examination Pattern:**

The External jury will be of 50 Marks, i.e. 25 marks for the portfolio/projects submitted & 25 marks for the final Viva.

B.ARCH. SEMESTER –III					BARC304			STRUCTURES IN ARCHITECTURE. - III	
Scheme of Teaching					Scheme of Exam			Duration of Examination	Credits
L	T	P	S	Total	Internal	External	Total	3 Hours	2
1	2	0	0	3	50	50	100		

**Objectives:**

To teach the fundamental aspects of indeterminacy with the help of thumb rules as applicable to simple Design problems.

**Methodology:**

Through class lectures, Presentations, site visits, case studies and making models & testing them. Study of behavior of structures through models and testing them for given load.

Unit	Hours/Periods	Contents
I.	9	Concept of structural indeterminacy & its application in structural system concepts of Soil Mechanics, soil bearing capacity. Design of foundation
II.	9	Arches:- Type & behavior of arches with history. Introduction to 3 hinged arches Frames:- In determinacy of frames will different end Condition.
III.	9	Introduction of Columns, basic principles, column buckling, Euler formula, slenderness ratio
IV.	9	Form active Structures. – Tensile structures

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC304.1	Understand RCC as structural material.
BARC304.2	Understand the behaviors of RCC structural members
BARC304.3	Be able to design simple structural members.
BARC304.4	Students have knowledge of structural analysis of any building structure.

**Textbooks:**

Understanding Concept of Structural Analysis & Design- J.P. Parikh

**Reference Books:**

- Applied Mechanics - S.B. Junarkar & H.J.Shah
- Engineering Mechanics - R.S.Khurmi
- Mechanics of solids -M.N.Patel, P.V.Patel, C.S.Sanghvi, J.S.Thakur
- Structure in Architecture - Mario Salvadori
- Structures - Schodeck
- Elements of Structure – Morgan
- Structure and Design by G G Schierle, PhD, FAIA

**General guidelines for the teacher:**

- To introduce the students to the global building environment and the inherent design features
- Students will learn through models & case studies of structural systems.
- The paper will be set by the external expert.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 Questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.

B.ARCH. SEM-III					BARC305			HISTORY OF ARCHITECTURE -III	
Scheme of Teaching					Scheme of Examination			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** To provide the knowledge of the evolution of different architectural styles through study of Multi-Religious & Provincial World Architecture.

**Methodology:** Study of the evolution of different styles of Architecture from 600 CE to 1400CE until the Italian Renaissance around the globe

Unit	Hours/Periods	Contents	Unit
I.	6	0600-0800 CE	<ul style="list-style-type: none"> <li>Rise of Islam in Arabia; Dome of Rock, Jerusalem &amp; Great mosque of Samarra, Iraq.</li> <li>Pallavas &amp; Chalukyas in India-Kailasnath Temple, Ellora; Mahavihara at Nalanda</li> <li>Glimpses of Europe in 800 CE:Palatine Chapel</li> <li>Mayan cities, Gulf of Mexico</li> </ul>
II.	6	0800-1000 CE	<ul style="list-style-type: none"> <li>Rise of Rajputs: Sun Temple at Modhera, Kandariya Mahadev Temple, and Orissan temples- Lingaraja Temple, Rajarani Temple &amp; Jain temples at Mount Abu</li> <li>Pure Land Buddhism in Japan: Phoenix Hall at Byodo-in</li> <li>Germany: a new seed of power in Europe;St Michael in Hildesheim; Pisa Cathedral,Italy</li> </ul>
III.	6	1000-1200 CE	<ul style="list-style-type: none"> <li>Seljuks' Madrasas in Turkey &amp; Iwans in Iran, qubba in Morocco</li> <li>Chola Dynasty's Vrah Vishnulok, Angkor Wat at Cambodia</li> <li>Pagoda of Pagan, Burma</li> <li>Seven capitals of Delhi:Alai Darwaza, Tomb of Ghiyasuddin Tughlaq</li> <li>Sun Temple at Konarak, Orissa</li> </ul>
IV.	6	1200-1400 CE	<ul style="list-style-type: none"> <li>Churches of High Middle ages in Europe: Notre Dame of Reims, France</li> <li>Ming Dynasty's The Forbidden City,China</li> <li>Timurid Dome of Bibi Khanum Friday mosque at Samarkand, Uzbekistan &amp; at Gulbarga,India</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC305.1	The student will be able to understand impact of Islamic Architecture in India during Early Phase in 11th Century
BARC305.2	The student will be able to understand the development of Provincial Style of Architecture
BARC305.3	The student will be able to understand the Monumental Architecture of Mughal Style
BARC305.4	The student will be able to understand the influence of Colonial Architecture in British India and Its developments

**Text /Reference Books:**

- Ching, D K, A Global History of Architecture
- Parihar, S., “Some Aspects of Indo-Islamic Architecture”, Abhinav Publishers. 1999
- Fletcher, Banister Sir, History of Architecture
- Maheshwari, Sanjeev & Garg, Rajeev, Ancient Indian Architecture (From Blossom to Boom).
- A History of Architecture :- James Fergusan, John Willey
- Fergusan James, Willey John, “History of Indian & Eastern Architecture, Dodd, Mead & company 1899
- Tagdell Christopher, “The History of Architecture in India, Phaidon Press,1994

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.





B.ARCH. SEMESTER-III					BARC306			BUILDING SCIENCE-II	
Scheme of Teaching					Scheme of Examination			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** To familiarize the students with the design of ambient spaces and their surroundings; the factors affecting the design and the use of optimum devices for creating comfort.

Unit	Hours/Periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• Introduction to climatology, role of climate with respect to shelter, importance of studying Building Climatology.</li> <li>• Movement of earth around the sun, change of seasons, distribution of global pressure belts and global wind movements, global climatic zones.</li> <li>• Definition of weather, climate, elements of climate, interrelationship of climatic elements and psychometric chart.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Study of indigenous shelters in response to the climatic zones in India</li> <li>• Definition and explanation of thermal comfort, relationship of climatic, elements with thermal comfort, thermal stress index, bio climatic chart, effective temperature and corrected effective temperature histogram.</li> <li>• Heat exchange between building and environment (qualitative aspect only), thermal properties of materials, thermal properties of building elements, solar gain factor, solar temperature.</li> <li>• Use of C. Mahony's tables.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Solar chart and its importance, understanding the movement of sun across the sky, importance of understanding the optimum orientation and building form in different climatic zones, concept of shading devices.</li> <li>• Sun path diagram</li> <li>• Calculation for the design of horizontal and vertical shading devices.</li> </ul>
IV.	6	<ul style="list-style-type: none"> <li>• Air movement inside buildings, Microclimate</li> <li>• Guidelines for designing well-ventilated buildings.</li> <li>• Optimum Orientation of Building — Importance, Form and Placement of Building</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC306.1	Climatology is the science of studying the average atmospheric conditions of a region in long-term perspective.
BARC306.2	Students learn about the primary goal of Climatology is to study the unique characteristics of atmosphere in controlling the global climate, origin, types of climates, causes and processes influencing the climatic variations, elements of weather and the impact of climate on humans or vice-versa.
BARC306.3	Under the umbrella of climatology, the structure and composition of atmosphere are studied first.
BARC306.4	This further helps in designing of building or site.

### **Text /Reference Books:**

- O.H.Koenigsberger and Others, “ Manual of Tropical Housing and Building ” – Part I - Climate Design, Orient Longman, Madras, India, 2010.
- Bureau of Indian Standards IS 792, “Hand book on Functional requirements of buildings other than industrial buildings , 1987.
- Martin Evans, “Housing Climate and Comfort” , Architectural Press, London , 1980
- B. Givoni, “ Man, Climate and Architecture ” , Architectural Sciences Series – Applied Science Publishers Ltd., London , 1981.
- B. Givoni , “ Passive and Low Energy Cooling of building ” , Van Nortrand Reinhold New York, USA 1994 .
- Galloe, Salam and Sayigh A.M.M. , “Architecture, Comfort and Energy”, Elsevier Science Ltd. , Oxford, U.K. , 1998

### **University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.

B.ARCH. SEMESTER –III					BARC307			BUILDING TECHNOLOGY-II	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

#### Objectives:

To acquaint the students with the basic principles used in all basic building services with regards to Water supply, Sanitation, and storm water drainage

#### Methodology:

Subject shall be taught through the combination of Guest Lectures, Field visits, Visits to the Project Sites, actual display of Fittings, Pipes, Joints used and by carrying out exercises in layout of simple drainage systems for Small buildings, Planning of Bathrooms and Lavatory Blocks in Domestic and Multi-storied building

Unit	Hours/Periods	Contents
I.	6	<b>Water Supply:</b> Potable Water, Water treatment techniques, Requirements of water supply to different types of buildings, fixtures, methods of distribution of water
II.	6	Municipal water distribution systems, underground and overhead water tanks. Brief description of rainwater harvesting and water table recharging techniques.
III.	6	<b>Sanitation and Drainage:</b> Refuse, different form of refuse: garbage/solid waste, storm water, their collection and disposal systems. <ul style="list-style-type: none"> <li>•Drainage layout for building premises, kitchen, utility and toilet layouts, fixtures and fittings.</li> <li>•Types of traps, manholes, grease chambers, inspection chambers, intercepting traps.</li> <li>•Ventilation of drains and sewers, principles of design of sewer lines,</li> </ul>
IV.	6	Drainage in non municipal areas, soak wells, septic tanks. Storm and rain water drainage system. <ul style="list-style-type: none"> <li>•Sustainable and eco-friendly Sewage treatment techniques: biogas plants, sewage treatment methods</li> <li>•Specialized water supply and drainage requirements: swimming pools, basement level supply and disposal, terrace gardens supply and drainage etc.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC307.1	Acquire knowledge of principles used in building services with special emphasis on water supply.
BARC307.2	Understand Building Wiring System and illuminance with reference to Architecture.
BARC307.3	Understand the basic norms as per National Building Code.
BARC307.4	Understand different types & selection of lighting fixtures according to requirement.

**Text /Reference Books:**

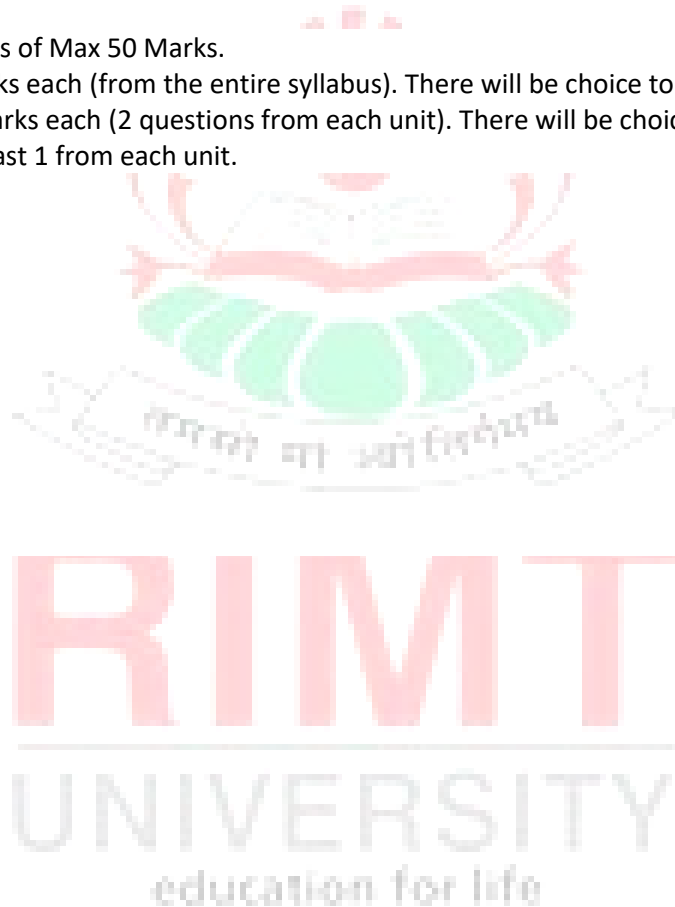
- Duggal K.N. , “ Public Health Service , Publisher, Chand, 1967
- Water Supply Sanitation BY R. Birdi
- Barry R, “ Building Services , John Wiley and Sons Ltd 1998
- Garg S . K , “ Water Supply Engineering, Khanna Publishers
- Water Supply& Sanitation : - G.S.Bindra/ J.S.Bindra

**General guidelines for the teacher:**

- On site studies
- Market surveys of different water supply and drainage pipes, fittings and fixtures.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER –III					BARC308			ARCHITECTURAL DRAWING- III	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	3
0	2	0	2	4	75	75	150		

**Objectives:-** To develop perception ;presentation of simple architectural forms & buildings.

**Methodology:-**Studio assignments & lectures. Demonstration of 3-D geometrical objects & their 2-D representation on sheet.

Unit	Hours/Periods	Contents
I.	15	Perspective Drawing: Introduction to Grid Point Method.
II.	15	Two-point perspective views, using Measurement Point method
III.	15	Sciography:- <ul style="list-style-type: none"> <li>Shade and shadow of object of different shape at different levels and planes.</li> <li>Shade and shadow of facade of simple building &amp; architectural fenestrations</li> </ul>
IV.	15	<ul style="list-style-type: none"> <li>Shades and shadows in perspective views</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC308.1	Interact technically with surveyors, Be able to prepare and interpret survey drawings
BARC308.2	Gain a broad understanding of Land Survey , Get accustoms with the angular and linear measurements
BARC308.3	Trained with recording the field information and necessary plot
BARC308.4	Contemporary issues and developments

**Text /Reference Books:-**

- N.D. Bhatt V.M. Panchal, "Engineering Drawing, Charotar Publisher 48th edition, 2005
- Ching, Frank (Francis D.K.), "Architectural Graphics, Van Nostrand Reinhold, 5th ed 2009
- Robert W Gill, "Manual of Rendering with Pen and Ink, Published on: 1990-04
- Fraser Reeki, "Reekie's Architectural Drawing, Tony K. McCarthy Wiley, Aug1995
- Ching Francis D.K. –Design Drawing .
- Rendow Yee- Architectural Drawing .

**General guidelines for the teacher:**

- Maximum drafting work will be done in the studio.
- Models of solids will be used as teaching aids.

**University Examination Pattern:**

- The Question Paper is of maximum 75 marks.
- 3 questions of 25 marks each, must be attempted out of 5 in all

B.ARCH. SEMESTER-III					BARC-309			PARAMETRIC ARCHITECTURE- II	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam, only Internals	1
0	0	2	0	2	50	00	50		

**Objectives:**

- To introduce the students advanced modelling techniques in Ruby/ Python
- To create Custom Objects and extend them using Inheritance. Additionally, this course explores the use of Grasshopper in Python.

**Methodology:-**

- Students will learn how to construct a Grid to host objects, make Panels on to a Grid
- To develop the panels into small modules

**Content:-**

Google Sketch –Up –  
Sketching in different modes like, natural, sepia, monochrome, etc.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC309.1	Make student familiar to the software and use it effectively
BARC309.2	Students will learn about to create 3D objects in a 2D environment. Whether you plan to model for 3D printing or for other purposes, Sketch-up
BARC309.3	Students can create simple 3D physical models
BARC309.4	Allow students to better visualize their idea than they could do by sketching on paper.

**Text /Reference Books:**

- Goldenberg, Joseph, Autocad Architecture 2008 – Comprehensive Tutorial Autodesk 2008
- AutoDesk , “Auto Cad Manual 2012”
- Google, “Google Sketch up Manual”
- Aubin , Paul F, Mastering Auto CAD Architecture 2008.
- Elise, Moss, AutoCAD Architecture 2008 Fundamentals Autodesk 2008.

**General guidelines for the teacher:**

The teacher shall make live demonstrations in the computer lab on the small scale projects.

B.ARCH. SEMESTER-IV					BARC401			ARCHITECTURAL DESIGN - IV	
Scheme of Teaching					Scheme of Examination= Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	12 Hours ( Evaluation by External Viva –voce )	6
1	0	2	4	7	150	150	300		

**Objectives:-** To develop the design of buildings with respect to site, landscape, climate and Socio-economic conditions in semi-urban/rural context .& the application of indigenous technology w.r.t. **Vernacular Architecture**.

**Methodology:**

- Researching a modal community for the Vernacular studies, to be able to present the semi-urban/rural infra-structure in the light of designing typical buildings and related amenities.
- Developing the over-all community layout identifying the positioning of key facilities as required in the local culture.
- Individual/ Group studio exercises leading to design development

Unit	Hours/Periods	Contents
I.	21	Design of a country-side House/Farm-House considering live stock ,farm’s land site orientation, prevailing wind direction and the use of local building materials and traditions.
II.	21	Agricultural Infrastructure
III.	21	Design of public place like Community Centre, Gram Panchayat, Anganwadi, Dispensary
IV.	21	Built & Unbuilt open spaces for congregation / communities

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC401.1	Acquire knowledge on traditional materials and construction techniques which can be used in the design of built spaces in the modern context.
BARC401.2	Interpretation of vernacular architecture in terms of its Functional aspects, Cultural aspects, Climatic considerations, Construction methods and techniques, Materials.
BARC401.3	Understand the concept of Vernacular Architecture and study of Indian Vernacular Architecture in detail.
BARC401.4	Understand the design process and its connection to the built environment.

**Note:-**

- (a) Design should be vernacular in cont External  
 (b) Method of construction includes:- Data collection and analysis, Site conditions, Climatic Conditions, Demographic & Socio-Cultural setup, User requirements

## Reference / Text books:

- Time Saver Standards for Architectural Design Data – John Hancock Callender.
- Ching, F.D.K., “Design Drawing”, Van Nostrand Reinhold. 2.
- V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
- Neufert, P., “Architects Data”, 3rd Ed., Blackwell Science.
- Watson, D. (Editor), “Time-saver Standards for Architectural Design: Technical Data for Professional Practice”, 8th Ed., McGraw-Hill.
- Francis D.K.Ching, Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York, 1979.
- Structure in Nature- Strategy for Design – Peter Pearce
- Patterns in Nature- Peter Streens
- Lidwell,William,Holden,Kestina,Butler,Jill,” Universal Principles Of Design”, Rockport-Publications, Massachussets

## Guidelines to Teacher:-

- Case study and library study should be conducted as and when required.
- Provision for physically challenged persons should be incorporated in design solutions.
- Exercises to be taken up to emphasis the significance of the user in the process of design.

## University Examination Pattern:

- The Question Paper is of Max. 150 Marks.
- The Design Problem has to be informed to the students a week in advance .
- The students are expected to present their designs in simple plans & views .
- They are not required to adhere to Measured Drawings; i.e; they will make presentation drawings only.
- **The answer sheets will be marked on the basis of external viva-voce**





B.ARCH. SEMESTER-IV					BARC402			BUILDING CONSTRUCTION & MATERIALS - IV	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	4
1	0	2	2	5	100	100	200		

**Objectives:-**

- To introduce and familiarize the students with constituents, manufacturing process/ availability/ properties/characteristics/defects/ classifications and usage of traditional building materials and their use in simple building work.
- To make students understand and appreciate the various methods of building construction in coordination with the building materials and science related to them

**Methodology:-**

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	15	<ul style="list-style-type: none"> <li>• Adhesives as Building Material</li> <li>• Water Proofing Compounds</li> </ul>
II.	15	<ul style="list-style-type: none"> <li>• Structures in brickwork like fire places, jambs, cavity walls, arches, lintels, partitions in masonry</li> </ul>
III.	15	<ul style="list-style-type: none"> <li>• Cantilevered stairs in masonry</li> </ul>
IV.	15	<ul style="list-style-type: none"> <li>• Dhajji wall Construction and principles of earthquake resistance</li> <li>• Retaining Walls- materials and sections</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC402.1	To develop understanding about building elements and their construction principles
BARC402.2	To develop understanding about composition of various compatible building materials for construction.
BARC402.3	The subjects should also focus on developing design abilities by applying basic principles of construction
BARC402.4	Develop a fundamental understanding of material in construction systems and techniques, dimensions and intrinsic qualities that influence the design process.

**Text books:**

- R Barry, Building Construction, East West Press, New Delhi, 1999.
- B C Punmia, building Construction
- P N Khanna, Civil Engineering Handbook
- Ching D K, Building Construction Illustrated

### Reference Books:

- Don A. Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- W.B.Mckay, 'Building Construction', Vol.1, 2, 3, Longmans, U.K. 1981.
- R.Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
- Dr S P Bindra Arora, Text books on Building Construction.
- Shelters, Shacks, and Shanties By D. C. BEARD With Illustrations by the Author NEW YORK Charles Scribner's Sons 1916

### General guidelines for the teacher:

- To introduce the students to primary building materials and their applications in building construction.
- To cultivate personal observation and self learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.

### University Examination Pattern:

- The Question Paper is of Max. 100 Marks.
- Part A -10 short type questions of 4 Marks, covering entire syllabus
- Part B -4 Questions of 15 marks each to be attempted out of a total of 8 questions set from all the four units.
- **The answer sheets will be marked on the basis of external viva-voce**



B.ARCH. SEMESTER –IV					BARC403			COMPUTER GRAPHIC SKILLS-II	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva –voce)	2
1	0	2	0	3	50	50	100		

**Objectives:-** Introduction and the use of software available for architectural applications.

**Methodology:-**

- Integration of practical exercises along with the design studio project
- Demonstrations & lectures explaining the uses and application of commands

Unit	Hours/Periods	Contents
I.	12	Advanced 2D drafting using Auto CAD.
II.	12	Use of layers and blocks exercise on simple working drawings

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC403.1	Create, manipulate and edit 2D drawings and figures.
BARC403.2	Introduces Autodesk's AutoCAD software as a design and drafting tool. Introduces basic 2D CAD commands, command interface, workspace, viewports and printing concepts.
BARC403.3	Covers creation, retrieval and modification of 2D drawing files that meet industry standards with an emphasis on mechanical design for the manufacturing industry.
BARC403.4	Apply elements of mechanical drafting such as layers, dimensions, drawing formats, and 2D figures in projects

**Text /Reference Books:**

- Goldenberg, Joseph, Autocad Architecture 2008 – Comprehensive Tutorial Autodesk 2008
- AutoDesk , “Auto Cad Manual 2012”
- Aubin , Paul F, Mastering Auto CAD Architecture 2008.
- Elise, Moss , AutoCAD Architecture 2008 Fundamentals Autodesk 2008.

**Guidelines for the teachers:** The teacher should demonstrate the commands.

**University Examination Pattern:**

The External jury will be of 50 Marks; i.e 25 marks for the portfolio/projects & 25 marks for viva.

B.ARCH. SEMESTER-IV					BARC404			STRUCTURES IN ARCHITECTURE - IV	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credits
L	T	P	S	Total	Internal	External	Total	3 Hours	2
1	2	0	0	3	50	50	100		

**Objectives:**

To teach the fundamental aspects of Limit state method with the help of thumb rules as applicable to simple Design problems.

**Methodology:**

Through class lectures, Presentations, site visits, case studies and making models & testing them. Study of behavior of structures through models and testing them for given load.

Unit	Hours/Periods	Contents
I.	9	Introduction- Materials, basic properties of concrete & steel, reinforcement, standard loading, characteristic strength, permissible stresses in concrete & steel as per Indian standard. Design philosophies- working Method, ultimate load method, Limit state method.
II.	9	Limit state Design Method- Safety & Serviceability requirements, Limit states, characteristics material strength, load & partial Safety factors. Design of Beams: Singly, doubly reinforced beam for flexure, Shear and Bond. Design of steel beams Design of RCC one way slab & two way slab.
III.	9	Design of Compression member: Design of short & slender columns
IV.	9	Vector Active Structure Systems.-Truss Systems Working out structure systems for Layout of a small building

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC404.1	Pre- Stressed Concrete principles and systems, loss of pre-stress, analysis and design of pre-stress beams.
BARC404.2	Effect of earthquake on concrete buildings, Role and design of beams, columns and joints in RC buildings. Planning for reducing earthquake effects on buildings.
BARC404.3	Design of riveted and welded connections (simple cases only), tension and compression members, beam and plate girder, introduction to grillage foundation and trusses.
BARC404.4	Elements of Earthquake Engineering, zoning, base shear, lateral forces, ductile detailing and introduction to new codes.

**Text books:**

1. Structure and Design By G G Schierle, PhD, FAIA

Reference Books:

1. Structure in Architecture - Mario Salvadori

2. Building Structure Primer - James E Ambrose

3. Structures - Schodeck

4. Structural Concepts and Systems for Architecture & Engineers - T.Y.Lin.

5. Elements of Structure – Morgan

**General guidelines for the Teacher:**

- To introduce the students to the global building environment and the inherent design features
- Students will learn through models & case studies of structural systems
- The paper will be set by the external expert

**University Examination Pattern:**

The Question Paper is of Max 50 Marks.

- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.

B.ARCH. SEM-IV					BARC405			HISTORY OF ARCHITECTURE -IV	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** To provide the knowledge of the evolution of different architectural styles through study of Multi-Religious & Provincial World Architecture.

**Methodology:** Study of the evolution of different styles of Architecture from 1500 CE to 1800CE around the globe

Unit	Hours/Periods		Contents
I.	6	1400-1500 CE	<ul style="list-style-type: none"> <li>Islamic Architecture in Deccan Plateau: jama masjid at Gulbargha</li> <li>Muhammad Shah's Tomb in Bengal</li> <li>Rajput forts : Chittor Fort</li> <li>Mamluks in Egypt: Tomb of sultan Qaitbay,</li> <li>Tughlaqs' Jami Masjid at Ahmedabad</li> </ul>
II.	6	1500-1600 CE	<ul style="list-style-type: none"> <li>Rise of Italian Renaissance; San Lorenzo, Florence</li> <li>Developments in Vatican City</li> <li>Church of St Andrea at Mantua, &amp; St Peter's Basilica</li> <li>St. Peter's plans by Michelangelo &amp; Bramante</li> <li>Developments in America- Mexico : Temple Mayor Rise, Peru: Urban Developments</li> </ul>
III.	6	1600-1650 CE	<ul style="list-style-type: none"> <li>Rise of Mughals in India: Fatehpur Sikri, Humayun's Tomb, Taj Mahal at Agra</li> <li>Vijay Nagar Kingdom; Gol Gumbaz, Bijapur</li> <li>Tea Houses in Japan: Katsura Imperial Villa</li> <li>Ming Dynasty, China: Potala Palace</li> <li>Churches at Kremlin</li> </ul>
IV.	6	1650-1700 CE	<ul style="list-style-type: none"> <li>Italian High Renaissance: Villa Rotonda, Villa Trissino by Ar. Andrea Palladio</li> <li>Bernini's layout for St. Peter's Square</li> <li>Russian The Baroque Era- St Paul's Cathedral, St. Petersburg, Russia</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC405.1	To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form.
BARC405.2	To develop a holistic approach to Architecture as an integral component of built environment
BARC405.3	Introduce the impact of growing international trade, industrialization and colonization on the architecture of India, Europe and America and preface the Modern movement.
BARC405.4	Students will Learn about how the colonial architecture flourished

**Text /Reference Books:**

- Ching, D K, A Global History of Architecture
- Parihar, S., “Some Aspects of Indo-Islamic Architecture”, Abhinav Publishers. 1999
- Fletcher, Banister Sir, History of Architecture
- Maheshwari, Sanjeev & Garg, Rajeev, Ancient Indian Architecture (From Blossom to Boom).
- A History of Architecture :- James Fergusan, John Willey
- Fergusan James, Willey John, “History of Indian & Eastern Architecture, Dodd, Mead & company 1899
- Tagdell Christopher, “The History of Architecture in India, Phaidon Press,1994

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER-IV					BARC406			BUILDING SCIENCE-III	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:**

- To familiarize students with the various elements of landscape architecture and the principle of landscape design and conservation.
- To develop and strengthen the competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales

Unit	Hours/Periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• Introduction to Landscape Architecture,</li> <li>• Elements- hard &amp; soft;</li> <li>• Evolution of Garden Design w.r.t. regional environment &amp; existing examples around the globe</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Spatial development in Landscape Design.</li> <li>• Plant materials - classification, characteristics, use and application in landscape design; their role as shading devices.</li> <li>• Influence of climate &amp; selection of color</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Landforms:- Site Planning for neighbourhood parks, children's play area and Campus development</li> <li>• pavements, furniture.</li> <li>• Water: waterfalls/streams/pools &amp; ponds</li> <li>• Light &amp; sound effects</li> </ul>
IV.	6	<ul style="list-style-type: none"> <li>• Urban open spaces and principles of urban landscape; Street landscaping, landscape design for waterfront areas and functional areas in urban centers; Green roofs and walls</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC406.1	Get familiarize with natural & man made elements and their impact on environment.
BARC406.2	Understand concept of sustainability & sustainable development.
BARC406.3	Understand various issues like climate change, ecological footprint etc.
BARC406.4	Understand low impact construction practices, life cycle cost and alternative energy resources.



**Text /Reference Books:**

- T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995
- Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company , 1993.
- Brian Hackett, Planting Design, Mc Graw Hill, Inc, 1976
- Cliff T and Y, Handbook of urban landscape”, Architectural press, 1973
- T .K. Bose and Chowdhury, “Tropical Garden Plants in Colour”, Horticulture and Allied Publishers, Calcutta, 1991

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.

B.ARCH. SEMESTER-IV					BARC407			BUILDING TECHNOLOGY-III	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:**

- To acquaint the students with the basic principles used in all basic building services with regards to electrical services in buildings.
- To enable the students in understanding Lighting and illumination with reference to Architecture.

**Methodology:**

- Subject shall be taught through the combination of Guest Lectures and exercises in simple layout for Small buildings
- Study of the basics of photometry, effects and ambience of artificial lighting, the study has to be conducted on a small residential building.

Unit	Hours/Periods	Contents
I.	6	Fundamental principles of Electricity, Transmission of power, distribution in cities, Transformers and load calculations, Single and three phase connections, Types of Generators, UPS.
II.	6	Building Wiring System: Service wires, metering, light and power circuits. electrical safety devices, MCB, ELCB, distribution boards, wiring methods, ISI Codes and standard materials, Conductors, switch boards, electrical points in general building, Concept of earthing, Electrical symbols used in Plans, NBC, preparation of layouts for residences and offices.
III.	6	Basics of Lighting and Radiation, Key Technical Terms of Lighting and illumination, Units of lighting, Basic layers of Lighting- Task, Accent and Ambient lighting.
IV.	6	Lighting Fixtures and types of lighting arrangement, Types of Lamps (CFL, LED, fluorescent, Sodium and high-pressure mercury vapor lamp etc.), Recommended levels of illumination for various occupancies.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC407.1	Acquire knowledge of principles used in building services with special emphasis on electricity.
BARC407.2	Understand lighting and illuminance with reference to Architecture.
BARC407.3	Understand the basic norms as per National Building Code.
BARC407.4	Understand different types & selection of lighting fixtures according to requirement.

**Text /Reference Books:**

- K.B. Raina, S.K. Bhattacharya,(2015). "Electrical Design"
- Time-saver Standards for Architectural Lighting.
- Williams, Ben (1999). "A History of Light and Lighting"
- "Lamp." Columbia Electronic Encyclopedia, 6Th Edition (2011)
- Rensellaer, Lighting Research Center "Illumination Fundamentals"

**Guidelines for Teacher:**

The student will be taught basics electrical design and to create a portfolio that clearly expresses his/her ability to utilize artificial and day Lighting for improvising Architecture and Design.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.

B.ARCH. SEMESTER –IV					BARC408			MEASURED DRAWING	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva-voce)	3
0	2	0	2	4	75	75	150		

**Objectives: -**

To be able to prepare working drawings for buildings for the purposes of architectural and structural drawings as per local building codes & byelaws of simple buildings.

**Methodology: -**Studio assignments & lectures .

Unit	Hours/periods	Contents
I.	15	Measurement of some historical or modern building using simple Methods and plane table for plans and site plans.
II.	15	Measurement of elevations and sections by using instruments such as theodolites .
III.	15	Village or neighborhood study, preparing settlement plans.
IV.	15	Socio- economic studies and conservation studies etc.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC408.1	Preparing Working drawings required for execution of actual construction work as per local building codes & byelaws.
BARC408.2	Create and utilize construction drawings.
BARC408.3	Decipher and communicate information through drawings and specifications.
BARC408.4	Understand co-relation of different components & services in a building.

**Text /Reference Books:-**

Building Drawing by Shah, kale & Patki

**General guidelines for the teacher:** • Maximum drafting work will be done in the studio.

**University Examination Pattern:**

The portfolio viva is of maximum 75 marks.

B.ARCH. SEMESTER – IV					BARC409			PARAMETRIC ARCHITECTURE-III	
Scheme of Teaching					Scheme of Exam. = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam, only Internal	1
0	0	2	0	2	50	00	50		

**Objectives** Introduction and the use of software available for architectural applications.

**Methodology:** The student investigates programming environment in the creation of a customized CAD environment

Unit	Hours/Periods	Contents
I.	12	Introduction to 3D commands. Simple exercises on 3D commands
II.	12	3D modeling of project & walk- through

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC409.1	Developing designs through 3D visualization & preparing presentation drawings in auto CAD.
BARC409.2	Knowing Fundamentals of auto CAD. Learning Commands of 3d in CAD.
BARC409.3	Learning Dimension, Text, Room & area plan, Colour scheme, Section, Call out, 3d crop view, Camera.  Preparing Walkthrough.
BARC409.4	Application- Design Project to be converted into 3D CAD.

**Text /Reference Books:**

- Goldenberg, Joseph, Autocad Architecture 2008 – Comprehensive Tutorial Autodesk 2008
- AutoDesk , “Auto Cad Manual 2012”
- Aubin , Paul F, Mastering Auto CAD Architecture 2008.
- Elise, Moss , AutoCAD Architecture 2008 Fundamentals Autodesk 2008.

**University Examination Pattern:**

The Internal jury will be of 50 Marks; i.e. 25 marks for the portfolio/projects & 25 marks for viva.

**General guidelines for the teacher:**

The teacher shall make live demonstrations in the computer lab on the small-scale projects.

B.ARCH.SEMESTER-V					BARC 501			ARCHITECTURE DESIGN -V	
Scheme of Teaching					Scheme of Examination= Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	18 Hours ( Evaluation by External Viva –voce )	6
1	0	4	3	8	150	150	300		

### Objectives:-

Application of Design theory and principles and Design of Low rise / medium rise /high rise buildings with complex issues to be tackled covering functional relationship, climatic condition, social aspects along with structural considerations and building services Application and use of relevant building bye-laws and provisions of National Building Code

### Methodology:

- Study of the various techniques of Energy-efficient design and recycling technologies for water & wastes is mandatory as these have to be incorporated in the design proposals. Awareness about LEEDS rating and best practices is expected.
- Individual/ Group studio exercises leading to design development

Unit	Hours/Periods	Contents
I.	21	Design of Club House /Auditorium/Theater or Assembling spaces - P.S. Stage
II.	21	-do- Final Stage with Models
III.	21	Design of an Institutional Building like Senior Secondary School / Public Library or Youth Hostel - P.S. Stage
IV.	21	-do- Final Stage with Models

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC501.1	Understand the design as function.
BARC501.2	Understand architectural design as a process and as a final product and the fundamentals of space, form and order in architecture.
BARC501.3	Know about the Indoor space, outdoor space, the concept of space in buildings and the relationship between man and space, defining spaces and the degree of enclosure, Organization of spaces, fenestration and character of facade, enclosure and internal spaces.
BARC501.4	To make student understand and develop the quality and hierarchy of space (private/semi-private/public/semi-public).

### Notes:-

- (a) Design should be urban in context with sustainability and local bye laws as the key factors.  
 (b) Method of construction includes: - Data collection and analysis, Site conditions, Climatic Conditions, Demographic & Socio-Cultural set up, User requirements.

### Reference / Text Books:

- Time Saver Standards for Architectural Design Data – John Hancock Callender.
- Ching, F.D.K., “Design Drawing”, Van Nostrand Reinhold. 2.
- V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
- Neufert, P., “Architects Data”, 3rd Ed., Blackwell Science.
- Watson, D. (Editor), “Time-saver Standards for Architectural Design: Technical Data for Professional Practice”, 8th Ed., McGraw-Hill.
- Francis D.K.Ching, Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York, 1979.
- Structure in Nature- Strategy for Design – Peter Pearce
- Patterns in Nature- Peter Streens
- Lidwell, William, Holden, Kestina, Butler, Jill,” Universal Principles Of Design”, Rockport-Publications, Massachussets

### Guidelines to Teacher: -

- Case study and library study should be conducted as and when required.
- Provision for physically challenged persons should be incorporated in design solutions.
- Exercises to be taken up to emphasis the significance of the user in the process of design.

### University Examination Pattern:

- The Question Paper is of Max. 150 Marks.
- The Design Problem has to be informed to the students a week in advance .
- The students are expected to present their designs in simple plans & views.
- They are not required to adhere to Measured Drawings; i.e; they will make presentation drawings only.
- **The answer sheets will be marked on the basis of external viva-voce.**



B.ARCH. SEMESTER-V					BARC502	BUILDING CONSTRUCTION & MATERIALS - V			
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	4
1	0	2	2	5	100	100	200		

**Objectives: -:**

- To introduce and familiarize the students with constituents, manufacturing process/ availability/ properties/characteristics/defects/ classifications and usage of traditional building materials and their use in simple building work.
- To make students understand and appreciate the various methods of building construction in coordination with the building materials and science related to them.

**Methodology: -**

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	21	<ul style="list-style-type: none"> <li>• Ferrous and Nonferrous metals</li> </ul>
II.	21	<ul style="list-style-type: none"> <li>• Plastics as Building Material -Thermoplastics and thermosetting plastics – properties and architectural uses of plastics – structural plastics – Reinforced plastics and Decorative laminates-plastic coatings, Adhesives and sealants – Modifiers and Plasticizers, Use of nano-materials</li> </ul>
III.	21	<ul style="list-style-type: none"> <li>• Panelling&amp; Partitions in Timber and Aluminium sections</li> <li>• Glass Block Partitions</li> <li>• Fabrications of plastics (PVC and UPVC). Primary plastic building products for walls, roof and partitions</li> </ul>
IV.	21	<ul style="list-style-type: none"> <li>• ESCALATORS, RAMPS AND ELEVATORS: Construction Details of Ramps and Elevators• Details of Escalators•</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC502.1	Get familiarize with manufacturing process / properties / availability / usage of materials & methods of construction in buildings.
BARC502.2	Knowing Usability & suitability of different types of partitions.
BARC502.3	Understand various application details of materials with respect to durability, functionality, aesthetics, maintenance etc.
BARC502.4	Understand selection of elements relevant to site conditions.

**Text books:**

- R Barry, Building Construction, East West Press, New Delhi, 1999.



**Reference Books:**

1. Don A. Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
2. W.B.Mckay, 'Building Construction', Vol.1, 2, 3, Longmans, U.K. 1981.
3. R.Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
4. Dr S P Bindra Arora, Text books on Building Construction.
5. *Shelters, Shacks, and Shanties* By D. C. BEARD With Illustrations by the Author NEW YORK Charles Scribner's Sons 1916

**General guidelines for the teacher:**

- To introduce the students to primary building materials and their applications in building construction.
- To cultivate personal observation and self learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.

**University Examination Pattern:**

The Question Paper is of Max. 100 Marks.

- Part A -10 short type questions of 4 Marks, covering entire syllabus
- Part B -4 Questions of 15 marks each to be attempted out of a total of 8 questions set from all the four units.
- **The answer sheets will be marked on the basis of external viva-voce**



B.ARCH. SEMESTER –V					BARC503			COMPUTER GRAPHIC SKILLS-III	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam	2
1	0	2	0	3	50	50	100	(Evaluation by External Viva-voce)	

**Objectives:** Introduction and the use of 3DS Max and Corel Draw software for architectural applications, as a tool for comprehensive modeling, animation, simulation, and rendering solution for 3D animations, architectural visualization, and images

**Methodology:-**

- Integration of practical exercises along with the design studio project
- Demonstrations & lectures explaining the uses and application of commands

Unit	Hours/Periods	Contents
I.	12	Introduction to Corel Draw <ul style="list-style-type: none"> <li>• Exploring the CorelDraw Screen</li> <li>• File Management</li> <li>• Setting Up the Page</li> </ul>
II.	12	<ul style="list-style-type: none"> <li>• Moving Around and Viewing Drawings</li> <li>• Customizing Options</li> <li>• Drawing and Shaping Objects</li> <li>• Selecting &amp; Manipulating Objects</li> <li>• Transforming Objects</li> <li>• Outlining &amp; Filling Objects</li> <li>• Arranging Objects</li> </ul>
III.	12	<ul style="list-style-type: none"> <li>• Special Effects</li> <li>• Working with Text</li> <li>• Working with Brushes</li> <li>• Working with Paragraph</li> <li>• Special Text Effects</li> </ul>
IV.	12	<ul style="list-style-type: none"> <li>• Using Symbols and Clipart</li> <li>• Working with Bitmaps</li> <li>• Special Page Layouts</li> <li>• Printing</li> <li>• Using Styles and Templates</li> <li>• Using Corel Trace</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC503.1	students will have the knowledge and ability to use Corel Draw confidently and effectively.
BARC503.2	Coreldraw is vector-based designing software used to create logos, flexes, brochures, invitation cards, and any kind of vector design based on the lining.
BARC503.3	This works with vector-based images, which edit two-dimensional images such as logos and posters.
BARC503.4	It is used for designing different artwork like posters, logos, cards any vector-related graphics.

**Guidelines for the teachers:**

The teacher should demonstrate the commands.

**University Examination Pattern:**

The External jury will be of 50 Marks; i.e.25 marks for the portfolio/projects submitted &25 marks for the final Viva.



B.ARCH. SEMESTER-V					BARC504			STRUCTURES IN ARCHITECTURE -V	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credits
L	T	P	S	Total	Internal	External	Total	3 Hours	2
1	2	0	0	3	50	50	100		

**Objectives:** To teach the basics of Seismic Design, Steel Design & Composite Structure Systems

**Methodology:**

Through class lectures, Presentations, site visits, case studies and making models & testing them. Study of behavior of structures through models and testing them for given load.

Unit	Hours/Periods	Contents
I.	9	Design of steel beams
II.	9	Trusses- Definition of truss, Perfect truss, Imperfect truss, Type of trusses & suitability, analysis of simple stress by Analytical method
III.	9	Designs of connection in steel structure: Bolted & welded Connection, assumptions, different type of joints, design of Various types of welded connections subjected to direct loads & moments.
IV.	9	Surface Active Structures-Plate, Folded & Shell structures. Working out structure systems for Layout of a small building

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC504.1	To understand the principles of Design of RCC Structures, Analysis of Portal frames, Principles of Bulk – active and Vector active structures.
BARC504.2	The course outlines the metamorphosis of various structural concepts and systems during the development of architecture at various times.
BARC504.3	It also discusses the role of non-conventional innovative structural systems in the contemporary practice of architecture. It also highlights the impact of new materials and structural solutions on the innovative forms of architecture.
BARC504.4	The course thus aims at enabling students to design innovative non-conventional forms in their architectural design in a feasible manner, with a better understanding of the structural behavior of these forms.

**Text /Reference Books:**

- Structure and Design By G GSchierle, PhD, FAIA
- Structure in Architecture - Mario Salvadori
- Building Structure Primer - James E Ambrose
- Structures - Schodeck
- Structural Concepts and Systems for Architecture & Engineers - T.Y.Lin.
- Elements of Structure – Morgan

**General guidelines for the teacher:**

To introduce the students to the global building environment and the inherent design features  
Students will learn through models & case studies of structural systems

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEM-V					BARC505			HISTORY OF ARCHITECTURE -V	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:**

To provide the knowledge of the evolution of different architectural styles through study of Multi-Religious & Provincial World Architecture.

**Methodology:**

Study of the evolution of different styles of Architecture from 1500 CE to 1800CE around the globe.

Unit	Hours/Periods		Contents
I.	6	1700-1800 CE	<ul style="list-style-type: none"> <li>The Baroque Era- St Paul's Cathedral, St. Petersburg, Russia</li> <li>Neo-Palladianism: Stowe gardens, England</li> <li>Durbar square, Nepal</li> <li>Rise of Jaipur</li> <li>Spread of Colonialism: The nayaks of Madurai- Meenakshi Temple</li> </ul>
II.	6	1800-1850 CE	<ul style="list-style-type: none"> <li>Neo-Classicism, Romanticism &amp; Picturesque Architectural Styles in Europe: Salt Works of Chaux, France, works of Ar.Ledoux, &amp; Ar. Durand</li> <li>PutuoZongcheng at Chengde, China</li> <li>US Capital, Washington</li> <li>Golden temple, Amritsar</li> <li>Glimpses of Colonial Calcutta</li> <li>Establishment of Bangkok by King Rama &amp; Golden Stupa at Wat PraKaew</li> </ul>
III.	6	1850-1900 CE	<ul style="list-style-type: none"> <li>Neo-Gothicism in England: Parliament House</li> <li>Transition from Victorian Era to Beaux Arts through the Industrial Revolution: <ul style="list-style-type: none"> <li>London Law courts,</li> <li>Crystal Palace &amp;</li> <li>Supreme Court, Rome,</li> </ul> </li> <li>Glass House at Werkbund Exhibition, Germany</li> <li>Art Nouveau-Ar Victor horta : Maison Tassel</li> <li>City Beautiful Movement in US</li> <li>Garden City Movement: Ebenezer Howard's concept</li> </ul>
IV.	6	1900-1925 CE	<ul style="list-style-type: none"> <li>Erich Mendelson's Expressionism at Einstein Tower, Germany</li> <li>Lutyen's Delhi &amp; Baker's Parliament House</li> <li>Russian Constructivism: Rusakov Factory Club</li> <li>Bauhaus School by Walter Gropius</li> <li>Villa Savoye by Corbusier</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC505.1	Architectural style through study of world Architecture from 1700-1800CE.
BARC505.2	Evolution of Architectural style from 1800-1850CE.
BARC505.3	From 1850-1900CE Architectural styles through study of multi-religious and world Architecture.
BARC505.4	Around the globe -study different Architectural styles from 1900-1925CE.

**Text /Reference Books:**

- Ching, D K, A Global History of Architecture
- Parihar, S., "Some Aspects of Indo-Islamic Architecture", Abhinav Publishers. 1999
- Fletcher, Banister Sir, History of Architecture
- Maheshwari, Sanjeev & Garg, Rajeev, Ancient Indian Architecture (From Blossom to Boom).
- A History of Architecture :- James Fergusan, John Willey
- Fergusan James, Willey John, "History of Indian & Eastern Architecture, Dodd, Mead & company 1899
- Tagdell Christopher, "The History of Architecture in India, Phaidon Press,1994

**University Examination Pattern :**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER-V					BARC506			BUILDING SCIENCE -IV	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** Developing an understanding regarding environmental sustainability and environmentally responsible green buildings.

Unit	Hours/Periods	Contents
I.	6	Natural environment Vis a vis built environment. living environment Characteristics and components of Urban Ecosystem solar radiation, heat flow, air-movement, Land use, drainage and sanitation
II.	6	Concepts of green field development: Brown field development, environmental impact and ecological balance, FAR, layouts, sustainable Site development, vegetation, landscape elements, alternative services and technologies, rain water harvesting, on site sewerage retention, treatment, recycle and reuse
III.	6	Building Resources: Passive energy system Design, Building envelope, orientation and components of building fabric and Shading, High rise buildings, modular building Construction, curtain walls, Sourcing and recycling of building materials, alternative Calcareous, metallic and non metallic, materials
IV.	6	Sick Building Syndrome, & Importance of green buildings in the contexts of Indian sub continent

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC506.1	Students will acquire a solid base of knowledge of components of Urban Ecosystem
BARC506.2	Students will develop the skills necessary for the effective practice of planning of green field development: Brown field development
BARC506.3	Students will develop the values necessary for the Passive energy system Design.
BARC506.4	Students will learn about the Sick Building Syndrome, & Importance of green buildings

**Text /Reference Books:**

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Down to Earth, Centre for Science and Environment
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196



### **University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any 4 questions, with at least 1 from each unit.

B.ARCH. SEM-V					BARC507			BUILDING TECHNOLOGY- IV	
Scheme of Teaching					Scheme of Examination (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:**

To acquaint the students with the basic principles used in all basic building services with regards to electrical and mechanical services in buildings.

**Methodology:**

Subject shall be taught through the combination of Guest Lectures, Field visits, Visits to the Project Sites , by carrying out exercises in simple layout s for Small buildings

Unit	Hours/Periods	Contents
I.	6	<ul style="list-style-type: none"> <li>Acoustical concepts- wave theory, sound power, sound intensity, decibels, sound power level, sound intensity level, sound pressure level, frequency bands concept of reflection, absorption, transmission. · Absorption coefficient, NRC, sound absorbing materials, -fibrous, membrane, resonators, perforated facing, application techniques. · Noise control by absorption, sound transmission, transmission loss, composite barriers, noise reduction between rooms, light construction.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>Reverberation time (RT), calculation of RT, sample problems, RT and noise criteria for spaces for speech and music. · Acoustical design of enclosed spaces for speech and music, reflection analysis reflection/diffusion, echoes, flutter echo, foci. · Acoustical design consideration in interior design and sound amplification system.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Triangle of fire, Materials to be used in construction, Staircases, Fire escape distances for different buildings, Fire spread in Buildings, Fire doors, Basements, Lifts,</li> <li>Electrical Sub-station, AHU Shut off, NBC Rules for fire. · Fire safety standards and requirements for various types of Buildings.</li> </ul>
IV.	6	<ul style="list-style-type: none"> <li>Fire alarm system and components, Hydrant System and Components, Pump house and location. · Wet riser system, Down comer system and Sprinkler Systems for fire Fighting services. · Security System, Access Control System, Intruder detection and CCTV systems.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC507.1	Students will acquire a solid base of knowledge of components of acoustics
BARC507.2	Students will develop the skills necessary for the effective practice of planning acoustical design of enclosed spaces and acoustical design considerations in interior design
BARC507.3	Students will learn about fire safety standards and requirements for various types of buildings
BARC507.4	Students will learn about fire alarm systems and its components.

**Text /Reference Books:**

- David, E., Architectural Acoustics
- Narsmhan, An introduction to Building Physics
- Services and Environmental Engineering, BRE Digests.
- Carrer and Pitam, G. Modern Air-conditioning, Heating and Ventilation
- Servems and fellows, Air-conditioning and ventilation, John Wiley.
- Strakosch, Elevators and Escalators, John Wiley

**General guidelines for the teacher:**

- On site studies
- Market surveys of different materials for Sound & Fire Insulation.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER –V					BARC 508			WORKING DRAWING	
<b>Scheme of Teaching</b>					<b>Scheme of Exam = Marks</b>			<b>Duration of Exam</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>No Exam,</b>	<b>3</b>
<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>75</b>	<b>75</b>	<b>150</b>	<b>(Evaluation by External viva voce)</b>	

**Objectives:-**

Architectural Detailing and Execution Drawings. With details of Mechanical Electrical & Plumbing Preparation of complete Local Development Authority drawing for a small two storied building.

**Methodology:-** Studio assignments & lectures

Unit	Hours/Periods	Contents
I.	12	All floor plans, Sections, Elevations with Electrical layout duly marked in one floor of the design drawings
II.	12	Electrical, Lighting Details duly marked in one floor of design drawings
III.	12	Mechanical Details duly marked in one floor of design drawings
IV.	12	Plumbing Details duly marked in one floor of design drawings

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC508.1	Students will develop the skills and knowledge to create detailed architectural drawings
BARC508.2	Students will gain an understanding of Mechanical, Electrical and Plumbing systems
BARC508.3	Students will understand co-relation of different components & services in a building
BARC508.4	Students will be able to create drawings that illustrate the layout, placement and connections of MEP components

**Text /Reference Books: -**

- Building Drawing by Shah, kale & Patki
- Civil Engineering Building Practice by Suraj Singh
- Building construction drafting and design by John Molnar, P.E
- Civil Engineering Building Practice by Suraj Singh

**General guidelines for the teacher:**

- Maximum drafting work will be done in the studio.

**University Examination Pattern:**

The External jury will be of 50 Marks; i.e. 25 marks for the portfolio/projects submitted & 25 marks for the final Viva.

B.ARCH. SEMESTER-V					BARC509			PARAMETRIC ARCHITECTURE-IV	
Scheme of Teaching					Scheme of Examination			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam, (Only Internal)	1
0	0	2	0	2	50	0	50		

**Objectives:** To familiarize the students with 3DS Max.

Unit	Hours/Periods	Contents
I.	12	Introduction to 3DS Max Importing drawings from AutoCad and making 3D views
II.	12	Furniture modeling using software 3Ds max.
III.	12	Exterior and Interior modeling using software 3Ds max  Material attachment, Light focusing, Different views, Rendering with Background and Foreground

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC509.1	Students will have the knowledge and ability to use 3DS Mas confidently and effectively.
BARC509.2	Students will learn how to import AutoCAD drawings into 3DS Max and utilize them as a base for creating 3D models and scenes
BARC509.3	Students will develop the skills to create detailed 3D models of furniture objects using 3DS Max
BARC509.4	Students will acquire the ability to create realistic 3D models of exterior and interior spaces using 3DS Max and set up lighting in their 3D scenes.

**University Examination Pattern:**

The Internal jury will be of 50 Marks; i.e 25 marks for the portfolio/projects & 25 marks for viva.

**General guidelines for the teacher:**

The teacher shall make live demonstrations in the computer lab on the small-scale projects.

B. ARCH. SEMESTER-VI					BARC601			ARCHITECTURAL DESIGN-VI	
Scheme of Teaching					Scheme of Examination= Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	18 Hours (Evaluation by External Viva –voce)	6
1	0	4	3	8	150	150	300		

**Objectives: -**

Course aims at teaching the design of buildings for passive recreation and large span buildings for public uses.

**Methodology: -**

- Study of the various techniques of Energy-efficient design and recycling technologies for water & wastes is mandatory as these have to be incorporated in the design proposals. Awareness about LEEDS rating and best practices is expected.
- Individual/ Group studio exercises leading to design development.

Unit	Hours/Periods	Contents
I.	21	Design of a multi-storied building like office building, shopping mall. The focus would be on understanding how to design for an urban setting. - P.S. Stage
II.	21	-do- Final Stage with Models
III.	21	Design of Infotainment center/ hotel/ small hospital - P.S. Stage
IV.	21	-do- Final Stage with Models

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC601.1	Learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach.
BARC601.2	Understanding site planning: organization, scale, hierarchy, orientation and climate.
BARC601.3	Understand complex services in multi-storied buildings; understanding the architectural content of services in buildings.
BARC601.4	Implicate knowledge of design fundamentals and knowledge gained in other subjects to develop better design solutions. Develop appropriate graphic skills and presentation techniques (models, rendering) to explain the contents of a design.

**Notes:-**

- Design should be urban in context with sustainability and local byelaws as the key factors
- Method of construction includes:- Data collection and analysis, Site conditions, Climatic Conditions, Demographic & Socio-Cultural setup, User requirement

**Reference / Text books:-**

- Time Saver Standards for Architectural Design Data – John Hancock Callender.
- Ching, F.D.K., “Design Drawing”, Van Nostrand Reinhold.2.
- V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi,1973.
- Neufert, P., “Architects Data”, 3rd Ed., Blackwell Science.
- Watson, D. (Editor), “Time-saver Standards for Architectural Design: Technical Data for Professional Practice”, 8th Ed.,McGraw-Hill.
- Francis D.K.Ching, Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York,1979.
- Structure in Nature- Strategy for Design – Peter Pearce
- Patterns in Nature- Peter Streens
- Lidwell, William, Holden, Kestina, Butler, Jill,” Universal Principles Of Design”, Rockport-Publications, Massachusetts

**Guidelines To Teacher: -**

- Case study and library study should be conducted as and when required.
- Provision for physically challenged persons should be incorporated in design solutions.
- Exercises to be taken up to emphasis the significance of the user in the process of design.

**University Examination Pattern:**

- The Question Paper is of Max. 150Marks.
- The Design Problem has to be informed to the students a week in advance.
- The students are expected to present their designs in simple plans & views.
- They are not required to adhere to Measured Drawings; i.e; they will make presentation drawings only.
- The answer sheets will be marked on the basis of external viva-voce.



B. ARCH. SEMESTER-VI					BARC602			BUILDING CONSTRUCTION & MATERIALS-VI	
Scheme of Teaching					Scheme of Examination =Marks			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	4 Hours	4
1	0	2	2	5	100	100	200		

**Objectives: -**

- To introduce and familiarize the students with constituents, manufacturing process/ availability/ properties/characteristics/defects/ classifications and usage of traditional building materials and their use in simple building work.
- To make students understand and appreciate the various methods of building construction in coordination with the building materials and science related to them.

**Methodology: -**

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	21	<ul style="list-style-type: none"> <li>• Study of Gypsum &amp; Paints as Building Materials</li> </ul>
II.	21	<ul style="list-style-type: none"> <li>• Floors – Decked Floors</li> </ul>
III.	21	<ul style="list-style-type: none"> <li>• Roofs- Roofs and Trusses: Steel Trusses.</li> <li>• Detail of terracing for flat roofs. Water proofing and rainwater disposal., Rainwater Harvesting</li> </ul>
IV.	21	<ul style="list-style-type: none"> <li>• Expansion Joints</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC602.1	Get familiarize with properties / availability / usage of materials & methods of construction in buildings.
BARC602.2	Knowing Usability & suitability of different types of floors.
BARC602.3	Understand the details of different trusses with respect to durability, functionality, aesthetics, maintenance etc.
BARC602.4	Understand the importance of Expansion Joints to site conditions.

**Text books:**

1. R Barry, Building Construction, East West Press, New Delhi, 1999.



**Reference Books:**

1. Don A. Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
2. W.B. McKay, 'Building Construction', Vol.1, 2, 3, Longmans, U.K.1981.
3. R. Chudley, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
4. Dr S P Bindra Arora, Textbooks on Building Construction.
5. Shelters, Shacks, and Shanties by D. C. BEARD With Illustrations by the Author NEWYORK Charles Scribner's Sons191

**General guidelines for the teacher:**

- To introduce the students to primary building materials and their applications in building construction.
- To cultivate personal observation and self-learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.

**University Examination Pattern:**

The Question Paper is of Max. 100 Marks.

- Part A -10 short type questions of 4 Marks, covering entire syllabus.
- Part B -4 Questions of 15 marks each to be attempted out of a total of 8 questions set from all the four units.
- The answer sheets will be marked on the basis of external viva-voce.



B.ARCH. SEMESTER –VI					BARC603			COMPUTER GRAPHIC SKILLS-IV	
Scheme of Teaching					Scheme of Examination			Duration of Exam	Credit
L	T	P	S	Total	Internal	External	Total	No Exam	2
1	0	2	0	3	50	50	100	(Evaluation by External Viva voce)	

**Objectives:-**Introduction and the use of 3 DS Max software for architectural applications. as a tool for comprehensive modeling, animation, simulation, and rendering solution for 3D animations, architectural visualization, and images

**Methodology:-**Integration of practical exercises along with the design studio project  
Demonstrations & lectures explaining the uses and application of commands

Unit	Hours/Periods	Contents
I.	12	<b>Introduction to Photoshop</b> <ul style="list-style-type: none"> <li>• The Photoshop Environment</li> <li>• Creating Custom Workspaces</li> <li>• Opening Images</li> <li>• Using the File Browser</li> <li>• Image Magnification</li> <li>• Viewing Document Information</li> <li>• Moving the Image</li> <li>• Undoing Mistakes and the History</li> <li>• Palette Using the options bar and other panels</li> <li>• Using the Tools</li> <li>• Displaying Drawing Guides</li> <li>• Setting Preferences</li> </ul>
II.	12	<b>Photoshop Image Manipulation</b> <ul style="list-style-type: none"> <li>• Opening an Image in Photoshop</li> <li>• Creating images in Photoshop</li> <li>• Saving images in Photoshop</li> <li>• Basic image editing</li> <li>• Cropping an Image</li> <li>• Bitmap Images</li> <li>• Vector Images</li> <li>• Image Size and Resolution Settings</li> <li>• Scanning Images</li> <li>• Placing Files</li> <li>• Supported import and export formats</li> </ul>
		<b>Layer Basics</b> <ul style="list-style-type: none"> <li>• About Layers-fill and adjustment Layers</li> <li>• Using the Layers Palette</li> <li>• Creating Layers</li> <li>• Deleting Layers</li> <li>• Moving Layers</li> <li>• Layer Opacity</li> <li>• Locking Layers</li> <li>• Layer modes and blending options</li> <li>• Apply Layers Style &amp; Flattening and saving file</li> </ul> <b>Color Basics</b>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC603.1	students will have the knowledge and ability to use Photo shop confidently and effectively.
BARC603.2	Student will gain the skills and abilities to use Photo shop that are employable and rewarding.
BARC603.3	Student will learn to render the architectural plan sections and elevations etc.
BARC603.4	It will also help the student to explain their ideas of designs in creative way

**Text / Reference Books:**

- Goldenberg, Joseph, Autocad Architecture 2008 – Comprehensive Tutorial Autodesk2008
- AutoDesk , “Auto Cad Manual2012”
- Aubin , Paul F, Mastering Auto CAD Architecture2008.
- Elise, Moss , AutoCAD Architecture 2008 Fundamentals Autodesk2008.

**Guidelines for the teachers:**

The teacher should demonstrate the commands.

**University Examination Pattern:**

The External jury will be of 50 Marks; i.e 25 marks for the portfolio/projects submitted & 25 marks for the final Viva.



B.ARCH.SEMESTER-VI					BARC604			STRUCTURES IN ARCHITECTURE-VI	
Scheme of Teaching					Scheme of Exam			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
1	2	0	0	3	50	50	100		

**Objectives:**

To teach the basics of Seismic Design, Steel Design & Composite Structure Systems

**Methodology:**

Through class lectures, Presentations, site visits, case studies and making models & testing them.

Study of behavior of structures through models and testing them for given load.

Unit	Hours/Periods	Contents
I.	9	Introduction of earthquake resistant structure, Behavior of structure under seismic load, earthquake failure
II.	9	Lateral Force Design & diagonal tension
III.	9	Introduction to Pre-stressed concrete structures
IV.	9	Composite Structural Systems; Composite sections (made of more than one material) Working out structure systems for Layout of a small building

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC604.1	Students will understand about the seismic load
BARC604.2	Students will understand about the lateral forces on the building.
BARC604.3	Students will understand about the Pre-stressed concrete structures.
BARC604.4	Students will understand about the Composite Structural Systems. students can apply the classroom concepts in real life.

**Textbooks:**

1. Structure and Design By G G Schierle, PhD, FAIA

**Reference Books:**

1. Structure in Architecture - Mario Salvadori
2. Building Structure Primer - James E Ambrose
3. Structures - Schodeck
4. Structural Concepts and Systems for Architecture & Engineers - T.Y. Lin.
5. Elements of Structure – Morgan

**General guidelines for the teacher:**

- To introduce the students to the global building environment and the inherent design features
- Students will learn through models & case studies of structural systems
- The paper will be set by the external expert

**University Examination Pattern**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEM-VI					BARC605			HISTORY OF ARCHITECTURE -VI	
Scheme of Teaching					Scheme of Examination			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:-**To provide the knowledge of the evolution of different architectural styles through study of Multi-Religious & Provincial World Architecture.

**Methodology:-**

Study of the evolution of styles of Architecture from 1500 CE to 1800CE around the globe

Unit	Hours/Periods		Contents
I.	6	1925-1950 CE	Rise of Modernism <ul style="list-style-type: none"> <li>• Mies Van Der Rohe's Barcelona Pavilion &amp; Farnsworth House</li> <li>• Buckminster Fuller: Geodesic Dome &amp; Dymaxion House</li> <li>• Corbusier's Palace of Soviets</li> <li>• Organic Architecture by F L wright Robie House, Taliesin East</li> <li>• Emergence of tall buildings: Raymond Hood's Rockefeller Centre, New York</li> </ul>
II.	6	1950-1975 CE	<ul style="list-style-type: none"> <li>• Cities of Chandigarh &amp; Capitol complex, Bhubneshwar &amp; Gandhinagar.</li> <li>• National Congress, Brasilia</li> <li>• Guggenheim Museum, Manhattan</li> <li>• Louis Kahn's Parliament of Bangladesh</li> <li>• Sydney Opera House by John Utzon</li> </ul>
III.	6	1975-2000 CE	<ul style="list-style-type: none"> <li>• Ahmedabad after Corbusier: CEPT, Gandhi Ashram &amp; Sangath</li> <li>• Kenzo Tange's Masterplan for city of Abuja, Nigeria</li> <li>• Post Modernism: pompidou Centre, France</li> <li>• Phillip Johnson's AT &amp; T building, New York</li> <li>• I M Pei's Pyramide Du Louvre, Paris</li> </ul>
IV.	6	2000-till date	Globalisation <ul style="list-style-type: none"> <li>• Rise of Shanghai</li> <li>• San Tiago calatrava's Milwaukee Artmuseum, Wisconsin</li> <li>• Dubai Skyline</li> <li>• Concept of smart Cities: Barcelona</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

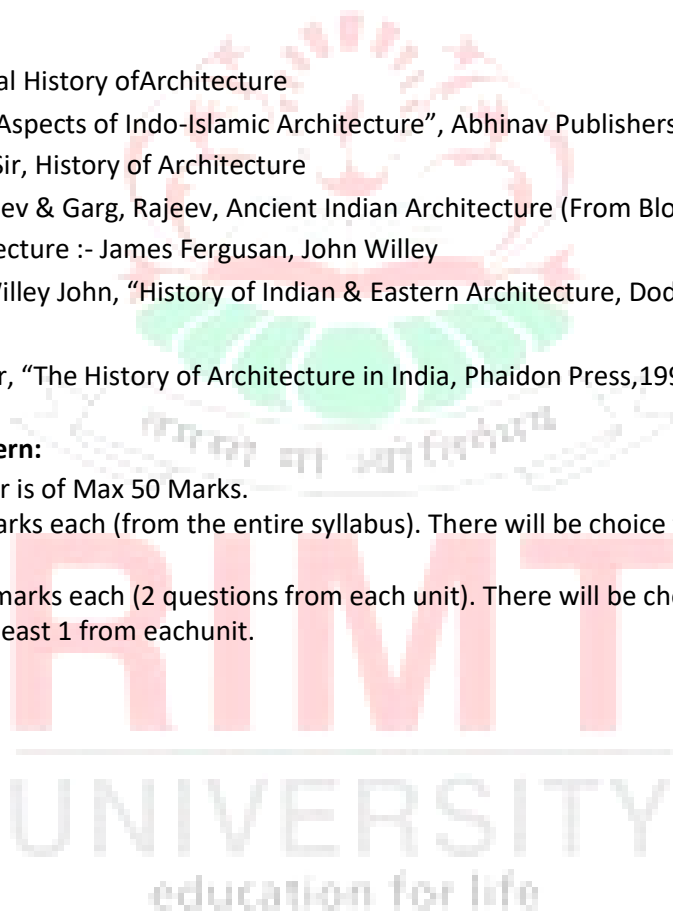
BARC605.1	Understand the reasons of emergence, growth and termination of prevailing architectural periods.
BARC605.2	Analytical understandings on theories of design to be able to translate creative thinking of space.
BARC605.3	Understand the building type and its architectural style.
BARC605.4	Assess the merits of an architectural design in terms of key social, aesthetic and functional aspects.

**Text /Reference Books:**

- Ching, D K, A Global History of Architecture
- Parihar, S., "Some Aspects of Indo-Islamic Architecture", Abhinav Publishers. 1999
- Fletcher, Banister Sir, History of Architecture
- Maheshwari, Sanjeev & Garg, Rajeev, Ancient Indian Architecture (From Blossom to Boom).  
A History of Architecture :- James Fergusan, John Willey
- Fergusan James, Willey John, "History of Indian & Eastern Architecture, Dodd, Mead & company 1899
- Tagdell Christopher, "The History of Architecture in India, Phaidon Press,1994

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEM-VI					BARC606			URBAN AND REGIONAL PLANNING	
Scheme of Teaching					Scheme of Examination			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:-** The study of this subject emphasizes on planning philosophies, overview of planning process and components of land use planning. It aims to train the students to carry out the further studies in the specialized field of Urban and Regional Planning.

**Methodology:** Studio Assignments, Lectures with the help of audio visual aid.

Unit	Hours/Periods	Contents
I.	6	<ul style="list-style-type: none"> <li>Urban and Regional Planning principles and considerations: Urban structure.</li> <li>Urban typology, density and sustainability - spatial types and morphologies related to intensity of use,</li> <li>consumption of resources and production and maintenance of viable communities</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>Accessibility –ease, safety and choice when moving to and through places; Legibility and way finding; Designing places to stimulate public activity</li> <li>Function and fit; Complementary mixed uses-constructive interaction;</li> <li>Character and meaning;</li> <li>Order and incident;</li> <li>Continuity and change in time and place, contemporary culture</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Civil society- building social capital</li> <li>Sociology and social science and its relation to physical planning Theories of Urbanization – Marx Theory</li> </ul>
IV.	6	<ul style="list-style-type: none"> <li>Human Aspects of Urban Form.</li> <li>Regional planning macro and microeconomics.</li> <li>Planning need, issues and five year plans,</li> <li>Economic uplift, backwardness, Poverty alleviation;</li> <li>Sustainable development, conservation measures, reduce recycle, reuse concept, care for future generation</li> </ul>



**COURSE OUTCOMES:** On completion of this course, the students will be able to

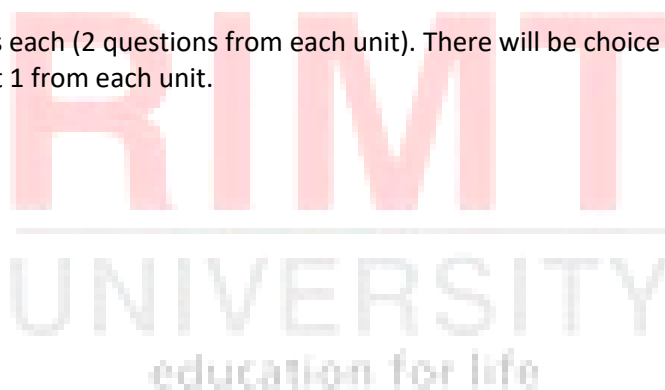
BARC606.1	Students will acquire a solid base of knowledge in the principles and practices of learning, including urban spatial structure, local public finance, economics of development, infrastructure provision, and globalization.
BARC606.2	Students will develop the skills necessary for the effective practice of planning, including its purpose, meaning and history; methods that envision future change; elements of plans; adoption, administration, and implementation of plans; speaking for the disadvantaged; laws and policies of environmental planning.
BARC606.3	Students will develop the values necessary for the effective practice of planning, including problem-solving skills; research skills; written, graphical, and oral skills; computational skills; collaboration with peers; meeting professional standards; forecasting and scenarios; implementation of plans; working with diverse communities.
BARC606.4	Students will learn the values and ethical standards affecting the practice of planning, including the values of justice, equity, fairness, efficiency, order, and beauty; the values of fair representation and equal opportunity; and respecting complex legacies.

**Text/Reference Books**

- Regional Planning in India Paperback – 2011 by Mahesh Chand (Author), V. K. Puri (Author)
- Urban and Regional Planning in India: by S K Kulshresth

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEM-VI					BARC607			BUILDING TECHNOLOGY-V	
Scheme of Teaching					Scheme of Examination			Duration of Exam.	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:**

To acquaint the students with the basic principles used in all basic building services with regards to electrical and mechanical services in buildings.

**Methodology:**

Subject shall be taught through the combination of Guest Lectures, Field visits, Visits to the Project Sites , by carrying out exercises in simple layout s for Small buildings

Unit	Hours/Periods	Contents
I.	6	Fundamental principles of Heating Ventilation And Air conditioning, IAQ, comfort conditions, gas laws
II.	6	Refrigeration cycle, A/C equipment, compressor heat exchangers, condenser, evaporators
III.	6	Types of Air-conditioning: single zone, multi zone, window air conditioners, split air conditioners, duct able air conditioners, package system and central air conditioning
IV.	6	All air systems and chilled water systems. A/C plant room, AHU's Building ducting, diffusers and grills, FC units..

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC607.1	Building services engineering, technical building services, architectural engineering, building engineering or facilities and services planning engineering refers to the implementation of engineering for the internal environment and environmental impact of a building.
BARC607.2	Building services engineers are responsible for the design, installation, operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmentally operation of modern buildings.
BARC607.3	This course is designed to enable students to understand various systems of Electrical services, Fire fighting.
BARC607.4	Illumination and Elevators/Escalator services; and its design application for a small and large building.

**Text /Reference Books:**

- David, E., Architectural Acoustics
- Narsmhan, An introduction to Building Physics
- Carrer and Pitam, G. Modern Air-conditioning, Heating and Ventilation
- Servems and fellows, Air-conditioning and ventilation, John Wiley.

**General guidelines for the teacher:**

- On site studies and Market surveys to be conducted

**University Examination Pattern**

The Question Paper is of Max 50 Marks.

- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions.
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER-VI					BARC608			BUILDING BYELAWS	
Scheme of Teaching					Scheme of Examination			Duration of Exam.	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:-**

- Architectural practice and building regulations.
- Familiarizing with Building Bye-laws through Local Developments Authority Guidelines, applicable to Residential and Non Residential building

Unit	Hours/Periods	Contents
I.	6	Building bylaws :terminology, ground coverage, FSI calculations, building height regulations, building use regulation
II.	6	Submission plan, methods of municipal approval, NBC, fire prevention and safety measures, other regulatory aspects such as master plan and zonal plan, NBC
III.	6	Provisions with respect to Land use classifications and use permitted Means of Access, Community open spaces and amenities, Requirement of Plots. Code of conduct for specially able & various services like water supply & sanitation, electrical, mechanical etc
IV.	6	NOC, Occupation certificate, Buildings services approvals and completion certificate procedure. Codal provisions with respect to Classification of Buildings, Open spaces within a plot, Offstreet parking spaces, Requirement of parts or buildings.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC608.1	Building Bye-Laws are legal tools used to regulate coverage, height, building bulk, and architectural design and construction aspects of buildings so as to achieve orderly development of an area.
BARC608.2	Students will develop the skills necessary to protect any building against noise, fire, earthquakes, structural failures, and any hazardous activity.
BARC608.3	Students will learn about the NBC standered codes
BARC608.4	Students will learn aboutNOC approvals, managing of open spaces & offstreet parking.

**Text books and Reference Books:**

- National Building Codes2005
- Local Building Byelaws
- Master plan of any area as specified by theteacher

**University Examination Pattern:**

The Question Paper is of Max 50 Marks.

- 7 questions of 2 marks each (from the entire syllabus). There will be choice to answer any 5 questions
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any four questions, with at least 1 from each unit.



B.ARCH. SEMESTER –VI					BARC609			PARAMETRIC ARCHITECTURE-V	
Scheme of Teaching					Scheme of Examination			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam, only internals	1
0	0	2	0	2	50	00	50		

**Objectives:** By the end of the semester students are expected to have a general understanding of the following:

1. The fundamentals of computer graphics
2. Basic modeling and animation techniques
3. State of the art in 3D computer graphics

Unit	Hours/Periods	Contents
I.	12	Rendering Techniques in 3DS Max
II.	12	Creating Walk-Throughs /Animating the views in 3Ds Max

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC609.1	Students will learn the process of rendering their 3D models and scenes into high quality images or animations.
BARC609.2	Students will explore different rendering settings and options.
BARC609.3	Students will learn how to create walkthroughs and animate the scenes in 3DS Max.
BARC609.4	Students will gain skills in animating cameras within 3DS Max to create dynamic and engaging views.

B.ARCH. SEMESTER-VII					BARC701			ARCHITECTURAL DESIGN - VII	
Scheme of Teaching					Scheme of Examination= Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	18 Hours ( Evaluation by External Viva –voce )	6
1	0	4	3	8	150	150	300		

**Objectives:-** To familiarize the students with large scale housing and building projects with emphasis on building services and systems, architectural controls and building bye laws.

**Methodology:-** Study of the various techniques of Energy-efficient design and recycling technologies for water & wastes is mandatory as these have to be incorporated in the design proposals. Awareness about LEEDS rating and best practices is expected. Individual/ Group studio exercises leading to design development

Unit	Hours/Periods	Contents
I.	21	Large spans viz exhibition pavilions / industrial buildings / Multiplex - P.S. Stage
II.	21	-do- Final Stage with Models
III.	21	Multi-functional mid-rise buildings with specialized services, such as Housing (G+3) with Site area 1 hectare
IV.	21	<ul style="list-style-type: none"> <li>Housing Continued.</li> <li>Site planning of an Institutional campus in terms of road arteries ,landscape, electrical substations &amp; fire tanks</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC701.1	Undertake comprehensive design with special emphasis on Structure System, Services, Architectural Control & Building Bye Laws.
BARC701.2	Understand the importance Climatic factors .
BARC701.3	Understand the Co-relation of structure system, circulation and other functional utility of spaces.
BARC701.4	Design user friendly public spaces for differently abled people.

**NOTE:-** Method of construction includes:- Data collection and analysis, Site conditions, Climatic Conditions, Demographic & Socio-Cultural setup, User requirements

**Reference / Text Books:**

- Time Saver Standards for Architectural Design Data – John Hancock Callender.
- Ching, F.D.K., “Design Drawing”, Van Nostrand Reinhold. 2.
- V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
- Neufert, P., “Architects Data”, 3rd Ed., Blackwell Science.
- Watson, D. (Editor), “Time-saver Standards for Architectural Design: Technical Data for Professional Practice”, 8th Ed., McGraw-Hill.
- Francis D.K.Ching, Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York, 1979.
- Structure in Nature- Strategy for Design – Peter Pearce
- Patterns in Nature- Peter Streens
- Lidwell, William, Holden, Kestina, Butler, Jill, “ Universal Principles Of Design”, Rockport-Publications, Massachusetts
- 

**Guidelines to teacher:-**

- Case study and library study should be conducted as and when required.
- Provision for physically challenged persons should be incorporated in design solutions.
- Exercises to be taken up to emphasis the significance of the user in the process of design.
- For end semester exam, marks would be awarded on basis of EXTERNAL VIVA-VOCE of both the Design Portfolio & the End-Semester Answer Sheet



B.ARCH. SEMESTER-VII					BARC702			BUILDING CONSTRUCTION & MATERIALS- VII	
Scheme of Teaching					Scheme of Examination = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	4Hours	4
1	0	2	2	5	100	100	200		

**Objectives:-:**

To enable the student to study various constructional details in metals i.e., steel & aluminum in coordination with study of materials & science related to them.

To enable the student to know about latest techniques like prefabrication, pre-stressed, etc used in industry

**Methodology:-**

- Introduction to materials and construction through lectures and studio exercises.
- Site visits to gain knowledge about construction details.
- Introduction to some basic construction methods and elements.

Unit	Hours/Periods	Contents
I.	21	<ul style="list-style-type: none"> <li>• The study about application of stainless steel in interior and exterior as well; the maintenance required in stainless steel.</li> </ul>
II.	21	Doors and windows in : <ul style="list-style-type: none"> <li>• Rolled steel section</li> <li>• Pressed steel frames</li> <li>• Sliding, folding and pivoted doors in UPVC</li> </ul>
III.	21	<ul style="list-style-type: none"> <li>• Commercial kitchen dry section (study, designing and working drawings).</li> </ul>
IV.	21	<ul style="list-style-type: none"> <li>• Commercial kitchen wet section (study, designing and working drawings).</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC702.1	Introduction to the study of building construction and materials, its importance.
BARC702.2	Various construction details in metals in coordination with study of materials and science related to them.
BARC702.3	Enable to know about latest techniques used in industry such as commercial kitchen.
BARC702.4	Designing and working drawing details.

**General guidelines for the teacher:**

- To introduce the students to primary building materials and their applications in building construction.
- To cultivate personal observation and self learning in the students, site visits should be conducted so as to cover the given syllabus.
- Students will observe measure, sketch and annotate what they see at site and submit a site visit report to the teachers concerned for evaluation. This award shall form part and parcel of the sessional work for internal assessment.

**University Examination Pattern:**

The Question Paper is of Max. 100 Marks.

- Part A -10 short type questions of 2 Marks, covering entire syllabus
- Part B -4 Questions of 20 marks to be attempted out of a total of 8 questions set from all the four units.
- **The answer sheets will be marked on the basis of external viva-voce**

B.ARCH. SEMESTER –VII					BARC703			COMPUTER GRAPHIC SKILLS -V	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No External (Evaluation by external Viva-voce)	2
1	0	2	0	3	50	50	100		

**OBJECTIVE:** Introduction and the use of Photoshop EPS as a tool for architectural visualization, and images.

Unit	Hours/Periods	Contents
I.	12	<b>Transforms</b> <ul style="list-style-type: none"> <li>• Using free transform</li> <li>• Move</li> <li>• Rotate</li> <li>• Scale</li> <li>• Skew Distort</li> <li>• Perspective</li> <li>• Flip-vertical, horizontal</li> <li>• Invert</li> <li>• Rotate 180, 90ocw, 90occw</li> </ul>
II.	12	<b>Working with Selections</b> <ul style="list-style-type: none"> <li>• Using the quick selection tool</li> <li>• Moving a selected area</li> <li>• Manipulating selection</li> <li>• Refining the edges of a selection</li> </ul> <b>Masks and Channels</b> <ul style="list-style-type: none"> <li>• Editing a mask</li> <li>• Applying a filter effect to a masked selection</li> <li>• Creating a Gradient mask</li> </ul>
III.	12	<b>Action</b> <ul style="list-style-type: none"> <li>• Using the action palette</li> <li>• Recording action</li> <li>• Playing action</li> <li>• Editing action</li> <li>• Loading a saved action</li> </ul> <b>Text Editing and Special Effects</b> <ul style="list-style-type: none"> <li>• About the type Layer Creating horizontal and vertical type</li> <li>• Using horizontal and vertical type</li> <li>• mask tools</li> <li>• Using character palette for text editing Creating text warp</li> <li>• Rasterizing type</li> <li>• Converting type to Shapes</li> <li>• Adding effect to text</li> </ul>
VI.	12	<b>Photoshop Special Effects and Filter</b> <ul style="list-style-type: none"> <li>• About special effects</li> <li>• Using filters</li> <li>• Basic filters</li> <li>• Filter Combinations</li> </ul> <b>Creating Links Within An Image</b>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC703.1	students will have the knowledge and ability to use Photo shop confidently and effectively.
BARC703.2	Student will gain the skills and abilities to use Photo shop that are employable and rewarding.
BARC703.3	Student will learn to render the architectural plan sections and elevations etc.
BARC703.4	It will also help the student to explain their ideas of designs in creative way

**Text /Reference Books:**

- Mastering Photoshop 2016  
by Brendan Dillon (Foreword), James Vandezande (Author), Eddy Krygiel (Author)

**Guidelines for the teachers:** The teacher should demonstrate the software.

**University Examination Pattern:**

The External jury will be of 50 Marks; i.e 30 marks for the portfolio/projects submitted & 20 marks for the final Viva.

B.ARCH. SEMESTER-VII					BARC704			ESTIMATING & COSTING	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Exam.	Credits
L	T	P	S	Total	Internal	External	Total	3 Hours	2
1	2	0	0	3	50	50	100		

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

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>Estimate &amp; Types of Estimate.</li> <li>Methods of Estimates--Approximate &amp; detailed methods of Estimate including Plinth area method, Carpet/Floor Area method, Cubic Content method.</li> <li>Preparing estimates of quantities of materials for various items of work e.g. earthwork, brickwork, flooring, roofing etc. - units of measurements and payments.</li> <li>Analysis of rates of material and labour required for various items of work.</li> <li>Bill of Quantities-Methods of taking out the quantities of R.C.C. construction.</li> <li>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.</li> </ul>
II.	6	<p><b>Specifications</b></p> <ul style="list-style-type: none"> <li>Introduction, importance, Role, Functions and Types of Specifications</li> <li>Detailed Specifications for various basic building materials.</li> <li>Studio exercise related to specifications for small building project, standard P.W.D. specifications.</li> <li>Writing specifications for civil works as: Damp Proof Course, Brick Masonry, Concreting Flooring, Plastering &amp; Pointing</li> <li>Timber Doors &amp; Windows</li> <li>Steel Doors &amp; Windows</li> <li>Painting and Varnishing</li> <li>Services, Sanitary Fixtures &amp; Electric Wiring</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Tenders- Type, Process, Scrutiny and Selection of Contractor, Pre-Qualification and Registration of Contractor.</li> <li>Valuation - Purpose, Objective, Types and Method of valuation.</li> </ul>
IV	6	<ul style="list-style-type: none"> <li>Arbitration and Reconciliation Act.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC704.1	Students will have the knowledge about estimates and types of estimates.
BARC704.2	Student will learn about methods of estimates and prepare estimates of quantities of materials for various items of work
BARC704.3	Student will learn about specifications and detailed specification for various basic building materials
BARC704.4	Students will also gain knowledge about tenders and valuation.

**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'.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 5 questions of 2 mark each (from the entire syllabus).
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any 4 questions

B.ARCH. SEMESTER-VII					BARC-705			INTERIOR DESIGN	
Scheme of Teaching					Scheme of Examination = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

#### Objectives:-

To make the students study the Interior Design principles and their applications, and to foster creative ability and inculcate skills to understand and conceive architectural design.

#### Methodology:-

- Field studies and case studies for understanding the treatment and handling of interior spaces in context to functional requirements.

Unit	Hours/Periods	Contents
I.	9	<ul style="list-style-type: none"> <li>• Definition of interior design, Interior architectural design process, vocabulary of design in terms of principles and elements</li> <li>• Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design.</li> </ul>
II.	9	<ul style="list-style-type: none"> <li>• Brief study of the history of interior architectural design through the ages relating to historical context, design movements and ideas etc.</li> <li>• Brief study of folk arts and crafts with reference to interior design and decoration</li> </ul>
III.	9	<ul style="list-style-type: none"> <li>• Introduction to various elements of interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc., and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.</li> <li>• Accessories used for enhancement of interiors, paintings, objects-de-art, etc.</li> </ul>
IV.	9	<ul style="list-style-type: none"> <li>• Study of the relationship between furniture and spaces, human movements &amp; furniture designs related to human comfort. Function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas.</li> <li>• Study of interior lighting</li> <li>• Interior landscaping, elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC705.1	To create different design schemes for different spaces. To generate character of different spaces according to the function.
BARC705.2	To understand the impact of different elements such as furniture and decorative features and upholstery. Understand the meaning and impact of design as it relates to human interaction, technology, theoretical frameworks, and interdisciplinary efforts.
BARC705.3	Understand the intricacies of interior space planning and its historical background. Understand the modern trends in the field.
BARC705.4	Interpret, evaluate and represent abstract concepts during all phases of the design process to indicate conditions, relationships, and requirements within the interior environment. Explore and generate creative solutions via a systematic and coordinated design process that integrates functional and aesthetic concerns.

**Text books and Reference Books:**

1. Ching, F. D. K. (1987). *Interior Design Illustrated*. New York : V.N.R. Publications.
2. Doshi, S. (Ed.) (1982). *The Impulse to adorn - Studies in traditional Indian Architecture*. Marg Publications.
3. Kathryn, B. H. and Marcus, G. H. (1993). *Landmarks of twentieth Century Design*. Abbey Ville Press.
4. Pendero, J. and Zelnik, M. (1979). *Human Dimension and Interior space: A Source Book of Design Reference Standards*. New York : Whitney Library of Design.

**General guidelines for the teacher:**

- To make visits on disaster preparedness workshops.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 5 questions of 2 mark each (from the entire syllabus).  
8 Questions of 10 marks each (2 questions from each unit).  
There will be choice to answer any 4 questions, with at least 1 from each unit.



B.ARCH. SEMESTER-VII					BARC706			URBAN DESIGN	
Scheme of Teaching					Scheme of Examination = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:-** The overall goal of the course is to help students formulate an understanding of the urban forms and spaces. The contemporary needs of the society and the role of spaces will be dealt along with the need for design control.

**Methodology:**

Students will understand the fundamental concepts and theories of urban design and apply them in their design projects.

UNIT	HOURS/PERIODS	CONTENTS
I.	6	INTRODUCTION <ul style="list-style-type: none"> <li>• Emergence of urban design as a discipline</li> <li>• Introduction, Role, Scope and Importance of Urban Design</li> <li>• Distinction between Urban Design, Architecture and Town Planning</li> <li>• Concepts of urban design</li> <li>• Elements of Urban Design- Pattern, Grains, Texture, Density etc, their role and importance.</li> <li>• Urban design parameters- space and place, morphology, urban form and structure.</li> </ul>
II.	6	BASIC PRINCIPLES & TECHNIQUES IN URBAN DESIGN <ul style="list-style-type: none"> <li>• Determinants of Urban Form – Landform, Climate, Symbolism, Activity Pattern, Socio-cultural Factors etc. and their role and importance.</li> <li>• Imagability- Elements and their role and importance including Paths, Nodes, Landmarks ,Edges, Districts etc</li> <li>• Urban scale, Mass and Space;</li> </ul>
III.	6	STUDY OF URBAN SPACES AND CITIES <ul style="list-style-type: none"> <li>• To introduce the components of a city and their interdependent roles- urban fabric ;</li> <li>• Expressive quality of built forms, spaces in public domain like street, square, precinct, piazza, mall etc</li> <li>• Urban Design study of selected Capital Cities- Chandigarh and Delhi</li> </ul>
IV.	6	DEVELOPMENT CONTROLS, POLICIES AND FRAMEWORK <ul style="list-style-type: none"> <li>• Development Controls- Role and Importance in Urban Design.</li> <li>• Introduction to Legal and Institutional framework for Urban Design including Delhi Urban Art Commission- Objectives, Constitution, Role, Importance, Impact etc</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC706.1	Analyze and explain the Behavioral and Perceptual approach to the city as visual experience with the help of Kevin Lynch and Gordon Cullen's theories.
BARC706.2	Analyze and Design Social and Cultural layer that influence Urban areas.
BARC706.3	Classify and Create the spaces (built and unbuilt) in relation with Scale, Size, Byelaws in the process of transformation of Space and form.
BARC706.4	Demonstrate and Design the relationship b/w Physical activity and built environment, Human activity and Built environment.

**Reference / Text Books:**

1. The Concise townscape- Gordon Cullen
2. Image of the city - Kevin Lynch
3. Architecture of town and cities - Paul D. Speriregon, The MIT press
4. Urban design – street and square, Cliff Moughtin, Bath Press
5. Town and square - Paul Zucker
6. The urban pattern - Arthur B Gallion, CBS publishers
7. Architecture and the urban experience - Raymond J Curran. Van Nostrand Reinhold Company
8. Indian mega city and economic reforms - A.K.Jain , Management publishing Company

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 5 questions of 2 mark each (from the entire syllabus).
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any 4 questions

B.ARCH. SEMESTER-VII					BARC707			MODEL MAKING	
Scheme of Teaching					Scheme of Examination = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No exam ( Evaluation by External Viva- Voce)	2
1	0	2	0	3	50	50	100		

**Objectives:** - The teaching of this subject shall help the students to learn different materials used in models.

**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.

Unit	Hours/periods	Contents
I.	6	Study and practice of various methods and materials used in the preparation of models for the following purposes: <ul style="list-style-type: none"> <li>• Quick study models for developing a design idea.</li> <li>• Block models for study and development of site plans and layouts.</li> <li>• Presentation models of single building or group of buildings.</li> </ul>
II.	6	Detailed models showing various features of architectural design such as doors, windows, projections, structures etc.
III.	6	Detailed models of buildings, with removable roof-tops, showing interior layout, furniture, fittings etc.
IV.	6	Detailed models of site plans showing: <ul style="list-style-type: none"> <li>• roads</li> <li>• contours</li> <li>• landscape elements</li> <li>• lamp-posts</li> <li>• human figures etc</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC707.1	To understand various materials and methods used in preparation of models.
BARC707.2	Introduce different techniques of model making in various materials and basic processes for fabrication and assembly of simple building components.
BARC707.3	The aim of this subject is to familiarize students with different types of materials and manufacturing techniques for creating art forms/ models.

**Reference / Text Books:**

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

**University Examination Pattern:**

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.

B.ARCH. SEMESTER-VII					BARC-708			DISASTER MANAGEMENT	
Scheme of Teaching					Scheme of Examination = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3 Hours	2
2	0	0	0	2	50	50	100		

**Objectives:-**

To make the students understand the various pre & post disaster design and management measures.

**Methodology:-**

- Introduction to disaster management.
- Measures to be taken in both natural and manmade disasters.

Unit	Hours/Periods	Contents
I.	9	<ul style="list-style-type: none"> <li>• Introduction to disaster management</li> <li>• Types of disaster (natural or man-made)</li> <li>• Causes of disaster risks and preparedness. Principles of Emergency Management, Safety precautions and standards in work environment</li> </ul>
II.	9	Emerging approaches in disaster management –three stages <ul style="list-style-type: none"> <li>• Pre –disaster stage(preparedness)</li> <li>• Emergency stage</li> <li>• Post disaster stage-rehabilitation</li> </ul>
III.	9	<b>Earthquake</b> <ul style="list-style-type: none"> <li>• Problems &amp; design issues</li> <li>• General Principles of designing</li> <li>• Special construction techniques.</li> </ul>
IV.	9	<ul style="list-style-type: none"> <li>• General requirements, principles and measures for building design for Fire, floods, cyclones, avalanche, etc.</li> <li>• Special construction technique.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC708.1	Analyze relationship between Development and Disasters.
BARC708.2	Understand concept of sustainability & sustainable development.
BARC708.3	Understand various issues like climate change, ecological footprint etc.
BARC708.4	Understand low impact construction practices, life cycle cost and alternative energy resources.

**Text books and Reference Books:**

1. Disaster Mitigation; Experience and Reflection by Pradeep Sahni
2. Natural hazards & disaster by Donald Hyndman & David Hyndman-Cengage Learning

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
  - 5 questions of 2 mark each (from the entire syllabus).
- 8 Questions of 10 marks each (2 questions from each unit).  
There will be choice to answer any 4 questions, with at least 1 from each unit.

B.ARCH. SEMESTER –VII					BARC709			PARAMETRIC ARCHITECTURE-VI	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (only internal)	2
1	0	2	0	3	100	0	100		

**Objective:** Introduction and the use of Autodesk Revit Architecture as a tool for building design, Simulation and drafting.

**Methodology:**-Integration of practical exercises along with the design studio project

- Demonstrations & lectures explaining the use

Unit	Hours/Periods	Contents
I.	6	REVIT ARCHITECTURE <ul style="list-style-type: none"> <li>• STRUCTURAL MODELLING               <ul style="list-style-type: none"> <li>○ Structural Template</li> <li>○ Structural Component Families</li> <li>○ Structural Columns</li> <li>○ Beams</li> <li>○ Joins and Cutback</li> <li>○ Beam System o Braces</li> <li>○ Structural Walls o Foundations</li> <li>○ Structural Floor</li> </ul> </li> <li>• VIEWS               <ul style="list-style-type: none"> <li>○ Lights</li> <li>○ Rendering</li> <li>○ Walkthrough</li> </ul> </li> </ul>
II.	6	Site design <ul style="list-style-type: none"> <li>• Creating Toposurface</li> <li>• Contours</li> <li>• Building Pads</li> <li>• Graded Regions</li> <li>• Parking Components</li> <li>• Site Components</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC709.1	Developing designs through 3D visualization & preparing structural drawings in Revit.
BARC709.2	Knowing Fundamentals of Revit. Learning about structural columns, beams, joins and cutback and using them in the revit model.
BARC709.3	Learning how to create views and walkthrough in Revit and applying lighting in the scenes.
BARC709.4	Learning how to design the site in Revit using contours and site components.

**Text /Reference Books:**

Mastering Autodesk Revit Architecture 2016 by Brendan Dillon (Foreword), James Vandezande (Author), Eddy Krygiel (Author)

**Guidelines for the teachers:** The teacher should demonstrate the software.

**University Examination Pattern:**

The External jury will be of 50 Marks; i.e 30 marks for the portfolio/projects submitted & 20 marks for the final Viva.



B.ARCH. SEMESTER –VIII					BARC801			PRACTICAL TRAINING	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva-voce)	18
0	0	0	0	0	540	360	900		

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

- **Practical Training Manual:**

1. The total marks shall be suitably apportioned to assess on regular basis the monthly reports, office work and work done outside office hours.
2. 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).
3. 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.

### **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.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC801.1	Acquire knowledge of the process involved in addressing a design problem.
BARC801.2	Employ modes of architectural representation and other discipline-specific vocabulary and analytic systems.
BARC801.3	Office experience in respect of preparation of working drawing, detailing drawings of perspective, preparation of architectural models, study of filing systems of documents, drawings, ammonia prints and preparation of tender document. Acquaint with the practice in field outside the academic world to give insight of broader issues architect needs to deal with.
BARC801.4	Site experience, in respect of supervision of the construction activity, Observation, layout on site, study of the staking methods of various building, materials, taking the measurement and recording.

B.ARCH. SEMESTER –VIII					BARC802			PROJECT REPORT	
Scheme of Teaching					Scheme of Exam = Marks			Duration of Examination	
L	T	P	S	Total	Internal	External	Total	No Exam (Evaluation by External Viva-voce)	Credit
0	0	0	0	0	12080200				4

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

#### **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.

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

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC802.1	The intricacies of Architectural Profession by working with practicing Architects/Architectural firms.
BARC802.2	Understand multifaceted aspects of a building or a complex in the stage of construction.
BARC802.3	Acquire knowledge of analyzing, making inferences of a project.
BARC802.4	Acquire skills of communicate through software presentations.

**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.

B.ARCH. SEMESTER-IX					BARC901			ARCHITECTURAL DESIGN - VIII	
Scheme of Teaching					Scheme of Examination(Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam, (Evaluation by External Viva on Portfolio)	10
2	0	2	7	11	250	250	500		

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

### 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.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC901.1	Use of Development control rules like, density, zoning, FSI etc. redevelopment and urban conservation techniques.To understand the working of public & educational buildings and the process of planning and development of community area.
BARC901.2	To study Design orientation of advance & specialized buildings- environmental services, climate & acoustical system oriented buildings, their appropriate structural buildings & construction techniques.
BARC901.3	Study of urban environment, complex building forms, positive and negative space relationship, Parking Provision, Precincts concept and pedestrian movement.
BARC901.4	Leading the students to equip themselves, with Professional Competency and Capabilities to incorporate, detail out, plan, design & execute by using this acquired knowledge / know-how in all their future works / designs, of various Buildings as Professional Architects.

### 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.

**Reference / Text 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**.

**Guidelines to teacher:-**

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

B.ARCH. SEMESTER-IX					BARC902			RESEARCH METHODOLOGY	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** To promote Research in Architecture by making students aware and familiarize with various Methods of Research.

**Methodology**

- Emphasis shall be laid on understanding the role of research in Architecture. Students will be asked to carry out detailed survey of any residential/ commercial/ slum etc through different methods defined in the contents and prepare a research report based on the data collected, analysis made based on various statistical tools and conclusions drawn. Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, case studies and making reference to already prepared research reports.

Unit	Hours/periods	Contents
I.	6	“Research” and its Significance in Architecture involving: • Meaning of Research. • Relationship between Design and Research. • Types of Research, Areas of Research, • Qualitative and Quantitative Paradigms.
II.	6	Methods of Research in Architecture including: • Interview • Questionnaire including Designing Questionnaire • Surveys- Pre & Post Occupancy Survey • Observation • Mapping
III.	6	Research Design: • Components of Research, • Literature Study and Research- formulating Questions, Hypothesis, Closing the Samples, • Methods of Data Collection, Analysis and drawing Inferences • Concepts of Dependent, • Significance of the Research Outcome. • Preparing Time Schedule & Budget for a Research Plan.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC902.1	To understand the significance in literature study and methods of research in architecture.
BARC902.2	Articulate a clear research question or problem and formulate a hypothesis thereby preparing a synopsis for architectural thesis project
BARC902.3	Identify and demonstrate appropriate research methodologies, know when to use them and apply problem solving skills to constructively address research setbacks
BARC902.4	Use library and other tools to search for existing body of research relevant to their topic.

**Reference /Text Books:**

1. Research Design: Qualitative & Quantitative Approaches -- Creswell, J.W.
2. Surveys in Social Research, Jaipur -- De Vaus, D.A
3. Qualitative Data Analysis: A User Friendly Guide for Social Scientists -- Dey
4. Architectural Research Methods -- Groat, L. &Wang D.
5. Handbook of Qualitative Research -- Norman K Denzin and Yvonna S Lincoln (Eds.)

**University Examination Pattern:**

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).



B.ARCH. SEMESTER-IX					BARC903			CONSTRUCTION MANAGEMENT	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
1	2	0	0	3	50	50	100		

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

### 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.

Unit	Hours/periods	Contents
I.	6	<b>Project Management-</b> Concept, Background, Purpose, Aim, Objectives, Scope and its Significance <ul style="list-style-type: none"> <li>• <b>Traditional Management Systems-</b> Advantages and limitations</li> <li>• <b>Role of Architect</b> in Construction/Project Management</li> <li>• <b>Resources</b> of Construction Industry.</li> <li>• <b>Construction</b> stages, Construction team, Equipment Management</li> </ul>
II.	6	<b>Project Management Techniques-</b> Network, CPM, PERT <ul style="list-style-type: none"> <li>• <b>CPM Analysis-</b> Critical Path, Float Computation Result Sheet etc.</li> <li>• <b>PERT-</b> Introduction, Theory and Network analysis</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• <b>Cost Time</b> analysis in Network Planning</li> <li>• <b>Financing of Project</b>, Depreciation and Break even Cost analysis</li> <li>• <b>Cost Control-</b> Budget, Accounting System, Problems</li> </ul>
IV	6	<b>Quality and Safety-</b> Objectives, Issues, Organizing for Quality and Safety <ul style="list-style-type: none"> <li>• <b>Stages of Inspection</b> and Quality control</li> <li>• <b>Planning of Temporary Services</b> at the site.</li> <li>• <b>Security of Materials</b> and Manpower at building site.</li> <li>• <b>Computer Application</b> in Construction Management</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC903.1	To provide an insight into management of building construction projects involving handling of various resources.
BARC903.2	Design Management: Coordinating with all the stakeholders, consultants and others having a say in design process in order to arrive at a final programme in a timely and efficient manner
BARC903.3	Project Management: The scope of activities will depend upon the Project Delivery Method deployed.
BARC903.1	Broadly deals with all the activities concerned with the implementation process subsequent to the preparation of design and construction drawings.

**Reference /Text 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. Mukhopadhyay, 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**.

**University Examination Pattern:**

- The Question Paper is of Max 50 Marks.
- 5 questions of 2 mark each (from the entire syllabus).
- 8 Questions of 10 marks each (2 questions from each unit). There will be choice to answer any 4 questions

B.ARCH. SEMESTER-IX					BARC904			CONTEMPORARY THEORIES IN ARCHITECTURE	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
20	0	0	2		50	50	100		

**Objectives:** To make students understand, appreciate and familiar with the recent Architectural Movements of importance and their impact on built environment.

### Methodology

- Emphasis shall be laid on understanding of journey of Architecture and trends guiding the profession in post- fifties and its impact on changing the typologies of various buildings including materials and technologies used.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits.

Unit	Hrs/periods	Contents
I.	6	Overview of World Architecture since 1950 in relation to: <ul style="list-style-type: none"> <li>• Late Modernism</li> <li>• Post Modernism</li> <li>• De-constructivism</li> </ul>
II.	6	Study of Various Theories governing Contemporary Architecture through : <ul style="list-style-type: none"> <li>• Case Studies</li> <li>• Architectural Trends</li> <li>• Impact on Urban Built Environment</li> </ul>
III.	6	Emerging Building Typologies with Focus on: <ul style="list-style-type: none"> <li>• Residential Development</li> <li>• Offices &amp; Commercial Development</li> <li>• Skyscrapers</li> <li>• Institutional Development</li> <li>• Public Development</li> <li>• Industrial Development</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC904.1	Understanding the journey of world Architecture & trends since 1950 in relation to architectural movements.
BARC904.2	Study the various theories governing contemporary Architecture.
BARC904.3	Study the various programs, functions and philosophies related to contemporary theories.
BARC904.4	Study in changing the typologies of various building including materials and technologies used.

**Reference /Text Books:**

1. The Language of Post Modern Architecture by Charles Jencks
2. Modern Architecture since 1900 by William j. Curtis.
3. Intentions in Architecture by Nordberg Schulz
4. Contemporary Indian Architecture after the Masters by Bhatt V and Scriver P
5. "Architecture in the 20th Century", Vol. 1-2, Taschen, by Gossel, P. and Leuthauser, G.

**University Examination Pattern:**

1. One compulsory question covering the course contents of both Units. • In addition, Four questions are to be set from each Units. • Students are required to attempt five questions including compulsory question with two questions from each Units. • Question paper is to be set covering entire syllabus by making parts and mixing the topics.

B.ARCH. SEMESTER-IX					BARC905			PROFESSIONAL PRACTICE	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

#### Objectives:

- To make students understand and familiar with different aspects of Architectural Practice and Professional Responsibilities.

#### Methodology

- Teaching in the subject will be a combination of Expert lectures from Architects working in the profession, visits to the offices and discussions with reputed Architects.
- Students should be encouraged to attend professional meets organized by the professional bodies including IIA, COA, IOE etc.

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li><b>Architects</b> – Role, Functions, Social Obligations, Profession Activities, Responsibilities etc.</li> <li><b>Indian Architects Act 1972</b> – Scope, Objective, Role &amp; Importance in managing the profession and professionals.</li> <li><b>Council of Architecture</b> – Constitution, Role and Function, Registration of Architects etc.</li> <li><b>Indian Institute of Architects</b> – History, Objectives, Role and Function in promoting Architectural profession and education.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li><b>Architectural Practice</b> – Type of Practices, Setting office, Office Organization, Management, Income Tax, Service Tax etc.</li> <li><b>Architectural Competition</b> – Importance, Type, Procedure, Guidelines framed by Council of Architectural to conduct competition, including Role of Board of Assessors, Professional Adviser and Technical Advisers.</li> <li><b>Code of Professional conduct</b></li> <li>Conditions Governing the <b>Appointment of Architects</b>, Scale of Professional charges, Execution of work and payment of fee.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Duties, Responsibilities and Liabilities of <b>Client, Architect, Contractor</b> and their mutual relationship.</li> <li><b>Tenders</b>- Type, Process, Scrutiny and Selection of Contractor, Pre Qualification and Registration of Contractor.</li> <li>Concept of <b>Contract</b>.</li> <li><b>Copy Right Act</b> as Applicable to Architectural work.</li> <li><b>Complaints</b> – Procedure for lodging complaints, and their Resolution based on Indian Architects Act 1972</li> <li><b>Valuation</b> - Purpose, Objective, Types and Method of valuation.</li> <li>Arbitration and Reconciliation Act.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC905.1	To acquaint students with their roles and responsibilities of dealing with various related agencies and the freedom/ limitations as a professional as well as their real status in the society.
BARC905.2	To make students aware about the various codes of practices and different acts regarding the construction of building .Learns how to setup and run office
BARC905.3	Learnt the payment schedule, architectural services schedule, different MEP services consultants work.
BARC905.4	To understand the plan approval process from the sanctioning authority. Need and Role of Arbitrator.

**Reference /Text Books:**

- Indian Institute of Architects Hand Book – IIA
- The Indian Architects Act, 1972.
- Council of Architecture – Hand Book of Professional Documents – 2007.
- Indian Arbitration Act.
- Chakraborty M, “Estimating, Costing & Specification and Valuation in Civil Engineering and Service Tax Manual”
- Nanavati R, “Professional Practice”
- Apte V S, “Professional Practice & Management”

**University Examination Pattern:**

- One compulsory question of short answer type containing 5 questions of 2 marks each (10 Marks) is to be set from the entire syllabus (4 Marks and 6 marks from unit I and Unit –II respectively)
- In addition,three questions are to be set from UNIT 1 & II. Two question are to be set from Unit III
- Students are required to attempt five questions including compulsory question with minimum one question from each UNIT.
- Questions paper is to be set covering entire syllabus by making parts and mixing the topics.

B.ARCH. SEMESTER-IX					BARC906A			PRODUCT DESIGN	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
1	0	2	0	3	50	50	100		

### Objective

Taking the learning of form studies that is platonic forms, natural forms, colors, materials and finishes; students shall advance in the form studies towards product styling.

Unit	Hrs/Periods	Contents
I.	21	To understand the meaning of the form (metaphor, attributes and emotions) through stylized products from different domains. • To understand the role of light in surface transitions with color and finishes.
II.	21	Introduction to new materials and processes. • Introduction to environment friendly materials and the processes. (Including traditionally used materials in our context and culture.) • Advance studies in mass production processes and their influence on design and development of products.
III.	21	• Emphasis on material search and process selection in relation to cost, product safety, function, human factors, form, finishes and joining methods. • To conduct industry /workshop visits to observe and understand processes.

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC906A.1	Employ research and analysis methodologies as it pertains to the product design process, meaning, and user experience.
BARC906A.2	The Product Design program trains designers to use their creativity, design thinking, and design process to bring new ideas, products,
BARC906A.3	Use the Product Design and Development Process, as a means to manage the development of an idea from concept through to production.
BARC906A.4	Design product by using tools, materials, craft techniques etc.

### Reference Books:

Emotional Design: Why We Love (or Hate) Everyday Things by Don Norman

- The Psychology Of Everyday Things by Don Norman
- The Semantic Turn: A New Foundation for Design by Klaus Krippendorff.

Cradle to cradle by William Macdoughn.

- Industrial design: Materials and manufacturing guide by Jim Lesko.
- Sustainable Materials, Processes and Production (The Manufacturing Guides) by Rob Thompson.
- Modern Materials and Manufacturing Processes (3rd Edition) by R. Gregg Bruce and William K. Dalton

**Evaluation**

Continuous assessment of sessional work may consist of sketches, drawings, study models in various materials, journals, visit reports, power point presentations etc.

**University Examination Pattern:**

The Question Paper is of Max. 50 Marks.

- Part A -5 out of 7 short type questions of 2 Marks, covering entire syllabus
- Part B -4 Questions of 10 marks each to be attempted out of a total of 8 questions set from all the units.



B.ARCH. SEMESTER-IX					BARC906B			FURNITURE DESIGN	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
1	0	2	0	3	50	50	100		

### Objective

Develop competency for designing and critical thinking of furniture forms in relation to human scale

Unit	Hrs/Periods	Contents
I.	21	Physical dimensions of human body as a working machine <ul style="list-style-type: none"> <li>• Human body as a system of levers</li> <li>• Identification &amp; analysis of posture</li> <li>• Effect of wrong posture on cardiovascular &amp; musculoskeletal system (example: back trouble, inter vertebral disc pressure, lower back and inter abdominal pressure)</li> <li>• Design application of anthropometry</li> <li>• Study of basic furniture dimensions based on anthropometric measurements</li> </ul>
II.	21	Study of Italian, French, English furniture Introduction to furniture Aesthetics
III.	21	Study of modern furniture
IV	21	Design of furniture according to consumer ergonomics Planning simple furniture layouts of the different interior spaces such as: living room, dining room, bedroom, bathroom, kitchen, pantry, utility, foyer, corridor, passage, balcony etc

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC906B.1	Can analyse the role of human scale in furniture design, Identify posture & study of basic furniture dimensions.
BARC906B.2	Identify materials, aesthetic properties & different types of furniture.
BARC906B.3	To develop new ideas to design a furniture by knowing contemporary resources.
BARC906B.4	Design furniture , interior by using tools, materials, craft techniques etc.

### Evaluation

Continuous assessment of sessional work may consist of sketches, drawings, study models in various materials, journals, visit reports, power point presentations etc

**Reference /Text Books:**

- De Chiara Joseph & Callender John, Time Saver Standards for Building Types or Architectural
- Interior Design, McGrawHill Book Co.
- Hanks, A. David. Decorative Designs of Frank Lloyd Wright, Dover Publications, Inc. New York, 1999.
- Alan Colquhoun, "Modern Architecture, History of Arts", Oxford University Press, 1st edition, 2002.

**University Examination Pattern:**

The Question Paper is of Max. 50 Marks.

- Part A -5 out of 7 short type questions of 2 Marks, covering entire syllabus
- Part B -4 Questions of 10 marks each to be attempted out of a total of 8 questions set from all the four units.

B.ARCH. SEMESTER-IX					BARC907A			HOUSING	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
1	0	2	0	3	50	50	100		

### 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.

Unit	Hours/periods	Contents
I.	6	<p>Introduction, Role and Importance in the context of social and economic context</p> <ul style="list-style-type: none"> <li>• Typologies, Comparative Advantages and Disadvantages</li> <li>• Need and Demand</li> <li>• Shortage, Problems and solutions in the Indian Context</li> <li>• Housing Cost, Components and Strategies for minimizing Cost.</li> </ul>
II.	6	<p>Institutions involved in Providing Housing in India</p> <ul style="list-style-type: none"> <li>• Housing Finance and Institutions involved in Financing Housing in India</li> <li>• Affordable Housing</li> <li>• Land, its role and importance in Housing</li> <li>• Slums – Definition, Characteristics, Causes and solutions in the Indian Context.</li> </ul>
III.	6	<p>Housing policies in India.</p> <ul style="list-style-type: none"> <li>• Housing through Five year plans.</li> <li>• Role of private Sector in Housing.</li> <li>• Low Cost Housing.</li> <li>• Housing Survey .</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC907A.1	Knowledge of design principles and elements in residential architecture, understanding of housing functions as generator for architectural expressions and Knowledge of current questions related to housing design.
BARC907A.2	Housing design skills. General competence in design methods, materiality and detailing.
BARC907A.3	Basic housing design skills based on the knowledge acquired in the studio. Emphasis is on dwelling quality, quality of housing areas, as well as the ability to present architectural ideas in drawings and models.
BARC907A.4	General competence in design methods, construction principles, building materials, detailing.

**Reference /Text 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'.

**University Examination Pattern:**

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).

B.ARCH. SEMESTER-IX					BARC907B			TRAFFIC & TRANSPORT PLANNING	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
1	0	2	0	3	50	50	100		

#### Objectives:-

To create awareness, impart knowledge about Traffic and Transportation and related issues.

#### Methodology:-

- Teaching in the subject will be a combination of Expert lectures and visits to areas of high traffic including City centre, Commercial areas, Wholesale Markets. Core Areas and Major Road Network passing through the city. The visit will also include traffic nodes like Bus Terminus, Railway Station, and Truck Terminus.
- Students should be made to do a small traffic survey in a congested area.

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• <b>Traffic and Transportation-</b> Introduction, Need, Role and Importance</li> <li>• <b>Transport Systems-</b>Typologies, basic character and comparative advantages and disadvantages.</li> <li>• Role of <b>Bicycle</b> as a preferred mode of transport including planning for Bi-cycles</li> <li>• <b>Inter and Intra city Traffic-</b> Nature, characteristics, problems and solutions</li> <li>• <b>Accidents-</b> Causes, effects, and remedies to promote Road Safety</li> <li>• <b>Problems and Issues</b> related to Traffic and Transportation in the Indian cities and core areas with options to meet these challenges.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• <b>Traffic Control Devices-</b> Typology, Application and comparative Merits and Demerits</li> <li>• <b>Signage-</b> Introduction, Objectives, Function and classification</li> <li>• Design of <b>Road Intersections</b>, Rotaries, Over bridges, Underpasses,</li> <li>• Flyovers with reference to a well-designed city like Chandigarh.</li> <li>• <b>Roads-</b> Hierarchy, Classification, Capacity, Road Cross-sections</li> <li>• <b>Mass Transportation/ Public Transport-</b>Concept, Characteristic, Mode,</li> <li>• Advantages and disadvantages</li> <li>• <b>Surveys-</b>Objectives, Need, Importance, Types and Methodologies for conducting Traffic Surveys.</li> <li>• <b>Parking-</b> Introduction, Types, Requirement, Problems and Solutions.</li> <li>• <b>National Transport Policy</b></li> <li>• <b>Traffic Management and Land use Planning</b></li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC907B.1	Identify urban transportation problems Develop data base for calibration of travel demand models. Plan urban transport networks. Estimate urban travel demand
BARC907B.2	Conduct field studies for estimating traffic flow characteristics. Determine the capacity and level of service of a highway element.
BARC907B.3	Differentiate various curve fitting techniques. Estimate parking space requirements. Design traffic signal systems.
BARC907B.4	Model traffic stream behavior at the micro and macro level. Determine the capacity of highways. Identify urban transport corridors and prepare urban transportation plans

**Reference /Text Books:**

- Kadiyali, “Traffic and Transportation”
- National Transport Policy
- Agarwal S C, “Architecture and Town Planning”
- Institute of Town Planner (India) – Readers Volume
- UDPFI Guidelines – Ministry of Urban Development
- National Building Code,2005

**University Examination Pattern:**

- One compulsory question of short answer type containing 5 questions of 2 marks each (10 Marks) is to be set from the entire syllabus (4 Marks and 6 marks)
- In addition, three questions are to be set from UNIT 1. Four questions are to be set from Unit III
- Students are required to attempt Five questions including compulsory question with Minimum One question from each UNIT.
- Questions paper is to be set covering entire syllabus by making parts and mixing the Topics.

B.ARCH. SEMESTER-IX					BARC907C			TOWN PLANNING	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
1	0	2	0	3	50	50	100		

### 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.

### Methodology

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

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>Town Planning - Introduction, Role, Importance and Scope.</li> <li>Planning Principals - Nile Valley, Greek and Roman Periods.</li> <li>Town Planning in India - Indus Valley (Mohenjodaro), Islamic (Fatehpur Sikri), Medieval (Jaipur) and Colonial Period (New Delhi).</li> <li>Human Settlements - Classification based on Road Pattern, Form, space, use &amp; Population.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>Towns and Cities in India – Issues, Problems and strategies for development.</li> <li>Urbanization – Introduction, Definition, pattern, causes and effect in India.</li> <li>Master Plan – Objectives, Contents, Role, Importance, Methodology and critical evaluation.</li> <li>Regional Plan - Objectives, Contents, Role, Importance, Methodology and critical evaluation.</li> <li>Smart Cities – Intent, Content, Scope, Approach, Methodology and critical Appraisal.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Planning Concepts- Garden City, Linear City, Industrial City and Sustainable City, Compact city and TOD.</li> <li>Study of New Towns in India – Chandigarh, Gandhi Nagar, Bhubaneswar and Raipur.</li> <li>Development Authorities – Role and Importance in Urban Development.</li> <li>Neighborhood – Introduction, Concept, Objective, Principle and case study.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC907C.1	Study of various zones in urban context e.g. commercial, entertainment, residential etc in terms of the connectivity, circulation, open areas etc.
BARC907C.2	Students will take an overview of issues and trends relevant to the campus and the subjects selected by them for their final year dissertation
BARC907C.3	Understanding Statistical and graphical data analysis. Learning Services audit analysis of an commercial area.Knowing Existing Land use plan & Land values
BARC907C.4	Understand the concept of place making in a city. Study of Building use and land ownership

**Reference /Text 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'.

**University Examination Pattern:**

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).



B.ARCH. SEMESTER-IX					BARC908 A			SIKH ARCHITECTURE	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**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

**Methodology:-**

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

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• Evolution of Sacred Sikh Architecture – Salient features of a Gurdwara</li> <li>• Varieties of Arches, Domes, Capitals and other building elements</li> <li>• Building examples: Golden Temple, Amritsar, 5 Takhts of Sikhism and other historical Gurdwaras of India</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Forts, Palaces, Institutions and Landscape elements developed under Sikh rulers in prominent cities like Amritsar, Patiala, Nabha, Kapurthala, Gobindgarh, Anandpur Sahib</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Contemporary examples of Sikh Gurdwaras built in late 20th and 21st Century</li> <li>• Study of design of Khalsa Heritage Memorial complex at Anandpur Sahib</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC908A.1	Understanding of Sikh- past, history, cultural heritage, architecture
BARC908A.2	Understanding the concept of Sikh historic buildings & sites.
BARC908A.3	Demonstrate the importance of looking, seeing & interpreting the study of Sikh architecture.
BARC908A.4	Understanding / studying the various types of shapes and forms of the dome.

**Reference /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**.

**University Examination Pattern:**

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).

B.ARCH. SEMESTER-IX					BARC908 B			HILL ARCHITECTURE	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**Objectives: -**

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

**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.

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>Historical perspective of hill architecture and its unique attributes and concerns.</li> <li>Major hill settlements in various regions of the world.</li> <li>A broad view of traditional hill architecture of medieval European settlements and other places.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>Traditional hill settlements of India.</li> <li>An overview of vernacular hill architecture of Himachal Pradesh.</li> <li>Building types, techniques and materials of vernacular architecture of Himachal Pradesh.</li> <li>Lessons from vernacular architecture and their time tested indigenous technology.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>Modern buildings on the hills in India.</li> <li>Constraints of climate, topography and availability of materials.</li> <li>Design factors such as access, circulation and gradients.</li> <li>Structural aspects of modern buildings and necessary safeguards.</li> <li>Environmental and ecological concerns and safeguards.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC908B.1	Understand the concept of Vernacular Architecture of Indian hills in detail, particularly of Indian state Himachal Pradesh.
BARC908B.2	Interpretation of hill architecture in terms of its Functional aspects, Cultural aspects, Climatic considerations, Construction methods and techniques, Materials.
BARC908B.3	Reinterpretation of hill architecture in Modern construction.
BARC908B.4	Understanding the concept of hill architecture in context with world's hill architecture.

**Reference /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**.

**University Examination Pattern:**

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).

B.ARCH. SEMESTER-X					BARC1001			ARCHITECTURAL DESIGN – IX (THESIS PROJECT)	
Scheme of Teaching					Scheme of Examination(Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	No Exam (External Viva by Jury)	18
4	0	4	12	20	450	450	900		

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

### 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, and 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-coordinator, 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**

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)	Evolution of Design	
	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)	Draft Final report (Incorporating improvements suggested in Rough Report, Design Criteria and explanatory sketches of Evolution of Design).	1 week
2.	External Examination	4 weeks

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1001.1	Identify a research topic, conduct a literature review, and analyze and synthesize information to develop a unique and well-supported argument or design solution.
BARC1001.2	Apply their knowledge of architecture to design a building, space, or urban environment that addresses the research question or problem.
BARC1001.3	Communicate their ideas effectively through written, oral, and visual presentations, and will gain experience in project management and teamwork.
BARC1001.4	Understand the design process and its connection to the built environment.

**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.

B.ARCH. SEMESTER-IX					BARC1002A			REAL ESTATE MANAGEMENT	
<b>Scheme of Teaching</b>					<b>Scheme of Exam (Marks)</b>			<b>Duration of Examination</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>3Hours</b>	<b>2</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>	<b>50</b>	<b>100</b>		

**Objectives:** To acquaint the students with the basic principles used in the development and management related real estate field.

**Methodology:**

Subject shall be taught through the combination of class lectures, Presentations, site visits, case studies by carrying out exercises related Real Estate Sector as in the Development.

<b>Unit</b>	<b>Hrs/Periods</b>	<b>CONTENTS</b>
I.	6	<b>Introduction to Real Estate</b> Real Estate, Land, Real Property, Classification of Properties, Characteristics of Different Property Types, Real Estate Management (REM)Public Property Management vs. Private Property Management
II.	6	<b>Real Estate Development (RED)</b> Real Estate Development Process, Real Estate Developer's Role, Different Partners in the RED Process
III.	6	<b>The Relationship between Management and Real Estate</b> General Management Challenges, General Management Functions, Managerial Role, Managerial Skills, Management Process, Different Firms by Real Estate Functions
IV	6	<b>Property Management Strategies</b> Strategies and Responsibilities of the Management Team, Property Management Functions and the Development Process, Developing the Property Strategic Plan, Property Strategic Planning Process



**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1002A.1	Summarize the scope of the existing real estate industry in the current business environment and to classify the various statutory and legal regulations applicable to real estate market.
BARC1002A.2	Outline the roles, responsibilities, rights and liabilities of different real estate stakeholders. Get exposure to the various documentation procedures for different real estate transactions, appraisals, agreements and valuation of properties.
BARC1002A.3	To perform Quantitative analysis with a methodology used in different transactions using the current rates of properties, registration charges and appropriate fees applicable in different states.
BARC1002A.4	Delineate project development process, compare the different sources of real estate funds and classify the risks associated therein. Formulate a real estate project by assessing its feasibility and evolving strategies for effective management.

**Reference /Text Books:**

THORNCROFT, M., (1965) Principles of Estate Management, *Estates Gazette*.

1. TRIPPI R. R., 1989. A decision support system for real estate investment portfolio Management Information & Management, vol. 16, p. 47-54.
2. UNESCO - online: <http://whc.unesco.org/>.

**University Examination Pattern:**

The Question Paper is of Max. 50 Marks.

- Part A -5 out of 7 short type questions of 2 Marks, covering entire syllabus
- Part B -4 Questions of 10 marks each to be attempted out of a total of 8 questions set from all the four units.

B.ARCH. SEMESTER-IX					BARC1002B			ARCHITECTURAL JOURNALISM	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**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.

**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.

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• Introduction of Journalism in general</li> <li>• Theories of journalism, Techniques and processes</li> <li>• Contemporary Architectural journalism, Digital Journalism, Architecture, Arts and Journalism / Media</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Phrasing and summarizing a given report</li> <li>• Editing given material</li> <li>• Writing original reports on design projects</li> <li>• Writing Editorials for Magazines and Journals</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Reporting activities like seminars, Panel discussions, Conferences etc.</li> <li>• Thesis or Research Report writing</li> <li>• Writing Captions for Pictures, Programmes and Events</li> <li>• Organizing material for publication in Newspapers, magazines etc.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1002B.1	To analyze the role of writing in architectural journalism.
BARC1002B.2	To asses various techniques and methods of researching and writing architectural research papers.
BARC1002B.3	To explain the potential of architectural writings and journalism.
BARC1002B.4	To publish a research paper on an architectural topic.

**Reference /Text 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.

**University Examination Pattern:**

- 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).

B.ARCH. SEMESTER-IX					BARC1003A			BUILDING MAINTENANCE	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** -Students should know the role of maintenance in buildings

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

Unit	Hours/periods	Contents
I.	6	Maintenance- Introduction, Need, Scope, Importance& Role of an Architect. <ul style="list-style-type: none"> <li>• Maintenance-Economic and Social significance</li> <li>• Distress in structures</li> <li>• Causes of distress, defects and decay</li> <li>• Role of climatic elements</li> <li>• Classification of maintenance works</li> </ul>
II.	6	Various defects in Buildings (Masonry, Load bearing and Framed structure) from foundation to parapet level including services <ul style="list-style-type: none"> <li>• Diagnostic Techniques</li> </ul>
III.	6	Prevention measures/Defects due to poor design and construction <ul style="list-style-type: none"> <li>• Treatment methods/Repair materials</li> <li>• Retrofitting</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1003A.1	Developing concept of maintenance as continuous phenomena and preventive approach for longevity of buildings.
BARC1003A.2	Identify standard building and construction materials, basic building mechanical systems and components, and discuss applicable solutions to mitigate building envelope and basic mechanical system component failures.
BARC1003A.3	Describe procedures for research, requisition, and procurement of materials and parts to complete construction and maintenance tasks and/or work orders.
BARC1003A.4	Apply quantitative methods to common building maintenance tasks.

**Reference /Text Books:**

1. A.C.Panchdhari, 'Maintenance of buildings', New Age International 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,
6. Publishers, New Delhi, **2005**.
7. 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'.

**University Examination Pattern:**

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).

B.ARCH. SEMESTER-IX					BARC1003B			ARCHITECTURAL CONSERVATION	
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**Objectives:** - To promote understanding and importance of the Historical buildings and their Preservation and conservation.

**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.

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• Heritage- Introduction, Definition, Role, Importance, Scope and Limitations</li> <li>• Study of basic historical styles in Indian Architecture.</li> <li>• Study of ornamentation and detailing in historical buildings in various styles.</li> <li>• Study of construction methods and structural analysis of various historical building styles e.g. Arches Domes, Vaults and Shikharas etc.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Study of finishes in historical buildings.</li> <li>• Effects of weathering/ pollution on historical buildings.</li> <li>• Study of landscaping style/ Plantation around historical buildings.</li> <li>• Knowledge of plantation/ water features in Mughal Garden and Hindu Temples.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Methods of studying and documenting historical monuments in the context of guidelines issued by UNESCO, INTACH.</li> <li>• Methods of saving monuments from vandalism.</li> <li>• Institutional framework to protect Heritage</li> <li>• <b>Role of Historic Building/Area/City in Present Context:</b></li> <li>• 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.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1003B.1	Understand conservation and its process.
BARC1003B.2	Study and find better techniques of conservation.
BARC1003B.3	Analyze, troubleshoot, and implement conservation related solutions with previously done works and researches.
BARC1003B.4	Learn the process of documenting the work of conservation.

**Reference /Text 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**.

**University Examination Pattern:**

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).

B.ARCH. SEMESTER-IX					BARC1004A	ENERGY EFFICIENT BUILDINGS AND BUILDING AUTOMATION			
Scheme of Teaching					Scheme of Exam (Marks)			Duration of Examination	Credit
L	T	P	S	Total	Internal	External	Total	3Hours	2
2	0	0	0	2	50	50	100		

**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.

**Methodology:-**

- 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.

Unit	Hours/periods	Contents
I.	6	<ul style="list-style-type: none"> <li>• <b>Energy Sources:</b> Introduction to renewable &amp; non- renewable energy sources</li> <li>• <b>Global Scenario:</b> Global availability of renewable &amp; non- renewable energy sources</li> <li>• <b>Energy Consumption in various building typologies:</b> Analysis of energy consumption in terms of energy load through heating/ cooling/ventilation/ lighting &amp; other loads.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• <b>Energy efficient measures:</b> 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.</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Introduction to Building automation in general and understanding the issues related to the control system in a building.</li> <li>• Basic concept of computerized control systems, network designed to monitor and control various systems for lighting, ventilation, alarms &amp; security, communication, etc.</li> <li>• Issues related to illumination and lighting. Systems to allow / control Natural light. Aperture/openings and shading devices control systems based on automated systems.</li> <li>• Issues related to ventilation air handling with automated systems of control of apertures and artificial ventilation-air conditioning.</li> <li>• Issues related to systems of communication (mechanical systems).</li> </ul>



**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1004A.1	How energy Efficient architecture can be adopted as an alternative in today’s perspective.
BARC1004A.2	How to create energy efficient building by actively harnessing renewable nature sources of energy (solar energy etc) and utilizing materials that least pollutes the environment.
BARC1004A.3	Know about the designing of energy efficient building envelopes that respond to the climate of a place bldg.
BARC1004A.4	Aware about resource–efficient practices in India, advocating of the application of renewable energy system and the promotion of efficient lighting & HVAC system to reduce energy demand.

**Reference /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**.

**University Examination Pattern:**

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).

B.ARCH. SEMESTER-IX					BARC1004 B			ADVANCED CONSTRUCTION & MATERIALS	
<b>Scheme of Teaching</b>					<b>Scheme of Exam (Marks)</b>			<b>Duration of Examination</b>	<b>Credit</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>Total</b>	<b>Internal</b>	<b>External</b>	<b>Total</b>	<b>3Hours</b>	<b>2</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>	<b>50</b>	<b>100</b>		

**Objectives: -**

- To make students understand and appreciate the role and importance of economy in the built environment

<b>Unit</b>	<b>Hours/periods</b>	<b>Contents</b>
I.	6	<ul style="list-style-type: none"> <li>• Building Economics-Introduction, Definition, Role, Scope, Importance and Principles</li> <li>• Cost of Building- Components and their impact on Cost</li> <li>• Cost of Building- Typologies including Life Cycle Cost, Construction Cost, Maintenance</li> <li>• Cost Management- Aims, Objectives, Need, Principles, Procedure, Cost Analysis.</li> </ul>
II.	6	<ul style="list-style-type: none"> <li>• Cost Reduction -Using Site Planning and Architectural Design</li> <li>• Cost Reduction –Using Specification, Space optimization and Structural Innovations</li> <li>• Space Norms- Role, importance, Principles involved in defining Space Norms with special reference to National Building Code.</li> <li>• Cost Analysis- Low Rise and High Rise Buildings</li> </ul>
III.	6	<ul style="list-style-type: none"> <li>• Technology – Role, Importance, Use in making buildings cost- effective</li> <li>• Building Technologies – Typologies including Modular construction, Pre-Engineered Buildings etc. their merits and demerits</li> <li>• Mass Production and Standardization- Need, Principles, Role and Importance in promoting cost effectiveness</li> <li>• Materials- Role, Importance, Analysis, Innovation/ up-gradation in making buildings cost- effective</li> <li>• Construction Techniques- Principles involved, Impact on building cost with specific reference to few innovative techniques with comparative merits and Demerits.</li> </ul>

**COURSE OUTCOMES:** On completion of this course, the students will be able to

BARC1004B.1	Understand The role of Materials in architecture.
BARC1004B.2	Bridging the gap between architectural Materials & Advanced Construction
BARC1004B.3	Understand Materials relationship with aesthetics, space, form and structure.
BARC1004B.4	Analyze, troubleshoot, and implement solutions with new functions.

**Reference /Text 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.

**University Examination Pattern:**

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).