



**VIT**<sup>®</sup>

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**Vellore Institute of Technology**

(Deemed to be University under section 3 of UGC Act, 1956)

**SCHOOL OF ARCHITECTURE  
(V-SPARC)**

**B. ARCH**

(Bachelor of Architecture)

Curriculum

*(2021-2022 admitted students)*



## **VISION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY**

Transforming life through excellence in education and research.

## **MISSION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY**

**World class Education:** Excellence in education, grounded in ethics and critical thinking, for improvement of life.

**Cutting edge Research:** An innovation ecosystem to extend knowledge and solve critical problems.

**Impactful People:** Happy, accountable, caring and effective workforce and students.

**Rewarding Co-creations:** Active collaboration with national & international industries & universities for productivity and economic development.

**Service to Society:** Service to the region and world through knowledge and compassion.

## **VISION STATEMENT OF THE SCHOOL OF ARCHITECTURE**

V-SPARC School of Architecture strives to evolve socially sensitive individuals equipped with design, technology process and realization skills to contribute responsibly to the changing needs of the natural and built environment.

## **MISSION STATEMENT OF THE SCHOOL OF ARCHITECTURE**

- To be seen as an institution promoting the interests of society and resolving physical and socio-economic challenges through research and socially responsible thought processes.
- To create a globally relevant, collaborative and confident student community, capable of independent thinking and effective action.



## **B. Arch (Bachelor of Architecture)**

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

1. Ability to apply technological and aesthetic principles in providing solutions to issues concerning the built environment
2. Ability to engage with other socio- economic and engineering disciplines in the provisions of architectural solutions
3. Ability to provide sustainable and humane directions in built form development



## **B. Arch (Bachelor of Architecture)**

### **PROGRAMME OUTCOMES (POs)**

PO\_01: Having an ability to apply mathematics and science in engineering applications.

PO\_02: Having a clear understanding of the subject related concepts and of contemporary issues and apply them to identify, formulate and analyse complex engineering problems.

PO\_03: Having an ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment

PO\_04: Having an ability to design and conduct experiments, as well as to analyse and interpret data, and synthesis of information

PO\_05: Having an ability to use techniques, skills, resources and modern engineering and IT tools necessary for engineering practice

PO\_06: Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems

PO\_07: Having adaptive thinking and adaptability in relation to environmental context and sustainable development

PO\_08: Having a clear understanding of professional and ethical responsibility

PO\_09: Having cross cultural competency exhibited by working as a member or in teams

PO\_10: Having a good working knowledge of communicating in English – communication with engineering community and society

PO\_11: Having a good cognitive load management skills related to project management and finance

PO\_12: Having interest and recognise the need for independent and lifelong learning



## **B. Arch (Bachelor of Architecture)**

### **ADDITIONAL PROGRAMME OUTCOMES (APOs)**

APO\_01: Having an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient)

APO\_02: Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)

APO\_03: Having design thinking capability

APO\_04: Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning)

APO\_05: Having Virtual Collaborating ability

APO\_06: Having an ability to use the social media effectively for productive use

APO\_07: Having critical thinking and innovative skills

APO\_08: Having a good digital footprint



## **B. Arch (Bachelor of Architecture)**

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

On completion of B. Arch (Bachelor of Architecture) programme, graduates will be able to

- PSO1: Understand architecture through the knowledge of building sciences, civil engineering technology, pure and applied arts, and environmental studies, historical, cultural, socio-economic and legal parameters related to the built environment.
- PSO2: Analyse and Evaluate built form and environmental needs pertinent to a specific context and apply the knowledge of architecture in providing directions for responsible development intervention. .
- PSO3: Create sustainable architectural design solution to meet societal needs.



## **B. Arch (Bachelor of Architecture)**

### **CREDIT STRUCTURE**

#### **Category-wise Credit distribution**

<b>Category</b>	<b>Credits</b>
Discipline Core Courses (DCC)	<b>147</b>
Building Sciences and Application Engineering (BSAE)	<b>46</b>
Discipline Electives (DE)	<b>38</b>
Ability Enhancement Courses (AEC)	<b>17</b>
Skill Enhancement Courses (SEC)	10
Total credits	<b>258</b>



## B. Arch (Bachelor of Architecture)

### DETAILED CURRICULUM

#### Discipline Core Courses (DCC)

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC101P	Architectural Design I: Foundation Design Studio	0	0	12	12	NIL
2.	BARC102P	Architectural Graphics	0	0	4	4	NIL
3.	BARC103P	Visual Arts and Communication	0	0	8	8	NIL
4.	BARC104P	Architectural Design II: Spatial Exploration	0	0	12	12	BARC101L
5.	BARC107L	Architectural Design Thinking	2	0	0	2	NIL
6.	BARC201P	Architectural Design III: Rural Environment Studies	0	0	12	12	BARC104P
7.	BARC204P	Architectural Design IV: Midscale Urban Built Forms	0	0	12	12	BARC201P
8.	BARC301P	Architectural Design V: Civic Design	0	0	12	12	BARC204P
9.	BARC305P	Architectural Design VI: Technical Drawings	0	0	12	12	BARC301P
10.	BARC401P	Architectural Design VII: Complex Typologies	0	0	12	12	BARC305P
11.	BARC499J	Architectural Thesis				15	BARC498J
12.	BARC111L	History of Architecture: Ancient	3	0	0	3	NIL
13.	BARC202L	History of Architecture: Medieval to Renaissance	3	0	0	3	BARC111L
14.	BARC302L	History of Architecture: Industrial Era	2	0	0	2	BARC202L
15.	BARC402L	History of Architecture: Contemporary	2	0	0	2	BARC302L
16.	BARC403P	Architectural Design VIII: Urban Design	0	0	12	12	BARC301P
17.	BARC112L	Human Settlements and Vernacular Architecture	3	0	0	3	NIL
18.	BARC303L	Housing	3	0	0	3	BARC201P
19.	BARC203L	Site Planning and Landscape	3	0	0	3	BARC104P
20.	BARC404L	Architectural Specifications and Estimation	3	0	0	3	BARC301P





## **B. Arch (Bachelor of Architecture)**

### **Building Sciences and Applied Engineering**

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC105E	Building Materials-Indigenous	1	0	4	5	
2.	BARC106L	Structural Systems Evolution	3	0	0	3	
3.	BARC205E	Construction Technology: Concrete and Steel	1	0	4	5	BARC105E
4.	BARC304E	Construction Technology: Aluminum, Glass and Finishes	1	0	4	5	BARC205E
5.	BARC405L	Construction Technology: Prefab Products and Manufacture	3	0	0	3	BARC304E
6.	BARC207L	Principles of Structures	3	0	0	3	BARC106L
7.	BARC306L	Strength of Materials	3	0	0	3	BARC207L
8.	BARC406L	Architectural Structural Design: Reinforced Concrete	3	0	0	3	BARC306L
9.	BARC410L	Architectural Structural Design: Steel and Timber	3	0	0	3	BARC409L
10.	BARC208L	Climate Responsive Architecture	3	0	0	3	BARC104P
11.	BARC315L	Building Services-I	3	0	0	3	
12.	BARC407L	Building Services-II	3	0	0	3	BARC315L
13.	BARC316P	Building Environment Lab	0	0	4	4	BARC208L



## Discipline Electives

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC307L	Modern Architectural Thought	3	0	0	3	BARC107L
2.	BARC308P	Interior Design	0	0	4	4	NIL
3.	BARC309L	Art Forms Appreciation	3	0	0	3	NIL
4.	BARC310P	Ideation	0	0	4	4	NIL
5.	BARC408L	Architectural Photography and Journalism	2	0	0	2	BARC305P
6.	BARC409L	Sustainable Architecture	3	0	0	3	BARC208L
7.	BARC411P	Furniture Design	0	0	4	4	NIL
8.	BARC412L	Architectural Conservation	3	0	0	3	BARC201P
9.	BARC413L	Building Systems Integration	3	0	0	3	BARC407L
10.	BARC496J	Travel Learning				02	NIL
11.	BARC312L	Theory of Landscape Design	3	0	0	3	BARC203L
12.	BARC414P	Introduction to Computational Design and Digital Fabrication I	0	0	4	4	BARC210P



### Ability Enhancement Courses

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC314L	Professional Practice and Advanced Construction Management	3	0	0	3	BARC305P
2.	BARC498J	Architectural Internship				12	BARC305P
3.	BARC497J	Architectural Dissertation				02	

### Discipline Electives

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC110P	Introduction to Digital Graphics	0	0	4	4	NIL
2.	BARC210P	Advanced Digital Graphics: Skill Development	0	0	4	4	BARC110P
3.	BARC423L	Architectural Entrepreneurship	2	0	0	2	NIL



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## **B. Arch (Bachelor of Architecture)**

# **Syllabus**



## Discipline Core Courses (DCC)

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC101P	Architectural Design I: Foundation Design Studio	0	0	12	12	NIL
2.	BARC102P	Architectural Graphics	0	0	4	4	NIL
3.	BARC103P	Visual Arts and Communication	0	0	8	8	NIL
4.	BARC104P	Architectural Design II: Spatial Exploration	0	0	12	12	BARC101L
5.	BARC107L	Architectural Design Thinking	2	0	0	2	NIL
6.	BARC201P	Architectural Design III: Rural Environment Studies	0	0	12	12	BARC104P
7.	BARC204P	Architectural Design IV: Midscale Urban Built Forms	0	0	12	12	BARC201P
8.	BARC301P	Architectural Design V: Civic Design	0	0	12	12	BARC204P
9.	BARC305P	Architectural Design VI: Technical Drawings	0	0	12	12	BARC301P
10.	BARC401P	Architectural Design VII: Complex Typologies	0	0	12	12	BARC305P
11.	BARC499J	Architectural Thesis				15	BARC498J
12.	BARC111L	History of Architecture: Ancient	3	0	0	3	NIL
13.	BARC202L	History of Architecture: Medieval to Renaissance	3	0	0	3	BARC111L
14.	BARC302L	History of Architecture: Industrial Era	2	0	0	2	BARC202L
15.	BARC402L	History of Architecture: Contemporary	2	0	0	2	BARC302L
16.	BARC403P	Architectural Design VIII: Urban Design	0	0	12	12	BARC301P
17.	BARC112L	Human Settlements and Vernacular Architecture	3	0	0	3	NIL
18.	BARC303L	Housing	3	0	0	3	BARC201P
19.	BARC203L	Site Planning and Landscape	3	0	0	3	BARC104P
20.	BARC404L	Architectural Specifications and Estimation	3	0	0	3	BARC301P



BARC101P	Architectural Design I-Foundation Design	L	T	P	C
		0	0	12	12
Pre-requisite	NIL	Version 1.0			
<b>Course Objectives:</b>					
1. In this studio course, students are introduced to the concepts of visual and spatial cognitive perception through a process of understanding the properties of space, colour and light and creative exercises to understand their inter relationships. The process also develops a skillset for communicating abstract ideas through drawings and models					
<b>Expected Course Outcome:</b> At the end of the course the student should be able					
1. To understand the properties of point, line and space in cognitive applications.					
2. To understand and apply the principles of composition of visual and spatial elements in defining space and its qualities.					
3. To create tangible forms of communication to express abstract ideas.					
<b>Module: 1</b>	<b>Introduction to spatial coordinates</b>	<b>12 Hours</b>			
Introduction to the concepts of point, line and plane in defining space through simple model making exercises, origami and compositional exercises. Development of surfaces and volumes, point and planar compositions with elementary drawings of representation.					
<b>Module: 2</b>	<b>Volumetric compositions</b>	<b>12 Hours</b>			
Understanding simple platonic volumes through models and representation drawings. Experiencing structural stability through stick and string models with drawings.					
<b>Module: 3</b>	<b>Colour</b>	<b>24 Hours</b>			
Introduction to the colour palette, primary, secondary, tertiary colours with rendering exercises to generate tangible means to express abstract ideas.					
<b>Module: 4</b>	<b>Light</b>	<b>24 Hours</b>			
Exercises in light of various intensities and shadow analysis of simple compositions. Sketches of light and shade and experiments in light quality over multiple geometric volumes. Photo documentation and sketching exercises of generated models.					
<b>Module: 5</b>	<b>Texture and Material</b>	<b>24 Hours</b>			
Creation of spatial models using articulated linear elements, planar surfaces and geometric solids incorporating different materials and textures with photo documentation and sketching exercises.					
<b>Module: 6</b>	<b>Fractal geometry</b>	<b>24 Hours</b>			
Introduction to fractal geometry. Exercises in modelling fractal geometric forms.					
<b>Module: 7</b>	<b>Scale, measurement and proportion</b>	<b>24 Hours</b>			



Introduction to scaling of objects, measurement formats, proportion studies, analysis of simple functional objects and creation of a utilitarian object.			
<b>Module: 8</b>	<b>Project Presentation</b>		<b>36 Hours</b>
Seminars and exercises on art, music and the deliberation of abstraction into tangible forms with real life examples. Discussions and analysis on the elements of art and design.			
<b>Total Lecture Hours</b>			<b>180 Hours</b>
<b>Reference Books</b>			
	Ching Francis.D.K. 2014. <i>Architecture - Form, Space and Order</i> : Phaidon Press.		
	Leonard Parker, et al. 2014. <i>Basic Design Principles of Architecture</i> . Kindle books.		
	De. Chiara and Callender. 2014. <i>Time Saver Standards for Building types</i> . McGraw Hill N.Y.		
	Neufert, E., Neufert, P., & Kister, J. 2012. <i>Architects' Data</i> . Chichester. West Sussex. UK: Wiley-Blackwell.		
	Jackson Paul. 2011. <i>Folding Techniques for Designers: From Sheet to Form</i> : Laurence King Publishing.		
	Anthony di Mari & Nora Yoo. 2013. <i>Operative Design: A Catalog of Spatial Verbs</i> : BIS Publishers.		
	Anthony di Mari . 2014. <i>Conditional Design: An introduction to elemental architecture</i> : BIS Publishers.		
	Khoda Ritu, Pai Vanita et al. 2016. <i>Raza's Bindu</i> .illustrated by Kundan Sharbaz.		
Mode of evaluation: Assignments, Final Assessment Test			
List of exercises (Indicative)			
1. Investigate the symbiotic relationship between positive and negative spaces in a cubic volume. Represent your findings graphically and through 3D physical models			12 Hours
2. Create geometric volumes through combination of lines and planes to simulate a pavilion environment			12 Hours
3. Study the effect of light and colours on interior spaces through simulation models and photographic documentation			12 Hours
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



BARC102P	Architectural Graphics	L	T	P	C
		<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>Pre-requisite</b>	<b>Nil</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To understand and generate geometric shapes and volumes through manual methods and there developing a cognitive approach using had eye hand coordination in geometric construction.					
<b>Expected Course Outcome:</b>					
At the end of the course, the student should be able to					
[1] <b>Understand</b> basic architecture drafting principles, sheet formatting and lines and lettering in graphic communication.					
[2] <b>Distinguish</b> different geometric shapes and their projections, graphic scales.					
[3] <b>Understand</b> architectural projections, types of arches and conic sections.					
[4] <b>Visualize</b> , understand, and document spaces using various methods of measure drawing.					
<b>Module: 1</b>	Introduction to technical tools related to manual architectural drafting and sheet size and formatting.	<b>4 Hours</b>			
<b>Module: 2</b>	Introduction to architectural lettering & font types and sheet composition	<b>4 Hours</b>			
<b>Module: 3</b>	Line weights & types - Dimensional lines and formats	<b>4 Hours</b>			
<b>Module: 4</b>	Line drawing of simple geometric shapes demonstrating line weights, dimensions	<b>4 Hours</b>			
<b>Module: 5</b>	Introduction to linear & graphic scales. Exercise in scale reduction & scale enlargement	<b>4 Hours</b>			
<b>Module: 6</b>	Scaling of building elements through photo-interpretation.	<b>4 Hours</b>			
<b>Module: 7</b>	Principles of Orthographic projections - simple platonic volumes	<b>4 Hours</b>			
<b>Module: 8</b>	Exercise in drawing elements - Arch types & Conics.	<b>8 Hours</b>			
<b>Module: 9</b>	Exercises in orthographic projection and section of a simple abstracted architectural volume	<b>8 Hours</b>			
<b>Module: 10</b>	Isometric drawings of geometric solid volumes of building elements	<b>8 Hours</b>			
<b>Module: 11</b>	Exercise in simple measured drawing - Architectural details, furniture, etc.	<b>8 Hours</b>			
<b>Total Lecture Hours</b>		<b>60 Hours</b>			
<b>Reference Books</b>					
1.	Morris, I.H. 2012. <i>Geometrical Drawing for Art Students</i> : Orient Black swan Pvt.Ltd.				
2.	Bhatt, N.D. and Panchal V.M. 2000. <i>Engineering Drawing Plane and Solid Geometry</i> , 42nd edition: Charotar Publication.				
Recommended by Board of Studies		21/2/2022			
Approved by Academic Council		<b>No. 66</b>	Date	16-6-2022	





<b>BARC103P</b>	<b>Visual Arts and Communication</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		0	0	8	8
<b>Pre-requisite</b>	<b>NIL</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
The course is aimed to encourage students for free expression and creativity and to be able to understand the basic characteristics of different techniques in sketching and its practical applications.					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
[1] <b>Obtain the skill of observation</b> and demonstrate the observation through different medias.					
[2] <b>Understand visual concepts</b> of colour, scale, proportion, composition, harmony, rhythm, contrast and related attributes of visual imagery.					
[3] <b>Understand</b> visual principles and attributes defining an interior space such as light, shade, textures, etc)					
[4] <b>Explore and demonstrate</b> two-dimensionally the principles of Design (contrast, balance, emphasis, proportion, hierarchy, repetition, rhythm, pattern, white space, movement, variety, and unity )					
[5] <b>Form Based Exploration</b> and iterating to abstract results.					
[6] <b>Exploration of skills</b> like photography as an offhand attempt to document a building which will stimulate understanding of form-space relation, aspects of visual cognition and psychological responses of humans.					
[7] <b>Be competent</b> with a variety of common digital illustration media and imply learning of previously taught COs					
[8] <b>Exert</b> skills & narrate design through illustrations.					
<b>Module: 1</b>	<b>Study of Objects in Light and shade</b>	<b>8 Hours</b>			
Still Life: Eye-Mind-Hand synchronization					
(1) Short Time Observation-Sketch Exercises (Stimulation Exercise for Observation)					
(2) Different Mediums Application – Monochrome					
(3) Different Mediums Application – Colored					
<b>Module: 2</b>	<b>Sketching Exercises</b>	<b>16 Hours</b>			
An immersive live sketching exercises in numerous outdoor settings					
(The exercises may focus on the scale, proportions, context, lines, etc)					
<b>Module: 3</b>	<b>Sketching Exercises</b>	<b>16 Hours</b>			
An immersive live sketching exercises of Interiors of Built spaces					
(The exercises may focus on the play of light and shade, textures, pattern, etc.)					
<b>Module: 4</b>	<b>Two- Dimensional Composition</b>	<b>8 Hours</b>			
The exercises will enable the students to create aesthetic organization of various design element i.e. line, shape, form .The process should be iterative and deliverable can be two-dimensional.					
<b>Module: 5</b>	<b>Composition and Understanding of Form</b>	<b>16 Hours</b>			
The exercises will enable the students to create composition with different existing. The exercise can be iterative and scale can be increased eventually.					

The next phase of exercise will lead to abstracting the composition to new forms.



<b>Module: 6</b>	<b>Photo Documentation</b>	<b>16 Hours</b>			
An exercise for analytical appraisal of building form in terms of visual characters through documenting various settings through photos captured by the students.					
<b>Module: 7</b>	<b>Digital Media Exploration</b>	<b>16 Hours</b>			
Exercise to learn image editing, expurgating, processing and enhancing using basic computer software.(Compositional principles, Poster Design, Signages Study and Design)					
<b>Module: 8</b>	<b>Interaction with Visual Communication Experts</b>	<b>24 Hours</b>			
Hands on Experience of few illustration methods to be effective in explaining Architecture.					
<b>Total Lecture Hours</b>		<b>120 Hours</b>			
<b>Reference Books</b>					
1.	Basic Visual Concepts and Principles for Artists, Architects and Designers by Charles Wallschlagerm & Cynthia Busic-Snyder, McGraw Hill, New York 1992				
2.	Design fundamentals in Architecture by V. S. Parmar, Somaiya Publications Minorions Pvt. Ltd., New Delhi, 1973.				
3.	Art Fundamentals Theory & Practice by Ocvirk, Stinson, Wigg, Bone, Cayton, Mc Graw Hill, 2012.				
4.	Foundations of Art and design by Alan Pipes, Lawrence King Publishing limited, 2008.				
5.	Rendering with Pen + Ink, Thames & Hudson, 2003				
6.	Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold NY, 1993.				
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test					
Recommended by Board of Studies		21/2/2022			
Approved by Academic Council		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"><b>No. 66</b></td> <td style="width: 20%;">Date</td> <td style="width: 60%;">16-6-2022</td> </tr> </table>	<b>No. 66</b>	Date	16-6-2022
<b>No. 66</b>	Date	16-6-2022			



<b>BARC104P</b>	<b>Architectural Design II: Spatial Exploration</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
<b>Pre-requisite</b>	<b>BARC101P:Architectural Design I: Foundation Design</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>1. The studio course is aimed at understanding spatial experience relating to people, built form and material in a certain activity within a context. The focus would be to enhance the quality of spatial experience and to build stronger links between people, context, materiality and activity. This is also to explore cross cultural spatial relationships and conceptualize the idea of Space within a Space.</p>					
<b>Expected Course Outcome:</b> At the end of the course the student should be able					
<p>1. To understand activity and spatial relationship in terms of privacy, daylight, circulation and furniture layout.</p> <p>2. Evaluate existing examples correlating human anthropometrics and spatial relationship using visual tools like drawing and models.</p> <p>3. Design personal spaces using architectural elements and anthropometric principles</p> <p>4. Understand and apply simple principles of structural design and form and evaluate building components in terms of materials and disposition and communicate them clearly.</p>					
<b>Module: 1</b>	<b>Introduction to building components</b>	<b>12 Hours</b>			
Visit an existing built space- understanding and exploring the building components and sketching basic elements like Walls, Floors, beams, windows, doors, staircase, facade, etc.					
<b>Module: 2</b>	<b>Experiments in spatial volume, scale and proportion</b>	<b>12 Hours</b>			
Creation of geometric volumes in different scales of a simple functional enclosed entity and experiencing inner and outer spaces Understanding simple platonic volumes through models and representation drawings.					
<b>Module: 3</b>	<b>Experiments in anthropometrics</b>	<b>24 Hours</b>			
Full scale studies and experiments of interior functional models like kitchen units and wardrobes. Toilets and understanding of anthropometric qualities.					
<b>Module: 4</b>	<b>Experiments in internal elements</b>	<b>24 Hours</b>			
Full scale experiments in interior applications like seaters, staircases, balusters, fenestration,					
<b>Module: 5</b>	<b>Design exercise-Introduction</b>	<b>24 Hours</b>			
Design of a small structure like a residence, visitor’s information centre, café, to demonstrate understanding of internal and external spaces and low-level complexity of internal space relationships- Zoning and spatial scale, proportion and dimension.					



<b>Module: 6</b>	<b>Design Schematics 1</b>	<b>24 Hours</b>
Development of 3-D models and schematic design works.		
<b>Module: 7</b>	<b>Design Presentation</b>	<b>24 Hours</b>
Presentation drawings of the project with appropriate presentation formats.		
<b>Module: 8</b>	<b>Project Seminar</b>	<b>36 Hours</b>
Design charrette to discuss and analyse works at different stages.		
<b>Total Lecture Hours</b>		<b>180 Hours</b>

<b>Reference Books</b>		
1	Ching Francis.D.K. 2012. <i>Architecture - Form Space and Order</i> . Phaidon Press.	
2	Mark Jarzombek, et.al. 2015. <i>A Global History of Architecture</i> . John Wiley and Sons.	
3	No author. 1995. <i>Documentation of Kerala's Domestic Architecture</i> , MCF, Dakshinchitra.	
4	No author. 2014. <i>Vernacular Architecture of Tamilnadu MCF</i> . Dakshinchitra.	
5	Kolkman René & Blackburn Stuart.2014. <i>Tribal Architecture in Northeast India</i> . Brill.	
6	Kalfazade Nihat. 2009. <i>Diagrammatic Potency of the "Nine Square Grid in Architecture</i> . VDM Verlag.	
7	Clark H. Roger and Pause Michael. 1996. <i>Precedents in Architecture</i> , Van, Nostrand Reinhold.	
8	Story Kevin.J. 2020. <i>The Complexities of John Hejduk's Work: Exorcising Outlines, Apparitions and Angels</i> : Routledge.	
Mode of evaluation: Continuous Assignments, Final Assessment Test		
<b>List of exercises</b> (Indicative)		
1. Site visits to gain knowledge about building components – Documentation work		
2. Design a simple habitable space and providing a schematic drawing showing the spatial planning, materials, interior furnishing, sizes and other details		
3.Create a public interactive space area to an appropriate scale and spatially study the internal volumes and build a short narrative on the spatial quality.		
Recommended by Board of Studies	21/2/2022	
Approved by Academic Council	<b>No. 66</b>	Date 16-6-2022



BARC107L	Architectural Design Thinking	L	T	P	C
		2	0	0	2
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
The objective of the course is to understand and analyze the factors which contribute to the design process and to review processes for design realization from theoretical studies.					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
[1] <b>Develop</b> abstract ideas into tangible entities through linear or lateral thought processes.					
[2] <b>Analyze</b> design solutions and create tangible guidelines for abstract outcomes.					
[3] <b>Create</b> design solutions that meet the needs of users through enhanced aesthetic and sensorial sensibility.					
[4] <b>Devise</b> a systematic approach while providing design solutions.					
[5] <b>Determine</b> how forms and material properties may be used to create particular user experiences.					
<b>Module: 1</b>	Introduction to Design Theory Concepts of abstraction and ideation to application. Linear and lateral thought processes. Subjective and Objective analyses.	<b>4 Hours</b>			
<b>Module: 2</b>	Design thinking - History and Theory.	<b>4 Hours</b>			
<b>Module: 3</b>	Building Empathy: Analysis of everyday objects, understanding the synthesis of form and function.	<b>4 Hours</b>			
<b>Module: 4</b>	Understanding users through empathy maps, Architectural examples balancing built form spirit, aesthetics and user needs.	<b>4 Hours</b>			
<b>Module: 5</b>	Exploration and ideation of design process. Identifying problem statement, review of requirements, case studies, analysis of constraints, user needs statement to generate big ideas development of final product, feedback and improvement, Evolution of concepts and their types.	<b>4 Hours</b>			
<b>Module: 6</b>	Sensorial studies, Sequencing of space, introverted and extroverted spaces, relationships among volumes, factors influencing spatial experience, sensorial features, psychology of space, phenomenology.	<b>4 Hours</b>			
<b>Module: 7</b>	Role of Technological advancement and innovative approaches in design thinking processes with examples	<b>4 Hours</b>			
<b>Module: 8</b>	Lectures by contemporary designers	<b>2 Hours</b>			
<b>Total Lecture ours</b>		<b>30 Hours</b>			



<b>Text Books</b>			
1.	Francis D.K.Ching. <i>Architecture-Form, Space and Order</i> : John Wiley & Sons.2001.		
2.	Unwin Simon. <i>Analysing Architecture</i> : Taylor and Francis.2014.		
3.	Pandya Yati.. <i>Elements of Space making</i> . Mapin.2014		
<b>Reference Books</b>			
1.	Parker Tom.. <i>Architect's Eye</i> : Taylor and Francis.2014		
2.			
3.	Bachelard Gaston., <i>The Poetics of Space</i> : Penguin Classics.2014		
4.	Bono de Edward.. <i>Lateral Thinking</i> : Penguin. UK, 2016		
5.	Pallasmaa Juhani.. <i>The Eyes of the Skin</i> : John Wiley & Sons.2012		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test, Project component.			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



<b>BARC201P</b>	<b>Architectural Design III: Rural Environment Studies</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
<b>Pre-requisite</b>	<b>ABARC104P: Architectural Design II-Spatial Exploration</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>1.To understand/engage with the basic issues of socio-cultural and physical context of built environment and experience rural contexts of diverse typologies and in transformation.</p> <p>2.To understand planning and design through abstraction of the various elements of village settlements and their relationships.</p> <p>3.To study basic materials, technologies in design and explore vernacular construction and sustainability</p>					
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
<p>1. To <b>understand/engage</b> with the basic issues of socio-cultural and physical context of built environment and experiencing rural contexts of diverse typologies and in transformation.</p> <p>2. To <b>understand</b> the settlement pattern, evolution of rural architectural expression and various aspects such as value system, and their ingenious relationships to the built environment.</p> <p>3. To <b>identify</b> best practices, technologies in settlement design, and propose a community driven sustainable people-oriented solution.</p> <p>4. To <b>apply</b> sensitive development options for development of the rural community.</p>					
<b>Module: 1</b>	<b>Understanding the Rural and Urban Continuum</b>	<b>12 Hours</b>			
Understanding the Rural and Urban Continuum, Influence of Urbanization and villages in transformation, Contemporary challenges, Village types according to their structure, Problems of rural system					
<b>Module: 2</b>	<b>Documentation Project</b>	<b>24 Hours</b>			
Documentation Project (in-situ- travel to site and in Studio) - Drawings to understand village forms, settlement patterns, contextual responsiveness, dwelling typologies, cultural influences, construction materials and techniques, community spaces and natural resources. Preparation of report					
<b>Module: 3</b>	<b>Analysis and Identification of issues</b>	<b>24 Hours</b>			
Analysis and Identification of issues - quantitative and qualitative analysis, Spatial mapping and digitization					
<b>Module: 4</b>	<b>Macro level intervention</b>	<b>24 Hours</b>			
Macro level intervention – Envisage future changes or demands on a large-scale policy or infrastructural proposals or recommendations benefitting the entire community. Proposals include disaster management, rural road infrastructure, solid and liquid waste management plan, energy management plan, etc.					
<b>Module: 5</b>	<b>Micro level intervention</b>	<b>24 Hours</b>			



Micro level intervention - Rural projects that involve design at settlement and building level - noon meal centre, market, primary health centre, department store, primary school, vocational training institute			
<b>Module: 6</b>	<b>Design Development</b>	<b>24 Hours</b>	
Exercises detailing Site plan and presentation of concepts of different typologies through various modes and techniques that will move constantly between 2D representation and 3D massing based on function and need: user requirements, anthropometrics, space standards.			
<b>Module: 7</b>	<b>Detailing Architectural Drawings</b>	<b>24 Hours</b>	
Exercises detailing Sections and elevation studies/ 3D Models			
<b>Module: 8</b>	<b>Presentation</b>	<b>24 Hours</b>	
Final Charrette/ Juries with practicing architects			
<b>Total Lecture Hours</b>			<b>180 Hours</b>
<b>Reference Book (s)</b>			
2.	Desai. A. R, "Rural Sociology in India" (2011). Popular Prakashan Ltd. New edition.		
3.	URDPFI guidelines. 2015. Ministry of Urban Development		
<b>Mode of Evaluation:</b> Continuous Assessment Test, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022





<b>BARC204P</b>	<b>Architectural Design IV: Midscale Urban Built Forms</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
<b>Pre-requisite</b>	<b>BARC201P: Architectural Design III: Rural Environment Studies</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	In this studio course, students learn to study midscale urban architecture encompassing conventional typologies such as housing, commercial workspaces, retail environments, industrial buildings, infill context architecture, health facilities, vocational centers, youth hostels, mixed use typologies, hotels, resorts, food courts, markets and other commercial entities commonly found in the urban context. Students will learn to integrate an architectural form into the cultural context and environmental conditions of the site and will apply the knowledge gained from courses on materials, structures, construction, computation, history, and theory of architecture in relevant precedent courses and make choices regarding the incorporation of such principles into their design project. The course will further help build design ability to produce responsive design proposals for multifunctional buildings of intermediate scale. A time constrained problem to develop conceptual proposals for a small project may be introduced appropriately as part of the process.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	To analyse site features, context and statutory provisions in relation to design processes.				
2.	To design buildings of simple generic typologies normally encountered in the urban context.				
3.	To understand principles of design and deliver context-specific architectural design solutions.				
<b>Module: 1</b>	<b>Introduction to Building Typologies and Regulatory Codes</b>	<b>12 Hours</b>			
Introduction to common building typologies in the urban context, Master Planning and Detailed Development Planning. Introduction to building bye laws and built form statutory regulations. Preliminary understanding of purpose and structure of the National Building Code, 2016. Discussions on typologies and relevance to urban planning.					
<b>Module: 2</b>	<b>Design Studio Brief</b>	<b>12 Hours</b>			
Introduction of multiple projects in the realm of housing, commercial workspaces, retail environments, industrial buildings, infill context architecture, health facilities, vocational centers, auditoria, youth hostels, mixed use typologies, resorts, food courts, markets and other commercial entities commonly found in the urban context. Outline of design exercise (intermediate scale) with site specific details and contextual references.					
<b>Module: 3</b>	<b>Case studies</b>	<b>24 Hours</b>			
Case studies to understand functional and spatial relationships including integration of structural concepts and utilities. Investigations into scale and relationship between different functional areas. Qualitative studies in spatial design, materials, structural and visual thematic. Site and climate analyses. Group presentations and discussions.					
<b>Module: 4</b>	<b>Mind mapping and concept formation</b>	<b>24 Hours</b>			



Ideation of preliminary design directions using multiple parameters of form, material, scale and site based upon inputs derived from Module 3 with emphasis on three-dimensional modelling and discovery of form-function relationships with hand drawn sketches. Emphasis on abstract thinking and mind mapping.			
<b>Module: 5</b>	<b>Schematic design</b>	<b>24 Hours</b>	
Drawing of mind mapped three-dimensional entities into orthographic projections of plans, elevations and sections while iterating scale and proportion to suit structural and functional needs.			
<b>Module: 6</b>	<b>Technology Integration and Design Refinement</b>	<b>24 Hours</b>	
Resolving structural needs and envelope articulation towards creating a spatial entity equipped to meet technical needs of built form and sustainable environmental relationships.			
<b>Module: 7</b>	<b>Detailed Architectural Drawings</b>	<b>24 Hours</b>	
Comprehensive design development including evolution of architectural details			
<b>Module: 8</b>	<b>Project Presentation</b>	<b>36 Hours</b>	
Presentation drawings and physical/virtual modelling to demonstrate the contextual response, spatial quality and functional appropriateness of the design proposal. Final Charrette/ Juries with practicing architects			
<b>Total Lecture Hours</b>			<b>180 Hours</b>
<b>Reference Book (s)</b>			
1.	Ching Francis.D.K. 2014. Architecture - Form, Space and Order: Phaidon Press.		
2.	De. Chiara and Callender. 2014. <i>Time Saver Standards for Building types</i> . McGraw Hill N.Y.		
3.	Smithles KW. 1983. Principles of Design in Architecture. Chapman and Hall.		
4.	Neufert, E., Neufert, P., & Kister, J. 2012. Architects' Data. Chichester. West Sussex. UK: Wiley-Blackwell.		
5.	National Building Code of India, 2016, Bureau of Indian Standards.		
6.	Agkathidis, A., Hudert, M. and Schillig, G. (2007) Form Defining Strategies: Experimental Architectural Design. Wasmuth.		
7.	Williams D. (2007) Sustainable Design: Ecology, Architecture & Planning. John Wiley & Sons.		
<b>Mode of Evaluation:</b> Continuous Assessment, Final Assessment Test with External Review			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022



BARC301P	Architectural Design V: Civic Design	L	T	P	C
		0	0	12	12
Pre-requisite	BARC204P: Architectural Design IV: Midscale Urban Built Forms	Version 1.0			
<b>Course Objectives:</b>					
1.	To understand the purpose of civic building and its architectural sensibility to define the health and wellbeing of citizens, public education, community interaction, administrative structure, correctional facility and their architectural expression through history.				
2.	To comprehend the role of built environment in enhancing the civic sense and responsibility among the citizens.				
3.	To enquire and understand the intricate and mutual relationship between architecture of civic space and the imageability of the its immediate context				
4.	To understand the role of built environments in therapeutic and nurturing institutions, etc or/and institutions of similar scale and complexity in urban/semi-urban context.				
5.	To initiate a basic integration and understanding of technologies and building services.				
6.	To investigate the role of history, philosophy, aesthetics, and thematic abstractions influencing contemporary architecture and other emerging trends in practice.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Understanding the gamut of civic buildings through research work, field visits and seminars and identifying sites for specific typologies.				
2.	Analysis of sites and building programs including the physical, environmental, regulatory, visual and spatial requirements for designing specific institutions.				
3.	Providing context-specific architectural design solution to meet specific civic needs.				
<b>Module: 1</b>	<b>Introduction to Civic Institutions</b>	<b>12 Hours</b>			
Introduction to the studio, understanding design parameters pertaining to civic design, Different typologies of institutions					
<b>Module: 2</b>	<b>Documenting Tangible and Intangible factors</b>	<b>24 Hours</b>			
Documenting various tangible and intangible factors in a neighborhood/city context that influence the site for civic design and relevant precedent studies - Sketches, drawings, photographs, study models Evaluating the design philosophies followed by architects in the design process of public buildings.					
<b>Module: 3</b>	<b>Site Analysis and Design programme</b>	<b>12 Hours</b>			
Identifying and delineating the site; Formulation of design programme of an appropriate scale pertaining to the functions of the identified civic project					
<b>Module: 4</b>	<b>Ideation and Design narratives</b>	<b>30 Hours</b>			
Exercises that motivate students to ideate relevant design narratives/vision that underlies the heart of architectural design to accommodate the intended civic proposals - Sketches, drawings, photographs, study models, digital and computational simulation involving iterative process					
<b>Module: 5</b>	<b>Design Development</b>	<b>36 Hours</b>			
Drawings and simulations to iterate/explore design process to develop sustainable architectural solutions that comprehensively address the design requirements of the civic project					
<b>Module: 6</b>	<b>Small project</b>	<b>30 Hours</b>			
Time problem/ small project to evoke specific issues – like urban art installations/ temporary structures. Advanced design processes; detail form finding and production of drawings to understand quality representations to explicitly discuss the design ideas					



<b>Module: 7</b>	<b>Design Representations</b>	<b>24 Hours</b>
Detailed Development of presentation drawings that communicate the design ideation, technicalities and the spatial tectonics.		
<b>Module: 8</b>	<b>Design Charrettes</b>	<b>12 Hours</b>
Design Charrette(s) and final jury/ discussion with practicing architects and related disciplines		
<b>Total Lecture Hours</b>		<b>180 Hours</b>
<b>Reference Book (s)</b>		
1.	“Planning the Architects Hand Book - Edward. D. Mills, Butterworth, London, 1985	
2.	Time Saver Standards for Building types” ,De. Chiara and Callender, McGraw – Hill Co., N.Y., 2017	
3.	The Dynamic Decade, Campus Planning, David Godchalk, 2011	
4.	“Sustainable Design: Ecology, Architecture & Planning”, Daniel Williams, John Wiley & sons,2007	
<b>Mode of Evaluation:</b> Continuous assessment and Design Viva-voce.		
<b>Recommended by Board of Studies</b>	21/2/2022	
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date 16-6-2022



BARC305P	Architectural Design VI: Technical Drawings	L	T	P	C
		0	0	12	6
<b>Pre-requisite</b>	<b>BARC301P: Architectural Design V: Civic Design</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To understand the process of translation of design into built reality and the realities of site conditions through an understanding of conventional architectural communication processes.				
2.	To understand and communicate graphically the tangible integration of design, structure and utilities.				
3.	To explore concepts of architectural detailing and working drawings.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Understand the nomenclature, graphics symbols, formats, conventions and compositional clarity associated with technical drawings.				
2.	Apply architectural detailing and planning refinements including engineering systems integration				
3.	Produce construction drawings for a specific project.				
<b>Module: 1</b>	<b>Architectural Drawing - Introduction</b>	<b>36 Hours</b>			
Introduction to construction drawings, formatting and scheduling including understanding of working drawings, detailed drawings and schedules, shop drawings. Design level refinement in architectural and landscape drawings of precedent learning, correction of preliminary drawings to match spatial standards and drafting standards.					
<b>Module: 2</b>	<b>Digital drafting methods and techniques</b>	<b>24 Hours</b>			
Preparation of drawings as per industry standards and formatting methods using digital drafting applications. (CAD, BIM, Revit).					
<b>Module: 3</b>	<b>Case studies &amp; Site visits</b>	<b>12 Hours</b>			
Case studies and site visits to architectural projects to explore structure, finishes and architectural details.					
<b>Module: 4</b>	<b>Structural and Utilities Integration</b>	<b>24 Hours</b>			
Integrating structural components such as columns and beams. Understanding and application of utility services including comprehension of scale and location of appropriate MEP provisions.					
<b>Module: 5</b>	<b>Detailed drawing Exploration</b>	<b>24 Hours</b>			
Exploring sample architectural details as pertinent to the project and creation of technically correct drawings.					
<b>Module: 6</b>	<b>Application of Building information modeling</b>	<b>18 Hours</b>			
Hands on application Building Information Modeling in decision making, collaboration, coordination of multiple trades, potential time savings and development of a successful architectural detailed model.					
<b>Module: 7</b>	<b>Product Specifications</b>	<b>12 Hours</b>			
Discussions with product suppliers on various building components and analysis of contemporary specifications and applied methods in construction.					
<b>Module: 8</b>	<b>Preparation of GFC package as per industry standards</b>	<b>30 Hours</b>			
Preparation of Good for Construction Drawing Package including title block preparation, layouts, Sheet numbering, Scaling of drawings, sheet size decisions, enlarged details, creative detailing, vendor specific detailing and presentation.					
<b>Total Lecture Hours</b>					<b>180 Hours</b>



<b>Text Book(s)</b>			
1.	Architect's pocket book by Charlotte Baden-Powell, Jonathan Hetreed & Ann Ross, 2008		
2.	Landscape architect's pocket book by Garmory, Rachel Tennant and Siobhan Vernon, 2009		
3.	Building Planning and Drawing by M. V. Chitawadagi and S. S. Bhavikatti, Dreamtech Press, 2019		
<b>Reference Book (s)</b>			
1.	RIBA working Drawings Handbook, Keith Styles, 2014		
2.	Campus Planning, University Planning - The search of perfection - Jonathan Coulson, 2015		
<b>Mode of Evaluation:</b> Continuous Assessment, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022



<b>BARC305P</b>	<b>Architectural Design VII: Complex Technologies</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
<b>Pre-requisite</b>	<b>BARC301P: Architectural Design VI: Technical Drawings</b>	<b>Version1.0</b>			
<b>Course Objectives:</b>					
1.	To present a thesis through a process of architectural learning involving text and field research, user feedback and precedent studies, identifying a focal point of research interest and demonstrating an application of the research process through a tangible architectural project based upon a definitive built form programme integrating all architectural, structural and technology integration to sustain the same in an environmentally responsible manner.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Research architectural data for solutions to complex planning needs, identify the issues to be resolved, undertake field work and identify suitable development directives for projects.				
2.	Analyse options for design development and prepare design drawings and models to communicate these ideas.				
3.	Provide context-specific architectural design solution to meet specific civic needs. Provide thesis reports in relevant formats.				
<b>Module: 1</b>	<b>Introduction to the project</b>	<b>12 Hours</b>			
Introduction to the studio, approval of the project with goals and objectives, scope and limitations, precedent examples if any. Focal study of the object pertaining to specific technologies or architectural character or other direction of research may be indicated. The project could be identified from multiple development projects proposed by public or private bodies. The scale and rigour may also be indicated appropriately.					
<b>Module: 2</b>	<b>Documenting Tangible and Intangible factors</b>	<b>24 Hours</b>			
Documenting various tangible and intangible factors in a neighborhood/city context that influence the design.. Study of statutory development control guidelines. Focus study research and directions for application. Case studies of similar nature.					
<b>Module: 3</b>	<b>Site Analysis and Design programme</b>	<b>12 Hours</b>			
Formulation of design programme of an appropriate scale pertaining to the functions of the identified development project including relevant studies of MEP standards, statutory limitations, etc. Preparation of built form programme/environmental programme					
<b>Module: 4</b>	<b>Ideation and Design narratives</b>	<b>30 Hours</b>			
Preliminary larger level ideation including imageability of the development, built volume disposition, zoning, open and built-up area delineation, city level integration, entries and exits, volumetric options. Exercises that motivate students to ideate relevant design narratives/vision that underlies the heart of architectural design to accommodate the intended proposals - Sketches, drawings, photographs, study models, digital and computational simulation involving iterative processes					
<b>Module: 5</b>	<b>Schematic Design Development-Stage 1</b>	<b>36 Hours</b>			
Drawings and simulations to iterate/explore design process to develop sustainable architectural solutions that comprehensively address the design requirements of the project.					
<b>Module: 6</b>	<b>Schematic Design Development-Stage 2</b>	<b>30 Hours</b>			
Detailed development of plans and technical systems integration including detailed 3-D volumetric drawings.					
<b>Module: 7</b>	<b>Design Representations</b>	<b>24 Hours</b>			
Detailed Development of presentation drawings that communicate the design ideation, technicalities and the spatial tectonics. Mandatory presentation of thesis report, architectural models and visuals as appropriate.					
<b>Module: 8</b>	<b>Design Charrettes</b>	<b>12 Hours</b>			
Design Charrette(s) and final jury/ discussion with practicing architects and related disciplines					



<b>Total Lecture Hours</b>		<b>180 Hours</b>	
<b>Reference Book (s)</b>			
1.	“Planning the Architects Hand Book - Edward. D. Mills, Butterworth, London, 1985		
2.	Time Saver Standards for Building types” ,De. Chiara and Callender, McGraw – Hill Co., N.Y., 1973		
3.	The Dynamic Decade, Campus Planning, David Godchalk, 2011		
4.	“Sustainable Design: Ecology, Architecture & Planning”, Daniel Williams, John Wiley & sons,2007		
<b>Mode of Evaluation:</b> Continuous assessment and Design Viva-voce.			
<b>Recommended by Board of Studies</b>	21/2/2022		
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date	16-6-2022





<b>BARC499J</b>	<b>Architectural Thesis</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>
<b>Pre-requisite</b>	<b>BARC498J: Architectural Internship</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To focus on a deliverable thesis through a process of architectural learning involving text and field research, user feedback and precedent studies, identifying a focal point of research interest and demonstrating an application of the research process through a tangible architectural project based upon a definitive built form programme integrating all architectural, structural and technology integration to sustain the same in an environmentally responsible manner.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Research architectural data for solutions to complex planning needs, identify the issues to be resolved, undertake field work and identify suitable development directives for projects.				
2.	Prepare thesis reports in relevant formats. Author research papers wherever possible.				
3.	Provide context-specific architectural design solution to meet specific civic needs.				
<b>Module: 1</b>	<b>Introduction to the project</b>				
Introduction to the studio, approval of the project with goals and objectives, scope and limitations, precedent examples if any. Focal study of the object pertaining to specific technologies or architectural character or other direction of research may be indicated. The project could be identified from multiple development projects proposed by public or private bodies. The scale and rigour may also be indicated appropriately.					
<b>Module: 2</b>	<b>Documenting Tangible and Intangible factors</b>				
Documenting various tangible and intangible factors in a neighborhood/city context that influence the design.. Study of statutory development control guidelines. Focus study research and directions for application. Case studies of similar nature.					
<b>Module: 3</b>	<b>Site Analysis and Design programme</b>				
Formulation of design programme of an appropriate scale pertaining to the functions of the identified development project including relevant studies of MEP standards, statutory limitations, etc. Preparation of built form programme/environmental programme					
<b>Module: 4</b>	<b>Ideation and Design narratives</b>				
Preliminary larger level ideation including imageability of the development, built volume disposition, zoning, open and built up area delineation, city level integration, entries and exits, volumetric options.Exercises that motivate students to ideate relevant design narratives/vision that underlies the heart of architectural design to accommodate the intended proposals - Sketches, drawings, photographs, study models, digital and computational simulation involving iterative processes					
<b>Module: 5</b>	<b>Schematic Design Development-Stage 1</b>				
Drawings and simulations to iterate/explore design process to develop sustainable architectural solutions that comprehensively address the design requirements of the project.					
<b>Module: 6</b>	<b>Schematic Design Development-Stage 2</b>				
Detailed development of plans and technical systems integration including detailed 3-D volumetric drawings.					
<b>Module: 7</b>	<b>Design Representations</b>				
Detailed Development of presentation drawings that communicate the design ideation, technicalities and the spatial tectonics. Mandatory presentation of thesis report, architectural models and visuals as appropriate.					
<b>Module: 8</b>	<b>Design Charrettes</b>				
Design Charrette(s) and final jury/ discussion with practicing architects and related disciplines					
<b>Total Lecture Hours</b>					<b>225 Hours</b>



<b>Reference Book (s)</b>			
1.	"Planning the Architects Hand Book - Edward. D. Mills, Butterworth, London, 1985		
2.	Time Saver Standards for Building types" ,De. Chiara and Callender, McGraw – Hill Co., N.Y., 2017		
3.	The Dynamic Decade, Campus Planning, David Godchalk, 2011		
4.	"Sustainable Design: Ecology, Architecture & Planning", Daniel Williams, John Wiley & sons,2007		
<b>Mode of Evaluation:</b> Continuous assessment and Design Viva-voce.			
<b>Recommended by Board of Studies</b>	21/2/2022		
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date	16-6-2022



BARC111L	History of Architecture: Ancient	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1) The course would bring questioning and critical thinking skills, commencing with why there is a need to study history with reference to architecture. 2) The discourse should manoeuvre from reading, learning, and understanding the tools of architectural analysis. 3) The course should provide an insight into the architecture of the prehistoric period and early civilizations across the world. 4) The course delivery is framed by taking different crucial lenses to trace and examine the path, pattern, and language the various civilizations have taken up. 5) The different aspects can include social, religious, and political character; construction methods; building materials; and the influence of geology, geography, and climate.					
<b>Expected Course Outcome:</b>					
At the end of the course, the student should be able to 1) Explore the history and theory of architecture from prehistoric times and the evolution of architectural typologies based on function or form across the globe. 2) Examine the earliest types of settlement patterns as well as various ancient civilizations. 3) Apply architecture to track the emergence and evolution of important societal institutions such as intelligence, religion, and culture pertaining to the Indian Continent. 4) Analyse the evolution and development of architecture in China and Japan. 5) Discover how Greek architecture evolved in response to social, political, and economic upheavals, as well as cultural and environmental factors. 6) To investigate and comprehend how architecture evolved in response to various classical texts, and thus in Rome. 7) Recognize the evolution, transformation, and architectural manifestation of a religion in historical, cultural, geographic, and technological contexts. 8) To develop an understanding of the given construct and develop critical thinking skills to lead towards an ideal construct.					
<b>Module: 1</b>	<b>Prehistoric Architecture &amp; early settlement (1200BC &amp; Before)</b>	<b>4 Hours</b>			
Theoretical and practical with evidence relevance of History in architecture. Introduction of different ages of human history. Typology & Evolution of form in Architecture manifestations- Acquired from indigen natural resources, monolithic and constructed manifestations- cave dwelling, earliest known man-made shelter, Ritual Spaces and Burial Structures and Early Settlements					
<b>Module: 2</b>	<b>River valley civilizations (3500 -800 BC)</b>	<b>9 Hours</b>			



<p>Introduction to chronology of human civilizations and first societies , elements and determinants of human settlements, Agro-pastoral Settlement , Contextual Understanding - Geography, Political Scenario, social, religious, cultural and economic systems and Trade</p> <p><b>Ancient Egypt-</b> Understanding the culture and evolution of Architecture with respect to contextual Understanding – Trade, Political system, religious beliefs and practices, evolution of funerary architecture- Mastaba , Stepped Pyramids(Zoser), evolution of Pyramids (Bent, Red, Giza), process of mummification, temples , hypostyle Halls, cult temple</p> <p><b>Mesopotamia</b> - Urbanization in the fertile crescent – Sumerian, Akkadian, Babylonian, Assyrian and onset of Persian culture, evolution of city, Gods and empires and manifestation through architecture- ziggurat, temples , palaces , gates, Babylonia- Hamurabi and his contribution to the world- code of law, hanging garden</p> <p><b>India-</b>Indus Valley Civilization - Ghaggar-Hakra River valley, Harappa, Mohenjo-Daro, Rakhigarhi, Muziris, Arikmedu</p> <p><b>Ancient China-</b> Henan Culture , Shang Dynasty, Zhou Dynasty China</p>		
<b>Module: 3</b>	<b>Ancient Indian Architecture (800BC- 0 BC)</b>	<b>6 Hours</b>
<p>Evolution of Ancient Indian architecture, cultural and spiritual heritage (Reference to various ancient religion- Buddhism, Jainism, and Hinduism)</p> <p>Rock-Cut Architecture- Barabar Hills , Buddhist Caves, Ajanta Caves, Ellora, Elephanta, Rani Gumpha, Chaitya Hall- Karli.</p> <p>Buddhist Architecture- Educational Institutions and other related structures, Takshila, Sanchi Stupa, Lion Capital, Sarnath. Jainism – Jandial, Mt Abu</p>		
<b>Module: 4</b>	<b>Japanese and Chinese Architecture (800BC- 0 BC)</b>	<b>4 Hours</b>
<p>Japanese and Chinese Civilizations' architectural characteristics, building typologies, settlement patterns, planning principles, and construction techniques. The relationship of the leadership of the various dynasties to the architecture of the respective lands.</p> <p><b>China</b> – Hongshan (Ritual Centers &amp; Ritual altars).</p> <p><b>Japan-</b> Kofun Period, Nara Period</p>		
<b>Module: 5</b>	<b>Classical Period: Greece (800CE- 400 CE)</b>	<b>4 Hours</b>
<p>Introduction to Classical Greek history &amp; architecture -Polis, Politics &amp; Mythology.</p> <p>Ancient Greek Cities - Minoan and Mycenaean cultures, Hellenic Greek and relevance to India.</p> <p>Building Typology: Public Buildings- agora, stoas, theaters, bouletrion and stadias, domestic architecture, Orders (Doric, Ionic, Corinthian) and Temples.</p> <p>City Planning(Acropolis, Agora, Athens)</p> <p>Architectural Concepts &amp; evolutions of principles : Optical Correction, Golden Mean, Golden Ratio, Fibbonachi Sequence</p>		
<b>Module: 6</b>	<b>Classical Period: Rome (800 CE- 200 CE)</b>	<b>5 Hours</b>
<p>Introduction to Classical Roman History &amp; Architecture- Etruscan, Imperial and Republic Rome, City planning and Vitruvius Principles</p> <p>Architectural Typology- Civic Buildings : Thermae, Circus, Forums and basilicas, Aqueducts. Domestic architecture(Domus). Commemorative architecture.</p>		



Construction Techniques and Innovations – Arches, Domes and orders in architecture-Tuscan and Composite			
<b>Module: 7</b>	<b>Rise of Christian Architecture (400 CE)</b>		<b>4 Hours</b>
Birth and spread of Christianity – Transformation of the Roman Empire – Early Christian worship and burial, Church Planning & Types - Construction, Material & Form Development, Byzantine, Baptisteries , Christian architecture in India			
<b>Module: 8</b>	<b>Guest Lectures and model making workshops</b>		<b>6 Hours</b>
Interactions with experts of History, Theory and Criticism Model making workshop for the case examples.			
<b>Total Lecture Hours</b>			<b>45 Hours</b>
<b>Text Book</b>			
1.	Ching, F. D. K., Jarzombek, M. and Prakash, V, <i>A Global History of Architecture</i> , 2nd Ed. John Wiley and Sons, 2010.		
2.	Kostof, S. (1995). <i>History of Architecture</i> , New York: Oxford University Press.		
3.	Bannister Fletcher, <i>A History of Architecture</i> , 21st Edition, Bloomsbury Publishing, 2020		
<b>Reference Books</b>			
1.	Brown, Percy. <i>Indian Architecture (Buddhist, Hindu, Islamic period)</i> , DB Taraporevala Sons & Co, Mumbai, (reprint 2011)		
2.	ChristoperTadgell, <i>The History of Architecture in India from the Dawn of civilization to the End of the Raj</i> , Longman Group U.K. Ltd., London, 1990.		
3.	Benevolo, <i>The History of the City</i> , MIT Press 2010 (reprint)		
4.	Marcus Vitruvius Pollio, <i>The Ten Books on Architecture</i> , 2016, Elibron Classics		
5.	Bubbar, D. K. (2005). <i>The Spirit of Indian Architecture</i> . New Delhi : Rupa & Co.		
6.	Copplesstone, T. and Lloyd, S. (1971). <i>World Architecture: An Illustrated History</i> . London: Verona Printed.		
7.	Leland M Roth, <i>Understanding Architecture: Its Elements, History and Meaning</i> , Craftsman House, 2004		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



<b>BARC202L</b>	<b>History of Architecture– Medieval and Renaissance</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC111L: History of Architecture - Ancient Period</b>				
<b>Course Objectives:</b>					
1) This course is a survey of world architecture in the medieval and renaissance period in a broad range of historical, regional and cultural contexts. 2) Major social, physical and technical factors which influence architecture are identified. 3) The concepts and styles will be read, discussed and analysed from the evolution to the execution in different eras. 4) Readings and discussions to investigate the discourse of architectural history and establishing a framework in rationalization of the role of architecture in larger systems of civilizations and mannerisms can be explored.					
<b>Expected Course Outcome:</b>					
At the end of the course, the student should be able to 1) Distinguish place- and period-specific architectural styles across the world from 500 AD to 1750 AD 2) Interpret and analyse early mediaeval art and architecture and place it in its original social, political, and spiritual contexts to understand how archetypes were constructed, defined, and understood. 3) Analyse the architecture in the medieval era and its evolution, influences and responses on current built forms across the world. 4) Understand the central tenets of medieval art and architecture in India during Provincial Rule. 5) Understand the impact of dynastic power on architectural development and examining the role of patrons. 6) Analyse the architecture in the Renaissance Period and its evolution, responses and influences on current built forms across the world. 7) Develop architectural vocabulary related to certain styles, visual literacy abilities, and a basic comprehension of the methodologies and goals of art historical research. 8) Develop an understanding of the given construct and develop a critical thinking skill to lead towards an ideal constructs.					
<b>Module: 1</b>	<b>Introduction (500-1600)AD</b>	<b>2 Hours</b>			
Introduction to history and theory of Medieval Era – Brief Discussion on Broad chronological boundaries. Outline of approach and attitude to historiography and the approach to the evolution of architecture and cultures. Changing social conditions in the world during Medieval and Renaissance period.					
<b>Module: 2</b>	<b>Indian Architecture (500 - 800)AD</b>	<b>4 Hours</b>			
Brief history of South India, Temple architecture –temples as community spaces & temple City Planning , Temple Types and Styles : Dravidian Style Temples - Pallavas, Cholas, Pandyas - Tanjore, Srirangam, Temples in Kanchipuram, Kumbakonam, Darasuram& Rameswaram, Pancharathas, Mamallapuram Monuments, Meenakshi Amman temple, Brihadeeshwara Temple, Gangaikonda Cholapuram . Nagara Style - Modhera Sun Temple, Jain temple Mt. Abu					



Exception of Orissan Temples - Lingaraja Temple, Konark Sun Temple		
<b>Module: 3</b>	<b>World Architecture (800-1600 AD)</b>	<b>3 Hours</b>
<p>Persian Architecture: 4 Styles &amp; Phases, materials, typologies and symbolism in Persian architecture.</p> <p>Romanesque and Gothic- Spatial organization, material and structural systems, Amiens Cathedral, Italian Town halls, Pisa group of buildings.</p> <p>Other key institutions and cities – Town Planning &amp; Urbanization: Siena , Chicen Itza, Pienza, Machu Pichu &amp; The Forbidden City of Peking</p>		
<b>Module: 4</b>	<b>The Sultanate and Provincial Style Architecture in India (1200-1600)CE</b>	<b>6 Hours</b>
<p>Early Muslim dynasties (Delhi): Slave, Khalji, Tughlaq, Sayyid, Lodhis and Shershah Suri regimes. Formation of ‘Indo-Islamic’ style. Development of basic mosque and tomb prototypes.</p> <p>Development of colloquial styles in various provinces of India (Rajputs, Marathas and Deccan states) -Gujrat, Bengal, Bijapur, Bidar , Mandu and Deccan region.</p> <p>Regimes of South India – Nayaks of Madurai, Thirumala Nayak and Setupatis of Ramnad:</p> <p>Water Infrastructure - Step wells of Delhi, Gujarat, Rajasthan and South India.</p>		
<b>Module: 5</b>	<b>Mughal Empire (1300-1750) CE</b>	<b>12 Hours</b>
<p>Mughal Architecture in India: Sur and Early Mughal Architecture, Sasaram and Delhi under Sher Shah. Architecture of the Timurids in India- Babur, Hamayun, Akhbar, Jahangir and Shahjahan ( Agra , Fatehpur Sikri, Gol Gumbaz, Red Fort , Humayun’s Tomb, Taj Mahal, Red Fort &amp; Jama Masjid )</p> <p>Architectural principles and structure systems proportions, structure systems, landscape, materials, scale and distinct features.</p>		
<b>Module: 6</b>	<b>Renaissance and Mannerism &amp; Other Empires (1200-1700 AD)</b>	<b>6 Hours</b>
<p>Early Renaissance – Italian Renaissance: Brunelleschi and Alberti</p> <p>High Renaissance – Bramante, Raphael &amp; Michaelangelo</p> <p>Renaissance façade and features (Florence and St Peter’s Church)</p> <p>Discourse on Regional Variations of Renaissance - English and French</p> <p>Mannerism: Classical texts &amp; principles of proportion (Michaelangelo), Interplay between manmade and nature in villas(Palladio) &amp; Venetian Architecture</p>		
<b>Module: 7</b>	<b>Baroque and Rococo (1600-1750) CE</b>	<b>6 Hours</b>
<p>Global perspective, ideologies, and philosophies of key artists – Baroque and Rococo</p> <p>Baroque Period: Early Baroque, High Baroque - Dynamism and systemization, Bernini, Borromini, Cortona and their works. Responding to the religious and defensive requirement</p> <p>Rococo Period: Italy, Spain and France</p> <p>Different mediums of artistic expression-art, furniture, gardens and interiors (St.Carlos, St. Peters, Louvre, Palace of Versailles)</p> <p>Counter Reformation and its impact on Catholic Church</p>		
<b>Module: 8</b>	<b>Guest Lectures and Model Exercise</b>	<b>6 Hours</b>
<p>Interactions with experts of History, Theory and Criticism.</p> <p>Model making workshop for the case examples (1201 AD to 1750 AD).</p>		
Total Lecture Hours		<b>45 Hours</b>



<b>Text Book</b>			
1.	Ching, F. D. K., Jarzombek, M. and Prakash, V, <i>A Global History of Architecture</i> , 2nd Ed. John Wiley and Sons, 2010.		
2.	Kostof, S. (1995). <i>History of Architecture</i> , New York: Oxford University Press.		
3.	Bannister Fletcher, <i>A History of Architecture</i> , 21st Edition, Bloomsbury Publishing, 2020		
Reference Books			
1.	Leland M Roth, <i>Understanding Architecture: Its Elements, History and Meaning</i> , Craftsman, House, 2004		
2.	Brown, Percy " <i>Indian Architecture (Islamic period)</i> ", , DB Taraporevala Sons & Co, Mumbai, 2011		
3.	Paul Letarouilly, <i>Edifices de Rome Moderne</i> (Classic Reprints), Princeton Architectural Press, 1981		
4.	Benevolo, <i>The History of the City</i> , MIT Press 2010 (reprint)		
5.	Bannister Fletcher, <i>A History of Architecture, 21th Edition</i> , Bloomsbury Publishing, 2020 (reprint)		
6.	Rudolf Wittkower, <i>Architecture Principles in the Age of Humanism</i> , Wiley ,1998		
7.	Monica Juneja, <i>Architecture in Medieval India</i> , Univ of Michigan, Permanent Black, 2001		
8.	Adam Hardy, <i>The Temple Architecture of India</i> , Wiley & Sons, 2008		
9.	Ching, F. D. K., Jarzombek, M. and Prakash, V, <i>A Global History of Architecture</i> , 2nd Ed. John Wiley and Sons, 2010.		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022





<b>BARC302L</b>	<b>History of Architecture: Industrial Era</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Pre-requisite</b>	<b>BARC202L: History of Architecture: Medieval to Renaissance</b>	Version 1.0			
<b>Course Objectives:</b>					
<p>The course is aimed at</p> <ul style="list-style-type: none"> <li>[1] Providing an introduction to architecture of industrial era.</li> <li>[2] Studying the relevance of building technologies in relation to industrial revolution and colonialism.</li> <li>[3] Developing skills of observation, critical appreciation and writing, complementing the experience of buildings during that time period.</li> <li>[4] Critical appreciation of the broad changing complexities and aspirations (cultural, social, economic, Technological etc.) in society that impacts architecture.</li> </ul>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to</p> <ol style="list-style-type: none"> <li>1. <b>Understand</b> the social, cultural and economic scenarios that led to the development of Industrial Era in architecture.</li> <li>2. <b>Study</b> the relationship with the preceding architectural era's such as renaissance, Baroque and Rococo.</li> <li>3. <b>Develop</b> observational skills to recognize the style depending upon the context and time period.</li> <li>4. <b>Understand</b> the evolution of urban design in architecture in industrial era</li> <li>5. <b>Analyze</b> the outcomes of industrial era with respect to industrial architecture.</li> </ol>					
<b>Module: 1</b>	<b>Introduction 1600 AD – 1700 AD</b>	<b>4 Hours</b>			
<p>Influence of Baroque art on architecture in Europe            End of Baroque and Rococo and beginning of Industrial Era  <i>Eg: Palace of Versailles, Hall of Mirrors</i>            The change in social and familial systems.</p>					
<b>Module: 2</b>	<b>Socio – cultural changes in Europe and America – 1740 AD – 1800 AD</b>	<b>4 Hours</b>			
<p>Change in the hierarchy of society, perception on economy, evolution of industrial materials and technology in Europe            Evolution of Industrial towns – <i>London - UK, George town - Chennai, Fort Williams – Kolkata</i>            Evolution of styles of Building based upon utilitarianism and public use – Banks, Insurance, public works, mills, hospitals, schools and infrastructure.            Issues of the early Industrial towns – <i>Slums</i></p>					



<b>Module: 3</b>	<b>Impact of Industrial revolution on architecture in Europe and America 1700 – 1850 AD</b>	<b>4 Hours</b>
<p>Industrial materials and construction technology            Neo – Classical Architecture in the west  <i>Eg: Eiffel Tower, Crystal Palace, Pulteney Bridge, The white House, Academy of Athens,</i>            Eclecticism. <i>Eg: Russian eclecticism</i></p>		
<b>Module: 4</b>	<b>Revival Architecture in Europe and India</b>	<b>5 Hours</b>
<p>Gothic, Renaissance, Egyptian Revival architecture using modern material and technology.            John Ruskin and his writings on Gothic Revival, Seven lamps of architecture.</p>		
<b>Module: 5</b>	<b>Colonies of India 1500 AD – 1800 AD</b>	<b>4 Hours</b>
<p>Portuguese, French and Dutch colonies in India            Amalgamation of architectural styles between the colonial style and Indian style.            Socio – cultural context.  <i>Eg: Colonial architecture of Pondicherry, Goa, Kerala, Nayak architecture in Madurai</i></p>		
<b>Module: 6</b>	<b>British in India – 1800 AD – 1947 AD</b>	<b>4 Hours</b>
<p>Neo classical. <i>Ex: St. Andrews Kerk - Chennai, Town Hall – Kolkatta.</i>            Eclecticism: <i>Indo-saracenic style and Robert Chisholm</i>            Revival styles – <i>Ex: Victoria Railway station, High court – Mumbai.</i></p>		
<b>Module: 7</b>	<b>Impact of Industrial era to the development of modern architecture 1800 AD – 1900 AD</b>	<b>4 Hours</b>
<p>Contributions of Nicolas Durand and Viollet Le Duc in the development of modern architectural concepts.            Learning of early modern architects such as <i>William Morris, Mies Van De Rohe, Daniel Burnham, William Le Baron</i></p>		
<b>Module: 8</b>	<b>Interaction with an Historian</b>	<b>1 Hours</b>
<p>Interactions with architectural historians - The significant aspects of The Industrial Era</p>		
<b>Total Lecture Hours</b>		<b>30 Hours</b>



<b>BARC402L</b>	<b>History of Architecture: Contemporary</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Pre-requisite</b>	<b>BARC302L: History of Architecture: Industrial Era</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>The course is aimed at:</p> <ul style="list-style-type: none"> <li>[1] Providing an introduction to contemporary Indian and international architecture.</li> <li>[2] Using information from courses on earlier periods, the students will analyse, identify the influence and forces evolving contemporary architecture.</li> <li>[3] Understanding the design philosophies of selected contemporary architects.</li> <li>[4] Enhancing students' knowledge of contemporary architectural concepts and capacity to discuss them.</li> </ul>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to</p> <ul style="list-style-type: none"> <li>[1] <b>Understand</b> the social, economic, geographic and technological influence on architecture and the influence of architecture on our societies.</li> <li>[2] <b>Study</b> the styles of contemporary styles of design and the architects who founded them with respect to Europe, America and India.</li> <li>[3] <b>Analyze</b> the impact of international style and post modernism in west and India.</li> <li>[4] <b>Understand</b> the evolution of architecture towards today's architect and practices.</li> </ul>					
<b>Module: 1</b>	<b>Initial Impulses toward contemporary architecture. 1800 AD to 1900 AD</b>	<b>2 Hours</b>			
<p>Industrial Age, technological change, political change, (<i>railways, mass housing, etc.</i>). Global colonial rule and in India. Growth of Indian towns - Madras, and Kolkata etc.</p>					
<b>Module: 2</b>	<b>Foundations of Modern Architecture in Europe 1800 AD – 2000 AD</b>	<b>5 Hours</b>			
<p>Evolution of early modern architecture from Industrial architecture</p> <p>Social, economic and cultural scenarios in Europe – War, population explosion, migration</p> <p>Modernism in Europe: <i>William Morris, Victor Horta, Mies Van de Rohe, Alvar Alto, Peter Behrens, Le Corbusier</i></p> <p><i>Socialist housing (Vienna, Soviet Union), Constructivism, De Stijl, and Bauhaus etc,</i></p>					



<b>Module: 3</b>	<b>Early North American Modernism and its Influence 1800 AD – 2000 AD</b>	<b>4 Hours</b>
<p>American Modernism and F.L Wright.          Post war influencers - <i>Richard Neutra, Victor Gruen</i>.          The advent of high rise and commercial architecture.</p>		
<b>Module: 4</b>	<b>Indian Independence, post 1947 AD</b>	<b>4 Hours</b>
<p>Pre-independence: <i>Indo-saracenic, art deco and classical, Lutyens and New Delhi</i>.          Post-independence - <i>Le Corbusier, Charles Correa</i>          The Indian Pioneers/ post - war: <i>Achyut Kanvinde, Charles Correa, B.V Doshi, Louis Kahn, Anant Raje, Raj Rewal, Nari Gandhi etc.</i></p>		
<b>Module: 5</b>	<b>The Indian Pioneers and Global Modernism and International Style (1940 – 1970 AD)</b>	<b>5 Hours</b>
<p>Other influencers in India: <i>Laurie Baker, Joseph Stein, Louis Khan</i>          International developments: <i>Mies Van der Rohe, C. Mackintosh, A. Perret, Peter Behrens, Adolf Loos, Architects of MoMa</i>. The rise of the corporate architecture firm: SOM, KPF etc.</p>		
<b>Module: 6</b>	<b>Post-modernism and Critical Regionalism, Late 1900 AD</b>	<b>5 Hours</b>
<p>Post-modern: <i>Charles Jenks, Philip Johnson, Venturi</i>.          Deconstructivism: <i>Charles Moore, Peter Eisenman, Frank Gehry</i>          Critical regionalism - <i>Kenneth Frampton, Alexander Tzonis and Liane Lefaivre, Jørn Utzon, Alvaro Siza, Tadao Ando. Hasan Fathy, B.V Doshi, Laurie Baker, Geoffrey Bawa etc</i></p>		
<b>Module: 7</b>	<b>Indian modern Architecture and Continuing Modernism around the globe</b>	<b>4Hours</b>
<p>New modernism: <i>Peter Zumthor, OMA, Renzo Piano, Toyo Ito, Herzog &amp;De Meuron</i>          Architects firms: <i>MVRDV in Netherlands, MASS Design Group</i>.          India: Review of current practicing architects and women practitioners.</p>		
<b>Module: 8</b>	<b>Invited Guest Lectures with Practicing Architectural Historians etc.</b>	<b>1 Hours</b>
<p>Emerging trends, Parametric Architecture, bio-mimicry, complex collaborative.</p>		
<b><u>Total Lecture Hours</u></b>		<b>30 Hours</b>



### Reference Books

1. Nikolaus Pevsener, "Sources of modern architecture and design", Themes and Hudson, 1989.
2. William J.R., Curtis, "Modern architecture since 1900", Prentice hall, New Jersey USA, 1983.
3. Peter Scriver and Amit Srivastava, Modern Indian Architecture, Reaktion books, 2015
4. Rahul Mehrotra, Architecture in India since 1990, GmbH & Company KG, 2011
5. Kenneth Frampton, Modern Architecture - A Critical History, Thames & Hudson, 2007
6. Rayner Banham, Theory and Design in the First Machine Age. (Various publishers). Originally 1960.
7. K.R. Sitalakshmi, RArchitecture of Indian Modernity, the case of madras.2015
8. Neera Adarkar, The chawls of Mumbai. 2012
9. Jon Lang, A concise history of modern architecture in India. 2002.

Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test

Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



<b>BARC403P</b>	<b>Architectural Design VIII-Urban Design</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
<b>Pre-requisite</b>	<b>BARC301P: Architectural Design V: Civic Design</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To understand and design the physical structure of urban areas through an analysis of physical built forms, transportation networks, landscape, socio economic influences and environmental factors.				
2.	To understand the concepts of public space , urban renewal, redevelopment and conservation within the urban context and create sustainable urban development models through an understanding of the concept of master planning.				
3.	To understand the relationship between individual site developments and the cityscape. To study legislation and apply the principles of zoning and development control byelaws				
4.	To understand and demonstrate the concept of urban design through analysing its relationship to urban planning and architecture.				
5.	To understand urban services and utilities.				
6.	To use advanced graphic communication tools to communicate design ideas.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Study and develop urban districts to provide directions for urban design derived from an analysis of the prevailing physical, social, economic and environmental factors				
2.	Design building environments and infrastructure which demonstrate understanding of contextual relevance and appropriateness.				
3.	Design master plans for sites and appropriate utility configurations.				
<b>Module: 1</b>	<b>Introduction to Urban Design Principles</b>	<b>12 Hours</b>			
Introduction to Master Plan and definitions of land use, density, planning controls, etc. Introduction to the subject of urban design through discussions on examples of cities and districts. identification of a city and district which would serve to discuss multiple issues and include the potential to provide suitable directions for analysis, planning and design					
<b>Module: 2</b>	<b>Documentation of study area precincts</b>	<b>36 Hours</b>			
Documenting and analysis of various physical attributes of delineated areas within the urban context chosen, including physical characteristics such as architectural character, landscape, transport networks and environmental, social and economic parameters. Study of the Master Plan provisions for the town and urban districts. Lectures and discussions on streetscape and urban design. Models, sketches and photo documentation and interviews with stakeholders.					
<b>Module: 3</b>	<b>Site Analysis and Design programme</b>	<b>24 Hours</b>			
Formulating a goal and series of objectives for the project through identification of the issues, problems and potentials analysed from the study process. Creation of optional strategy plans for development.					
<b>Module: 4</b>	<b>Ideation and Design narratives</b>	<b>24 Hours</b>			
Conceptual built form development and street design including landscape conforming to Master Plans. Directions for transport strategy, heritage area conservation, area redevelopment, renewal, environmental protection, enhancement of social and economic order, street design and public spatial quality enhancement.					
<b>Module: 5</b>	<b>Schematic Design Development</b>	<b>24 Hours</b>			
Drawings and simulations to iterate/explore alternative schematic design processes to develop sustainable architectural and urban design solutions that comprehensively address the design requirements of the project.					
<b>Module: 6</b>	<b>Detailed design proposal</b>	<b>24 Hours</b>			



Demonstration project incorporating schematic drawings of architectural developments and street/landscape/environmental design.			
<b>Module: 7</b>	<b>Design Representations</b>	<b>12Hours</b>	
Time problem-incorporation of public art and detailed architectural small project to evoke specific issues – like urban art installations/ temporary structures.			
<b>Module: 8</b>	<b>Design Charrettes</b>	<b>24 Hours</b>	
Detailed Development of presentation drawings that communicate the design ideation, technicalities and spatial tectonics. Design Charrette(s) and final jury/ discussion with practicing architects and related disciplines			
<b>Total Lecture Hours</b>		<b>180 Hours</b>	
<b>Reference Book (s)</b>			
1.	“Planning the Architects Hand Book - Edward. D. Mills, Butterworth, London, 1985		
2.	Time Saver Standards for Building types” ,De. Chiara and Callender, McGraw – Hill Co., N.Y., 2017		
3.	The Dynamic Decade, Campus Planning, David Godchalk, 2011		
4.	“Sustainable Design: Ecology, Architecture & Planning”, Daniel Williams, John Wiley & sons,2007		
<b>Mode of Evaluation:</b> Continuous assessment and Design Viva-voce.			
<b>Recommended by Board of Studies</b>	21/2/2022		
<b>Approved by Academic Council</b>	<b>No. 66</b>	<b>Date</b>	16-6-2022



BARC112L	<b>Human Settlements and Vernacular Architecture</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To create insights into the evolution of human settlements from ancient to modern era w.r.t social, cultural, economic and environmental aspects and human values.				
2.	To provide an understanding of human settlements' vocabulary together with concepts and processes in planning and urban renewal.				
3.	To analyze major human settlements issues and challenges at all scales (from global to the local i.e. dwelling level)				
4.	To expose students to the varied Vernacular architecture of different regions (India and Abroad)				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Analyze</b> the evolution of human settlements through history and conclude solutions towards sustainable settlement.				
2.	<b>Develop</b> a critical understanding to examine the multi-faceted challenges of human settlements in the context of dynamic change through multi-disciplinary and multi-scalar perspectives.				
3.	<b>Understand</b> and appreciate the diversity of vernacular architecture at local and global context.				
4.	<b>Develop</b> an understanding of traditional knowledge systems and construction techniques of different region over architectural expressions and forms that lead to sensible context specific design.				
<b>Module: 1</b>	<b>Introduction</b>	<b>6 Hours</b>			
Definition of Ekistics and the earlier works of Doxiadis , Elements and Goals of Human Settlements – human beings and settlements – Anatomy & classification of Human settlements, Ekistic Grid and Anthropocosmos Model					
<b>Module: 2</b>	<b>Forms of Human Settlements</b>	<b>6 Hours</b>			
Principles and laws of ekistics, internal balance and physical characteristics, human needs, forces shaping settlements, Structure and Forms of human settlements, ekistics synthesis.					
<b>Module: 3</b>	<b>Planning Principles in India</b>	<b>6 Hours</b>			
Traditional Vastu treatise - Mayamata, Manasara, and Smirti Shastra, the planning of towns, villages, the design of temples, halls, pavilions, City Planning Principles – Vedic Period, Temple Towns -Madurai, Srirangam, Kanchipuram, Mughal Towns etc					
<b>Module: 4</b>	<b>Planning Concepts – India and Abroad</b>	<b>6 Hours</b>			
Administrative Town – Canberra, Washington, Beijing, Agriculture Market Towns – Kansas city, Lahore, Baghdad, Cultural Towns – Jerusalem, Varanasi, Puri					
<b>Module: 5</b>	<b>Introduction to Vernacular Architecture</b>	<b>6 Hours</b>			
Definition, Scope and the role of vernacular architecture, Causative forces and underlying principles of its form, Symbols and meanings					
<b>Module: 6</b>	<b>Study of Practices and Design Principles of Vernacular Architecture</b>	<b>6 Hours</b>			
Identifying various Contemporary Architects (national and International) who have taken inspiration and applied vernacular principles in their contemporary architecture interventions					





<b>Module: 7</b>	<b>Study of Different Settlements</b>	<b>6 Hours</b>
Study of different settlements that encompasses people’s dwellings and other constructions, relating to their respective environments and resources using traditional techniques.		
<b>Module: 8</b>	<b>Contemporary Issues:</b>	<b>3 Hours</b>
Guest Lectures, Seminars and students’ final presentation		
<b>Total Lecture Hours</b>		<b>45 Hours</b>
<b>Text Book(s)</b>		
1.	Doxiadis, C.A Ekistics: An introduction to the Science of Human Settlements (Oxford University Press, London, 1968.	
2.	Doxiadis, C. A Architecture in Transition. New York: Oxford University Press. 1963	
3.	Doxiadis C.A., Anthropopolis: City For Human Development, Athens Publishing Center, Athens, 1974.	
<b>Reference Book (s)</b>		
1.	Sandra Piesik, 2017, “Habitat -Vernacular Architecture for a Changing Planet”, Thames & Hudson Ltd.	
2.	Ward B. & Dubos R., 1972, “Only One Earth: The Care and Maintenance Of A Small Planet”, New York, W.W. Norton.	
3.	Meir. R..L. 1965. “Megalopolis Formation in the Midwest, Ann Arbor, Dept. of Conservation”, University of Michigan.	
4.	Beatley, Timothy. 2012. “Sustainability in Planning: The Arc and Trajectory of a Move- ment, and New Directions for the Twenty-First Century.” In Planning Ideas that Matter: Livability, Territoriality, Governance and Reflective Practice, pp. 91-124. Cambridge, MA: The MIT Press.	
5.	Song, Yan. 2012. “Suburban Sprawl and “Smart Growth” In the Oxford Handbook of Urban Planning 418.	
6.	Cooper, I. (1998), “Traditional buildings of India”. Thames and Hudson Ltd, London.	
7.	Christian Schittich, 2019. “Vernacular Architecture - Atlas for Living Throughout the World”, Birkha Üser.	
8.	John May and Anthony Reids, 2010, “Handmade Houses & Other Buildings: The World of Vernacular Architecture”. Thames and Hudson.	
<b>List of Challenging Experiments (Indicative)</b>		
1.	Analyzing the neighborhood with respect to forces shaping the settlement ( social, economic, environment, physical)	
2.	Abstract the elements of an indigenous dwelling (any region) and explore its relation to climate and way of life.	
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test		
<b>Recommended by Board of Studies</b>	21/2/2022	
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date 16-6-2022



<b>BARC303L</b>	<b>Housing</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>BARC201P: Architectural Design Studio III: Rural Environmental Studies</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions. .				
2.	This course is intended to expose the students about the housing scenario in the Indian Context and Global context. It is imperative for the students to learn the Housing project formulation techniques and Housing Design strategies to be competent enough in the growing housing market.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Evaluate the various National and Global Housing policy and its impact on housing development in Indian and Global context.				
2.	Understand the various issues concerning housing & housing development in Indian & global context covering a cross section of income groups				
3.	Understand the housing standards, site planning principles, housing concepts and types.				
4.	Analyze the factors governing the design of housing projects of various scales and types and the futuristic trends in housing design				
<b>Module: 1</b>	<b>Housing and Development</b>	<b>4 Hours</b>			
Importance and Reflections of Housing on Social, Cultural and Economic Development – Role of Government and Public Agencies in Housing Development – National Housing Policy in India – Comparison of Housing Policies and Programmes of Developed and Developing Countries					
<b>Module: 2</b>	<b>Housing Scenario In India</b>	<b>6 Hours</b>			
Housing Quality and its Determinants – Housing Supply and Demand Assessments –Factors of influence on Housing Development – Trends in Housing Market – Five Year Plans of GOI. Nature and Type of housing development Programmes - Public and Private Sector Housing. Housing agencies for Policymaking - Objectives and Functioning of State Government agencies					
<b>Module: 3</b>	<b>Evolution Of Housing- Global context</b>	<b>6 Hours</b>			
Historical review of development of dwelling typologies in various contexts. History of modern housing typologies, the age of the Renaissance, the industrial revolution, Post world war socialist housing, Modern Movement in housing, current practices.					
<b>Module: 4</b>	<b>Evolution Of Housing- Indian context</b>	<b>6 Hours</b>			
Context of urban and rural housing - Indigenous /traditional vernacular settlements – Typologies way of life technologies and materials. Influence of socio economic and environmental factors on Physical form of housing. Influence of colonial architecture. Critical Regionalism - Experiments in housing by Charles Correa, B.V.Doshi, Laurie Baker, current practices.					
<b>Module: 5</b>	<b>Housing Design Methodology</b>	<b>6 Hours</b>			
Factors affecting Housing Design Physical, Socio- Economical and Resources. Site Planning for housing. Selection of site for housing, consideration of physical characteristics of site, Integration of services and parking. Housing layout concepts – Row housing, cluster housing, Terrace housing, Incremental Housing, High rise housing and New Townships.- Refugee Housing - Incremental housing concept. Large Scale housing/ Mega townships and informal settlements. Housing for aged – Employees Housing					
<b>Module: 6</b>	<b>Housing Design and Case Studies</b>	<b>9 Hours</b>			
Understanding of various Housing categories through case studies of Private and Public Sector Housing – Built-form and Development Control– Design Issues in Private-Public Partnership Projects					



Case studies for Traditional Housing- its characteristics, tenure ship problems and issues. Case studies – Renowned housing Projects in India and abroad			
<b>Module: 7</b>	<b>Modern Techniques in housing construction</b>	<b>6 Hours</b>	
Prefabrication techniques –modular house, panelized and precast homes, Disaster resistance and mitigation, Industrialized mass housing construction systems, sustainable practices – zero energy home, eco friendly home, green homes - Teri – Griha and its rating system.			
<b>Module: 8</b>	<b>Expert Lectures</b>	<b>2 Hours</b>	
Interaction with Practicing Architects, Planners, Builders, NGO’s etc.			
<b>Total Lecture Hours</b>		<b>45 Hours</b>	
<b>Reference Book (s)</b>			
1.	B.V. Doshi - Aranya low cost housing case study. Vastu shilpa Foundation Ahmedabad, 2014 (reprint)		
2.	Charles Correa, „Housing and Urbanization: Building Solutions for People and Cities“, Thames & Hudson. May 2003, 2012 (reprint)		
3.	Joseph De Chiara , Time-Saver Standards for Housing and Residential Development 2, Sub Edition.		
4.	Heinrich Engels, The Japanese House, A Tradition for Contemporary Architecture, Tuttle, 2009 Gautam Bhatia, Laurie Baker - Life, works and writings, Penguin Books, 2003		
5.	J. Rosie Tighe and Elizabeth J. Mueller „The Affordable Housing Reader“ Routledge; 2012		
6.	Annual Report 2010-2011, Ministry of Housing & Urban Poverty Alleviation, Government of India		
7.	National Urban Housing and Habitat Policy – 2007, Government of India, Ministry of Housing & Urban Poverty Alleviation, New Delhi.		
	Manual under right to information act, 2005, Government of Tamil Nadu, Tamil Nadu Slum Clearance Board, Chennai		
<b>List of Challenging Experiments (Indicative)</b>			
1.	Housing Management and Community Participation. Exercise on study of local Neighborhood housing through observation, activity mapping charts with temporal changes, figure ground map for open and built space analysis, connectivity, landuse analysis, Site plan and sections.		
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	<b>Date</b> 16-6-2022



<b>BARC203L</b>	<b>Site Planning &amp; Landscape</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>BARC104P: Architectural Design II: Spatial Exploration</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To equip students with the basic principles and theories which underlie the systematic study of topographic features, basic skills of Surveying and Levelling related to Architecture.				
2.	To make students understand the relationship between the built and the un-built environment and principles of site analysis and site planning for various building typologies for varied site conditions.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Understand the objectives, principles of surveying, leveling and advanced techniques of surveying				
2.	Understand the process and the stages involved in site analysis and site planning				
3.	Design the spatial aspects in a site and site circulation.				
4.	Introduce the various aspects of Landscape design and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.				
5.	Develop and strengthen the competence in dealing with site utilities and infrastructure.				
<b>Module: 1</b>	<b>Surveying</b>	<b>12 Hours</b>			
Definition of plot, site, land and region, units of measurements. Introduction to methods of surveying and context of use. Modern surveying Instruments such as Electronic Distance Measurement (EDM) and Total Stations and their application. Understanding of administrative maps and site drawings, including Field Measurement Book (FMB). Obtaining site metadata using GIS maps.					
<b>Module: 2</b>	<b>Landscape Masterplan and Grading</b>	<b>4 Hours</b>			
Identification of contours, contour analysis & 3d modelling of the site, zoning of open spaces and built up areas as per site contours, use of existing levels to minimize cut and fill and use of site contours for effective site drainage and rainwater harvesting.					
<b>Module: 3</b>	<b>Site inventory and site analysis</b>	<b>4 Hours</b>			
Importance of site inventory and site analysis, use of symbols and graphical representations. Collection of data on Onsite & Offsite Factors. Site as offering potential/ limitations to architectural design. Site Ecosystem and Analysis. Site analysis – Process of Site Analysis - Site Synthesis - Site Essence Map. Maps of matrix analysis & composite analysis methods. Case studies. Preparation of site analysis diagrams.					
<b>Module: 4</b>	<b>Soft scape identification &amp; design</b>	<b>4 Hours</b>			
Identifying existing site vegetation, introduction of planting in relationship to the locality, aesthetic approach towards planting, design of soft scape in relationship with built up areas.					
<b>Module: 5</b>	<b>Site circulation</b>	<b>6 Hours</b>			



Design considerations for circulation networks. Pedestrian circulation: movement, material, design consideration, linkage and visual system, spatial experience. Vehicular circulation – types of roads, hierarchy of roads, road networks, Turning radii, street intersections and safety, parking standards and layouts. Relationship between site circulation and existing contour profile & Landscape.			
<b>Module: 6</b>	<b>Site Context And Regulations</b>	<b>6 Hours</b>	
Detailed understanding of context of the site. Introduction to master plans, land use for cities, Development control rules, Ecologically sensitive areas, Environmental Impact Assessment (EIA) studies, Site selection criteria.			
<b>Module: 7</b>	<b>Landscape/Site services design</b>	<b>6 Hours</b>	
Water Supply and Sanitation - Conveyance of Water at Site Level - Conveyance of Sewage at Site Level. Principles of positive drainage and grading for drainage. Location and design of sewage treatment plants. Surface Runoff management for different site contexts. Rain Water Harvesting -Techniques at Site Level, Fire Fighting Systems at site level. Electrical Services - Distribution from the Source to Campus, Outdoor Lighting Systems. Preparation of a site plan/site Layout with site circulation and services for a small project.			
<b>Module: 8</b>	<b>Expert Lectures</b>	<b>3 Hours</b>	
Guest Lectures by subject experts			
<b>Total Lecture Hours</b>			<b>45 Hours</b>
<b>Text Book(s)</b>			
1.	Punmia B.C, Surveying, Volume1, Standard Book House, New Delhi, 2005		
2.	Surveying and Levelling for Architects – January 2014 by Prof. Harbhajan Singh (Author)		
<b>Reference Book (s)</b>			
1.	Kevin Lynch and Gary Hack, Site planning, MIT Press, Cambridge, 2005		
2.	John Ormsbee Simonds, Landscape architecture – A manual of site planning and design Mc.Graw Hill, 1977		
3.	John I.Motloch, Introduction to landscape design, New York : John Wiley, 2001.		
4.	Edward.T.White., “SiteAnalysis”, Architectural Media, 1983		
5.	Storm Steven, “Site engineering for landscape Architects”, John wiley & Sons Inc, 2004.		
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date	16-6-2022



BARC404L	Architectural Specifications and Estimation	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC301P: Architectural Design V: Civic Design</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<ol style="list-style-type: none"> <li>1. To determination of quantities of items and labor requirement of constructional engineering works.</li> <li>2. To prepare various aspects of estimating of quantities of items of works involved for all types of building typologies</li> <li>3. To prepare specification for all the construction items</li> <li>4. To introduce quantity analysis of construction works like, multi-storied structures, water-supply &amp; sanitary works, etc</li> </ol>					
<b>Expected Course Outcome:</b>					
<ol style="list-style-type: none"> <li>1. Understand the components of specification &amp; estimation</li> <li>2. Prepare estimate of cost for works. Evolve rates for various building works based upon given parameters</li> <li>3. Assess Detailed specifications for civil works, Building services, infrastructure, interior and landscape Design</li> <li>4. Evaluate the processes of Estimation and Specification</li> <li>5. Analyse the rates for various items of work</li> <li>6. Understand the application of computation tools in estimation</li> </ol>					
<b>Module:1</b>	<b>Introduction</b>	<b>3 Hours</b>			
Purpose of estimating and costing in Practice, Types of estimates. Objectives and importance of specification, Specification of materials, specification of works, specification as per building classification, Language of specific writing					
<b>Module:2</b>	<b>Procedure &amp; Elements of Building Estimate</b>	<b>9 Hours</b>			
Unit of measurement, Estimate, Actual cost, Essentials of an estimator, Detailed Estimate, Principle of units for various items of work, the units of measurement and payments, size of standard modular items, Degree of accuracy in estimating and main items of the work Methods of estimating quantities, estimating quantities of building. Estimation of quantity of load bearing structure with single room & two rooms, Estimation of quantity single storied residential building, Estimation of quantity Different R.C.C. structures, Estimation of quantity of water supply and sanitary works, Estimation of quantity of Trusses.					
<b>Module:3</b>	<b>Specification</b>	<b>6 Hours</b>			
Detailed specifications for civil works-excavation, plain and reinforced cement concrete, steel reinforcement, masonry of different kinds, wall and floor finishes, joinery, weathering and waterproofing systems, cladding and other related works integral to civil construction					
<b>Module:4</b>	<b>Estimation &amp; Specification of building services</b>	<b>6 Hours</b>			
Overview of estimation & specifications for electrical and mechanical and associated infrastructure works such as illumination, acoustics, security systems and network infrastructure with broad understanding of processes					
<b>Module:5</b>	<b>Rate Analysis &amp; Abstracting and Billing</b>	<b>6 Hours</b>			
Prerequisites, factors affecting rate analysis, over head expenses, procedure for rate analysis, schedule of rates, Task work: labour requirement for different works, material requirement for different works, Rate analysis of different Items of work.					



Purpose of abstract, preparation of abstract, measurement and billing, Checking of bills and final bill			
<b>Module:6</b>	<b>Application of BIM in Estimation &amp; Specification &amp; Report writing</b>	<b>6 Hours</b>	
Building Information Systems and their applications in computation of quantities and estimates Principle for report writing & presentation			
<b>Module:7</b>	<b>Estimation &amp; Specification of interior &amp; landscape</b>	<b>6 Hours</b>	
Overview of estimation & specifications for interior and landscape works with examples			
<b>Module:8</b>	<b>Interactive session &amp; Professional training</b>	<b>3 Hours</b>	
Expose to practical implications & Real time projects with Industrial engagements			
<b>Total Lecture Hours:</b>		<b>45 Hours</b>	
<b>Text Book(s)</b>			
1.	Dutta, B. N., 'Estimation and Costing in Civil Engineering', UBS Publishers & Distributors pvt.ltd, 2012		
2.	Kohli, D D and Kohli, R C., 'A Text Book of Estimating and Costing (Civil)', S Chand & Company Ltd., 2012		
3.	S. C. Rangwala, Estimating And Costing, Charotar Publishing House, Anand, 2017		
4.	Gurcharan Singh and Jagdish Singh, 'Estimating ,Costing and Valuation' Standard Publishers, 2012		
<b>Reference Books</b>			
1.	Aggarwal, A., Upadhyay, A.K., Civil Estimating, Costing &Valuation, S.K Kataria & Sons, New Delhi. 2021		
2.	Patil, B.S., Civil Engineering Contracts, Vol. – I, Orient Longman Publication, 2015		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
<b>List of Challenging Experiments (Indicative)</b>			
1.	Market Survey: Traditional and modular materials, Market survey of materials of Construction, Wages of labour, Tools plant and equipment of construction	X Hours	
Mode of assessment: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



## Building Sciences and Applied Engineering

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC105E	Building Materials-Indigenous	1	0	4	5	
2.	BARC106L	Structural Systems Evolution	3	0	0	3	
3.	BARC205E	Construction Technology: Concrete and Steel	1	0	4	5	BARC105E
4.	BARC304E	Construction Technology: Aluminum, Glass and Finishes	1	0	4	5	BARC205E
5.	BARC405L	Construction Technology: Prefab Products and Manufacture	3	0	0	3	BARC304E
6.	BARC207L	Principles of Structures	3	0	0	3	BARC106L
7.	BARC306L	Strength of Materials	3	0	0	3	BARC207L
8.	BARC406L	Architectural Structural Design: Reinforced Concrete	3	0	0	3	BARC306L
9.	BARC410L	Architectural Structural Design: Steel and Timber	3	0	0	3	BARC409L
10.	BARC208L	Climate Responsive Architecture	3	0	0	3	BARC104P
11.	BARC315L	Building Services-I	3	0	0	3	
12.	BARC407L	Building Services-II	3	0	0	3	BARC315L
13.	BARC316P	Building Environment Lab	0	0	4	4	BARC208L





BARC105E	Building Materials-Indigenous (ETH)	L	T	P	C
		1	0	4	5
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
The course is aimed To understand properties, manufacture and application of raw and natural building construction materials.					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to [1] <b>Identify</b> building's primary, physical, structural and functional aspects. [2] <b>Understand</b> naturally occurring materials and their properties for application in building construction. [3] <b>Evaluate</b> various types of natural building materials and construction techniques. [4] <b>Appraise</b> vernacular building materials and construction techniques					
<b>Module: 1</b>	<b>Introduction to material science</b>	<b>1 Hours</b>			
Explanation of various core building components and their function-the concepts of foundations, support systems like walls and columns, exterior skins of buildings, roofing, protection from and integration with natural elements, openings for lighting and access.					
<b>Module: 2</b>	<b>Soil based Design and construction techniques</b>	<b>2Hours</b>			
Foundations design details, Base courses, walls, Design of openings, arches vaults, floors and roofs. Design of buildings using rammed earth <b>Mud Blocks:</b> Stabilised mud blocks, Soil and its properties. Properties of construction quality soil, additives in stabilised soil blocks.					
<b>Module: 3</b>	<b>Vernacular Materials:</b>	<b>2 Hours</b>			
Mud and lime, bamboo and casuarinas as construction materials. Different kinds of thatch, use of palm trunks, palm rafters. Description of usage of these materials.					
<b>Module: 4</b>	<b>Stone as a construction material</b>	<b>3 Hours</b>			
Types of construction stone and their properties and use in building construction. Nature of stone wall construction in various building components like foundations, walls, buttresses, arches and roofing <b>Mortars</b> -Mortars and their applications. Study of sand and aggregate.					
<b>Module: 5</b>	<b>Brick as a construction material</b>	<b>3 Hours</b>			
Brick composition, sizes, strength, and method of manufacture, properties and types. Study of bonds and mortars of different types. <b>Bricks and their usage</b> Bricks in different building components like foundations, walls (conventional and cavity walls), arches, staircases, cladding, copings, flooring, brick jalis, decorative brickwork, Madras terrace roofing.					
<b>Module: 6</b>	<b>Terracotta products</b>	<b>1 Hours</b>			
Hollow bricks, jalis, weathering tiles, Mangalore tiles, hollow clay roofing blocks.					

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<b>Module: 7</b>	<b>Timber</b>	<b>2 Hours</b>	
Quality of timber used in buildings, defects, seasoning and preservation, popular timber varieties used in India, properties, strengths. <b>Typical usages of timber in building components Timber Construction</b> Timber in joinery, light weight roofing structures, staircases, interior walls, flooring, details of galvalinice roofs, wooden staircases.			
<b>Module: 8</b>	Interaction with alternate construction experts.	<b>1 hour</b>	
<b>Total Lecture Hours</b>		<b>15 Hours</b>	
<b>Reference Books</b>			
1.	S.P Arora and S.P. Bindra, Text book of Building Construction, GanpatRai publications (P) Ltd New Delhi - 110002, 2005.		
2.	S.K.Sharma, "A Text book of Building Construction", S.Chand& Co Ltd., New Delhi, 1998		
3.	KlansDukeeberg, Bambus – Bamboo, Karl Kramer verlag Stuttgart Germany, 2000		
4.	Barry, the construction of buildings Affiliated East West press put Ltd New Delhi 1999.		
5.	Francis D.K. Ching Building Construction illustrated John Wiley & Sons 2000		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



BARC105E	Building Materials-Indigenous (ELA)	L	T	P	C
		1	0	4	5
<b>Pre-requisite</b>	<b>Nil</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To understand and Impart drawing skills for the application of construction materials in architectural practice.					
<b>Expected Course Outcome:</b>					
[1] Demonstrate graphical representation of building components (Apply)					
[2] Demonstrate the construction techniques of various building components using natural and vernacular building materials (Apply)					
[3] Produce technically correct architectural details in construction of simple built form elements (Create)					
<b>Module: 1</b>	Graphical representation of building components	4 Hours			
<b>Module: 2</b>	Mud wall construction, compacted earth, stabilised mud blocks, roofing using thatch, damp proofing.	4 Hours			
<b>Module: 3</b>	Bamboo in architectural construction	4 Hours			
<b>Module: 4</b>	Stone Construction - Walls, Arch, Flooring, Lintel & Cladding	8 Hours			
<b>Module: 5</b>	Brick – Brick bonding, Walls, Arches.	8 Hours			
<b>Module: 6</b>	Brick – Staircase, Cladding, Decorative Brickwork, creative Jali pattern using bricks, Rat trap bond	4 Hours			
<b>Module: 7</b>	Clay block partition walls, screen walls, terracotta flooring	4 Hours			
<b>Module: 8</b>	Mangalore Tile works, Hollow clay roofing blocks, Weathering tiles on roofs.	8 Hours			
<b>Module: 9</b>	Typical details of timber usage in door frames & window frames, door & window shutters, louvered windows, ventilators.	4 Hours			
<b>Module: 10</b>	Wooden flooring, wood composites, fibre boards, pre-laminated.	4 Hours			
<b>Module: 11</b>	Ventilators: top hung, bottom hung, louvered, glazed	4 Hours			
<b>Module: 12</b>	Construction using natural timber in various structural components of the building.	4 Hours			
<b>Total Lecture Hours</b>		<b>60 Hours</b>			
<b>Reference Books</b>					
1.	S.P Arora and S.P. Bindra, Text book of Building Construction, GanpatRai publications (P) Ltd New Delhi - 110002, 2005.				
2.	S.K.Sharma, “A Text book of Building Construction”, S.Chand & Co Ltd., New Delhi, 1998				
3.	Reference books -				
4.	KlansDukeeberg, Bambus – Bamboo, Karl Kramer verlag Stuttgart Germany, 2000				
5.	Barry, the construction of buildings Affiliated East West press put Ltd New Delhi 1999.				



6.	Francis D.K. Ching Building Construction illustrated John Wiley & Sons 2000		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



BARC106L	Structural Systems Evolution	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To instil an understanding of structural concepts as they have evolved over history and to appreciate the application of structural systems in tandem with architectural design evolution					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
[1] <b>Understand</b> about the structural forms, tools, resources and techniques used in the construction of primitive dwelling units and rock cut shelters.					
[2] <b>Understand</b> about building of multi-level structures using lintel and column elements.					
[3] <b>Understand</b> construction and structural techniques using different types of bricks and mortars and Arches.					
[4] <b>Understand</b> different types of construction techniques using reinforced concrete and steel employed in small to mega structures.					
[5] <b>Understand</b> about innovative structural systems, sustainability aspects related to structures and construction and innovative and state-of-the-art materials, composites and alloys used in constructions.					
<b>Module: 1</b>	<b>Introduction to Shelter</b>	<b>6 Hours</b>			
Introduction to shelter as a fundamental aspect of existence. The relationship between resources, technology and structural ideation. Rock-cut caves and primitive dwellings: Structural forms and tools- use of natural materials.					
<b>Module: 2</b>	<b>Trabeated System</b>	<b>6 Hours</b>			
The concept of multilevel structures using basic concepts. Trabeated systems and stability -use of monolithic blocks for posts and lintels, articulation of joints in stone and timber, monolithic columns, multi-drum columns.					
<b>Module: 3</b>	<b>Modular Construction</b>	<b>6Hours</b>			
Modular construction- use of modular units in sun-dried mud blocks, stone, fired clay brick dry-stack construction to wet construction - role of binding mortars: mud and lime, the advent of concrete, vertical joints in wall construction, single leaf to multi-leaf constructions, cavity walls, and rationale behind dimensioning of walls.					
<b>Module: 4</b>	<b>Arcuated System</b>	<b>6 Hours</b>			
Arcuated systems-semi-circular, segmental, pointed arches, catenary curves, thrust lines and buttressing, corbelling, cross and groin vaults and domes, squinch. Development of the arching system					
<b>Module: 5</b>	<b>Advent of Steel and Reinforced Concrete</b>	<b>6 Hours</b>			
The advent of steel and reinforced cement concrete. Fundamental structural concepts of steel and RCC structures and the conquest of span and height, advances in strength of materials/structural analysis methods and fabrication.					



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Truss action (strut and tie) and connections, bridges and towers, steel frame structures. Bending resistance and framing action in RCC Foundation systems/RC beams/columns/beam-column joints/slabs (one-way, two-way, flat slabs, waffle slabs)			
<b>Module: 6</b>	<b>Advanced Systems in Reinforced Concrete and Steel</b>		<b>6 Hours</b>
Developments in structural RCC-prestressing and post-tensioning, prefabrication principles. Mega structures in steel and reinforced concrete and unique structural concepts employed-skyscrapers and bridges, stadia, structures for special applications. Composite steel-concrete structures, tensile structures, RCC shells			
<b>Module: 7</b>	<b>New Building Materials</b>		<b>6 Hours</b>
Structures in consonance with mechanical systems, pneumatic shelters, dismantlable structures, new-age systems. High performance materials, Nano mechanics, environmental impact, sustainability, energy efficiency High performance computing for structural analysis. Building skins Composites –fibre reinforced plastics, alloys, allotropes, carbon nanotubes, shape memory alloys.			
<b>Module: 8</b>	<b>Workshop</b>		<b>3 Hours</b>
Lecture on building up on simple structural form based on the basic understanding of the course and constructing a prototype in 1:1 scale (Three day hands on workshop can be conducted to conclude the course with external experts).			
<b>Total Lecture Hours</b>			<b>45 Hours</b>
<b>Reference Books</b>			
1.	Roma Agrawal. 2018. <i>Built: The hidden stories behind our structures</i> . Bloomsbury Publishing.		
2.	Bannister Fletcher. 2001. <i>History of Architecture</i> , 20th Edition: Architectural Press. 1996 Reprint.		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



BARC205E	Construction Technology: Concrete & Steel (Embedded Theory)	L	T	P	C
		1	0	4	5
<b>Pre-requisite</b>	<b>BARC105E: Building Materials-Indigenous</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To acquaint the students with contemporary construction practices primarily pertaining to the usage of cement concrete, ferrous and non-ferrous metals in various core building components and some important interrelationships and to create familiarity to apply this knowledge.					
<b>Expected Course Outcome:</b>					
Students will be able					
[1] <b>Understand</b> the concepts of cement and concrete as a building construction material.					
[2] Ability to <b>Apply</b> concrete as a versatile material in different contexts and innovatively in simple projects.					
[3] <b>Understand</b> of properties of ferrous and non-ferrous metals as materials for buildings.					
[4] <b>Understand</b> the possibilities of steel as an important building construction material.					
[5] <b>Apply</b> metal innovatively in building projects.					
<b>Module: 1</b>	<b>Cement</b>	<b>1 Hours</b>			
Brief overview of cement manufacture, functions of cement ingredients, field tests for cement, uses of cement, varieties of cement, specifications of ordinary cement					
<b>Module: 2</b>	<b>Cement Concrete</b>	<b>2Hours</b>			
Understanding plain cement concrete and its uses, ingredients and properties of cement concrete, effects of concrete additives, concrete proportioning, water cement ratio, workability and slump, concrete mixing, transportation, placement, consolidation, vibration, curing.					
<b>Module: 3</b>	<b>Special types of Concrete</b>	<b>2 Hours</b>			
Types of concrete, precast concrete, ready mix concrete, batching plants. Ferro cement					
<b>Module: 4</b>	<b>Ferrous Metals In Building Construction</b>	<b>2 Hours</b>			
Ferrous metals, brief review of pig iron, cast iron, wrought iron					
<b>Module: 5</b>	<b>Steel in Building Construction</b>	<b>2 Hours</b>			
Brief review of steel manufacture process, its properties and uses, various forms of architectural steel					
<b>Module: 6</b>	<b>Non-Ferrous Metals In Building Construction</b>	<b>2 Hours</b>			
Non-ferrous metals -aluminium, copper, lead, zinc, tin, nickel. Alloys of aluminium copper and steel, galvanised iron, gal volume					
<b>Module: 7</b>	<b>Stainless steel and structural steel</b>	<b>2 Hours</b>			
Stainless steel and structural steel in architectural construction					
<b>Module: 8</b>	Industry specialist lectures	<b>1 hour</b>			
<b>Total Lecture Hours</b>					<b>15 Hours</b>
<b>Reference Books</b>					



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6.	Engineering Materials-Material Science by S.C.Rangwala, Charotar Publishing House Pvt. Ltd.2014 ed.		
7.	Building Materials-P.C.Varghese, Prentice Hall of India Pvt.Ltd. New Delhi 2005 ed.		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022





<b>BARC205E</b>	<b>Construction Technology: Concrete &amp; Steel (Embedded Lab)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		1	0	4	5
<b>Pre-requisite</b>	<b>BARC105E : Building Materials-Indigenous</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To understand and Impart drawing skills for the application of Steel and concrete in architectural practice.					
<b>Expected Course Outcome:</b>					
[1] Ability to <b>design</b> and detail the basic components of a building as well as specific components in concrete where there is scope for architectural design.					
[2] Ability to <b>design</b> and detail structural and non-structural components of simple buildings using metals.					
<b>Module: 1</b>	Study of principles and methods of construction of RCC elements in buildings- a) foundations and columns– Raft foundations, Isolated footings, piles, grillage foundations, beams and slabs, porticos, sunshades, post tensioned slabs, prestressed beams in RCC construction.	<b>12 Hours</b>			
<b>Module: 2</b>	RCC in staircases-spiral, helical, waist slab, folded plate, review of formwork	<b>12 Hours</b>			
<b>Module: 3</b>	Structural steel in construction – steel columns, truss works, staircases, sheet metal cladding and roofing in industry	<b>12 Hours</b>			
<b>Module: 4</b>	steel windows, doors, collapsible gates, rolling shutters, mechanical gate systems, detailing of masonry, concrete, metal systems, high strength fasteners	<b>16 Hours</b>			
<b>Module: 5</b>	Field visits and discussions on creative detailing	<b>8 Hours</b>			
<b>Total Lecture Hours</b>					<b>60 Hours</b>
<b>Reference Books</b>					
7.	A Text Book of Building Construction by B.C.Punmia, Laxmi Publications Pvt.Ltd. New Delhi 2005				
8.	Construction of Buildings by Barry, Vol.1 and 2, Blackwell Publishing House, Oxford 2005				
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test					
Recommended by Board of Studies		21/2/2022			
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<b>BARC304E</b>	<b>Construction Technology: Aluminium, Glass &amp; Finishes (Embedded Theory)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		1	0	4	3
<b>Pre-requisite</b>	<b>BARC205E: Construction Technology: Concrete and Steel</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To understand properties, manufacture and application of Aluminium and glass in building construction. To study various construction Finishes employed in architecture practice.					
<b>Expected Course Outcome:</b>					
Students will be able [1] To <b>understand</b> Aluminium and glass as construction materials and their properties for application in building construction. [2] To <b>demonstrate</b> application knowledge of Finishing and speciality materials. [3] <b>Choose</b> materials for wall cladding, Acoustic and thermal insulation based on specific purposes [4] <b>Identify</b> different types of Paints, varnishes, adhesives and sealants for varied uses					
<b>Module: 1</b>	<b>Manufacturing of glass</b>	<b>1 Hours</b>			
Brief review of glass manufacture, composition , properties and uses of glass					
<b>Module: 2</b>	<b>Types of Glass</b>	<b>2Hours</b>			
Types of glass, treatment of glass					
<b>Module: 3</b>	<b>Finishing materials</b>	<b>2 Hours</b>			
Finishing materials for walls and floors-wall putties, textures, cementitious floor finishes, tiles and natural stones , speciality floors, grouts, etc					
<b>Module: 4</b>	<b>Wall cladding</b>	<b>2 Hours</b>			
Wall cladding on exteriors-composite panels, structural glazing, marble, granite and other cladding materials					
<b>Module: 5</b>	<b>Acoustic and thermal insulation</b>	<b>2 Hours</b>			
Acoustic and thermal insulation materials, plastics, fibre glass					
<b>Module: 6</b>	<b>Paints</b>	<b>2 Hours</b>			
Paints, varnishes and distempers					
<b>Module: 7</b>	<b>Adhesives and sealants</b>	<b>2 Hours</b>			
Speciality chemicals, sealants, adhesives					
<b>Module: 8</b>	Industry specialist lecture	<b>1 hour</b>			
<b>Total Lecture Hours</b>					<b>15 Hours</b>
<b>Reference Books</b>					
1.	Engineering Materials-Material Science by S.C.Rangwala, Charotar Publishing House Pvt. Ltd.2014 ed.				
2.	Building Materials by Duggal S.K., New Age international, New Delhi 2009				



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3.	Materials and Construction by Reshpande B, Oriental Watchman Publishing House, Poona-2, 2007 Construction Technology-Embedded Lab		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
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<b>BARC304E</b>	<b>Construction Technology: Aluminium, Glass &amp; Finishes (Embedded Lab)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		1	0	4	5
<b>Pre-requisite</b>	<b>BARC205E: Construction Technology: Concrete and Steel</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
[1] To understand and Impart drawing skills for the application of Aluminium and Glass in architectural practice.					
[2] To study various construction Finishes employed in architecture practice.					
<b>Expected Course Outcome:</b>					
[1] <b>Demonstrate</b> the construction details and application of Glass and Aluminium for various building components					
[2] <b>Demonstrate</b> the application of different materials for wall cladding and flooring					
[3] <b>Analyse</b> and demonstrate the suitability of different acoustic and thermal insulation materials and their application in building construction.					
<b>Module: 1</b>	Glass, aluminium and UPVC in partitions, windows, doors, handrails, balusters	<b>12 Hours</b>			
<b>Module: 2</b>	Glass and aluminium in frameless glass systems, structural glazing	<b>12 Hours</b>			
<b>Module: 3</b>	Wall cladding and flooring details of various kinds	<b>12 Hours</b>			
<b>Module: 4</b>	Waterproofing of basements, roofs, toilets, expansion joints, sealant details, acoustic panelling, thermal insulation	<b>16 Hours</b>			
<b>Module: 5</b>	Field visits and discussions on creative detailing	<b>8 Hours</b>			
<b>Total Lecture Hours</b>					<b>60 Hours</b>
<b>Reference Books</b>					
9.	A Text Book of Building Construction by B.C.Punmia, Laxmi Publications Pvt.Ltd. New Delhi 2005				
10.	The Text Book of Building Construction by S.P.Arora and S.P.Bindra				
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test					
Recommended by Board of Studies		21/2/2022			
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<b>BARC405L</b>	<b>Construction Technology: Prefabrication Products and Manufacture</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	BARC304E: Construction Technology: Aluminum and Glass and Finishes	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To appreciate modular building modules, industrial production for construction industry and design of the prefabricated elements for Indian context.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Understanding</b> prefabrication & modular production process from pre-design to assemble				
2.	<b>Appraise</b> prefabrication modular building elements and construction techniques				
3.	<b>Integration</b> of BIM in modular construction and fabrication of MEP components in modular construction				
<b>Module: 1</b>	<b>Introduction to Prefabrication</b>	<b>6 Hours</b>			
Need, principles, materials, modular coordination, standardization, systems, production, transportation and erection of prefabricated structure. Per-design, design, develop, detail, order, fabricate, deliver and assemble					
<b>Module: 2</b>	<b>Prefabricated Components</b>	<b>6 Hours</b>			
Behavior of structural components, Large panel constructions, Construction of roof & floor slabs, Wall panels, Columns and Shear walls (External skin) with case studies					
<b>Module: 3</b>	<b>Design Principles</b>	<b>6 Hours</b>			
Disuniting of structures, Design of cross section based on efficiency of material used, Problems in design because of joint flexibility, Allowance for joint deformation.					
<b>Module: 4</b>	<b>Joint in structural members</b>	<b>6 Hours</b>			
Joints for different structural connections, Dimensions & detailing, Design of expansion Joints					
<b>Module: 5</b>	<b>Design for Abnormal Loads</b>	<b>6 Hours</b>			
Progressive collapse, Code provisions, Equivalent design loads for considering abnormal effects such as earthquakes, cyclones, etc., Importance of avoidance of progressive collapse.					
<b>Module: 6</b>	<b>Schedule of construction</b>	<b>6 Hours</b>			
Site built & modular construction schedule - Design engineering, permits and approvals, site development & foundations, building construction at plant and installation & site restoration					
<b>Module: 7</b>	<b>Application of Building Information Modeling</b>	<b>9 Hours</b>			
Application of BIM in construction document development, conceptual design support, and pre-project planning services in prefabrication and modular construction					
<b>Module: 8</b>	<b>Interaction with alternate construction experts.</b>	<b>3 Hours</b>			
Case Studies					
<b>Total Lecture Hours</b>					<b>45 Hours</b>



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<b>Text Book (s)</b>			
1.	Prefab Architecture: A Guide to Modular Design and Construction, Dec 2010		
2.	CBRI, Building materials and components, India, 1990		
3.	Gerostiza C.Z., Hendrikson C. and Rehat D.R., Knowledge based process planning for construction and manufacturing, Academic Press Inc., 1994		
<b>Reference Book (s)</b>			
1.	Koncz T., Manual of precast concrete construction, Vols. I, II and III, Bauverlag, GMBH, 1971.		
2.	Structural design manual, Precast concrete connection details, Society for the studies in the use of precast concrete, Netherland Betor Verlag, 1978.		
3.	National Institute of Building Sciences - Off-Site Construction Council Resources <a href="https://www.nibs.org/index.php/reports/modular-construction-multifamily-housing">https://www.nibs.org/index.php/reports/modular-construction-multifamily-housing</a>		
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
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BARC207L	Principles of Structures	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC106L: Structural Systems Evolution</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b> The course is aims to impart foundation knowledge on structural principles for application in subsequent modules of structural design.					
<b>Expected Course Outcome:</b> At the end of the course the student should be able to [1] <b>Understand</b> principles related to physics, relevant to structural design. [2] <b>Determine</b> simple stresses and strains [3] <b>Apply</b> structural principle to real time analogies. [4] <b>Understand</b> the Types of structures and structural loads [5] <b>Analyse</b> trusses and frames [6] <b>Evaluate</b> various building materials that can be used for various components of buildings					
<b>Module: 1</b>	<b>Basics of behavior of structure</b>	<b>6 Hours</b>			
Fundamental Principles - Vectorial Representation of Forces and Moments, Coplanar forces - Resolution and Composition of forces and equilibrium of particles - Free body diagram					
<b>Module: 2</b>	<b>Centre of gravity and Moment of Inertia</b>	<b>6 Hours</b>			
Centre of gravity and Moment of Inertia- Radius of gyration- section modulus					
<b>Module: 3</b>	<b>Stress and Strain</b>	<b>6 Hours</b>			
Stress and strain - Hooke's law -tension -compression and shear Stress strain diagram for mild steel-Elastic constants- Applications					
<b>Module: 4</b>	<b>Stresses in composite sections</b>	<b>6 Hours</b>			
Principal stresses and strains-Stresses in composite sections- Thermal stresses					
<b>Module: 5</b>	<b>Types of structures and structural loads</b>	<b>6 Hours</b>			
Types of loads on structures-support and support reactions- Types of structures-analysis of beams					
<b>Module: 6</b>	<b>Truss and frames</b>	<b>6 Hours</b>			
Analysis of plane truss-Stresses in truss and frames					
<b>Module: 7</b>	<b>Components of buildings</b>	<b>6 Hours</b>			
Modern Construction Materials-Variou components of buildings- Bricks- Stone- Structural Steel and Aluminum – Roofing Materials- Flooring					
<b>Module: 8</b>	<b>Latest/Emerging technology</b>	<b>3 Hours</b>			
<b>Total Lecture Hours</b>		<b>45 Hours</b>			
<b>Reference Books</b>					
1.	Timoshenko.S, Young.D.H, J V Rao, Sukumar Pati (2013), Engineering Mechanics, McGraw Hill International Edition				
2.	Gere & Thimoshenko (2004), Mechanics of Materials, CBS Publishers & Distributors.				
3.	R.K.Bansal (2005), Strength of Materials, Laxmi Publications				
4.	S.S.Bhavikatti (2012), Engineering Mechanics, New Age International Publishers.				



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5.	S.Ramamrutham & R.Narayanan (2005), Strength of Materials, Dhanpat Rai publications.		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022





<b>BARC306L</b>	<b>Strength of Materials</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC207L: Principles of structures</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>The course is aimed at          This course deals with the concept of forces, force systems and moments under static condition. It also introduces the concept of simple stresses and strains subjected to axial force, bending and shear to understand the behaviour of member of a structure. It introduces various concepts and simple analysis techniques of structural components.</p>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to          [1] <b>Practice</b> shear force and bending moment computations and construct shear force and bending moment diagrams          [2] <b>Compute</b> bending stresses and deflection in determinate beams          [3] <b>Evaluate</b> theories to design columns and understand effect of eccentric loading.          [4] <b>Analyse</b> the structural concept of determinate &amp; indeterminate structures and Combined loading          [5] <b>Understand</b> the combined loadings and Theories of failure</p>					
<b>Module: 1</b>	<b>Concept of shear force and Bending Moment</b>	<b>8 Hours</b>			
Concept of shear force and Bending Moment-shear force and bending Moment diagrams for cantilever and simply supported beams subjected to point load, uniformly distributed loads and their combinations					
<b>Module: 2</b>	<b>Theory of simple bending</b>	<b>7 Hours</b>			
Theory of simple and pure bending-Bending equation- Section modulus (only for Rectangular, hollow rectangular)- Shear stress distribution for rectangular beam section- Torsion. Case study: Lab experiments on bending and Torsion test					
<b>Module: 3</b>	<b>Slope and deflection</b>	<b>7 Hours</b>			
Slope and deflection at a section - Double Integration and Macaulay's method for simply supported and Case Study: Lab experiments on Deflection of cantilever beams.					
<b>Module: 4</b>	<b>Theory of columns</b>	<b>6 Hours</b>			
Short and long columns - Euler's method and its limitation - Rankine's formula for columns- effect of eccentric loading – Case study: Lab experiments on Combined bending and direct stresses on column					
<b>Module: 5</b>	<b>Introduction to determinate &amp; indeterminate structures</b>	<b>6 Hours</b>			
Introduction to determinate and indeterminate structures-Static and kinematic indeterminacies-Energy theorems					
<b>Module: 6</b>	<b>Bending and torsion</b>	<b>6 Hours</b>			
Combined loading- Beams with axial load- bending and torsion- torsion and tension- bending and shear. Case study: Lab Experiment on Bending of beams with combination of loads					
<b>Module: 7</b>	<b>Theories of failure</b>	<b>3 Hours</b>			
Case study: Lab Experiments on Theories of failure - Strain energy in bending					
<b>Module: 8</b>	<b>Latest/Emerging technology</b>	<b>2 Hours</b>			
<b>Total Lecture Hours</b>					<b>45 Hours</b>



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**Reference Books:**

1. Timoshenko,S.P..and D.H. Young, Elements of Strength of Materials, Fifth Edition, East West Press
2. Gere & Thimoshenko (2004), Mechanics of Materials, CBS Publishers & Distributors.
3. R.K.Bansal (2005), Strength of Materials, Laxmi Publications
4. S.S.Bhavikatti (2012), Engineering Mechanics, New Age International Publishers.
5. S. Ramamrutham & R.Narayanan (2005), Strength of Materials, Dhanpat Rai publications

Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test

Recommended by Board of Studies

21/2/2022

Approved by Academic Council

**No. 66**

Date

16-6-2022



<b>BARC406L</b>	<b>Architectural Structural Design: Reinforced Concrete</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>BARC306L: Strength of Materials</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	Main purpose of this course is to understand the relationship between structural design and Architectural design. The course aims to impart basic knowledge on structural principles for application in subsequent modules of structural design.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Understand</b> principles related to physics, relevant to structural design and the different concepts of RCC structural elements and their role in building design.				
2.	<b>Analyze</b> different structural component depending on various theories of load mechanism.				
3.	<b>Evaluate</b> and optimize the suitable structural elements for design				
4.	<b>Design</b> different structural elements including beams, columns, footing, slabs and staircase				
5.	To <b>equip</b> students with skills in evaluating the usability of Thumb rules and standard design codes in designing structural systems and building components				
6	<b>Evaluate</b> the load and soil bearing capacity of the structural elements.				
<b>Module: 1</b>	<b>Design principles of structural components</b>	<b>5 Hours</b>			
Introduction to statically determinate and indeterminate structures - Design principles and standards of structural components – Beams, Column, Floor, Roof slabs and Staircases, Arches and cables.					
<b>Module: 2</b>	<b>Structural Design of beams</b>	<b>7 Hours</b>			
Analysis and design of singly and doubly reinforced beam section - Neutral axis, Lever arm, Moment of resistance, Balanced, Under reinforced and Over reinforced Beam section - Introduction to Reinforced Cement Concrete – Difference in working stress method (W.S.M) and Limit state method (L.S.M) of design.					
<b>Module: 3</b>	<b>Detailing of Reinforcement</b>	<b>6 Hours</b>			
Introduction to Reinforcement – Cover, Main reinforcement, Distribution steel – Shear reinforcement stirrups, 2 & 4 legged stirrups, Lateral ties, Area of steel, Spacing and splicing of steel bars. Case studies: Preparation of cross-sectional drawings for reinforcement details of beams, Slabs and columns.					
<b>Module: 4</b>	<b>Codal provision for structural members</b>	<b>6 Hours</b>			
Thumb rules for design based on Indian standard codes IS – 456, 2000 and usage of SP 16. - Causes of failures of the structural components - Case studies on slab collapsed at Chennai due to heavy rainfall and structure collapsed during construction at Pune - Classification of buildings as per National Building code (NBC) SP7 - Introduction and Structural System in Architecture.					
<b>Module: 5</b>	<b>Structural Design of Staircases</b>	<b>5 Hours</b>			
Design principles of staircase construction and its elements - Different types of staircase - RCC - Free standing stair cases, pergolas and covered walkways. Case study: Affordable white painted and exposed timber staircase and LAPD Glass staircase.					
<b>Module: 6</b>	<b>Structural Design of slabs and footings</b>	<b>9 Hours</b>			
Design principles of cantilever slab for Balconies, Shop fronts, False and suspended ceilings and One way and two-way slabs. Introduction to types of soils - Characteristics of soil – Safe and Ultimate bearing capacity of soil - Load bearing and framed structure, Types of foundations and footings. Case Study: Green roof, Folded plates and shells. Case Study: Soil testing methods.					

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<b>Module: 7</b>	<b>Structural design of prestressed concrete</b>	<b>5 Hours</b>
Introduction to Prestressed concrete - Classification and Types of prestressing system, End anchorage, Advantages and disadvantages of prestressed concrete, Case Study on performance of prestressed concrete over reinforced concrete construction.		
<b>Module: 8</b>	<b>Industry guest lecture</b>	<b>2 Hours</b>
Guest Lectures by industrial experts		
<b>Total Lecture Hours</b>		<b>45 Hours</b>
<b>Text Book(s)</b>		
1.	Unni Krishnan pillai & Devadoss menon - Reinforced concrete design	
<b>Reference Book (s)</b>		
1.	B.C.Punmia & Ashok kumar Jain – RCC design	
2.	Syed Mehdi Ashraf - Practical Design of Reinforced Concrete Buildings, Taylor & Francis	
3.	Design of Reinforced concrete structure: IS456 -2000 – N. Krishnaraju	
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test		
<b>Recommended by Board of Studies</b>	21/2/2022	
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date 16-6-2022



BARC410L	Architectural Structural Design: Steel & Timber	L	T	P	C
		3	0	0	3
Pre-requisite	BARC409L:Architectural Structural Design: Reinforced Concrete	Version 1.0			
<b>Course Objectives:</b>					
1.	This course will help the student to design the structural components of steel and reinforcement of structural components such as beams, columns, trusses as per the recommendations of BIS codal provisions.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Evaluate</b> and optimize the suitable structural materials and elements for design				
2.	<b>Design</b> different structural components like steel columns, girders, Steel and Timber Trusses				
3.	<b>Identify</b> the steel section for various structural components simple beams, columns and trusses.				
4.	<b>Evaluate</b> force systems to create structure systems				
5.	<b>Analyse</b> the architectural applications in steel and Timber section. of prestressed concrete				
<b>Module: 1</b>	<b>Properties of materials – Steel &amp; Timber</b>	<b>6 Hours</b>			
Bureau of Indian Standard (BIS) codes for Design loads, Properties of Structural Materials -Steel and Timber masonry. Types of connections and joints – Riveted and Bolted joints – Efficiency – Permissible stresses.					
<b>Module: 2</b>	<b>Design of Tension members (Beams)</b>	<b>7 Hours</b>			
Design principles – Design of Steel beams using single section and Built-up sections.					
<b>Module: 3</b>	<b>Design of compression member (Columns)</b>	<b>6 Hours</b>			
Design principles – Design of steel columns – Single section –Built-up-section					
<b>Module: 4</b>	<b>Steel Trusses</b>	<b>7 Hours</b>			
Introduction to Steel Trusses and Industrial Buildings – Steel framed structures - Behavior of structures under wind and seismic loads. Case study on construction of steel trusses.					
<b>Module: 5</b>	<b>Timber Trusses</b>	<b>7 Hours</b>			
Timber trussed roofs - Design requirements and principles of Timber using National Building Code (NBC). Case study on construction of Timber trusses.					
<b>Module: 6</b>	<b>Steel Section in Structural Components</b>	<b>5 Hours</b>			
Types of steel section – Various forms of steel - Design and drawings of steel beams and steel columns, steel trusses					
<b>Module: 7</b>	<b>Synthesis of Force Systems</b>	<b>5 Hours</b>			
Synthesis of force systems to create Structural and Architectural systems - Vector active, surface active and built- active systems – Case Study on high rise and large span steel structures.					
<b>Module: 8</b>	<b>Industrial guest Lectures</b>	<b>2 Hours</b>			
Guest Lectures by subject experts					
<b>Total Lecture Hours</b>					<b>45 Hours</b>

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<b>Text Book(s)</b>			
1.	S. Duggal - Design of Steel Structures, 3rd edition.		
2.	N.Subramanian - Steel Structures – Design and Practice,		
<b>Reference Book(s)</b>			
1.	S.S.Bhavikatti - Design of Steel structures by Limit state design as per IS 800-2007		
2.	Alexander Reichel, Peter Ackerman, Alexander Hentschel, Anette Hockberg.- Building with steel: Details, Principles and Examples.		
<b>Mode of Evaluation:</b> Continuous Assessment, Final Assessment			
<b>Recommended by Board of Studies</b>	21/2/2022		
<b>Approved by Academic Council</b>	<b>No. 66</b>	<b>Date</b>	16-6-2022



BARC208L	Climate Responsive Architecture	L	T	P	J	C
		3	0	0	0	3
<b>Pre-requisite</b>	<b>BARC104P: Architectural Design II: Spatial Exploration</b>	<b>Version 1.0</b>				
<b>Course Objective:</b> To impart a holistic understanding to the students on different aspects involved and considerations that need to be adopted in designing of building that are climate responsive.						
<b>Expected Course Outcome:</b>						
At the end of the course the student should be able to						
[1] <b>Understand</b> the factors which influence global climate and classification of climates across the world, climate pertaining to a region and site level.						
[2] <b>Understand</b> different factors affecting the human comfort and associated metrics reporting the comfort.						
[3] <b>Understand</b> the thermophysical properties of materials and construction types as well as heat loss and gain in buildings.						
[4] <b>Design</b> buildings and associated elements for solar protection and allowing the natural ventilation to and daylight to achieve thermal and visual comfort.						
[5] <b>Design</b> building for different climatic conditions incorporating appropriate strategies.						
<b>Module: 1</b>	<b>Introduction to Climate</b>	<b>4 Hours</b>				
Climate, weather, seasons; Factors affecting the global climate; Elements of climate and their measurements; Sources of weather data; Graphical representation of weather data; Brief introduction to weather data visualizing tools.						
<b>Module: 2</b>	<b>Classification of Climate and Types</b>	<b>5 Hours</b>				
Climatic zones: World & India; Climatic classification: Koppen; Characteristics of climates: Tropical region; Site climate and factors affecting it.						
<b>Module: 3</b>	<b>Human Thermal Comfort</b>	<b>6 Hours</b>				
Case studies of existing buildings in different geographies to understand and evaluate following concepts. Introduction to Human thermal comfort; Environmental variables influencing thermal comfort (Dry-bulb-temperature (DBT), Relative Humidity (RH), Mean Radiant Temperature (MRT); Wind speed & ventilation, Operative Temperature (OP); Subjective variables (Metabolic Activity, Clothing type); Human body response (i.e., heat loss and gain) to different indoor environmental conditions in architectural spaces; Comfort Indices: Heat Stress Index (HSI); Effective Temperature (ET), Corrected Effective Temperature (CET), Standard Effective Temperature (SET); Introduction to Thermal comfort models: ASHRAE and Adaptive Comfort Model Predictive Mean Vote (PMV), Predicted Percentage of Dissatisfied (PPD); Thermal comfort tool: CBE, Olgyay bioclimatic chart, Giovanni's Building Bioclimatic Chart.						
<b>Module: 4</b>	<b>Thermophysical Properties of Building Materials</b>	<b>6 Hours</b>				
Case studies of existing buildings in different geographies to understand and evaluate following concepts. Thermal quantities: Heat, Heat flow, Heat flow rate, Temperature and temperature difference, Sol-air temperature; Modes of Heat Transfer in Buildings: conduction; convection and radiation; Thermal properties building materials [walls, floors, roofs multilayer body]: conductivity,						



conductance (U-Value), resistivity and Resistance (R-Value), transmittance, reflectance, absorptance, sustainable building material; Time lag and decrement factors of different construction types; Properties of fenestration systems: Shading Coefficient (SC) and Solar Heat Gain Coefficient (SHGC); Special Glass Types: Low-Emissivity Glass; Electro-Chromatic glass.			
<b>Module: 5</b>	<b>Passive Solar Design Principles for Buildings (Radiation)</b>		<b>7 Hours</b>
Solar Geometry: Sun path for a location, optimization of building orientation; Building Heat loss and gain & control strategy: Thermal Mass, Structural insulation and cavity, design of shading devices, role of vegetation; Renewable energy technologies: Photovoltaic panels and Wind turbines.			
<b>Module: 6</b>	<b>Passive Solar Design Principles (Ventilation and Daylighting)</b>		<b>7 Hours</b>
Wind flow, site planning consideration to facilitate wind movement; Natural Ventilation strategies and Methods: Single sided, Cross ventilation and Stack effect, wing walls, wind catchers, earth air tunnels, Evaporative and convective cooling, Night flushing; Sources and nature of daylight; Building design consideration for facilitating daylight into spaces; Daylight Indices: Daylight Factor (DF), Daylight Autonomy; Useful Daylighting Illuminance; Daylighting Strategies; Glare and Glare Control.			
<b>Module: 7</b>	<b>Climate Specific Building Design Principles</b>		<b>4 Hours</b>
Principles of design of buildings in different climates: Tropical, Temperate and cold climates around the world.			
<b>Module: 8</b>	<b>Sustainable Building Rating Systems, Energy Codes and Special Topics</b>		<b>4 Hours</b>
Green Rating Systems: GRIHA, LEED, IGBC, ECBC; Lectures by experts.			
<b>Total Lecture Hours</b>			<b>45 Hours</b>
<b>Reference Books</b>			
1.	Szokolay, S.V., 2014. <i>Introduction to architectural science: the basis of sustainable design</i> . Routledge.		
2.	Koenigsberger, O.H., 1975. <i>Manual of tropical housing &amp; building</i> . Orient Blackswan.		
3.	Krishan, A. ed., 2001. <i>Climate responsive architecture: a design handbook for energy efficient buildings</i> . Tata McGraw-Hill Education.		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022





<b>BARC315L</b>	<b>Building Services: I</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3
<b>Pre-requisite</b>	<b>Nil</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>To acquaint students with the principles of water supply, water distribution and drainage, standards and codes, and design considerations for plumbing systems in building. The course will familiarize students with the electrical, security and communication systems of a building including the design aspects associated with their performance. It will further acquaint students with the systems for fire safety, codes relevant to them, and incorporation of the systems in building design.</p>					
<b>Expected Course Outcome:</b>					
<p>[1] Ability to <b>estimate</b> water demand and draw plumbing layouts, drainage and sewage networks for small buildings.</p> <p>[2] <b>Understand</b> the Sources of generation, methods of collection, its treatment and disposal, Sanitary requirements and regulations as per building codes.</p> <p>[3] <b>Ability</b> to workout electrical networks for a simple building through the knowledge gained on basics of electrical systems and various electrical installations.</p> <p>[4] <b>Ability</b> to work out various system like security, communication, and firefighting system layouts for buildings in project planning</p>					
<b>Module: 1</b>	<b>Water supply</b>	<b>3 Hours</b>			
<p>Introduction to water resources; collection, processing, distribution and storage of water; calculation of water demand and consumption; sizing of storage tanks and water quality standards for code compliance, importance of water conservation. Storm water collection, drain design, regulators, filtration beds and ground water recharge systems, surface drainage and subsoil drainage</p>					
<b>Module: 2</b>	<b>Water distribution</b>	<b>6 Hours</b>			
<p>Water Distribution: Conceptual understanding of public water distribution system. Service connections and systems of hot and cold water supply; plumbing networks; sanitary fixtures, fittings, valves and pipes, dual-plumbing systems. Principles of hydro pneumatic systems. Control systems including valves and metering devices, user end controls such as angle valves, shower panels, jacuzzi systems</p>					
<b>Module: 3</b>	<b>Waste water and Sewage Disposal systems</b>	<b>12 Hours</b>			
<p>Filtration, disinfection, water softening , standards for various uses, especially for potable use and in construction. Systems and components for sewage and stormwater drainage; wastewater treatment systems and septic tanks; building and site planning for water drainage and sewage disposal; water harvesting and water recycling; solid waste collection, segregation and disposal.</p>					



Sanitary requirements for various types of buildings as per the National Building Code		
<b>Module: 4</b>	<b>Electrical Services</b>	<b>6 Hours</b>
<p>Power transmission and distribution via overhead lines and underground cables. General structure of electrical power systems, Fundamentals of electricity, current, voltage. Power Factor, Earthing, Substations, Low-Voltage Power Distribution Systems Requirements, and Dimensions of power distribution systems, low voltage switchboards, bus bar system and types. Common domestic installations- water heater, radiator etc. Un-interrupted power supply, Emergency service, Inverters, Phase change over and methods</p>		
<b>Module: 5</b>	<b>Electrical System Design</b>	<b>6 Hours</b>
<p>Wires- specifications and carrying capacity and calculation of electrical loads. Types of switches, sockets and fixtures. Distribution boards, circuit breakers, fuses, electrical meters and their layout. Design considerations for electrical installations.</p> <p>Protection against overload, short circuit, earth fault, lightening conductors and other safety measures for buildings. Wiring systems- methods of wiring, joint and loop in. Types of electrical wiring- batten, capping &amp; casing, concealed conduits etc. Wiring material- types, sizes and specifications, main switch, MCB, DB meter.</p>		
<b>Module: 6</b>	<b>Security System, Communication systems</b>	<b>6 Hours</b>
<p>Introduction to security systems – Access control, Public Address systems, CCTV, fire detection and their interconnected role in protection.</p> <p>Intercoms, Wi-Fi, broadband data cabling, and CCTV systems. Networking.</p> <p>Schematic layout of installations and points for different building types</p>		
<b>Module: 7</b>	<b>Introduction to Fire Safety</b>	<b>3 Hours</b>
<p>Fire sources, spreading, and growth decay curve; material fire response and fire-retardant materials; fire hydrants, fire escapes, refuge areas, fire tender access; smoke detector, alarm, and sprinkler systems; representation of fire considerations in drawings.</p> <p>Discussion of fire safety measures by using case studies.</p>		
<b>Module: 8</b>	<b>Industry/Expert lecture. Visiting site under construction and post construction and submission of project report.</b>	<b>3 Hours</b>
<b>Total Lecture Hours</b>		<b>45 Hours</b>

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<b>Reference Books</b>			
1.	RS Deshpande “ <i>Sanitary Engineering – (Vol I and II)</i> ” 2011		
2.	S.C. Rangwala, <i>Water Supply and Sanitary Engineering</i> , Charter Publishing House, 1989.		
3.	Birdie, G S, and J S Birdie. <i>Water Supply and Sanitary Engineering</i> . New Delhi, Dhanpat Rai, 1992.		
4.	P.N. Khanna , <i>Indian Practical Civil Engineers Hand Book</i> , Engineers Publishers New Delhi 2005		
5.	H Cotton. <i>Electrical Technology ... Seventh Edition, Etc.</i> London, CBS publications, 2003		
6.	P.N. Khanna, <i>Indian Practical Civil Engineers Hand Book</i> , Engineers Publishers New Delhi 2005		
7.	<i>National Building Code</i> , 2015, Bureau of Indian Standards		
8.	<i>Bureau of Indian Standards. Code of Practice for Electrical Wiring Installations IS-732.</i> 2005		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



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BARC407L	Building Services-II	L	T	P	C
		3	0	0	3
Pre-requisite	BARC315L: Building Services-I	Version 1.0			
<b>Course Objectives:</b>					
1.	To introduce students to HVAC, Vertical transportation, Illumination and Acoustical services associated with buildings.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Summarize</b> the knowledge of heating, ventilation and air conditioning systems and their need in buildings.				
2.	<b>Calculating</b> air conditioning loads for different spaces/ building typologies and analyse the type of system required.				
3.	<b>Understand</b> how HVAC services are installed in small- and large-scale buildings.				
4.	<b>Summarize</b> the knowledge of vertical transportation systems to design the vertical services like elevators, escalators and travelators for varied building typologies.				
5.	<b>Understand</b> the fundamentals of electrical and natural light, its source and designing of electrical lighting for different building typologies.				
6.	<b>Analyze</b> building spaces and give design proposals pertaining to the aspects of lighting.				
7.	<b>Understand</b> the fundamentals of sound, its propagation in spaces, acoustical defects of spaces and their mitigation and rectification.				
8.	<b>Analyze</b> the source and the types of noise in and around the buildings and to provide suitable noise control or sound reinforcement.				
<b>Module: 1</b>	<b>Basics of HVAC &amp; Ventilation Requirement</b>				<b>5 Hours</b>
Need for HVAC in a building, Ventilation requirements, Rate of ventilation as per NBC, ASHARE 62.2 standards; Introduction to psychrometric process; Sources of heat gain and loss for buildings, Introduction to Indoor Thermal Comfort; Types of refrigeration cycles, DX systems and Chilled Water systems, Heat Pump.					
<b>Module: 2</b>	<b>HVAC equipment and Systems Types</b>				<b>5 Hours</b>
HVAC equipment; Zoning: Purpose and advantages; HVAC System Types: All air systems, VRV and VRF Systems, Hydronic Systems; Chilled water Systems, Radiant Heating and Cooling, Geo-thermal Heat-Pump, District heating and Cooling and their selection criterion.					
<b>Module: 3</b>	<b>HVAC Application</b>				<b>5 Hours</b>
Calculation of air conditioning loads, Space requirements, Energy conservation techniques; HVAC systems for Small Scale (Case-studies); HVAC systems for Large-scale Building and Campus (Case-studies).					
<b>Module: 4</b>	<b>Vertical Transportation: Elevators, escalators and Travelators</b>				<b>5 Hours</b>



Types of Elevators-Traction, sky lobby, lift lobby, Provision of elevators for a building; Service requirements: Quality of service, time, passenger handling capacity, space and physical requirements, machine room spaces and their typical layout; Planning considerations - location in building, Recommendations of the National Building Code, etc. Safety features and codes. Design of typical lift banks; Escalators, Application - Location and arrangement in buildings. Space requirement, travelators.		
<b>Module: 5</b>	<b>Fundamentals of Lighting</b>	<b>5 Hours</b>
Fundamental quantities of light, Photometry; Lamp types and specifications including lumen, color temperature, color rendering index, etc.; Luminaire components and types; Luminaire rating system (Ingress Protection), Lighting distribution patterns; Materials types and Interaction of light with materials. .		
<b>Module: 6</b>	<b>Lighting considerations and design</b>	<b>10 Hours</b>
Quantity of lighting: Minimum Illumination levels for different facilities Quality of lighting: Glare (Direct and Reflected/Veiling); Luminous efficacy of light sources; energy efficient lighting; general lighting considerations; lighting principles; Lighting calculation methods: Lumen method, Zonal cavity method and point method; Daylighting and Designing with daylight (PSALD).; Lighting Design for Hospitals; Lighting Design for Schools and Offices.		
<b>Module: 7</b>	<b>Acoustics in Architectural spaces and Noise control.</b>	<b>8 Hours</b>
Sound and its physical properties; spherical dissipation and inverse square law; Quantities of sound, Intensity, energy and power and pressure, loudness. Behavior of sound in enclosed spaces; Reverberation and reverberation time calculation, Sabine’s formula, and optimum reverberation levels for speech and music. Sound in enclosed spaces: Acoustical defects of architectural space; Sound attenuation - absorption, dispersion, etc. types of sound absorption materials, Sound Absorption Coefficient (SAC), Noise Reduction Coefficient (NRC), Type of Sound absorption Products; Acoustical design criteria for speech, music and open-air auditorium; methods adopted in designing acoustics for architectural spaces; Noise, Airborne and Structural Borne, Types of Noise and its sources in buildings, Noise attenuation: noise control methods for various noise types, Sound Transmittance Class (STC) for various for building elements and acoustical products; Outdoor noise, planning to mitigate outdoor noise, Sound barriers, Principles of sound barrier attenuation, shadow zone, distance from receiver etc.		
<b>Module: 8</b>	<b>Expert Lectures</b>	<b>2 Hours</b>
Expert Lectures related to HVAC, Illumination & Acoustics		
<b>Total Lecture Hours</b>		<b>45 Hours</b>
<b>Text Book(s)</b>		
1.	Mechanical and Electrical Equipment for Buildings 12th, By Walter T. Grondzik, Alison G. Kwok, John Wiley & Sons 2014.	
<b>Reference Book (s)</b>		
1.	The Lighting Handbook: Reference and Application:David L. DiLaura, Illuminating Engineering Society of North America:Illuminating Engineering Society of North America, 2011	
2.	Architectural Acoustics Illustrated; Michael Ermann; John Wiley & Sons, 2015	



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3.	Master Handbook of Acoustics, Sixth Edition,		
4.	F. Alton Everest, Ken C Pohlmann, McGraw Hill Professional, 08-Dec-2014		
5.	Architectural Acoustics, M.David Egan, J.Ross Publication, 2007		
6.	Noise Control in Buildings: Fundamental and Application, Mahavir Singh, Narosa Publishing House, 2014		
7.	Noise Control Management, Howard K. Pelton, Van Nostrand Reinhold, 1994		
<b>List of Challenging Experiments (Indicative)</b>			
1.	Study in a small residence the installation of HVAC, lighting and electrical systems.		
2.	Design conceptual drawings for HVAC, lighting and electrical systems for a small retail outlet.		
3.	Provide an alternate HVAC solution for a small commercial IT office/ How to optimize the use of artificial and natural lighting.		
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
<b>Recommended by Board of Studies</b>	21/2/2022		
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date	16-6-2022



BARC316P	Building Environment Lab	L	T	P	C
		0	0	4	4
Pre-requisite	BARC208L: Climate Responsive Architecture	Version 1.0			
<b>Course Objectives:</b>					
1.	To expose students to the process and pertinent aspects to modern surveying methods and designing climate-responsive buildings using manual methods and environmental analysis software tools.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Analyze</b> the terrain of a given site and prepare a topographical map for architectural design projects				
2.	<b>Analyze</b> a given climate and represent climatic data graphically to make meaningful inferences.				
3.	<b>Design</b> shading devices for windows based on the overheating period and optimize orientation of building as per solar radiation and wind direction.				
4.	<b>Analyze</b> the indoor thermal comfort based on different comfort models.				
5.	<b>Analyze</b> thermophysical properties of building materials and construction type and select appropriate material for construction for a given climate.				
6.	<b>Evaluate</b> the daylighting performance of a space/building.				
7.	<b>Design</b> a climate responsive building for a given climate.				
<b>Module: 1</b>	<b>Surveying</b>	<b>8 Hours</b>			
Surveying using Total Station equipment. Digitization of data and Contour Map preparation					
<b>Module: 2</b>	<b>Representation and Analysis of Climate</b>	<b>4 Hours</b>			
Graphical Representation of Weather Data: Manual Methods, Using software tool.					
<b>Module: 3</b>	<b>Design of Shading Devices, Mahoney Tables/ Bio Climatic Chart</b>	<b>12 Hours</b>			
Sun path diagram; Plotting overheating period on sun path diagram; shading protractor and design of shading devices. Design Recommendation based on Climate: Bioclimatic Chart, Mahoney tables.					
<b>Module: 4</b>	<b>Radiation Analysis and Orientation Optimization and Wind Analysis</b>	<b>8 Hours</b>			
Solar Radiation optimization of building form; Wind Ross and Wind Analysis; Building Orientation Optimization: Based on Solar Radiation or Wind direction.					
<b>Module: 5</b>	<b>Assessment of Thermal Comforts</b>	<b>8 Hours</b>			
Computing Mean Radiant Temperature (MRT): Experimentally, Analytically or Software tools Assessing Indoor Thermal Comfort: Using ASHRAE PMV/PPD and Adaptive Comfort Models.					
<b>Module: 6</b>	<b>Thermal Properties of Building Materials and Construction. &amp; Building Load Calculations</b>	<b>12 Hours</b>			
Calculation of U & R-Value; thermal diffusivity, Time-lag of multi-layered Building Elements and construction. Estimation of Building Heating and Cooling Load: CLTD/CLF method;					
<b>Module: 7</b>	<b>Daylighting Performance Analysis</b>	<b>4 Hours</b>			
Daylighting Performance Matrices: Daylight Factor (DF); Daylight Autonomy (DA), Useful Daylight Illuminance (UDI), Annual Sunlight Exposure (ASE). Daylight Performance Analysis of Indoor spaces using software tool, Scale models and field study. LEED daylight credits.					
<b>Module: 8</b>	<b>Design of Building &amp; Expert Workshops</b>	<b>4 Hours</b>			
Designing of a climate responsive building based on different types of analyses. Workshop by external experts.					



<b>Total Lecture Hours</b>		<b>60 Hours</b>
<b>Text Book(s)</b>		
1.	Szokolay, S.V., 2014. Introduction to architectural science: the basis of sustainable design. Routledge.	
<b>Reference Book(s)</b>		
1.	Koenigsberger, O.H., 1975. Manual of tropical housing & building. Orient Blackswan.	
2.	Krishan, A. ed., 2001. Climate responsive architecture: a design handbook for energy efficient buildings. Tata McGraw-Hill Education.	
3.	Givoni, B., 1969. Man, climate and architecture. Elsevier.	
4.	Rabl, A., Curtiss, P. S., Kreider, J. F. (2009). Heating and Cooling of Buildings: Design for Efficiency, Revised Second Edition. United States: CRC Press.	
<b>List of Challenging Experiments (Indicative)</b>		
1.	Analyze the topography of a given site using total station and prepare a contour map for a architectural design project.	8 Hours
2.	Analysing a given climate using climate consultant and ladybug environmental analysis tools and a brief summary on given climate.	8 Hours
3.	Design of shading devices for a window for each orientation using shading protractor.	8 Hours
4.	Analysing a given climate using Mahoney tables and arriving at design recommendations.	8 Hours
5.	Conducting radiation analysis for a building form with context and ascertaining the optimized orientation using ladybug environmental analysis tools.	8 Hours
6.	Wind speed and direction analysis using weather file for a given location	8 Hours
7.	Thermal comfort analysis of a small indoor room using ladybug environmental analysis tools.	8 Hours
8.	Computing U & R-value, time lag for a given wall, roof and floor assembly.	8 Hours
9.	Heating and cooling load calculation of a single room or a building.	8 Hours
10.	Assessing the daylight performance of a small room with and without shading using climate studio software or dive for rhino.	8 Hours
<b>Mode of Evaluation:</b> Continuous Assessment, Final Assessment		
<b>Recommended by Board of Studies</b>		21/2/2022
<b>Approved by Academic Council</b>		No. 66
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		16-6-2022





## Discipline Electives

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC307L	Modern Architectural Thought	3	0	0	3	BARC107L
2.	BARC308P	Interior Design	0	0	4	4	NIL
3.	BARC309L	Art Forms Appreciation	3	0	0	3	NIL
4.	BARC310P	Ideation	0	0	4	4	NIL
5.	BARC408L	Architectural Photography and Journalism	2	0	0	2	BARC305P
6.	BARC409L	Sustainable Architecture	3	0	0	3	BARC208L
7.	BARC411P	Furniture Design	0	0	4	4	NIL
8.	BARC412L	Architectural Conservation	3	0	0	3	BARC201P
9.	BARC413L	Building Systems Integration	3	0	0	3	BARC407L
10.	BARC496J	Travel Learning				02	NIL
11.	BARC312L	Theory of Landscape Design	3	0	0	3	BARC203L
12.	BARC414P	Introduction to Computational Design and Digital Fabrication I	0	0	4	4	BARC210P



BARC307L	Modern Architectural Thought	L	T	P	C
		3	0	0	3
Pre-requisite	BARC107L: Architectural Design Thinking	Version 1.0			
<b>Course Objectives:</b>					
To educate students on the philosophies/ideologies of various individuals of the 19th and 20th century leading to the ideation and realization of differential-built environments and to explore the relationship between thought process and realization					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
[1] <b>Understand</b> about the association and influence of philosophy of an individual and group on architecture and architectural Ideation.					
[2] <b>Understand</b> innovative architectural styles initiated by famous architects during early periods of 19 <sup>th</sup> century.					
[3] <b>Understand</b> modern architectural philosophy originated in Europe and United States.					
[4] <b>Understand</b> the architectural philosophy in the Asian and national context.					
[5] <b>Understand</b> the architectural philosophy postmodern and Hi-tech architects.					
<b>Module: 1</b>	Introduction to philosophical thought, understanding philosophy in the context of the individual, society, economic and political environment. Relationships between individual and collective philosophy and ideation.	<b>3 Hours</b>			
<b>Module: 2</b>	Directions of turn of the century architects-Eric Mendelsohn, Peter Behrens, Gerrit Rietveld, Hans Scharoun, Antoni Gaudi and others	<b>6 Hours</b>			
<b>Module: 3</b>	Modern western and architectural philosophy in the 20th century in Europe and the United States-Frank Lloyd Wright, Walter Gropius, le Corbusier, Mies van der Rohe, Alvar Aalto, Buckminster Fuller and others	<b>9 Hours</b>			
<b>Module: 4</b>	Asian thinkers of the 20th century-Geoffrey Bawa, KenzoTange, Kisho Kurokawa, Toyo Ito and others	<b>6 Hours</b>			
<b>Module: 5</b>	Contemporary Indian architectural thinking of the last five decades –Indian masters including Joseph Allen stein, Laurie Baker, Balakrishna Doshi, Charles Correa, Achyut Kanvinde among others.	<b>6 Hours</b>			
<b>Module: 6</b>	Contemporary international practices, the digital age, creative thinkers-among them Frank Gehry, ZahaHadid, Tadao Ando, Shigeru Ban, Norman Foster, Santiago Calatrava, Herzog and de Meuron	<b>6 Hours</b>			
<b>Module: 7</b>	Fantasia and visionary architecture and their proponents.	<b>3 Hours</b>			
<b>Module: 8</b>	Discussions with academics/professionals and seminars by students	<b>6 Hours</b>			
<b>Total Lecture Hours</b>					<b>45 Hours</b>
<b>Reference Books</b>					



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1	Juhani Pallasmaa, <i>The Embodied image: Imagination and Imagery in Architectur</i> , John Wiley & Sons (May 16th 2011)		
2	The Poetics of Space by Gaston Bachelard Publisher: Beacon Press (first published 1957; New edition April 1st 1994 and reprinted 2013)		
3	A Place in the Shade by Charles Correa Publisher: Penguin India (15 June 2010)		
4	Laurie Baker : Truth in Architecture by Atul Deulgaonkar Publisher: Jyotsna Prakashan (May 1 <sup>st</sup> 2015)		
5	Le Corbusier : Ideas and Forms by William J R Curtis Publisher: Phaidon Press (April 20th 2015)		
6	A Pattern Language by Christopher Alexander, Murray Silverstein, and Sara Ishikawa Publisher: Oxford University Press (August 25th 1977)...reprinted 2010		
7	Architectural Reflections: Studies in the Philosophy and Practice of Architecture by Colin St. John Wilson, Manchester University Press (2000 reprinted 2010)		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



BARC308P	Interior Design	L	T	P	C
		0	0	4	4
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>The course is aimed at</p> <p>[1] Familiarise the student with key concepts and current interior design practices within the field of housing and commercial spaces</p> <p>[2] To equip students with skills essential for client - designer presentation in a professional context</p> <p>[3] To make students understand the importance of specification of materials, furniture layout and barrier free design with respect to context.</p>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to</p> <p>[1] <b>Analyse</b> an interior space through its user requirement and propose design based solutions</p> <p>[2] <b>Apply</b> elements and principles of visual design (in 2D and 3D problems) using a wide range of illustration and drawing techniques.</p> <p>[3] <b>Understand</b> the principles of sustainability in interior design.</p>					
<b>Module: 1</b>	<b>History and Theory of Interior Design</b>	<b>16 Hours</b>			
Introduction, History and Theory of Interior Design Psychology and Perception of Interior space, Barrier Free Design. Design Project-1 Complete design, detailing, furniture layout, specification for the materials, and their application. The projects shall relate to interiors of residential, commercial, educational or other public spaces.					
<b>Module: 2</b>	<b>Interior Lighting: Acoustic Design</b>	<b>6 Hours</b>			
Architectural/Interior Lighting: Acoustic Design					
<b>Module: 3</b>	<b>Systems Integration</b>	<b>6 Hours</b>			
Indoor Air Quality/Ventilation: Systems Integration (HVAC, Plumbing, Electrical etc.)					
<b>Module: 4</b>	<b>Furniture Design and fixture layout</b>	<b>4 Hours</b>			
Furniture Design and Layout, Fixtures & Equipment:					
<b>Module: 5</b>	<b>Interior Landscaping</b>	<b>3 Hours</b>			
Materials & Finishes: Interior Landscaping					
<b>Module: 6</b>	<b>Sketchup for Interior Design</b>	<b>16 Hours</b>			
Design Project – 2 Sketchup for Interior Design					
<b>Module: 7</b>	<b>Sustainability in Interior Design</b>	<b>3 Hours</b>			
<b>Module: 8</b>	Introduction to LEED for ID or Green Associate	<b>6 Hours</b>			
<b>Total Lecture Hours</b>		<b>60 Hours</b>			

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<b>Reference Books</b>			
1	Joseph D.Chicara, Julius Panero, Martin Zelnik: Time Saver Standards for Interior Design & Space Planning, 2 <sup>nd</sup> Edition.2001.		
2	Julius Panero, Martin Zelnik:Human Dimension & Interior Space: A source book of Design Reference Standards"1979		
3	S.C.Reznikoff: Interior Graphic & Design Standards.1986.		
4	Susan M.Winchip: Fundamentals of Lighting, 2 <sup>nd</sup> Edition.		
5	Louise Jones: Environmentally Responsible Design - Green & Sustainable Design for Interior Designers		
6	Francis D.K.Ching: Interior Design Illustrated.3 <sup>rd</sup> Edition V.N.R.Pub. NY 2012		
7	SyanneSlesin and Stafford Ceiff- Indian Style, Clarkson N.Potter, New york, 1990.		
8	Periplus Editions, Michael Freeman, India Modern, 2005		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



BARC309L	Art Forms Appreciation	L	T	P	C
		3	0	0	3
Pre-requisite	Nil	Version 1.0			
<b>Course Objectives:</b>					
The course is aimed to create an overview and understanding of various art forms that exists from Ancient to modern times and between East and West.					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
[1] <b>Appreciate</b> of aesthetic qualities beyond the architecture					
[2] To <b>comprehend</b> the relationship between the arts and built environment					
[3] <b>Analyse</b> the techniques, art forms and styles					
[4] <b>Evaluate</b> the various forms of art and the works of Artists and appreciate them in the context of culture and sociological perspective					
<b>Module: 1</b>	<b>An introduction to understanding of art forms</b>	<b>2 Hours</b>			
Understanding the various art forms in the society and in different cultures.					
<b>Module: 2</b>	<b>Films / Documentaries</b>	<b>9Hours</b>			
Understanding and Appreciating <b>Films / Documentaries</b> from past to present times to Modern times & between East and West					
<b>Module: 3</b>	<b>Music/ Poetry</b>	<b>6 Hours</b>			
Understanding and Appreciating <b>Music/ Poetry</b> from Ancient times to Modern times & between East and West.					
<b>Module: 4</b>	<b>Dance / drama</b>	<b>6 Hours</b>			
Understanding and Appreciating Dance / <b>drama</b> from ancient times to Modern times & between East and West.					
<b>Module: 5</b>	<b>Painting/Sculpture</b>	<b>12 Hours</b>			
Understanding and Appreciating <b>Painting/Sculpture</b> from Ancient times to Modern times & between East and West.					
<b>Module: 6</b>	<b>Folk/ indigenous art</b>	<b>6 Hours</b>			
Understanding and Appreciating Folk/ <b>indigenous art</b> from ancient times to Modern times & between East and West.					
<b>Module: 7</b>	<b>Sociological perspective of Art and Culture</b>	<b>2 Hours</b>			
Art and Culture and Well-being - a sociological perspective					
<b>Module: 8</b>	<b>Interaction with contemporary artistes</b>	<b>2 Hours</b>			
<b>Total Lecture Hours</b>		<b>45 Hours</b>			



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<b>Reference Books</b>			
1.	Roberts, Ian. 2004. <i>Creative Authenticity: 16 principles to clarify and deepen your artistic vision</i> : Atelier Saint-Luc Press.		
2.	Raymond Lansing George. 1839-1929. <i>Writer: A Concise, Complete, and Practical Textbook of Rhetoric, Designed to Aid in the Appreciation As Well As Production of All Forms of Discourse by Correlating Them to Those of – Bog</i> . Online Books page.		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



BARC310P	Ideation	L	T	P	C
		0	0	4	4
Pre-requisite	Nil	Version 1.0			
<b>Course Objectives:</b>					
The course is aimed at [1] To explore the manifestation of diverse and innovative ideas into tangible, concrete reality.					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to [1] <b>Understanding</b> the qualities of Design problems and solutions [2] <b>Evaluate</b> ideas in the realms of music, art, sciences into physical manifestations through a process of inspired thinking and interpretation. [3] <b>Create</b> solutions to real world problems by thinking laterally					
<b>Module: 1</b>	<b>Idea to Form</b>	<b>4 Hours</b>			
Introduction and exercises - Idea to Form: What makes a Design - Various aspects of Design - Various areas of Design resolution methods through mini projects. Exercises that encompass the understanding of Idea to Form;					
<b>Module: 2</b>	<b>New ideas in furniture design</b>	<b>8 Hours</b>			
Projects to understand the new ideas in furniture design and human occupation/ seating, study, etc; along with brief report.					
<b>Module: 3</b>	<b>Spatial design</b>	<b>8 Hours</b>			
A Spatial design project that would have light and shade as major thrust area;					
<b>Module: 4</b>	<b>Impact of colour in an environment</b>	<b>4 Hours</b>			
Projects to showcase the impact of colour in an environment;					
<b>Module: 5</b>	<b>Recycling materials</b>	<b>8 Hours</b>			
Projects to explore recycling materials into new products					
<b>Module: 6</b>	<b>Flexible functions</b>	<b>8 Hours</b>			
Projects to explore flexible functions and multi-functionality and versatility					
<b>Module: 7</b>	<b>Nature as a Design Inspiration</b>	<b>8 Hours</b>			
Projects that has Nature as a Design Inspiration					
<b>Module: 8</b>	<b>Fractals and design in nature</b>	<b>4 Hours</b>			
Projects to demonstrate Fractals and design in nature.					
<b>Module: 9</b>	<b>Design inspiration from Nature</b>	<b>8 Hours</b>			
Projects to be facilitated with inspiration from Nature. Animals, Plants, Drawings, models along with brief report.					
<b>Total Lecture Hours</b>					<b>60 Hours</b>
<b>Reference Books</b>					





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1.	Edward De Bono - Lateral Thinking- Creativity, Penguin, 2009		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



<b>BARC408L</b>	<b>Architectural Photography and Journalism</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC305P: Architectural Design VI: Technical Drawings</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1. To develop a critical appreciation of buildings, precincts, public space and settlements in the context of society and environment and architectural theory and principles, through photography and journalistic writing.					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
1	<b>Understand</b> how building environment could be presented and described through photography and journalism as mediums.				
2	<b>Understand</b> how to critically appraise the works of renowned architectural photographers and journalists.				
3	<b>Develop</b> skills on writing articles about architecture for different genre of media such as national newspapers, Television, films, architectural journals, interviews and biographies, thematics.				
4	<b>Understand</b> how present social media and digital technologies could be utilized for architectural photography and journalism.				
<b>Module: 1</b>	<b>Introduction to architectural Photography and Journalism</b>	<b>2 Hours</b>			
Interactive exercises - Introducing to architectural photography and journalism as inter-related as well as distinct disciplines Nature of architectural photography - architectural photographers					
<b>Module: 2</b>	<b>Critical Observation in Architectural Photography and Journalism</b>	<b>4 Hours</b>			
Photography - Methodologies of critical observation and writing brief report.					
<b>Module: 3</b>	<b>Case studies of works of eminent photographers</b>	<b>4 Hours</b>			
Exercises and project based on evolution of architectural photography - with case studies and critical appraisal - GA, Futogawa, Dinesh Mehta, et al					
<b>Module: 4</b>	<b>Photography Field Visit</b>	<b>4 Hours</b>			
Field visit to precincts in Chennai and Bangalore					
<b>Module: 5</b>	<b>Techniques of writing in various architectural Journalism</b>	<b>4 Hours</b>			
Project report writings - based on kinds of architectural journalism – for national newspapers, Television, films, architectural journals, interviews and biographies, thematics.					
<b>Module: 6</b>	<b>Understanding the significance of Photo-documentation</b>	<b>2 Hours</b>			
Photography, Projects, Readings and discussions - interactive					
<b>Module: 7</b>	<b>Social media and architectural photography and journalism</b>	<b>4 Hours</b>			
Project - social media, Digital technology, projects - Emerging directions					

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<b>Module: 8</b>	<b>Guest Lecture by industry experts</b>	<b>6 Hours</b>	
Interactions with Architectural photographers and journalists			
<b>Total Lecture Hours</b>		<b>30 Hours</b>	
<b>Reference Books</b>			
4.	Adrian Schulz, Architectural Photography: Composition, Capture, and Digital Image Processing, Reilly Publications, 2009		
5.	Anthony White, Yokio Futagawa, Vance Bibliographies, university of California, Digitized 2009		
6.	MIT University Architecture Journals		
7.	The Journal of Architectural Historians		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



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BARC409L	Sustainable Architecture	L	T	P	C
		3	0	0	3
Pre-requisite	BARC208L:Climate Responsive Architecture	Version 1.0			
<b>Course Objectives:</b>					
1.	Adopt/incorporate sustainable practices in Building Design				
2.	Combining architectural design and planning principles with modern technology and traditional Community wisdom in order to design and manage a sustainable project.				
3.	Understand the concept of sustainable communities.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Understand</b> sustainability, its types in built environment and the importance of environmentally, ecologically sensitive architecture				
2.	Analyze different types of sustainable material and technologies used to design and construct sustainable buildings.				
3.	<b>Evaluate</b> various approaches to achieving sustainable buildings and Communities.				
4.	<b>Understand</b> different rating methods to evaluate sustainable methods.				
5.	<b>Summarize</b> the concepts of sustainability through case studies of sustainable buildings				
<b>Module: 1</b>	<b>Concepts of Sustainability</b>	<b>4 Hours</b>			
Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bio-regionalism - community basis shelter technology within bio-regional patterns and scales, Ethical- environmental degradation. Sustainable Development, Agenda 21, UN Goals					
<b>Module: 2</b>	<b>Strategies of Sustainable Architecture</b>	<b>4 Hours</b>			
Definition of Sustainability, - Carrying capacity, Eco system and food chain, natural cycles – Ecological foot print, Pillars of Sustainability. Sustainability in the built environment-ideas, concepts and current practices. Climate and built form, Sustainable practices in vernacular buildings of India. Terminologies related to sustainable buildings- carbon footprint, life cycle analysis, embodied energy etc.					
<b>Module: 3</b>	<b>Sustainable planning &amp; Design</b>	<b>4 Hours</b>			
Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas - Model ecosystem of the site, environmental monitoring and testing during construction- phasing of development - limits of change - Design facility within social and environmental thresholds. Site development strategies with Land-use zoning, Transport planning and landscape planning etc. Improving environmental quality, energy efficiency, efficient resource management (soil, water, waste and materials)through appropriate site selection and effective neighborhood planning.					
<b>Module: 4</b>	<b>Sustainable Building Materials and Construction</b>	<b>6 Hours</b>			
Role of Materials in Sustainable architecture. Material Strategies for Sustainable Construction- traditional, modern. Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: Sustainable production, transportation, infrastructure and distribution policies. Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources. Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes					
<b>Module: 5</b>	<b>Sustainable concepts and the design strategies</b>	<b>6 Hours</b>			



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Method of Achieving Sustainability in Buildings. Principles to improve the energy efficiency; use of local materials and on site growth of food, fuel and building materials. Resource Management: Energy, water, and waste audits; operations and maintenance; post occupancy surveys and reviews; building benchmarking.			
<b>Module: 6</b>	<b>Rating methods and Case studies of Sustainable Buildings</b>		<b>9 Hours</b>
Green architecture and various international and national rating systems for sustainability- Indian systems, Codes and compliances. Introduction to assessment tools and performance analysis software. Sustainable Development Case Studies: illustrated examples of the planning, development, and construction strategies adopted by eminent architects at the global level and in the Indian context. Net Zero Energy and Energy Positive Buildings: concept, and case studies. Future of Sustainable Design: Biophilia, Urbiphilia, biomimicry, and High-Performance Buildings			
<b>Module: 7</b>	<b>Sustainable Community planning</b>		<b>9 Hours</b>
Sustainable communities –needs/challenges. Integration of sustainable and green development practices into community development strategies. Public planning and policy initiatives Study of zero discharge sites and communities. Integrating renewable energy at neighborhood scale, smart grids, concept of solar cities, smart cities, eco cities.			
<b>Module: 8</b>	<b>Expert Lectures</b>		<b>3 Hours</b>
Sustainable Project Presentation by Architects- Philosophies and approaches adopted by the architects			
<b>Total Lecture Hours</b>			<b>45 Hours</b>
<b>Reference Book (s)</b>			
1.	Dominique Gauzin – Muller “Sustainable Architecture and Urbanism: Concepts, Technologies and examples”, Birkhauser, 2002.		
2.	Charles J. Kibert, Sustainable Construction: Green Building Design and Delivery, 4th Edition, ISBN: 978-1-119-05517-4 May 2016		
3.	Steven V. Szokolay, Introduction to Architectural Science The Basis of Sustainable Design, 3rd Edition, 2014		
4.	Paola Sassi, Strategies for Sustainable Architecture, ISBN 9780415341424 June 19, 2006 by Taylor & Francis		
5.	Sandra F.Mendler & William Odell, “HOK Guidebook to Sustainable Design”, John Wiley and sons, 2000.		
6.	Richard Hyder, “Environmental brief: Pathways for green design”, Taylor and Francis, 2007.		
7.	Bansal, N.K., Hauser, G., &Minke, G., ”Passive Building Design”, Elsevier, Amsterdam, 1994.		
8.	Sodha, M.S., Bansal, N.K., Bansal, P.K., Kumar, A., & Malik, M.A.S., ”Solar Passive Building”, Pergamon Press, Oxford, England, 1986.		
9.	Caring A.Langston Grace K.C.Ding, “Sustainable practices in built environment”, 2nd Edition, Publishers: Butterworth-Heinmann Linacre House Jordanhill Oxford, 2001		
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022



BARC411P	Furniture Design	L	T	P	C
		0	0	4	3
<b>Pre-requisite</b>	<b>Nil</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>[1] Familiarize with key contemporary concepts and current styles in furniture design in discovery format.</p> <p>[2] To understand an approach to furniture design as object and design of furniture arrangements in architectural spaces.</p> <p>[3] To equip students with skills essential for client - designer presentation in a professional context.</p> <p>[4] To make students understand the importance of specification of materials, furniture usage and barrier free design with respect to context.</p> <p>[5] To have students understand where digital design interfaces with material production and output.</p>					
<b>Expected Course Outcome:</b>					
At the end of the course the student should be able to					
<p>[1] <b>Analyse</b> and design furniture through its various components such as material, structure and style.</p> <p>[2] <b>Understand</b> and implement sustainable concepts in furniture design.</p> <p>[3] <b>Develop</b> skills to understand the process of furniture design and types of production.</p> <p>[4] <b>Provide</b> a competent furniture arrangement in an architectural space.</p>					
<b>Module: 1</b>	<b>Ergonomics and Human Anthropometrics</b>				
Exercise to understand Ergonomics and Human Anthropometrics.					
<b>Module: 2</b>	<b>Furniture Design Approaches, Designers and Styles</b>				
Introduction to Furniture Designers/Style: Antique, Traditional, Modern, Contemporary, Classical etc. Current trends in furniture design.					
<b>Module: 3</b>	<b>Types of Furniture</b>				
Types of Furniture – Built-in (cabinetry etc.), Modular, Manufactured, Systems Office furniture, Prefabricated, Custom-made, Craft or Artisanal, Seating, Storage, Children’s, Sleeping, Street Furniture (outdoor).					
<b>Module: 4</b>	<b>Materials in Furniture</b>				
Materials in Furniture – Wood (hardwoods, softwoods), Plywood, Bent wood, Bamboo/Cane, Metal, Plastics, Polyurethane, Glass. Upholstery Materials – Leather, Rexin, Fabrics(naturals, synthetics). Finishes – Laminate, Veneer, Lacquer, Varnish, Stains, Polish. Adhesives. The relationship of materials to digital production method both for mass production and crafted or artisanal furniture. Consider valuation of materials in light of architecture, sustainability and environmental issues.					



<b>Module: 5</b>	<b>Furniture Selection</b>		
Selection of furniture, cost, longevity in light of architectural design requirements.			
<b>Module: 6</b>	<b>Furniture Design</b>		<b>40 Hours</b>
Furniture design, including technology (structure & stability, and utilizing digital production) wood and metal joinery, sections, framework, detailing and design of furniture using found object in light of ergonomic, programmatic and architectural concerns.			
<b>Module: 7</b>	<b>Furniture Layout</b>		<b>16 Hours</b>
Furniture layout as a design project – the relationship to and creation of architectural context in combination with design of furniture elements (Standalone or Built-in).			
<b>Module: 8</b>	Guest faculty – Innovations in Furniture Design – Workshop		<b>4 Hours</b>
<b>Total Lecture Hours</b>			<b>60 Hours</b>
<b>Project Suggestions</b>			
<p>1. The students engage a given fixed floor plan to develop an inventive spirited program for. This is used both to drive the development of a piece of furniture and to create a layout. By engaging an existing plan, perhaps by an unknown architect it is easier to define working with furniture only, rather than with interior design.</p> <p>2. Study the difference between design for mass/factory production and hand crafted furniture in the contemporary context and specifically in the Indian context.</p>			
<b>References</b>			
<ol style="list-style-type: none"> <li>Francis Ching - <i>Form Space and Order</i>, Phaidon, 2012</li> <li>John F. Pile, <i>Interior Design</i>, Harry N. Abrams, Inc., Publishers.</li> <li>Amin Jaffer, <i>Furniture from British India and Ceylon</i>, Peabody Essex Museum; First Ed. (2001)</li> <li>Stuart Lawson, <i>Furniture Design: An Introduction to Development, Materials and Manufacturing</i>, Laurence King Publishing (October 1, 2013)</li> <li>Scott Openshaw, Erin Taylor, <i>Ergonomics and Design Reference Guide</i>, Allsteel (2006)</li> <li>Jerzy Smardzewski. <i>Furniture Design</i>. Switzerland: Springer (2015)</li> <li>Debkumar Chakrabarti. <i>Indian Anthropometric Dimensions for Ergonomic Design Practice</i>. National Institute of Design (1997) (found on Library Genesis &lt;libgen.rs&gt;</li> <li>James Krenov. <i>Cabinetmaker's Notebook (Woodworker's Library)</i> Craven Street Books (2000)</li> <li>Hideo Sato, Yasua Nakahara. <i>The Complete Japanese Joinery</i> Trans. Koichi Palu Nil. Vancouver: Hartley and Marks. (1967)</li> </ol>			
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			



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Recommended by Board of Studies	21/2/2022		
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BARC412L	Architectural Conservation	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC201P: Architectural Design III: Rural Environment Studies</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>The course is aimed at</p> <ul style="list-style-type: none"> <li>[1] To sensitise the student to heritage as an integral part of the built and social environment</li> <li>[2] Equip students to propose solutions which are pragmatic in contemporary time period.</li> <li>[3] Introduce to the importance of conservation in terms of sustainability and urban development</li> <li>[4] Introduce to the work, rules and regulations of conservation/ planning organisations (govt/ NGO) which function at local, national and international level.</li> </ul>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to</p> <ul style="list-style-type: none"> <li>[1] <b>Understand</b> the concepts of heritage and conservation</li> <li>[2] <b>Understand</b> the role of various national agencies in Architectural conservation</li> <li>[3] <b>Analyse</b> the components and concepts of conservation in various national and international case examples</li> <li>[4] <b>Apply</b> the skills in conserving, restoring a building; apply adaptive reuse principles to bring the structure back to life</li> <li>[5] <b>Experiment</b> design solution which shall be socially relevant on the character of the city.</li> </ul> <p>Develop awareness and sensitivity towards heritage and value of structures.</p>					
<b>Module: 1</b>	<b>Introduction to Architectural Conservation</b>	<b>2 Hours</b>			
Introduction to concepts of heritage and conservation, defining preservation, adaptive reuse, international and domestic agencies and their roles in conservation.					
<b>Module: 2</b>	<b>Role of National agencies in Architectural Conservation</b>	<b>4Hours</b>			
Museums, monument preservation, role of ASI and INTACH, central and state government policies and regulations, projects.					
<b>Module: 3</b>	<b>Architectural Conservation – National case examples</b>	<b>6 Hours</b>			
Case studies in conservation such as Hampi and Mamallapuram					
<b>Module: 4</b>	<b>Components in Architectural Conservation:</b>	<b>4 Hours</b>			
Listing of monuments, documentation, assessing architectural character, structural condition, techniques for preservation and adaptive reuse.					
<b>Module: 5</b>	<b>Adaptive reuse</b>	<b>4 Hours</b>			
Case studies in adaptive reuse- museums, hospitality centres, heritage hotels, etc					
<b>Module: 6</b>	<b>Conservation planning</b>	<b>4 Hours</b>			
Conservation planning, incentivisation, transfer of development rights, examples of developments in historic precincts.					
<b>Module: 7</b>	<b>Architectural Conservation – International case examples</b>	<b>4 Hours</b>			

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Conservation practices in the international context.			
<b>Module: 8</b>	Lectures by experts	<b>2 Hours</b>	
<b>Total Lecture Hours</b>		<b>30 Hours</b>	
Project:			
1.	Identify a heritage structure which is in a stage of neglect and provide strategies for rejuvenation.		
2.	Compare the effect of urbanisation on heritage site in two precincts.		
<b>Reference Books</b>			
6.	Conservation Manual by Bernard Felden, Intach Publication		
7.	Robert E, Stipe, A Richer Heritage: Historic Preservation in the Twenty-First Century Univ. Of North Carolina Press		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies		21/2/2022	
Approved by Academic Council		<b>No. 66</b>	Date 16-6-2022



BARC413L	Building Systems Integration	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC407L: Building Services-II</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	To refine the design process through the strategies of building systems integration				
2.	To understand how various systems that constitute a building design (site, climate, structure, skin, building services, space, and finishes) are interwoven and integrated to achieve a high-performance building				
3.	To attain an appreciation of building systems integration in architecture through case studies with an emphasis on sustainable design and construction				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	To understand the effect of theories of building systems integration on contemporary architectural design				
2.	To gain insight to the various building systems integration process and their relation to computation				
3.	To identify and go in depth into specific and appropriate aspects relating to the various contexts of integration and its relation to sustainability				
4.	To further advance creative and analytical thinking of the building systems integration				
<b>Module: 1</b>	<b>Introduction</b>	<b>3 Hours</b>			
Concept and application of building systems integration; historical context to integration; design issues related to integration and its effect on functional efficiency					
<b>Module: 2</b>	<b>Integration Systems</b>	<b>3 Hours</b>			
Systems thinking in architecture; integrated approach in design; building management and automation systems; application and importance of BIM in systems integration					
<b>Module: 3</b>	<b>Integrated building systems: I</b>	<b>9 Hours</b>			
Components and case studies of building systems integration: HVAC, electrical, and lighting					
<b>Module: 4</b>	<b>Integrated building systems: II</b>	<b>6 Hours</b>			
Components and case studies of building systems integration: plumbing and sanitary, fire-fighting, and vertical transportation					
<b>Module: 5</b>	<b>Integrated building systems: III</b>	<b>9 Hours</b>			
Components and case studies of building systems integration: security, communication, access control, acoustics, public address system, and maintenance systems					
<b>Module: 6</b>	<b>Sustainability and Energy</b>	<b>6 Hours</b>			
Design and technological solutions that enhance sustainability in the built environment and human well-being; concept of energy management system; role of automation in energy saving; energy generation and its integration in building					
<b>Module: 7</b>	<b>Current trends in Integration</b>	<b>6 Hours</b>			
Application of expert system in building automation; stages in development of expert system; knowledge base and decision support systems; impact of information technology; Use of IOT in systems; concept of artificial intelligence					
<b>Module: 8</b>	<b>Guest Lecture</b>	<b>3 Hours</b>			
Industry guest lecture by architects and allied field experts with live examples; advanced building services					
<b>Total Lecture Hours</b>					<b>45 Hours</b>
<b>Text Book(s)</b>					
1.	Vassigh, S. and Chandler J. (2011) Building Systems Integration. J. Ross Publishing				



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<b>Reference Book(s)</b>			
1.	Bachman, L. (2002) Integrated Buildings: Systems Basis of Architecture. Wiley		
2.	Moe, K. (2008) Integrated Design in Contemporary Architecture. Princeton Architectural Press		
<b>List of Challenging Experiments (Indicative)</b>			
1.	Preparing report for Integration of HVAC, electrical and lighting for current design studio project.		
2.	Preparing drawings for integration of plumbing and sanitary, fire-fighting, and vertical transportation in the current design studio project.		
3.	Preparing a business pitch for integration of security, communication, and access control of a modern residential project.		
<b>Mode of Evaluation:</b> Digital Assignments/ Quiz/ Continuous Assessment, Final Assessment/ Project			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022



<b>BARC496J</b>	<b>Travel Learning</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Pre-requisite</b>	<b>Nil</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>The course is aimed at</p> <ul style="list-style-type: none"> <li>• To travel to a site of historic/social or cultural significance in order to observe, evolve drawing skills appreciate the place and undertake basic documentation.</li> <li>• To complement the on-campus architecture subjects by providing direct personal experiences of built environments, which is an integral part of architectural education</li> <li>• To experience buildings in their context, meet architectural practitioners, visit other architecture programs, and engage in other off-campus activities both nationally and internationally in order to support the undergraduate architecture curriculum and inspire design excellence</li> </ul>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to</p> <p>[1] <b>Develop</b> knowledge, awareness and understanding of contexts of architectural development from a theoretical and historical standpoint.</p> <p>[2] <b>Develop</b> the ability to critically evaluate and contribute to any discussion on architectural theory/history.</p> <p>[3] <b>Develop</b> knowledge, understanding and awareness of historical development of structures, construction systems and elements leading to contemporary concerns.</p> <p>[4] Ability to <b>apply</b> understanding of historical precedent toward contemporary issue.</p> <p>[5] <b>Display</b> an ability to analyse built form in respect of historic context and display an understanding of research methodologies and the ability to communicate/display findings.</p>					
<b>Module: 1</b>	Discussion of experience of observations	<b>6 Hours</b>			
<b>Module: 2</b>	Basic documentation of way of life.	<b>18 Hours</b>			
<b>Module: 3</b>	Basic documentation of proportion and elements (Drawing and or photography)	<b>18 Hours</b>			
<b>Module: 4</b>	Record of materials and technology	<b>12 Hours</b>			
<b>Module: 5</b>	Interviews with community.	<b>12 Hours</b>			
<b>Module: 6</b>	To prepare a set of basic drawings and project reports with photographs recording the social, cultural, historic context.	<b>54 Hours</b>			
<b>Total Lecture Hours</b>					<b>120 Hours</b>
<b>Reference Books</b>					
1.	Morris, I.H. Geometrical Drawing for Art Students.				
2.	Bhatt, N.D. and Panchal V.M. Engineering Drawing: Plane and Solid Geometry, 42nd ed. Charotar Pub., Anand, 2000				
Recommended by Board of Studies		21/2/2022			
Approved by Academic Council		<b>No. 66</b>	Date	16-6-2022	



BARC312L	Theory of Landscape Design	L	T	P	C
		3	0	0	3
<b>Pre-requisite</b>	<b>BARC203L: Site planning and Landscape</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
<p>The course is aimed at</p> <p>[1] Providing an experiential understanding of practical Landscape design challenges.</p> <p>[2] Design solutions which empower the students to develop a holistic perspective towards Landscape Design.</p>					
<b>Expected Course Outcome:</b>					
<p>At the end of the course the student should be able to</p> <p>[1] Understand the evolution of gardens and Landscape design theory with examples from around the globe.</p> <p>[2] apply design theory to solve practical issues along with achieving proficiency in producing conceptual designs &amp; basic design detailing.</p> <p>[3] Provide knowledge about the industry standards in the use of digital presentation means for Analysis and designing purposes.</p>					
<b>Module: 1</b>	<b>Landscape design and its theoretical design</b>	<b>3 Hours</b>			
Introduction to understanding of landscape design and its theoretical design aspects to be considered.					
<b>Module: 2</b>	<b>Hard and Soft Landscape</b>	<b>11 Hours</b>			
Hard and Soft Landscape, Material of Construction, Types of vegetation - colour - scale - proportion - light and shade effect - and its image ability creation / user - experience factors					
<b>Module: 3</b>	<b>Cultural aspects of the landscape architecture</b>	<b>10 Hours</b>			
Cultural aspects of the landscape architecture with contextual understanding - history of landscape architecture and its theoretical aspect behind its design.					
<b>Module: 4</b>	<b>Scenic beauty of landscape design</b>	<b>4 Hours</b>			
Scenic beauty of landscape design and its various theoretical aspects.					
<b>Module: 5</b>	<b>Urban &amp; regional landscape</b>	<b>5 Hours</b>			
Urban & regional landscape characteristics					
<b>Module: 6</b>	<b>landscape setting</b>	<b>4 Hours</b>			
The characteristics of landscape setting and its intended outdoor activities, design elements contributing to different user experiences.					
<b>Module: 7</b>	<b>Sustainability and landscape Architecture</b>	<b>5 Hours</b>			
Sustainability and landscape Architecture - the indigenous aspect of landscaping					



<b>Module: 8</b>	<b>Simulation technologies in landscape design</b>	<b>3 Hours</b>
Simulation and simulation technologies available for user experience during design stage and the latest best practices in profession to showcase landscape design.		
<b>Total Lecture Hours</b>	<b>45 Hours</b>	
<b>Reference Books</b>		
	<ol style="list-style-type: none"><li>1. Theory in landscape architecture: a reader (penn studies in landscape architecture).</li><li>2. Landscape architecture theory: an evolving body of thought Feb 1, 2005 by Michael d. Murphy</li><li>3. Landscape as Urbanism: A General Theory by Charles Waldheim</li><li>4. Landscape architecture design theory and methods: Modern, Postmodern &amp; Post-postmodern, including Landscape... Feb 14, 2014 by Tom Turner, Geoffrey and susan jellicoe, the landscape of man, Thames and Hudson,1987</li><li>5. Cliff tandy hand book of urban landscape, the architectural press, London, 1971</li><li>6. John I. motloch, introduction to landscape design, 2nd edition, John Wiley &amp; sons, 2001</li></ol>	
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test		
Recommended by Board of Studies	21/2/2022	
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<b>BARC414P</b>	<b>Introduction to Computational Design and Digital Fabrication</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>Pre-requisite</b>	<b>BARC210P: Advanced Digital Graphics–Skill Development</b>	<b>Version</b>			
		1.0			
<b>Course Objectives:</b>					
1.	The course is aimed at introducing the students to digital fabrication and the underlying basics of computational design. All students should be able to think in 3D, to translate their ideas and designs into digital drawings and models, and develop a clear understanding of fabrication and construction as well as structural stability of their designs. This knowledge will be fundamental and applicable to their design skills throughout all subsequent design studios. This will be a studio and lab-based course supported by a few introductory lectures and software tutorials.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	To be able to design, digitally model and fabricate basic to complex geometries				
2.	To analyse the differences between various fabrication techniques and their applications				
3.	To understand how to operate laser cutting machine and CNC				
<b>Module: 1</b>	<b>Introduction</b>	<b>10 Hours</b>			
Introduction to computational design and parametric architecture					
<b>Module: 2</b>	<b>Analog and Digital Models</b>	<b>8 Hours</b>			
Translation of analog aggregation models of Fractals Workshop into digital models and manipulation/evolution					
<b>Module: 3</b>	<b>Introduction to Laser Cutting</b>	<b>8 Hours</b>			
Lab Demo: Use of laser cutter Laser cutting of preset, overlapping screen/jali patterns; laser cutting and assembly of basic units resulting in aggregation systems					
<b>Module: 4</b>	<b>Advanced Grasshopper Workshop-I</b>	<b>6 Hours</b>			
Software Tutorial: Advanced Grasshopper Workshop Studio Exercise: Digital modelling of complex geometries in Rhino using transform tools, contour command					
<b>Module: 5</b>	<b>Advanced Grasshopper Workshop-II</b>	<b>8 Hours</b>			
Software Tutorial: Advanced Grasshopper Workshop Studio Exercise: Digital modelling of complex geometries in Rhino using transform tools, contour command					
<b>Module: 6</b>	<b>2D forms to 3D</b>	<b>6 Hours</b>			
Slicing and overlap of 2D patterns using laser cutter to form shikharas and domes; slicing of complex and doubly-curved geometries using laser cutter and assembly					
<b>Module: 7</b>	<b>Introduction to Modeling with CNC Machine</b>	<b>10 Hours</b>			
Lab Demo: Introduction of CNC machine and its use in cutting of engineered wood+Major Studio and Lab Exercise: Design, 3D modeling and digital fabrication of a furniture piece in plywood using CNC cutting (group work)					





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<b>Module: 8</b>	<b>Hands on workshop</b>	<b>4 Hours</b>	
Guest Lecture /Workshop by external expert			
<b>Total Lecture Hours</b>		<b>60 Hours</b>	
<b>Reference Book (s)</b>			
1.	Aranda, B., Lasch, C. "Tooling," Pamphlet Architecture 27, Princeton Architectural Press 2006		
2.	Leach, N., Menges, A., & Yuan, P. "Digital Fabrication," Tongji University Press 2018		
3.	Beorkrem, C. "Material Strategies in Digital Fabrication," Routledge 2013		
4.	Escher, M. C. "The Graphic Work," Taschen 1989		
5.	Rao, R. "Science and Golden Ratios in Mandala Architecture," Contours of Indian Art and Architecture, No. 6, D. K. PrintWorld 2011		
6.	Sutton, D. "Islamic Design: A Genius for Geometry," Wooden Books 1999		
7.	Broug, E. "Islamic Geometric Design," Thames & Hudson 2013		
8.	Nakamichi, T. "Pattern Magic," 2010		
9.	Menges, A. "Material Computation: Higher Integration in Morphogenetic Design Architectural Design", Architectural Design Series, Book 216, Wiley 2012		
10.	Oxman, R. "The New Structuralism: Design, Engineering and Architectural Technologies (Architectural Design)", Architectural Design Series, Book 80, Wiley, Edition 1 2010		
11.	Schodek, Daniel, et al. Digital Design and Manufacturing: CAD/CAM Applications in Architecture and Design. New York, NY: John Wiley & Sons, 2004. ISBN: 9780471456360.		
<b>Mode of Evaluation:</b> Lab Assignments, Final Assessment Test			
<b>Recommended by Board of Studies</b>		21/2/2022	
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### Ability Enhancement Courses

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC314L	Professional Practice and Advanced Construction Management	3	0	0	3	BARC305P
2.	BARC498J	Architectural Internship				12	BARC305P
3.	BARC497J	Architectural Dissertation				02	



<b>BARC314L</b>	<b>Professional Practice and Advanced Construction Management</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>BARC305P: Architectural Design VI: Technical Drawings</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	The course is aimed at: To create awareness regarding the various activities involved in the practice of architecture and the role of professional and statutory bodies including legalities, interdisciplinary relationships and the implications of globalization.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Understand</b> the uniqueness of architectural profession, ethics and associated services				
2.	Get <b>familiarized</b> with the various roles and responsibilities of COA and IIA and various Architectural Design competitions				
3.	<b>Understand</b> the fee structure and legal legislation that are associated with architectural practice				
4.	To <b>demonstrate</b> understanding of legal and documentation practices as applicable to the architectural profession.				
5.	To provide <b>understanding</b> of globalization and relationship with allied professionals.				
<b>Module: 1</b>	<b>Introduction to Architectural Profession</b>	<b>3 Hours</b>			
Role of Architects in Society, Registration as an Architect, Role of the Council of Architecture and the Indian Institute of Architects and salient features of their roles and responsibilities. Introduction to The Architects Act and rules thereof.					
<b>Module: 2</b>	<b>Professional &amp; Regulatory Bodies for Architectural Practice In India, Code Of Conduct And Ethics</b>	<b>6 Hours</b>			
Introducing Architects (Professional Conduct) Regulations, Various stages in the execution of a project and scope of architect's services, fee structures, terms and conditions of engagement as defined by Council of Architecture (COA) and Indian Institute of Architects (IIA)					
<b>Module: 3</b>	<b>Architectural Competitions</b>	<b>3 Hours</b>			
Types of Architectural Competitions- As specified by the COA and other international bodies.					
<b>Module: 4</b>	<b>Tenders and Contracts</b>	<b>9 Hours</b>			
Introduction to tenders, Types of tenders, conditions, preparation of tender documents, tender analysis and bid evaluations recommendations. Introduction to e-tendering and procurement through government, quasi- government and Private entities. Understanding contracts, Articles of Agreement, Terms and Conditions, Bills of Quantities, Specifications, Special conditions.					
<b>Module: 5</b>	<b>Project formulation and management</b>	<b>9 Hours</b>			
Introduction of different types of execution (build operate transfer (BOT), Design build operate transfer (DBOT) , Public Private Partnership project (PPP) etc.). Process of execution-expression of interest (EOI), Request for proposal (RFP). Importance of planning, scheduling and controlling projects, Plan development process, time planning process, work scheduling process, Workflow diagram's structure (WBS) to track project progress, PERT chart and Critical path method.					



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<b>Module: 6</b>	<b>Legal Aspects, Important Legislations</b>	<b>6 Hours</b>
Legal Aspects of Practice, Arbitration-definition, advantages, conduct of arbitration proceedings, arbitration clause in contract agreements. Easements, copyrights and patenting, Consumer Protection Act, Liabilities of Architects under different statutes, professional Indemnity (PI) and other related legal codes. Important legislations and current trends, role of administrative bodies, salient legislation such as Person with Disabilities Act, Coastal Regulation Zone, Heritage conservation and preservation regulations, significance of National building Code		
<b>Module: 7</b>	<b>Globalization &amp; Architectural Profession</b>	<b>6 Hours</b>
Globalization and its impact on the profession, international collaborations, Information Technology and its impact on architectural practice, emerging specializations. Knowledge sharing by practicing architects and allied professionals from both India and abroad. Procedure for setting up Office for independent practice and other legal formalities		
<b>Module: 8</b>	<b>Architects and allied professionals.</b>	<b>3 Hours</b>
Knowledge sharing by practicing architects and allied professionals from both India and abroad.		
<b>Total Lecture Hours</b>		<b>45 Hours</b>
<b>Reference Book (s)</b>		
1.	Architects Act, 1972	
2.	Architects (Professional Conduct) Regulations 1989	
3.	National Building Code 2016	
4.	Handbook on Professional Practice by IIA	
5.	Publications of Council of Architecture (COA)	
6.	Architectural Practice and Procedure by V.S.Apte, 2008	
7.	Consumer Protection Act, 2011.	
8.	Factories Act, 1948	
9.	Persons with Disabilities Act, 1995	
10.	The Arbitration and Conciliation Act, 1996	
11.	Environment Protection Act, 1986	
12.	The Ancient Monuments and Archaeological sites and Remains Act, 1958 (amended In 2010)	
13.	Coastal Regulation Zone Notification 2019	
14.	P. S. Gehlot, Construction Planning and Management, New Age International Publishers; Second edition (1 January 2018)	
15.	Srinath, L.S., PERT and CPM Principles and Applications, 3rd ed. Affiliated East-West Press, New Delhi, 2003.	
<b>Mode of Evaluation:</b> Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test		
<b>Recommended by Board of Studies</b>	21/2/2022	
<b>Approved by Academic Council</b>	<b>No. 66</b>	Date 16-6-2022



<b>BARC498J</b>	<b>Architectural Internship</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		0	0	0	12
<b>Pre-requisite</b>	<b>BARC305P: Architectural Design VI: Technical Drawings</b>	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
To expose students to the management of execution of projects in a real-time professional working environment from conceptualization to realization through a process of involvement with concept processes, working drawings, documentation of works and realization of construction goals.					
<b>Expected Course Outcome:</b>					
Students will be able					
<ol style="list-style-type: none"> <li><b>Apply</b> the nomenclature, graphics symbols, formats, conventions and compositional clarity associated with architectural drawings, models and reports.</li> <li><b>Understanding</b> statutory documentation pertinent to architectural projects</li> <li><b>Understand</b> office administrative practices and protocols.</li> <li><b>Develop</b> collaborative working skills.</li> <li><b>Understand</b> the relationships between architectural design and site execution.</li> </ol>					
<b>Module: 1</b>	<b>Office Management Practices</b>				
Adhere to regulated office management practices.					
<b>Module: 2</b>	<b>Drawing Preparation</b>				
Carry out instructions related to drawing preparation					
<b>Module: 3</b>	<b>Team Work</b>				
Contribute to team activities.					
<b>Module: 4</b>	<b>Project Meetings and Discussion</b>				
Participate in client and vendor meetings and discussions.					
<b>Module: 5</b>	<b>Site Visits and Supervision</b>				
Understand site activities and contribute in supervisory exercises.					
<b>Module: 6</b>	<b>Report Preparation</b>				
Learn to prepare minutes of meetings and reports.					
<b>Total Lecture days</b>					<b>100</b>
Mode of evaluation: Continuous Assessment, Final Assessment Test					
Recommended by Board of Studies		21/2/2022			
Approved by Academic Council		<b>No. 66</b>	Date	16-6-2022	



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BARC497J	Architectural Dissertation	L	T	P	C	
		-	-	-	2	
Pre-requisite	Nil	<b>Version 1.0</b>				
<b>Course Objectives:</b>						
1.	Understand the role of research within the profession of architecture					
2.	To create a thriving research environment where the students are more conscious of the current research methods / process through multiple experiences of reading, discussing and writing.					
3.	To understand the need of the systematic process of abstraction, with a rigor of scientific and qualitative analysis.					
4.	To increase the student ability to collect, interpret and disseminate data for research.					
5.	To develop students ability in writing a report					
6.	To recognize inter-disciplinary research methods and develop a foundation for thesis and future research					
<b>Expected Course Outcome:</b> At the end of the course the student should be able to						
1.	Students should be able to <b>understand</b> the overall process of designing a research study from its inception to its report.					
2.	Students should be <b>familiar</b> with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research					
3.	<b>Appreciate</b> the components of scholarly writing and evaluate its quality.					
4.	Present the <b>analysis</b> and the outcomes of the research study through a short report exhibiting standards of technical writing					
<b>Overview of Dissertation</b>						
<p>Architectural Dissertation will be part of the course work for 8th semester (Winter semester). This course should be seen as a precursor to the architectural thesis project to be executed in semester 10 and ideally directed toward enriching its output.</p> <p>As a result of the global corona outbreak, the department has suspended the internship program and shifted it to 9th-semester program from the 8th semester to mitigate this challenge.</p> <p><b>Supervisory Structure:</b> From the available faculty pool of 10, each faculty will be guiding approximately 4 students. The allotment can vary based on the available strength of faculty and students.</p> <p><b>Class Contact Hours</b> The study program shall be based on a mutually agreeable schedule between the students and supervisors.</p> <p><b>Mode of Delivery</b> Discussion between student and assigned supervisor, either in person or virtually.</p>						
<b>Module: 1</b>	<b>Introduction to Research</b>					
Overview to the nature and purpose of the research process, different types of research, identifying a research topic and setting research objectives; developing a research strategy; characteristics of a good research project; ethical issues in conducting research.						
<b>Module: 2</b>	<b>Research Formulation and Design</b>					
Philosophies and the language of research theory building –the meaning of methodology, defining and identifying the research problem, purpose of the research, formulation of the research hypotheses, choosing the research strategy and methods.						



<b>Module: 3</b>	<b>Reviewing the Literature</b>		
Searching, evaluating, organizing and synthesizing the relevant literature; and, writing a literature review and managing bibliographic records. In addition, developing research questions for qualitative and quantitative research; and identifying characteristics/attributes			
<b>Module: 4</b>	<b>Researching and Data Collection</b>		
Methods of data collection – Form primary sources: observation and recording, interviews, Field research, and Survey research, questionnaire design; populations, samples, and sampling method			
<b>Module: 5</b>	<b>Processing and analysis of data</b>		
Analysing and interpreting the data and identifying the issues and summarizing and visualizing data sets; finding trends in data and formulating a research hypothesis.			
<b>Module: 6</b>	<b>Interpretation and Tabulation</b>		
Re-writing a research proposal, discussing findings, formulating conclusions, making recommendations.			
<b>Module: 7</b>	<b>Report Writing</b>		
Research writing in general – Layout of a research paper, Components: referencing – writing the bibliography – developing the outline – presentation; Ethical issues related to Plagiarism			
<b>Module: 8</b>	<b>Viva -Voce</b>		
Presentation of students work to the Panel members			
<b>Total Lecture Hours</b>			
<b>Text Book(s)</b>			
1.	David Wang, Groat Linda (2002), Architectural research Methods, Wiley Publication.		
2.	Niezabitowska, E.D (2018), Research Methods and Techniques in Architecture, Taylor and Francis, RIBA Books		
3.	Anthony, M., Graziano, A.M. and Raulin, M.L., 2009. Research Methods: A Process of Inquiry, Allyn and Bacon.		
<b>Reference Book (s)</b>			
1.	Clark, Roy Peter. Writing Tools: 50 Essential Strategies for Every Writer (2006)		
2.	MLA Handbook for Writers of Research Papers (7th ed.; 2009)		
3.	Fink, A., 2009. Conducting Research Literature Reviews: From the Internet to Paper. Sage Publications		
4.	Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Re- search Methodology, RBSA Publishers.		
<b>Mode of Evaluation:</b> Intermediate reviews with final manuscript and presentation / Seminar			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022



## Discipline Electives

S. No.	Course Code	Course Title	L	T	P	C	Prerequisite
1.	BARC110P	Introduction to Digital Graphics	0	0	4	4	NIL
2.	BARC210P	Advanced Digital Graphics: Skill Development	0	0	4	4	BARC110P
3.	BARC423L	Architectural Entrepreneurship	2	0	0	2	NIL





<b>BARC110P</b>	<b>Introduction to Digital Graphics</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>			
<b>Course Objectives:</b>					
1.	The course is aimed at equipping students with significant understanding of relevant digital software. Instill the role and importance of digital technologies in architectural design process. Developing familiarity of interface of different software program and their applications.				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	Convert architectural ideas into drawings using digital software				
2.	Understand and evaluate the spatial quality of a building using digital simulation tools				
3.	Compose and present architectural ideas in an effective format.				
<b>Module: 1</b>	<b>Introduction to architectural simulation</b>	<b>4 Hours</b>			
Introduction to computers - getting hands on familiarity with software's related to architectural simulation - the need and scope of using computers in architectural simulation.					
<b>Module: 2</b>	<b>Digital Software</b>	<b>16 Hours</b>			
Digital Software like AUTOCAD - understanding various aspects of drawing tools, edit tools, dimensioning, scaling, layers, color codes, printing etc.					
<b>Module: 3</b>	<b>Visualization software</b>	<b>12 Hours</b>			
Visualization software like SketchUp - Understanding 3d creation, editing tools, materials, basic rendering using sketch up. Converting files into various rendering software formats.					
<b>Module: 4</b>	<b>Presentation software</b>	<b>12 Hours</b>			
Presentation software like PHOTOSHOP AND RENDERING PLUGINS -					
<b>Module: 5</b>	<b>Options in visualization software</b>	<b>12 Hours</b>			
Exploring various other visualization software's for 3d creation and presentation.					
<b>Module: 6</b>	<b>Best practices in computer graphics.</b>	<b>4 Hours</b>			
<b>Total Lecture Hours</b>					<b>60 Hours</b>
<b>Reference Book (s)</b>					
1.	Bark, S.. An Introduction to Adobe Photoshop. Ventus Publishing ApS, Sheffield. (2012)				
2.	Gindis, E. Up and Running with AutoCAD 2015: 2D & 3D Drawing and Modelling. Oxford : Elsevier. (2014)				
3.	Seidler, D. R. Digital Drawing for Designers: A Visual Guide to AutoCAD 2012. London				
4.	Smith, B. L. 3ds Max Architectural Visualization Beginner to Intermediate. Sarasota : 3DATS. (2007)				
<b>List of Challenging Experiments (Indicative)</b>					
1.	Design and draft the technical drawings of a 3 BHK house for a plot area of 240sqm with proper line weights and standards.				<b>24 Hours</b>
2.	Design a restaurant a plot area of 450 sqm, prepare 3D views, walk throughs and marketing drawings.				<b>24 Hours</b>



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<b>Mode of Evaluation:</b> Continuous Assessment , Final Assessment Test			
<b>Recommended by Board of Studies</b>	21/2/2022		
<b>Approved by Academic Council</b>	<b>No. 66</b>	<b>Date</b>	16-6-2022



BARC210P	Advanced Digital Graphics: Skill Development	L	T	P	C
		0	0	4	4
Pre-requisite	BARC110P: Introduction to Digital Graphics	Version 1.0			
<b>Course Objectives:</b>					
1.	The course is aimed to familiarize students with building modelling and visualization software applied to architectural design solutions				
<b>Expected Course Outcome:</b> At the end of the course the student should be able to					
1.	<b>Examine</b> Conceptual and basic Massing studies using 3D computer applications.				
2.	<b>Develop</b> drawings with application software relevant to architectural design studio and investigation of gaming exercises in the digital domain to realize optimal outputs in applied situations				
3.	<b>To create</b> integrated design documents by taking full advantage of the building model. Integration of practical exercises along with the design studio projects.				
<b>Module: 1</b>	<b>Introduction to Revit Architecture</b>	<b>12 Hours</b>			
Starting an Architectural Project, Navigation Tools, Creating Architectural Walls, Basic Building Components, Editing Tools, Planes and Creating Standard Views, floors, roofs, staircases.					
<b>Module: 2</b>	<b>Revit Architecture Tools</b>	<b>12 Hours</b>			
Site Features, Understanding Massing Concepts, Creating Massing Geometry, Annotations and Dimensions, Rendering to Walkthroughs, Creating Drawing Sheets and Plotting.					
<b>Module: 3</b>	<b>Introduction to Rhino</b>	<b>8 Hours</b>			
Introduction to Rhino, interface and creating Lines, curves, 3d modelling with Nurbs and surfaces, nurbs typologies, surface continuity, solids and meshes, editing Geometry, point editing.					
<b>Module: 4</b>	<b>Advanced tools in Rhino</b>	<b>12 Hours</b>			
Lofting and editing, create deformable shapes, Split surfaces with curves and surfaces, Blend between two surfaces, Lighting and rendering, create solid primitives and solids text, Extruding, Booleans, Lofting, Revolving, and Sweeping.					
<b>Module: 5</b>	<b>Introduction to Grasshopper</b>	<b>8 Hours</b>			
Introduction to Grasshopper, parametric modelling using grasshopper, parameters, and components, imputing parameters, using of math and expressions, Meshes and their use in architecture, generative surfaces					
<b>Module: 6</b>	<b>Advanced tools in Grasshopper</b>	<b>8 Hours</b>			
Advanced object array, transformation basics, Algorithmic transformations, using morphing in Grasshopper, Data Tree, Curves and Surfaces - Analyzing curve and surface data, working with surface spheres, representing 3D geometry with polygon meshes, etc					
<b>Module: 7</b>	<b>Professional inputs on Project Presentation using advanced software.</b>	<b>4 Hours</b>			
<b>Total Lecture Hours</b>					<b>60 Hours</b>
<b>Text Book(s)</b>					
1.	Revit 2020 for Architecture: No Experience Required by Eric Wing, January 2020				
2.	The Aubin Academy Revit Architecture by Paul F Aubin Foreword by Ms Lynn Allen Edited by Stafford Steve, G3B Press. 2015				
3.	Rhinoceros Visualisation & Rendering: A guide to using Rhino 6 & Grasshopper for 3D rendering by Sim Pern Chong, 2018				



4.	Grasshopper: Visual Scripting for Rhinoceros 3D (Volume 1) First Edition by Prof. David Bachman, 2017		
<b>List of Challenging Experiments (Indicative)</b>			
1.	Design a 3BHK residence using Revit architecture – Plans, Elevations, Sections, Detailing etc.		8 Hours
2.	Designing a pavilion using Rhino and use the editing tools in the Rhino.		8 Hours
3.	Using grasshopper, a plugin tool to rhino – use parametric approach in the pavilion design.		8 Hours
4.	Design a façade using the rhino and grasshopper software.		8 Hours
<b>Mode of Evaluation:</b> Continuous Assessment, Final Assessment			
<b>Recommended by Board of Studies</b>		21/2/2022	
<b>Approved by Academic Council</b>		<b>No. 66</b>	Date 16-6-2022



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BARC423L	Architectural Entrepreneurship	L	T	P	J	C
		2	0	0	0	2
<b>Pre-requisite</b>	Nil	<b>Version 1.0</b>				
<b>Course Objectives:</b>						
<p>2. To provide guidance to students pursuing entrepreneurship opportunities in the architectural and allied professions.</p> <p>3. The coursework will entail sessions with experts in the respective domains besides academic overviews.</p>						
<b>Expected Course Outcome:</b>						
<p>At the end of the course the student should be able to</p> <p>[1] Differentiate between entrepreneurship versus paid employment and types of companies.</p> <p>[2] Understand components involved in the starting an architectural entrepreneurship in Indian</p> <p>[3] Understand components associated with architectural entrepreneurship ecosystem.</p>						
<b>Module: 1</b>		<b>4 Hours</b>				
An introduction to entrepreneurship versus paid employment. The directions ahead for young professionals. Basic concepts of partnerships, proprietorships, private and public limited companies.						
<b>Module: 2</b>		<b>4 Hours</b>				
Legal aspects of becoming an architectural entrepreneur in the Indian environment. Statutory requirements and formalities, Insurance, taxation, documentation and records. Special statutes pertaining to the architectural profession.						
<b>Module: 3</b>		<b>4 Hours</b>				
The concept of workspace-shared workspace. Outreach-the use of social media and marketing platforms.						
<b>Module: 4</b>		<b>4 Hours</b>				
Setting up an establishment-capital and revenue studies, planning for business, review of strategy, tapping of lateral opportunities, SWOC studies.						
<b>Module: 5</b>		<b>4 Hours</b>				
Time management-the role of clients, contractors and service providers						
<b>Module: 6</b>		<b>4 Hours</b>				
The skills of architectural presentation and the management of project delivery.						
<b>Module: 7</b>		<b>4 Hours</b>				
Scaling up and planning for the future						



<b>Module: 8</b>		<b>2 Hours</b>	
Discussions on contemporary professional trends.			
<b>Total Lecture Hours</b>		<b>45 Hours</b>	
<b>Reference Books</b>			
8.	H.Nandan, Fundamentals of Entrepreneurship, PHI, 3rd Edition 2013		
9.	Rajeev Roy, Entrepreneurship, Oxford, 2nd edition 2011		
Mode of evaluation: Continuous Assessment Test, Quizzes, Assignments, Final Assessment Test			
Recommended by Board of Studies	21/2/2022		
Approved by Academic Council	<b>No. 66</b>	Date	16-6-2022



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