

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL

DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

THIRD to TENTH
SEMESTER COURSE DETAILS

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THIRD TO TENTH SEMESTER- LIST OF COURSES

SEMESTER-3						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 030101	Architectural Design III	8	800	-	VV
2	BARC 030103	Building Materials and Construction III	5	500	WR	VV
3	BARC 030105	Computer as Tool in Architecture	2	200	-	VV
4	BARC 030102	Climate Responsive Architecture	3	300	WR	-
5	BARC 030104	Reinforced Cement Concrete I	3	300	WR	-
6	BARC 030106	History of Architecture II	2	200	WR	-
ELECTIVES COURSES						
7	BARC 0301E3	Anyone from the list- 3 rd and 4 th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

SEMESTER-4						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 040101	Architectural Design IV	8	800	-	VV
2	BARC 040103	Building Materials and Construction IV	5	500	WR	VV
3	BARC 040102	Electrical, Lighting and Fire Safety	2	200	WR	-
4	BARC 040104	Water Supply and Sanitation	3	300	WR	-
5	BARC 040106	Steel Structures	3	300	WR	-
6	BARC 040108	Contemporary Architecture	2	200	WR	-
ELECTIVES COURSES						
7	BARC 0401E4	Any one from the list-3 rd and 4 th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

3 rd and 4 th semester Elective Courses		
COURSE CODE	COURSES	
BARC 0301E3/ BARC 0401E4	A. Art Appreciation	
	B. Mix Media and Visual Communication	
	C. Built Environment and Behavioural Studies	
	D. Vernacular Architecture	
	E. MOOC/ SWAYAM/NPTEL/Other Equivalent Online Course	
	F. Skill Enhancement Elective by Department	
* Minimum 10 and Maximum 25 students will be registered in each elective offered for courses above		

SEMESTER-5						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 050101	Architectural Design V	8	800	-	VV
2	BARC 050103	Building Materials and Construction V	5	500	WR	VV
3	BARC 050105	Working Drawing I	4	400	-	VV
4	BARC 050102	HVAC and Acoustics	2	200	WR	-
5	BARC 050104	Structural concept in Architecture	2	200	WR	-
6	BARC 050106	Site Planning and Landscape Architecture	2	200	WR	-
ELECTIVES COURSES						
7	BARC 0501E5	Any one from the list- 5 th and 6 th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

SEMESTER-6						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 060101	Architectural Design VI	8	800	-	VV
2	BARC 060103	Working Drawing II	4	400	-	VV
3	BARC 060102	Estimation, Costing, and Specifications	3	300	WR	
4	BARC 060104	Energy Efficient Architecture	3	300	WR	-
5	BARC 060106	Theory of Design	2	200	WR	-
6	BARC 060108	Housing	3	300	WR	-
ELECTIVES COURSES						
7	BARC 0601E6	Any one from the list- 5 th and 6 th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

5 th and 6 th semester Elective Courses		
COURSE CODE	COURSES	
BARC 0501E5/ BARC 0601E6	A. Advance Computer Application, BIM, AI	
	B. Disaster Responsive Architecture	
	C. Low-Cost Building Techniques	
	D. Intelligent Buildings and automation	
	E. MOOC/ SWAYAM/NPTEL/Other Equivalent Course	
	F. Elective by department/industry Expert	
	G. Project-based Elective	
* Minimum 10 and Maximum 25 students will be registered in each elective offered for courses above		

SEMESTER-7						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 070101	Architectural Design VII	10	1000	-	VV
2	BARC 070103	Architectural Research Methods	4	400	-	VV
CHOOSE ANY THREE FROM SR. NO. 3,4,5, AND 6						
3	BARC 070102	Inclusive Design	3	300	WR	VV
4	BARC 070104	Project Formulation and Appraisal	3	300	WR	-
5	BARC 070106	Settlement Pattern and Planning	3	300	WR	-
6	BARC 070108	Retail and Interior Design	3	300	WR	VV
ELECTIVES COURSES						
8	BARC 0701E7	Any one from 7th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

7th semester Elective Courses		
COURSE CODE	COURSES	
BARC 0701E7	A. Product Design and Prototyping	
	B. Architectural Journalism	
	C. Non-conventional Materials and Techniques	
	D. MOOC/ SWAYAM/NPTEL/Other Equivalent Course	
	E. Elective by department/industry Expert	
	F. Project-based Elective	
* Minimum 10 and Maximum 25 students will be registered in each elective offered for the course A-F.		

SEMESTER-8							
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation		
					WR	VV	TP
COMPULSORY CORE COURSES							
1	BARC 080101	Professional Training	25	2500	-	VV	-
TOTAL			25	2500			

SEMESTER-9						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 090101	Architectural Design IX	10	1000	-	VV
2	BARC 090103	Thesis Programming	4	400	-	VV
CHOOSE ANY THREE FROM SR. NO. 3,4,5, AND 6						
3	BARC 090102	Architectural Conservation	3	300	WR	-
4	BARC 090104	Urban Design	3	300	WR	-
5	BARC 090106	Construction Project Management	3	300	WR	-
6	BARC 090108	Advance Landscape	3	300	WR	-
ELECTIVES COURSES						
8	BARC 0901E9	Anyone from 9 th and 10 th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

SEMESTER- 10						
Sr. No.	COURSE CODE	COURSES	CREDIT	MARKS	End Semester Evaluation	
					WR	VV
COMPULSORY CORE COURSES						
1	BARC 100101	Architectural Thesis	20	2000	-	VV
2	BARC 100102	Professional Practices	3	300	WR	-
ELECTIVES COURSES						
3	BARC 1001E10	Anyone from 9 th and 10 th semester Elective Courses	2	200	VV	
TOTAL MARKS				2500		
	TOTAL CREDITS		25			
	TOTAL CONTACT HOURS		25			

9 th and 10 th semester Elective Courses	
COURSE CODE	COURSES
BARC 0901E9/ BARC 1001E10	A. Sustainable Architecture
	B. Digital Design and Fabrication
	C. Integration of GIS in Architecture and Planning
	D. Disaster Resilience
	E. MOOC/SWAYAM/NPTEL/Other Equivalent Course
	F. Flexible Elective by department/industry Expert
	G. Common Pool Elective (Only available for 9 th semester)
* Minimum 10 and Maximum 25 students will be registered in each elective offered for courses above	

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL

DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

THIRD SEMESTER COMPULSORY CORE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03	BARC 030101	Architectural Design III	8	1	0	3	4
Course Overview: This studio course explores the design complexities of low-rise, small-scale buildings, with a focus on the interaction between interior and exterior spaces and their immediate physical context. Students will enhance their ability to conceptualize and develop architectural designs that are not only functional but also climate-responsive, taking into account the environmental and socio-cultural aspects of the site. The studio may be integrated with parallel courses such as Climate Responsive Architecture, History of Architecture, and/or relevant electives, offering a holistic approach to the architectural design process. The sequence of modules may be adjusted to align with the design objectives. Suggested typologies include: residences, community centers, Anganwadi, and primary health centers.							
Learning Outcomes: Upon successful completion of this course, students will: • Develop a sensitivity towards the existing physical context, including both built and unbuilt environments. • Understand the analysis of physical settings and apply this understanding to the design process. • Apply climate-responsive techniques in the design of small-scale, low-rise buildings. • Analyze climate data and develop passive design strategies for small-scale buildings. • Integrate aesthetic, functional, and structural considerations into comprehensive architectural designs.							
Module 1:		Development of Narrative and Study of Context and Physical Settings					
		Module Contents • In this module, students will create a design narrative based on the understanding of the user(s), environmental factors, and the relationship between the site and its context. The narrative will connect these elements, allowing students to develop a deeper understanding of the user's needs, cultural influences, and environmental conditions. • Students will conduct an in-depth study of the site's context, focusing on both built and unbuilt spaces, and identify the key attributes of the physical environment, such as topography, vegetation, and local climate. Key tasks of this module will include: • Basic site analysis and observation of contextual elements • Development of a design narrative integrating user needs and environmental factors.					
Module 2:		Identification of Specific Design Objectives in Alignment with User Program and Analysis of Physical Settings					
		Module Contents • This module focuses on translating the design narrative into specific design objectives that align with the user program. Students will analyze the site's topography, climate data, and spatial requirements emerging from activities such as circulation, functionality, and aesthetic needs. • This module will also emphasize the design's integration with the local climate, focusing on building orientation, materiality, and climate-responsive solutions that shape the architectural form and spatial arrangement.					

Module 3:	Schematic Design				
	Module Contents - This stage will emphasize the development of ideas for the form, function, and spatial organization of both the built and unbuilt spaces. Students will consider material choices, structural concepts, and the integration of climate-responsive strategies. - The schematic design will explore how passive design techniques—such as natural ventilation, solar orientation, and the thermal behavior of materials—can be incorporated into the design to enhance both sustainability and user experience.				
Module 4:	Design Development with Details of Form, Function, Material, and Construction Techniques				
	Module Contents - The final module focuses on the refinement and detailed development of the design. Students will develop their schematic design into a comprehensive proposal, including detailed drawings such as floor plans, elevations, and sections. - These drawings will depict the relationships between interior and exterior spaces, with special attention to materiality, vertical and horizontal circulation, and construction techniques. Students will also explore how these design elements work together to support the overall architectural concept while addressing functional, aesthetic, and environmental concerns.				
Note: - Students may start with hand sketches to explore initial ideas and concepts. This will allow for spontaneity and the exploration of form, function, and space without restrictions. - Physical models (study models) built using basic materials (paper, cardboard, foam, wood, clay, etc.) should be used to represent overall massing and volume, and to visualize and refine spatial relationships. - Manual handwork and physical modeling in the conceptual stages may be followed by the use of software tools for technical refinement, analysis, and visualizations.					
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
- Learning Resources/References - Rudofsky, B. (1964). Architecture without architects: An introduction to non-pedigreed architecture. Museum of Modern Art. - Brown, G. Z., and DeKay, M. (2014). Sun, wind, and light: Architectural design strategies (3rd ed.). John Wiley and Sons. - Alexander, C., Ishikawa, S., and Silverstein, M. (1977). A pattern language: Towns, buildings, construction. Oxford University Press. - Ching, F. D. K. (2023). Architecture: Form, space, and order (5th ed.). John Wiley and Sons. - Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A., and Szokolay, S. V. (2010). Manual of tropical housing and building: Climatic design. University Press.					

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Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
3	BARC 030103	Building Materials and Construction III	5	1	0	2	2
Course Overview: This course builds on students' existing knowledge of temporary structures and basic building elements, deepening their understanding of construction using timber and steel. It explores the application of timber in components such as roofs, floors, walls, doors, windows, and partitions, along with the study of relevant joinery details. The course also covers the use of steel in architectural elements like columns, beams, slabs, walls, doors, and roofs. Emphasis is placed on familiarizing students with these fundamental materials and their construction systems, while encouraging integration of this knowledge into architectural design projects for practical and informed application.							
Learning Outcomes: - To demonstrate a comprehensive understanding of the application of timber in various building elements. - To illustrate and interpret timber joinery details for architectural components. - To explain the use of steel in building elements and its integration into architectural systems. - To evaluate and compare the properties, advantages, and limitations of timber and steel as building materials. - To integrate knowledge of construction materials and techniques into architectural design solutions.							
Module 1:		Application of Timber in Building Construction – Timber Walls, Floors, Partitions, and Roofs					
		Module Contents - Timber Walls – Classification of timber walls, paneling systems, and joinery details - Timber Floors – Types of joist systems, decking, and joinery details - Timber Partitions – Paneling and framing, with/without glazing, joinery details - Timber Roofs – Trusses, rafters, joinery details, and structural forms of timber roofs					
Module 2:		Timber Doors and Windows					
		Module Contents - Timber Doors – Types (panel, flush, glazed), joinery details, and fixing methods - Timber Windows – Types (casement, panelled, louvered, pivoted), joinery details, and fittings - Fastenings and ironmongery – Applications in timber and steel doors/windows					
Module 3:		Application of Steel in Building Construction – Steel Columns, Beams, Walls, Floors, and Partitions					
		Module Contents - Steel Columns – Functions, types (rolled sections, built-up), material properties, and connection details - Steel Beams – Roles, types (rolled sections, built-up, box sections), structural behavior, and connection methods - Steel Floors – Steel joists, composite floor systems, decking methods, and connection details - Steel Walls and Partitions – Lightweight steel framing, infill panels, fixing systems, and movable partitions					
Module 4:		Steel Doors and Windows					
		Module Contents					

	- Steel Doors – Types (hollow metal sections, sheeted), fabrication details, and installation methods - Steel Windows – Types (steel casement), fabrication details, and fixing systems - Fastenings and ironmongery – Applications in timber and steel doors/windows				
Module 5:	Timber as a Construction Material, including Engineered Wood, Composite Wood Materials, Cladding, Partition Walls, and Finishing of Timber Module Contents - Basic Understanding and Properties of Timber – Characteristics of timber, including its physical, mechanical, and thermal properties, and its suitability for different construction applications - Engineered Wood – Various types of engineered wood products (e.g., plywood, MDF, LVL), their manufacturing processes, applications, and advantages in construction - Composite Wood Materials – Wood-plastic composites, their properties, uses in construction, and environmental considerations - Timber Partition Walls – Design and construction of timber partition walls, including framing systems, paneling, and acoustic performance - Finishing of Timber – Various finishing techniques including staining, varnishing, and painting, and their impact on durability, aesthetics, and maintenance				
Module 6:	Steel as a Construction Material – Composite Steel Materials for Cladding, Roofing, Partition Walls, and Finishing of Steel Module Contents - Basic Understanding and Properties of Steel – Characteristics of steel, including its physical, mechanical, and thermal properties such as strength, ductility, toughness, and corrosion resistance, relevant to construction applications - Types of Steel Used in the Building Industry – Various types of steel (e.g., mild steel, structural steel, stainless steel, galvanized steel, corten steel) and their suitability for different architectural and structural applications - Finishing of Steel – Surface treatment and finishing techniques such as galvanizing, painting, powder coating, and corrosion protection methods to enhance durability and aesthetics				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References - Chudley, R., and Greeno, R. (2016). Building construction handbook (11th ed.). Routledge. - Illston, J. M., and Domone, P. L. (2010). Construction materials: Their nature and behaviour (4th ed.). CRC Press. - McKay, W. B., and McKay, J. K. (2015). Building construction (Vols. 1–4). Routledge. - WoodSolutions.. Technical design guides and resources for timber construction. https://www.woodsolutions.com.au/ - SteelConstruction.info. The free encyclopedia for UK steel construction information. https://www.steelconstruction.info/ - Bureau of Indian Standards. (1994). IS 883:1994 – Code of practice for design of structural timber in buildings (2nd Rev.). - Bureau of Indian Standards. (2011). IS 4990:2011 – Plywood for concrete shuttering work – Specification. - Bureau of Indian Standards. (2011). IS 2062:2011 – Hot rolled medium and high tensile structural steel – Specification. - Bureau of Indian Standards. (2007). IS 800:2007 – General construction in steel – Code of practice. - Bureau of Indian Standards. (1973). IS 1200 (Part 21):1973 – Method of measurement of building and civil engineering works – Part 21: Cladding and metal work.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
03	BARC 030105	Computer as Tool in Architecture	2	1	0	1	0
Course Overview: This course intends to develop a theoretical understanding of various drafting software and their relevance in architecture. Students will acquire skills in 2D drafting using diverse tools and techniques, and learn to generate 3D models from 2D drawings with rendering skills such as material application, lighting, and background settings. The course supports the preparation of presentation drawings and quick generation of 3D rendered views, enhancing students' ability to develop both conceptual and final models in the Design Studio.							
Learning Outcomes: • Develop an understanding of computer-aided drafting. • Comprehend computer-aided drafting and its parameters as tools and their application in architecture. • Demonstrate the concepts of CAD drafting methods and techniques in 2D and 3D through various architectural projects of progressive complexity.							
Module 1:		Introduction to Computer-Aided Drafting Methods and Techniques (Demonstration) – 2D					
		Module content • Introduce computer-aided drafting and establish foundational toolsets and digital workspace configurations. • Develop and execute architectural plans, elevations, and sections using 2D CAD techniques. • Employ advanced manipulation strategies to refine and modify existing architectural drawings in a 2D environment.					
Module 2:		Introduction to Computer-Aided Drafting Methods and Techniques – 3D (Introduction)					
		Module content • tools and systems for 3D modelling in CAD. • Develop and draw various architectural volumes, forms, and surfaces through 2D CAD. • Convert and draw 2D architectural drawings into 3D forms.					
Module 3:		Introduction to Computer-Aided Drafting Methods and Techniques (Demonstration) – 3D					
		Module content • Apply more complex tools and methods to edit drawings in 3D CAD. • Exhibit high-quality presentation drawings, applying material textures and simulating lighting conditions. • Construct a comprehensive set of architectural drawings for a residential unit using 3D CAD methodologies.					
Module 4:		Photorealistic Modelling and Presentation Techniques					
		Module content • Develop precise solid and surface models that embody architectural scale, proportion, and formal elements. • Master camera placement, dynamic viewpoints, and the simulation of natural and artificial lighting, including the interplay of shades, shadows, and daylighting. • Enhance raster-based imagery via adjustments to resolution, tonal quality, and layer management.					

	• Execute compositions using vector-based tools and advanced page layout techniques for coherent architectural communication.
Evaluation: Distribution of % of marks	
Progressive Evaluation	50%
End term Examination	50%
Learning Resources/References	
1. Belec, A. (2023). Photorealistic materials and textures in Blender Cycles. Packt Publishing. 2. Klish, A., and Klish, A. (2020). 3Ds Max: Twenty tips for beginners. Easy Render. 3. Ching, F. D. K. (2015). Architectural graphics (6th ed.). Wiley. 4. Moss, E. (2024). Autodesk AutoCAD Architecture 2025 fundamentals. SDC Publications. 5. French, T. E., and Vierck, C. J. (1993). Engineering drawing and graphic technology (14th ed.). McGraw-Hill. 6. Goetsch, D. L., Chalk, W. S., and Nelson, J. A. (2010). Technical drawing (5th ed.). Delmar Cengage Learning. 7. Osorio, K. (2024). Computer-aided drawing and drafting. Asia Publishers and Distributors.	

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Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
03	BARC 030102	Climate Responsive Architecture	3	2	0	1	0
Course Overview: This course is designed to develop knowledge required to understand the influence of climate on architecture. It aims to acquaint students with the impact of climatic forces on built structures. Students are introduced to various theories and strategies related to building science and different climate zones. The course will enable students to develop an understanding of environment-friendly design. The subject will be taught in congruence with the Design Studio, and assignments will be linked to design exercises to achieve a higher level of learning and practical application.							
Learning Outcomes: • List the different elements of climate and climate zones. • Classify the factors of comfort and define comfort conditions. • Examine thermal comfort levels of built forms using mathematical formulae. • Assess the effects of site, sun, and wind on building response. • Identify unique design requirements according to climate. • Design shelters for different climatic conditions.							
Module 1:		Fundamentals of Climate and Climatic Classifications in Architecture					
		Module Contents • Climate, weather, and elements of climate • Classification of climatic zones – global and national • Climate-balanced architecture					
Module 2:		Bio-Climatic Approach					
		Module Contents • Human comfort – definitions and concepts • Thermal comfort factors and study of the bioclimatic chart and its requirements • Reading of the psychrometric chart and its applicability • Relationship of climatic elements to comfort					
Module 3:		Site and Building Design					
		Module Contents • Site selection, site planning (macro and micro climate) • Building configuration and climate response • Building orientation and placement with the effect of landscaping					
Module 4:		Sun and Building Design					
		Module Contents • Basic principles of heat transfer • Numerical based on heat transfer in buildings • Daylighting and solar control • Thermal insulation					
Module 5:		Wind and Building Design					
		Module Contents • Wind effects and air flow patterns • Ventilation techniques • Air movement around buildings • Stack effect and thermally induced air currents					

Module 6:	Architectural Application				
	Module Contents • Shelter for warm-humid climates • Shelter for hot-dry climates • Shelter for composite climate • Shelter for cold-cloudy and cold-sunny climates • Application of software in climate-responsive design				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Narasimhan, L. (2006). An introduction to building physics. Oxford University Press. 2. Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A., and Szokolay, S. V. (2010). Manual of tropical housing and building: Part I – Climatic design. Universities Press. 3. Krishan, A., Baker, N., Yannas, S., and Szokolay, S. (2001). Climate responsive architecture: A design handbook for energy efficient buildings. Tata McGraw-Hill. 4. Brown, G. Z., and DeKay, M. (2014). Sun, wind, and light: Architectural design strategies (3rd ed.). John Wiley and Sons. 5. Seshadri, T. N. (1985). Climatological and solar data for India. Central Building Research Institute.					

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Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
03	BARC 030104	Reinforced Cement Concrete I	3	2	0	1	0
Course Overview: The course enables students to design simple RCC (Reinforced Cement Concrete) structures and their basic components, such as columns, beams, slabs, and footings. It helps students understand the principles of RC structural systems and their application in subsequent architectural design projects.							
Learning Outcomes: - Students will be able to understand RCC structural systems and apply this knowledge in consecutive architectural design projects. - It will allow students to understand properties of concrete and its usage in different kinds of structures - This will allow students to gain knowledge about the wide range of design possibilities and structural strengths of concrete.							
Module 1:		Structural Design Concepts and Material Properties					
		Module Contents Introduction to concrete technology; composition and properties of concrete; strength and durability; modulus of rupture; creep and shrinkage of concrete. Reinforcing bars – types and grades; stress-strain diagrams of steel and concrete. Concrete mix design: nominal mix and design mix. Design philosophies – Working Stress Method, Limit State Method, and various limit states. Role of admixtures in concrete, honeycombing, cold joints, and high-performance concrete.					
Module 2:		Design for Flexure					
		Module Contents Introduction and assumptions for flexural design. Design of singly reinforced, doubly reinforced, and T-beams using Limit State Method. IS code provisions. Numerical problems.					
Module 3:		Development Length and Shear Bond					
		Module Contents Shear failure of beams; shear reinforcement; curtailment of reinforcement; bond, anchorage, and development length; IS code provisions; reinforcement detailing; numerical problems.					
Module 4:		Design of Compression Members, Slabs, and Staircases					
		Module Contents Short and long columns; IS code provisions; design of short columns under axial compression; design of long columns; use of interaction diagrams; lateral ties; reinforcement detailing; numerical problems. Effective span, one-way and two-way slabs; design of simply supported slabs; reinforcement detailing; numerical problems.					
Module 5:		Design of Footing					
		Module Contents Types of footing; theory of grid flooring and deep beams; isolated footings for rectangular and circular columns; reinforcement detailing; numerical problems.					
Module 6:		Introduction to Pre-Stressed Concrete and Strength Testing					
		Module Contents Introduction to pre-stressed concrete; difference between pre-tensioning and post-tensioning systems; advantages (including historical examples of economically designed					

	structures); basic design concepts of prestressed concrete beams; analysis of prestress and bending stress; resultant stress.	
Evaluation: Distribution of % of marks		
Progressive Evaluation		50%
End term Examination		50%
Learning Resources/References		
- Ramamrutham, S. (2005). Design of reinforced concrete structures: Working stress method. Dhanpat Rai Publishing Company. - Varghese, P. C. (2009). Limit state design of reinforced concrete (2nd ed.). PHI Learning Pvt. Ltd. - Jain, A. K. (2019). Reinforced concrete: Limit state design. Nem Chand and Bros. - Punmia, B. C., Jain, A. K., and Jain, A. K. (2016). Reinforced concrete structures (RCC). Laxmi Publications.		

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03	BARC 030106	History of Architecture II	2	2	0	0	0
Course Overview: Indian architecture reflects a dynamic interplay of indigenous traditions and external influences, shaped by millennia of cultural exchange. This course examines its chronological development—from the Vedic era to the 19th century, situating it within the broader context of global architectural history.							
Learning Outcomes: By the end of this course, students will: - Gain a structured understanding of India's architectural evolution. - Develop analytical tools to assess historical design and construction methods. - Recognize the socio-cultural and geopolitical factors influencing architectural developments.							
Module 1:		Introduction to Indian History and Buddhist Architecture					
		Module Contents A brief overview of Indian history from the Indus Valley to the Colonial Period, including the Vedic Era, Mahajanapadas, Jainism and Buddhism as religions and ideas, Imperial India, Islamic invasion, and colonial domination. Buddhist Architecture: - Introduction to new religious ideas - Prominent architectural types: Stupas, Viharas, and Chaityas - Construction typologies – built and rock-cut - Discussion with prominent case studies					
Module 2:		Temple Architecture					
		Module Contents - Definition, symbolism, and Vedic origins of temple architecture - Key architectural terminologies - Broad classification: Nagara, Dravida, and Vesara styles - Genesis and metamorphosis of each temple type, construction techniques, and materials used, with prominent examples - Derivative sub-styles: Kerala, Vijayanagara, Kashmir, Himachal, Bengal, Gujarat, etc.					
Module 3:		Early Indo-Islamic Architecture					
		Module Contents - Advent of Islam and architecture of early mosques - Brief overview of Delhi Sultanate period dynasties - Evolution of architecture during the Delhi Sultanate: tombs, mosques, and forts - Provincial Islamic architecture – North and South India - Examples of prominent North Indian provincial architecture: Bengal, Jaunpur, Gujarat, Malwa - Examples of prominent South Indian provincial architecture: Bidar, Berar, Bijapur, Golconda, Ahmednagar					
Module 4:		Mughal Architecture					
		Module Contents - Brief overview of the Mughal period from Babur to Aurangzeb - Evolution of tomb architecture during the Mughal period - Evolution of palaces, forts, and mosques during the Mughal period - Discussion on salient site features such as gardens, landscaping, waterworks,					

	entrances, axes, symmetry, and balance	
Evaluation: Distribution of % of marks		
Progressive Evaluation		50%
End term Examination		50%
Learning Resources/References		
1. Asher, C. B. (1992). Architecture of Mughal India. Cambridge University Press. 2. Brown, P. (1942). Indian architecture: Buddhist and Hindu period (Vol. 1). D. B. Taraporevala Sons. 3. Brown, P. (1942). Indian architecture: Islamic period (Vol. 2). D. B. Taraporevala Sons. 4. Ching, F. D. K., Jarzombek, M. M., and Prakash, V. (2017). A global history of architecture (3rd ed.). Wiley. 5. Grover, S. (1980). The architecture of India: Buddhist and Hindu. Vikas Publishing House. 6. Grover, S. (1981). The architecture of India: Islamic. Vikas Publishing House. 7. Nuttgens, P. (1997). The story of architecture (2nd ed.). Phaidon Press. 8. Tadgell, C. (1990). The history of architecture in India. Phaidon Press.		

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

FOURTH SEMESTER COMPULSORY CORE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
04	BARC 040101	Architectural Design IV	8	1	0	3	4
Course Overview: This design course is expected to advance and become more complex in terms of aesthetics, with a greater focus on architectural and functional elements. The study of functional patterns in both horizontal and vertical circulation for double-story structures with service application will be the main emphasis of the semester. Complexities such as site limitations and the introduction of fundamental bylaws will be part of the design project. The projects will be selected to expedite modularity and repetitive forms. The theme of this design will be interlinked with BMC-IV, Water Supply and Sanitation, Electric and Lighting services including fire-fighting, Contemporary architecture styles and RCC framed structures. The exercises can be taken up by the faculty in the order that they choose from any type that is related with the theme. Suggestive Typologies: school, nursing home, hostel, homestead, motel.							
Learning Outcomes: - The course will demonstrate the following learning outcomes: - To understand the given project in terms of the design process with requirements for the same - To collect data from standards, case studies and site visits for the current project. - To analyze data collected with relevance to the current project. - To generate design concepts required for the given project - To integrate learning from other allied subjects to the design proposal - To develop architectural drawings for the given project - To complete the architectural project with all given requirements for the given project							
Module 1:		Project Introduction- Introduction to project, process, building regulations and final deliverables					
		Module Contents - Introduction to byelaws with site restrictions is also initiated at this stage. The student will study and collect data using case studies through literature reviews, site visits and gathering of data/ information through literary sources. - The project outcome / design solutions will be in the form of sheets, elevations-sections, perspective views, etc. The schedule of intermediate reviews and their contents may be communicated with the help of a lesson plan.					
Module 2:		Design process- Context and Case study					
		Module Contents - Documentation of similar cases as per the intended project. Selection of case study with an understanding of the concept of "modularity" in macro and micro scale, as per the project involves Study of the use of materials and the construction techniques in elements of built forms and in response to the climate of the region. - Study of the Structural System in the built forms. Identification of possible design interventions used in the given context, climate, culture and functional setting. Synthesis from the above study. Site study of the given project as per location, geometry, climate, bye-laws and other existing natural and man-made features. Understanding site services					
Module 3:		Design process - User study and conceptual design development					
		Module Contents Design (project) aspect studies- functional requirement of the said project, users,					

	activity spaces to be studied and documented using different delineation modes. Conceptual Design. Use of physical block- models to understand conceptual design.				
Module 4:	Design Completion Module Contents • Spatial layout finalized. Form Development finalized. Development of Plans, Elevations, Sections and views as per requirement. Delineation of plans with details and furniture layout. • Site and surroundings with internal roads and landscape worked out. • Integration of the services with the designed to be ascertained.				
Module 5:	Anthropometric study of human activity space Module Contents • Final presentation including all requirements: - a) Project introduction, b) Case studies related to the typology with tangible inferences, c) Site study and User study, d) Alternative concepts and design iterations showing the evolution of the concept, e) Final design - site Plan with details, f) All plans, sections and elevations with relevant information. g) Physical model/ digital 3-D views, part sections and views and any other explanatory drawings to be furnished. This will end with the final Presentation and crit.				
Notes: Internal Progressive Evaluation will include periodic internal reviews pertaining to different stages in relation to the study modules. Minor problem: This is a flexible "problem" which is optional for this subject and if chosen need to be outlined in alignment with the semester's course and conducted as per the schedule designed by the faculty coordinating this subject. It may be another small-scale project, competition project, collaboration with another studio/ institute, or a detailing of the main project. The duration is ideally one -two weeks. Internal marks may be appropriately assigned for the same.					
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. 2005, National Building Code of India, Vol.1-5 2. DeChiara, Joseph, J.Crosbie, Michael (2001): Time Savers Standards for Building Types, McGraw-Hill Professional. 3. Neuferts, Ernst (2002): Architects Data, Blackwell 4. Williams, Daniel (2007): Sustainable Design: Ecology, Architecture and Planning, John Wiley and sons Inc, NJ 5. The American Institute of Architects, (2016): Architectural Graphic Standards, John Wiley and sons Inc 6. Bansal, Tarun (2010): Hotel Facility Planning: Oxford University Press 7. Krame, Sibylle (2018): Building to Educate: School Architecture and Design, Braun 8. Qin, Li (2013): School buildings, Design Media Publishing Limited 9. Bullard, Clark Wesley (2018): Design for a City Hotel, Forgotten Books 10. Torre, Stefano Della; Bocciarelli, Massimiliano; Daglio, Laura; Neri, Raffaella (2020): Buildings for Education: A Multidisciplinary Overview of The Design of School Buildings, https://link.springer.com/book/10.1007/978-3-030-33687-5 11. Local building byelaws corresponding to the site.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
04	BARC 040103	Building Materials and Construction IV	5	1	0	2	2
Course Overview: This course introduces the design and functional aspects of special doors, including collapsible doors and rolling shutters. It builds on prior knowledge of RCC to explore vertical circulation systems such as stairs, escalators, travelators, and elevators, covering their types and construction details in depth. Market surveys and site visits are integral to the learning process, providing practical exposure. Additionally, the course covers various types of cladding and surface finishes. It is integrated with core subjects like Architectural Design and Building Services to ensure a comprehensive understanding of building systems.							
Learning Outcomes: - To comprehend the various modes of vertical circulation through live examples. - To understand the applications, construction details and varieties of various modes of vertical circulation in the building. - To compare and analyze various materials used for cladding purposes for building components along with their construction details. - To be aware of the properties of various materials.							
Module 1:		Special Doors and Windows					
		Module Contents - Aluminum Doors, Windows, Partitions (fixed, hinged, multiple track sliding, with/ without mosquito net) - UPVC Doors and Windows (fixed, hinged, multiple track sliding, with/ without mosquito net) - Composite material Doors and Windows (Fiber boards, Cement boards, Steel mesh, WPC boards) - Finishes and hardware's with fixing methods					
Module 2:		Elevators					
		Module Contents Elevators- types, design consideration, technical requirements and usage					
Module 3:		Escalators and Walkalators					
		Module Contents - Escalators- types, technical requirements and usage - Walkalators- Types, technical requirements and usage					
Module 4:		Special/Custom door and windows					
		Module Contents - Revolving Doors — The operation, design considerations, and installation techniques of revolving doors, commonly used in high-traffic areas with different materials. - Sliding and Sliding-Folding Doors — The mechanism in different materials of sliding and pocket doors, including their space-saving benefits and installation requirements. - Collapsible Doors — The design and application of collapsible doors for secure and space-efficient access solutions. - Rolling Shutters — The functionality, materials, and installation methods of rolling shutters, often - for security and weather protection.					
Module 5:		Innovative Doors and Windows					

	Module Contents • Architectural considerations for design of doors and windows • Innovative doors and windows • Composite doors and windows				
Module 6:	Advanced Building Materials Module Contents • Structural Membranes (tensile fabrics PTFE, ETFE, like , etc.) • Glass- Structural glass, glazing and application • Advance concrete • Carbon fiber • Resins • Sealants • Cork and rubber				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Chudley, R., and Greeno, R. (2016). Building construction handbook (11th ed.). Routledge. 2. Illston, J. M., and Domone, P. L. (2010). Construction materials: Their nature and behaviour (4th ed.). CRC Press. 3. McKay, W. B., and McKay, J. K. (2015). Building construction (Vol. 1–4). Routledge. 4. WoodSolutions.. Technical design guides and resources for timber construction. Retrieved from https://www.woodsolutions.com.au/ 5. SteelConstruction.info. The free encyclopedia for UK steel construction information. Retrieved from https://www.steelconstruction.info/ 6. IS 883: 1994 — Code of Practice for Design of Structural Timber in Buildings (Second Revision). 7. IS 4990: 2011 — Plywood for Concrete Shuttering Work — Specification. 8. IS 2062: 2011 — Hot Rolled Medium and High Tensile Structural Steel — Specification. 9. IS 800: 2007 — General Construction in Steel — Code of Practice. 10. IS 1200 (Part 21): 1973 — Method of Measurement of Building and Civil Engineering Works — Part 21: Cladding and Metal Work.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
04	BARC 040102	Electrical, Lighting and Fire Safety	2	1	0	1	0
Course Overview: This course covers the building services designing and refers to the planning, installation, and coordination of systems that ensure environmental comfort, safety, and operational efficiency within built environments. This course introduces students to essential service systems – electrical, illumination, fire safety, and vertical circulation – relevant to both small-scale and large building projects. It emphasizes the role of service integration in architectural design and introduces performance-based safety, communication, and lighting planning.							
Learning Outcomes: - To understand the design logic behind electrical, fire safety, illumination, communication, and circulation systems. - To develop layout skills for key service systems in domestic and small commercial buildings. - To apply coordinated building services design, integrating architectural and structural needs.							
Module 1:		Electrical and Communication Systems					
		Module Contents - To understand internal and site-level electrical systems and communication networks in buildings, the module covers: - Basic principles of electricity - Electrical distribution and safety systems in buildings - Fixtures, appliances, and equipment - Electrical circuitry, internal wiring types and routing - Load estimation, peak demand, and operational energy cost - Communication systems low voltage supply: intercom, data cabling, Wi-Fi, broadband, CCTV - Safety standards, market survey, and IS codes					
Module 2:		Illumination Systems					
		Module Contents - To understand lighting principles and develop skills for functional and architectural lighting design, the module covers: - Lighting principles: Illuminance, glare, visual comfort - Types of lighting systems, lamps and luminaires - Layout design for residential and commercial building - Integration with daylighting and energy-saving strategies - Introduction to lighting software (DIALux/Relux – overview only)					
Module 3:		Fire Safety Systems					
		Module Contents - To understand building fire safety systems and their integration into architectural planning, the module covers: - Fire sources, spread patterns, and decay curves - Material response to fire; fire-retardant materials - Passive protection: fire-resistant walls, doors, compartmentation - Active protection: smoke detectors, alarms, sprinklers, hydrants - Fire escape design: stairwells, refuge areas, fire tender access - Representing fire safety in architectural drawings - Relevant code references (NBC, IS, NFPA)					
Module 4:		Vertical Transportation Systems					

	Module Contents - To develop design understanding for lifts, escalators, and their application in multi-story buildings, the module covers: - Types and components of various vertical transportation systems: lifts, escalators, auto-walks, etc. - Lift planning: number, capacity, elevator banks. - Shaft, pit, and machine room dimensions and clearances. - Installation, commissioning, and maintenance overview. - Placement principles and zoning strategies.				
Evaluation: Distribution of % of marks <table> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References - Kothari, D. P., & Nagrath, I. J. (2009). Basic electrical engineering (2nd ed.). Tata McGraw-Hill Education. - Mathew, J. (2010). Design and analysis of building electrical systems. Prentice Hall India. - Clark, W. H. (2003). Electrical design guide for commercial buildings. McGraw-Hill Professional. - Sclater, N. (2003). Handbook of electrical design details (2nd ed.). McGraw-Hill Professional. - Ching, F. D. K. (2014). Building construction illustrated (5th ed.). Wiley. - Grondzik, W. T., Kwok, A. G., Stein, B., & Reynolds, J. S. (2014). Mechanical and electrical equipment for buildings (12th ed.). Wiley. - American Society of Heating, Refrigerating and Air-Conditioning Engineers. (2013). ASHRAE handbook: Fundamentals (SI ed.). ASHRAE. - Bureau of Indian Standards. (2015). National building code of India 2015. Bureau of Indian Standards. - Bangash, M. Y. H., & Bangash, T. (2007). Lifts, elevators, escalators and moving walkways/travelators: Electro-mechanical fundamentals, analysis and design. Springer. - Sage, R. (2008). The architecture of light: Architectural lighting design concepts and techniques (2nd ed.). Conceptnine.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
04	BARC 040104	Water Supply and Sanitation	3	2	0	1	0
Course Overview: This course provides an understanding of the installation and functioning of essential building service systems, focusing on water supply, sewage disposal, and fire safety. It covers water supply systems at both neighborhood and building levels, along with the installation and planning of sewage disposal networks. Additionally, the course introduces the principles and components involved in effective fire safety system installation, emphasizing their importance in building design and public safety.							
Learning Outcomes: • Layout plan of water supply network system at neighborhood level. • Layout plan and detailing of water supply in buildings and detailing of water connection with fixtures • Layout plan of wastewater disposal from the building and detailing of sewer connections with MH, IC, toilets and kitchen fixtures, • Layout plan for passive and active means of fire safety in the building. Detailing of fire tank, pumping system, pipe layout, fire lifts and FHC design							
Module 1:		Water Supply neighborhood level					
		Module Contents • Quality of water, impurities and water treatment process. • Water demand calculations; norms and standards. • Sources and Water storage for supply • Water distribution network at neighborhood levels • Water supply connection to the building • Water pipe materials, apparatus, joints, fixtures and valves.					
Module 2:		Water Supply in buildings					
		Module Contents • Basic Principles and Water supply network systems for buildings • Water supply in low-rise and multistoried buildings • Water supply connections in roof tanks, toilets and kitchen fixtures • Water supply design for pipe sizes and pressure • Market survey for Pipe materials, fixtures and equipment.					
Module 3:		Sewerage connections at buildings					
		Module Contents • Market survey for sanitary materials, fixtures and equipment. • Design consideration for toilet and kitchen etc. • Basic Principles and types of sewage disposal system at buildings • Collection of liquid waste from toilets, kitchen and roof • Types of Traps, sewer apparatus, invert level calculations, inspection chambers • Pipe layout and sewer connection with Public Manholes • Introduction to functioning of various types of Sewer treatment plants					
Module 4:		Fire safety in buildings					
		Module Contents • Fire safety norms and Classification of buildings for fire safety • Methods for Passive means of fire control, compartments, fire exits, routes, signages, etc. • Active means of fire controls, Fire detection, alarms, automation, • Types of firefighting systems and planning for rescue, fire escape, fire lifts, etc.					

	• Types of fire apparatus, design of fire tanks, pumping system, sprinklers, etc. • Pipe/fixture layout for firefighting network, emergency lights, command and control center • Norms and standards for fire resistant materials, pressurized systems,
Evaluation: Distribution of % of marks	
Internal Progressive Evaluation of assignments and time problem	50%
End term Examination/VV	50%
Learning Resources/References	
1. Birdie, G. S., and Birdie, J. S. (2008). <i>Water supply and sanitary engineering</i> (8th ed.). Dhanpat Rai Publishing. 2. Peavy, H. S., Rowe, D. R., and Tchobanoglous, G. (1985). <i>Environmental engineering: Water supply, waste management and pollution control</i>. McGraw-Hill. 3. Punmia, B. C., Jain, A. K., and Jain, A. K. (2005). <i>Water supply engineering</i> (17th ed.). Laxmi Publications. 4. Tchobanoglous, G., Stensel, H. D., and Tsuchihashi, R. (2013). <i>Wastewater engineering: Treatment and resource recovery</i> (5th ed.). McGraw-Hill Education. 5. Hammer, M. J., and Hammer, M. J. Jr. (2012). <i>Water and wastewater technology</i> (7th ed.). Pearson Education. 6. Steel, E. W., and McGhee, T. J. (1985). <i>Water supply and sewerage</i> (6th ed.). McGraw-Hill Education. 7. Harvey, P., and Reed, B. (2004). <i>Rural water supply and sanitation: A training manual for village water supply and sanitation</i>. Practical Action Publishing. 8. Gaur, R. C. (2011). <i>Water supply and sanitation in India</i>. New Age International Publishers. 9. Sutherland, D., and Reed, R. (2004). <i>Small-scale water supply: A review of technologies</i>. Practical Action Publishing.	

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
04	BARC 040106	Steel Structures	3	2	0	1	0
Course Overview: This course is designed to equip students with the foundational knowledge and skills required to design simple steel structures and their basic components. It introduces the properties, behavior, and application of steel as a structural material in architectural design. Emphasis will be placed on understanding the structural principles, joint detailing, and load-bearing behavior specific to steel construction. The course is closely integrated with the Design Studio, allowing students to apply theoretical concepts to practical design exercises. Assignments will be directly linked to studio projects, fostering a hands-on approach that reinforces learning through real-time application in architectural design scenarios. Through this integration, students will gain a deeper appreciation for material selection, structural logic, and the role of steel in contemporary architecture							
Learning Outcomes: - The fundamental aspects of analysis and design and also discusses the practical requirements such as safety, feasibility and economy of steel structures. - Students will learn about the different types steel of joining methods - It will allow students to have a broader knowledge about the different elements of steel structure and how to use them - Students will also understand the strengths and weaknesses of the steel structures with examples.							
Module 1:		Module Title: General Considerations					
		Module Contents - Introduction to steel as a structural material. - Advantages and disadvantages of steel. - Structural Steel Stress strain curve for mild steel. Rolled steel sections. Loads. Permissible stresses. - Working stresses. Factor of safety. Minimum thickness of structural members. Design Methods					
Module 2:		Module Title: Simple Connections-Riveted, Bolted and Pinned Connections					
		Module Contents - Introduction, Riveted connections, Bolted connections, Pin connections. Type of joints and numerical on - finding strength in various connections					
Module 3:		Module Title: Simple Connections- Welded connections					
		Module Contents - Introduction. Types. Symbols. Welding process. Weld defects. - Permissible stresses. Design of butt welds. Design of fillet welds. - Design of intermittent fillet welds. Fillet weld for truss members. Plug and slot welds. Distortion of welded parts. Inspection of welds. Fillet weld Vs butt weld. Welded joints Vs Riveted joints.					
Module 4:		Module Title: Design of Compression Members					
		Module Contents Introduction. Effective length. Slenderness ratio. Column design formula. - Types of sections. Assumptions. Design of axially loaded compression members. - Built up columns (latticed columns) Lacing. Batten. - Compression members composed of two components back-to-back. - Encased column. Eccentrically loaded columns. Splices.					

Module 5:	Module Title: Column bases and Footings				
	Module Contents • Introduction. Types of column bases. • Slab base. Gusset base. Welded column bases. • Design of hold down angles and base plates. • Grillage footing.				
Module 6:	Module Title: Tension Members, Beams and Gantry Girders				
	Module Contents • Introduction. Types of tension members. Permissible stresses. Slenderness ratio. Net sectional area. • Design of tension member. Lug Angles. Splices. Gusset plate. • Use of Steel Table for selection of desired section. Introduction to the types of sections. Lateral Stability of Beams. Web Buckling and Web Crippling.				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Duggal, S. K. (2010). Design of Steel Structures (3rd ed.). Tata McGraw-Hill Education. 2. Libby, J. R. (1990). Prestressed concrete: Design and construction (2nd ed.). Chapman & Hall. (Originally published by Ronald Press; reprinted later by Chapman & Hall.) 3. Pillai, S. U., & Menon, D. (2003). Reinforced concrete design (2nd ed.). Tata McGraw-Hill Education. 4. Punmia, B. C., Jain, A. K., & Jain, A. K. (1998). Design of steel structures: Vol. I & II. Laxmi Publications. 5. Raju, N. K. (2006). Prestressed concrete (5th ed.). Tata McGraw-Hill Education. 6. Raju, N. K. (2006). Structural design and drawing: Reinforced concrete and steel (3rd ed.). Universities Press (India). 7. Varghese, P. C. (1997). Design of steel structures. Prentice-Hall of India.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
04	BARC 040108	Contemporary Architecture	2	2	0	0	0
Course Overview: This subject outlines the metamorphosis of the technology-based and program-based architecture of the occidental world since the late 18th century in Europe, America and the rest of the world. It analyses the design philosophies of individual 'masters of occidental architecture as well as that of groups or movements in the field of architecture and art in Europe and elsewhere. In the process of analysis and narration of the development of architecture as we find it now globally, these subject showcases and discusses salient buildings standing as landmarks of design intervention in the timeline of building activity. Design Connectivity – This lesson in the development of contemporary architecture is directly linked to the type of buildings the students are exposed to, and they would be supposed to design in their future career. The materials of construction are also commonplace. Hence, development of different contemporary styles of architecture would help students to use/apply them in their designs in all forthcoming semesters.							
Learning Outcomes: - To identify different styles and schools of contemporary architecture. - To analyses the contributing factors for the design development of different styles. - To analyses the works of the famous master architects introduced to the student. - To evaluate the works of modern architecture that the student is coming across in every day's life - To design buildings in the contemporary architectural styles.							
Module 1:		Industrial Revolution					
		Module Contents - Late Renaissance and Development of Open spaces, Transition of architecture from monumental to people-oriented designs - Advent of Steel and Henry Labrouste, Great exhibitions of 1851 and 1889 and their contributions, Gustave Eiffel - Development of Ferro Concrete: Auguste Perret, Tony Garnier					
Module 2:		Development of 'New Art and Architecture' in Europe; Deutsche Werkbund; Bauhaus; Programmatic Functionalism					
		Module Contents Development of 'New Art and Architecture' in Europe; Deutsche Werkbund; Bauhaus; Programmatic Functionalism					
Module 3:		Free Spirit of American Architecture; Chicago School; Organic Developments					
		Module Contents - Balloon Frame Structure and Plane Surfaces in America - Louis Sullivan - Frank Lloyd Wright					
Module 4:		International Style, Crisis Period and Reactionary Styles till date					
		Module Contents Examples - - Eero Saarinen - I.M. Pei - Kenzo Tange - Oscar Niemeyer					

Module 5:	Indian Architecture Since Independence	
	Module Contents - Transformation of Indian Architecture During Colonial Period - Influences and Effect. - Works of some master Architects from the post-Independence Period including, BUT not limited to -B.V. Doshi, Charles Correa, Raj Rewal, A.P. KanvindeandLaurie Baker	
Evaluation: Distribution of % of marks		
Progressive Evaluation		50%
End term Examination		50%
Learning Resources/References		
1. Giedion, S. (2009). Space, time and architecture: The growth of a new tradition (5th ed.). Harvard University Press. 2. Boyd, R. (1965). The puzzle of architecture. Melbourne University Press. 3. Frampton, K. (2007). Modern architecture: A critical history (4th ed.). Thames and Hudson. 4. Nuttgens, P. (1997). The story of architecture (2nd ed.). Phaidon Press Ltd. 5. Fletcher, B., Cruickshank, D., Saint, A., Frampton, K., and Blundell Jones, P. (Eds.). (1996). Sir Banister Fletcher's A history of architecture (20th ed.). Architectural Press. 6. Lang, J., Desai, M., and Desai, M. (1997). Architecture and independence: The search for identity—India 1880 to 1980. Oxford University Press. 7. Library of Contemporary Architecture.		

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

THIRD and FOURTH SEMESTER ELECTIVE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03/04	BARC 0301E3A/ BARC 0401E4A	Art Appreciation	2	1	1	0	0
Course Overview: This course intends to develop an appreciation for varied art forms and integrate this understanding into the domain of the built environment. Through the exploration of the historical evolution of artistic productions, students build a comprehensive body of knowledge that enhances their awareness of artistic traditions across different cultures and time periods. This foundation helps in cultivating artistic capacity, which in turn enriches design skills and creative expression. By situating art within its broader social, cultural, and environmental contexts, the framework encourages a deeper understanding of the role art plays in shaping human experiences and environments. Ultimately, the insights gained from this subject contribute to the development of a more analytical and reflective approach to design, enabling students to make more informed and contextually relevant design decisions.							
Learning Outcomes: - To understand the art form throughout the historical periods - To Understand different medium of art all over the India - To learn different kind of medium used to create different kind of art forms - To identify different styles of artwork							
Module 1:	Module Title Introduction to Art, Aesthetics and Philosophical approach to Art Appreciation						
	Module Contents This module introduces key philosophical positions in art and aesthetics through a historical review of major theories and concepts. By studying seminal texts, students gain a deeper understanding of aesthetic thought and its impact on the interpretation of art.						
Module 2:	Module Title - Classification of the Arts and Art Forms						
	Module Contents Define and classify different art forms - Understanding and classification of various art forms. - Comparative analysis and interfaces. - Study of visual art forms and comprehending the essence in design thinking						
Module 3:	Module Title - Visiting Art Spaces						
	Module Contents This module teaches students how to view and analyze art critically by engaging with it in settings like museums, galleries, artist studios, and art centers. These experiences enhance visual literacy and deepen understanding of artistic expression and context.						
Module 4:	Module Title- Art Analysis - Historical, Contemporary, Folk and tribal						
	Module Contents - Study of art forms in various historical periods and contexts from the Cave to the contemporary art - Survey and comparative analysis of Western high art. - Survey and comparative analysis of Indian high art.						

	• Survey and comparative analysis of folk traditions of indigenous communities. • Survey of contemporary art and influences				
Module 5:	Module Title - Skill development of Art - Style, Material and Technique				
	Module Contents • Material and technical exploration based on the study of master artists, contemporary, folk and tribal art • Study of master's work. Contemporary, folk and tribal art • Representation in various mediums				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Janson, H. W., & Janson, A. F. (2004). History of Art (6th ed.). Prentice Hall. 2. Martin, F. D., & Jacobus, L. A. (2017). Humanities Through the Arts (10th ed.). McGraw-Hill Education. 3. Mitter, P. (2001). Indian Art. Oxford University Press. 4. Coomaraswamy, A. K. (1956). Introduction to Indian Art. MunshiramManoharlal Publishers. 5. Berger, J. (1972). Ways of Seeing. Penguin Books. 6. Eco, U. (Ed.). (2004). History of Beauty (A. McEwen, Trans.). Rizzoli. 7. Gombrich, E. H. (1995). The Story of Art (16th ed.). Phaidon Press.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03/04	BARC 0301E3B/ BARC 0401E4B	Mix Media and Visual Communication	2	1	1	0	0
Course Overview: This course intends to equip architecture students with advanced knowledge and hands-on skills in using mixed media techniques for architectural visualization, combining traditional and digital tools (raster and vector), and leveraging image editing and rendering software for effective architectural presentation.							
Learning Outcomes: • Understand the concept and relevance of advanced mixed media in architecture • Apply editing tools for enhancing architectural drawings • Create layered compositions blending hand-drawn and digital work • Prepare files for print-ready architectural graphics • Develop cohesive architectural presentation boards • Design compelling presentation boards using mixed media • Curate and organize an architectural portfolio • Critically evaluate visual communication in design							
Module 1:		Introduction Module Contents • Definition and Scope of Mixed Media in Architecture • Evolution of rendering techniques – traditional to digital • Raster vs. Vector: Principles, differences, and when to use • Rendering styles and approaches (Photorealistic, Artistic, Diagrammatic) • Overview of key software: • Raster-based: Adobe Photoshop, Procreate, Krita • Vector-based: Adobe Illustrator, CorelDRAW, Inkscape • Hybrid: SketchUp + Photoshop, AutoCAD + Illustrator					
Module 2:		Image Creation and Editing Module Contents • Raster Techniques: • Layers, masking, blending, brushes, textures, filters • Digital collage, sketch overlays • Enhancing hand-drawn scans using Photoshop • Vector Techniques: • Pen tool, path editing, stroke and fill, typography • Creating icons, infographics, and schematic illustrations • Practical exercise: Combine CAD drawings with raster illustrations • Case studies: Use of mixed media in architectural presentations					
Module 3:		Software Application and Workflow Integration Module Contents • Understanding of print media • Standard paper sizes: A3, A4, and other formats • Types of paper: glossy, matte, bond, cardstock, etc. • Weight and thickness (GSM – Grams per Square Meter) • CMYK Colour Model and Differences between Laser Printers and Inkjet Printers • Specialty printing techniques: offset, digital, and screen printing					

Module 4:	Portfolio and Studio Integration	
	Module Contents • Importance of multimedia in presentations • Combining text, images, audio, and video for effective communication • Tools for creating audio-visual presentations (PowerPoint, Prezi, video editors) • Basics of animation in presentations (transitions, motion graphics) • Role of narration and voice overs in enhancing engagement • Best practices for smooth and professional presentations	
Evaluation: Distribution of % of marks		
Progressive Evaluation		50%
End term Examination		50%
Learning Resources/References		
1. Tauchid, R. (2008). The new acrylics: Complete guide to the new generation of acrylic paints. Watson-Guption. 2. Davies, J. (2009). Adventures in mixed media: Collage, layering, and painting techniques for creating expressive art. Quarry Books. 3. Maurer-Mathison, D. (2003). Collage, assemblage, and altered art: Creating unique images and forms with mixed media. Watson-Guption. 4. Piggy D., and Moore, T. (2012). Layered: Mixed media techniques for digital and traditional artists. North Light Books. 5. Foster, W. (Ed.). (2014). The complete book of mixed media art: More than 200 fundamental mixed media concepts and techniques. Walter Foster Publishing.		

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Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03/04	BARC 0301E3C/ BARC 0401E4C	Built Environment and Behavioural Studies	2	1	1	0	0
Course Overview: The main intention of the course is to equip students with basic study of human behavior and interaction with the built environment. The course includes topics such as beliefs, meanings, values and attitudes of individuals or groups concerning various built-environments from macro to micro such as neighborhoods, cities, transport routes and devices, or recreational areas; evaluation and effectiveness of Designed -spaces, created to accomplish specific objectives and Interrelationships between human environments and behavioral systems. The subject will have both live and literature-based assignments in line with the understanding obtained from design studio, building materials and construction and history of architecture							
Learning Outcomes: - To describe the elements of behavior and their relationship to the environment. - To interpret the traditional built environment in context with community /neighborhoodbehavioral pattern. - To distinguish between built habitats based on community behavior. - To identify man-environment cognition phenomena through some theories. - To interpret space design with social aspects (like age, gender, ability, economy) - To relate built spaces with human interpretations - To illustrate the differences in social space design with the help of examples.							
Module 1:		Introduction- Basic concept, User group and built environment.					
		Module Contents - Psychology and its relation to building space. - Family, gender and group social behavior, - Community behavior patterns - Behavioral concepts in neighborhood and communities					
Module 2:		Man-environment relationship					
		Module Contents - Development of perception, Memory and thinking, mental map. - Gestalt theory of Perception – environmental cognition and effect, spatial behaviour. - Failure of Gestalt theory in complex phenomena. - Other theories related to perception of space. Semantic and Semiotic approaches to environmental design					
Module 3:		Environment – Behaviour: phenomena and design					
		Module Contents - Behaviour Settings: Fits and Misfits, Anthropometrics and ergonomics. - Proxemics and Personal Space. - Territoriality and Defensible space. - User centric built space: - Age and built space and making space and place					
Module 4:		Social design aspects					
		Module Contents - Various methods are used to study the environment and human interaction with space, enabling evidence-based design decisions. - The key methodologies may include Interviews, Case Studies, Experiments, Post-					

Occupancy Evaluation (POE) etc.	
Evaluation: Distribution of % of marks	
Progressive Evaluation	50%
End term Examination	50%
Learning Resources/References 1. Alexander, C. (1977). A pattern language. Oxford University Press. 2. Andrew, F. (1993). Environmental psychology. Wadsworth. 3. Bechtel, R. (1977). Enclosing behavior. John Wiley. 4. Bell, G., and Randall, E. (1973). Urban environment and human behavior: An annotated bibliography. Dowden Hutchinson Ross. 5. Heimsath, C. (1977). Behavioral architecture. McGraw-Hill. 6. Kuller, R. (1978). Architectural psychology. McGraw-Hill. 7. Sommer, R. (1969). The behavioral basis of design. Englewood Cliffs. 8. Zeisel, J. (1984). Enquiry by design: Tools for environment-behavior research. Cambridge University Press. 9. Lynch, K. (1960). The image of the city. MIT Press.	

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Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03/04	BARC 0301E3D/ BARC 0401E4D	Vernacular Architecture	2	1	1	0	0
Course Overview: This course introduces students to the richness of vernacular architecture across India and other regions, focusing on how traditional building techniques, materials, and spatial arrangements reflect cultural identity and respond to local climates, geography, and social structures. The subject emphasizes analytical and research-based exploration of indigenous construction and design practices and encourages appreciation for sustainable and context-specific architectural solutions.							
Learning Outcomes: - Understand the definition, scope, and significance of vernacular architecture. - Analyze the socio-cultural, geographical, and climatic factors influencing traditional building forms. - Identify and document vernacular architectural typologies from various regions. - Critically evaluate the sustainability and relevance of vernacular practices in contemporary architecture. - Develop awareness of cultural heritage and indigenous knowledge systems.							
Module 1:		Introduction to Vernacular Architecture					
		Module Contents - Definition and Scope - Difference between Vernacular, Traditional, and Indigenous Architecture - Importance and Relevance in Contemporary Times - Cultural and Environmental Contexts					
Module 2:		Regional Case Studies – India					
		Module Contents - Vernacular Architecture of Kerala, Rajasthan, Himachal Pradesh, Gujarat, and Northeast India - Materials, Techniques, and Construction Systems - Planning and Spatial Organization - Influence of Climate, Topography, and Culture - Field Visits and Documentation Methods					
Module 3:		Global Vernacular Traditions					
		Module Contents - Vernacular Practices in Africa, Middle East, East Asia, and Latin America - Comparative Study with Indian Context - Climatic and Socio-Economic Adaptations - Lessons in Sustainability and Self-Sufficiency					
Module 4:		Application and Contemporary Relevance					
		Module Contents - Reviving Vernacular Practices in Modern Design - Hybrid and Contextual Design Approaches - Community Participation and Bottom-up Design - Integration with Sustainable Architecture - Studio-based Exercises and Group Presentations					

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources/References

1. Bary, D., Ilay. C. (1998); Traditional Buildings of India; Thames and Hudson Ltd
2. Oliver, P. (1997); Encyclopedia of Vernacular Architecture of the World; Cambridge University Press
3. Praman, V.S. (1989); Haveli - Wooden Houses and Mansions of Gujarat; Mapin Publishing Pvt. Ltd., Ahmedabad
4. Jain, K.; Jain, M. (1992); Mud Architecture of the Indian Desert; Aadi Centre, Ahmedabad
5. Tilotson, G.H.R. (1989); The tradition of Indian Architecture - Continuity, Controversy, Change since 1850; Oxford University Press
6. Richardson, V. (2001); New Vernacular Architecture; Laurence King Publishing
7. Tadgell, C. (1990); The History of Indian Architecture; Design and Technology Press, London
8. Research papers and other resource books as deemed fit/ suitable (by the teaching faculty)

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Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
03/04	BARC 0301E3E/ BARC 0401E4E	MOOC/ SWAYAM/NPTEL/Other Equivalent Courses	2	1	0	0	0
Course Overview: The intent of this elective subject is to encourage students to acquire knowledge through direct involvement in diverse online academic programs. It offers the flexibility to explore courses beyond the regular B.Arch. curriculum, allowing students to engage with multidisciplinary subjects that contribute to and enrich the field of architecture. By participating in offline/online skill development courses of their choice, students can broaden their understanding and enhance their professional competencies in areas relevant to architectural practice.							
Learning Outcomes: As per the chosen course							
		Exploration and Identification of Creative Fields					
		Module Contents - To explore allied disciplines which will contribute to the profession of Architecture. The fields can be like any of the listed below: - Photography - Building Construction Techniques - Graphic Design - Textile design - Arts and Crafts (Stone Art, Bamboo, Ceramic, Origami, Calligraphy, etc.,) - Video and Filmmaking - Animation - Research Paper writing This is just a suggestive list. The students are free to explore other allied areas which should be approved by the faculty coordinator.					
		Acquiring Skill/ Knowledge					
		Module Contents - To undergo the coursework/workshop - To document the process of the course undergone - To prepare a report/ portfolio of the work done					
		Demonstration of the Acquired Skill/Knowledge					
		Module Contents - To demonstrate the learnings of the course - To present the work in a forum					
Note:		Criteria for choosing the elective: - Courses opted for should be certified by recognized universities/forums like MOOC/SWAYAM/NPTEL - The courses chosen by students must be approved by the faculty coordinator or departmental committee. It should be ensured that the selected course aligns with the semester's level of complexity and builds appropriately on previously completed coursework - Module contents as per chosen course					

Evaluation: Distribution of % of marks

Progressive Evaluation	
End term Examination	

- Evaluation and Examination as per chosen course and institute policy for such course

Learning Resources/References

- As per chosen course

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Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
03/04	BARC 0301E3F/ BARC 0401E4F	Skill Enhancement Elective by Department	2	1	1	0	0				
Course Overview: Skill-based Electives can greatly enhance a student's learning by providing them with the opportunity to develop specialized skills and knowledge that are valuable in the field of architecture. These electives can cover a wide range of topics from architecture and allied fields, allowing students to tailor their education to their interests and career goals. Here are some suggested skill-based Electives for second-year B.Arch students: • Graphics Design and Portfolio Making • Design Thinking and Ideation • Design-build workshop • Hands-On Workshop: Mud, Bamboo and Vernacular Construction • Visual Storytelling • Freehand Sketching for Architecture • 3d Printing in Architecture This is not an exhaustive list and can be modified by the instructor with emerging techniques relevant to architecture or areas related with ongoing research projects in the Department of Architecture.											
Learning Outcomes: • Skill-based Electives will introduce foundational skills and concepts that will support students' development throughout the B.Arch. program.											
Module and content as per offered elective											
Evaluation: Distribution of % of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%										
End term Examination	50%										
Learning Resources/References • As per offered electives											

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BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

FIFTH SEMESTER COMPULSORY CORE
COURSE DETAILS

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Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05	BARC 050101	Architectural Design V	8	1	0	3	4
Course Overview: The studio shall focus on the design of multifunctional large-span public buildings (e.g., sports complexes, exhibition halls, interpretation centers, cultural centers, showrooms, auditoriums, temporary canopies). Emphasis on site planning, design parameters, graphical representation of design details, and architectural expression through functional and constructional elements. The focus areas of this studio must include Universal Design and the issues of accessibility. Inclusion of various provisions for differently abled users must be a mandatory requirement. The course will also be integrated in an applied nature with theory subjects like Site Planning and Landscape Architecture, Structural Concepts in Architecture, and HVAC and Acoustics in various modules.							
Learning Outcome: - It will allow students to apply site planning strategies that optimize integration with the urban context and enhance functionality. - It will allow students to develop the ability to design large-span public buildings that comply with regulations and incorporate appropriate structural systems. - It will allow students to demonstrate proficiency in expressing architectural concepts through functional and constructional design elements. - It will allow students to resolve circulation systems effectively for multiple user groups at both site and building levels. - This will allow students to integrate universal design, building services and construction principles into architectural design solutions. - This will allow students to attain competence in producing detailed and accurate graphical representations of design proposals.							
Module 1:		Understanding the context and development of design programme					
		Module Contents - Requirement finalization: Through case studies and adherence to established standards or through development based on logical reasoning to ensure comprehensive and contextually appropriate design solutions. - User studies: Analyzing diverse user groups of a public building to understand their needs, behaviors, and interactions with space. - Requirement identification: Evaluating activities and spatial relationships to determine functional and spatial needs for effective design planning.					
Module 2:		Site Analysis					
		Module Contents - Site features inventory, analysis, and synthesis: a comprehensive assessment of physical attributes, topography, socio-cultural contexts, built forms, and other relevant factors to inform design decisions. - Compliance framework with all applicable building regulations, including the National Building Code (NBC), local building byelaws, and fire safety codes, must be thoroughly understood to ensure legal and safe development. - Environmental considerations for the site, including ecological impacts, sustainability, and resource management, must be evaluated to promote environmentally responsible design. - Analysis of site and context in view of accessibility for users with different types of disabilities.					

Module 3	Concept Development
	• Site Zoning Based on Analysis and Synthesis: Prepare site zoning plans by integrating findings from comprehensive site analysis and synthesis, considering physical, environmental, and socio-cultural factors. • Establishing Project Goals and Conceptual Aspirations: Define project objectives and aspirational concepts, addressing environmental sustainability, climatic responsiveness, socio-cultural relevance, and other contextual priorities to guide the design process. • Building Narratives and Their Translation into Built Form: Develop socio-cultural narratives that reflect community values and historical contexts, translating them into tangible architectural structures that enhance cultural identity and user experience. • Form and Massing Development Based on Structural Systems: Develop architectural form and massing informed by appropriate structural systems, ensuring structural integrity, functionality, and aesthetic coherence in the design. • Conceptual Models for Design Development: Create conceptual site and building models as iterative tools to explore, refine, and communicate design ideas, facilitating creative and practical development throughout the project.
Module 4	Design Development
	Module Contents • Site Plan Development: Create site plans incorporating parking, circulation, thresholds, buffer zones, built areas, and services to ensure functional and spatial coherence. • Building Plans and Sections: Design building plans and sections, including furniture layouts, ventilation, and daylighting strategies, to optimize occupant comfort and functionality. • Built Form and Structural Integration: Resolve built form through appropriate structural systems, ensuring stability, efficiency, and alignment with design objectives like scale, proportions, symmetry/ asymmetry, rhythm, etc.
Module 5	Design Refinement
	Module Contents • Conceptual Design Advancement: Refine conceptual design by integrating construction materials and finishes to enhance functionality and aesthetics. • Building Circulation and Activity Spaces: Optimize building-level circulation and activity spaces for efficient movement and user engagement. • Structural System Refinement: Enhance structural systems to ensure constructability, stability, and design alignment. • Site Plan Redevelopment: Revise site plan to align with refined building design, ensuring cohesive integration. • Design Development must also include detailing of spaces in alignment with requirements of differently abled users.
Module 6	Documentation and Presentation
	Module Contents • Presentation Drawings: Create detailed drawings, including concept development, site plans, floor plans, sections, elevations, and technical details, to convey design intent. • 3D Visualization: Develop 3D views and digital walkthroughs to illustrate spatial qualities and design aesthetics. • Physical Model: Construct site and building models to provide tangible representations of the design proposal. • Details showing provisions for ramps, signages, colors, finishes, tiles, clearances, grab bars, etc. and other provisions needed for differently abled users.

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources / References and Learning Strategy

1. McHarg, I. L. (1992). Design with nature (25th anniversary ed.). Wiley.
2. Simonds, J. O. (2013). Landscape architecture: A manual of environmental planning and design (5th ed.). McGraw-Hill Education.
3. Lynch, K., and Hack, G. (1984). Site planning (3rd ed.). MIT Press
4. Ching, F. D. K., Onouye, B. S., and Zuberbuhler, D. (2014). Building structures illustrated: Patterns, systems, and design (2nd ed.). Wiley.
5. Neufert, E., Neufert, P., Baiche, B., and Walliman, N. (2019). Neufert architects' data (5th international English ed.). Wiley-Blackwell.
6. Chiara, J. D., Panero, J., and Zelnik, M. (2001). Time-saver standards for architectural design: Technical data for professional practice (8th ed.). McGraw-Hill Education.
7. Bureau of Indian Standards. (2016). National Building Code of India 2016: Volume 1. Bureau of Indian Standards.
8. Bureau of Indian Standards. (2016). National Building Code of India 2016: Volume 2. Bureau of Indian Standards.
9. Ching, F. D. K. (2014). Architecture: Form, space, and order (4th ed.). Wiley.
10. Alexander, C., Ishikawa, S., and Silverstein, M. (1977). A pattern language: Towns, buildings, construction. Oxford University Press.
11. Alexander, C. (1979). The timeless way of building. Oxford University Press
12. Various applicable acts/codes related to accessibility in building design.

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Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05	BARC 050103	Building Materials and Construction V	5	1	0	2	2
Course Overview: This course provides an in-depth understanding of structural systems used in contemporary architecture, with a focus on both large-span and high-rise structures. Students will gain knowledge of large-span concrete structures through the study of design principles and reinforcement details. The course also introduces large-span steel structures, emphasizing span considerations, functional requirements, and construction techniques. Additionally, students will explore the design and structural concepts of high-rise buildings, including the integration of essential services. The course covers false ceiling systems, highlighting materials and installation methods, and introduces modular and prefabrication techniques applicable to various building elements, promoting efficiency and innovation in construction.							
Learning Outcome - To comprehend various types of roofing structures used for different purposes in daily life and to explain alternatives to long-span steel structures. - To understand the variety of available MS sections (hot and cold rolled) for diverse uses and to comprehend the details and arrangements of their combinations. - To make students aware of the prefabrication process in advanced building construction techniques. - To compare various types of steel roofing with different materials to analyze construction details and components of roof structures. - To explain different types of formwork systems available in the market and their implications on the design and construction process. - To apply knowledge of formwork systems to select the appropriate system for a given situation.							
Module 1:		Large span concrete structures					
		Module Contents - Post and Pre-Tensioned Slabs - Flat slab - Waffle/ ribbed/ coffered slab - Shell structures - Concrete domes and vaults					
Module 2:		Modular and Prefabrication construction					
		Module Contents - Foundation - Column, floors, walls, slabs, roofs. - Modular units- Scale, material, techniques					
Module 3:		Large-span steel structures					
		- Module Contents - Trusses — types, details, and functions - PEB/Portal Frame — types, details, and functions - Space Frame — types, details, and functions - Tensile Structures — cables and fabric - Composite Structures — steel and masonry - Steel Connections — riveting, bolting, and welding					
Module 4:		High Rise Structures					
		- Module Contents - Introduction and evolution of high-rise buildings					

	• Structural systems and their integration with architectural designs • Service installations in high-rise buildings • Foundations in high-rise buildings • Construction methods and technology				
Module 5:	Ceiling Systems Module Contents • Materials of suspended ceilings: study the variety of false ceiling types and materials available in the market. • Modern factory shed construction: study modern building construction materials. • Study various patented construction materials available under different trade names, including their specifications, properties, and uses, such as Vineertex, Marblax, Fixopan, Anchor Boards, Novopan, composite aluminum bond, etc.				
Module 6:	Advanced formwork systems Module Contents • Concrete Formwork: An Introduction • Integrated Concrete / Formwork Life Cycle • Horizontal Formwork Systems • Vertical Formwork Systems • Selection Criteria for Formwork System				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Chudley, R., and Greeno, R. (2016). Building construction handbook (11th ed.). Routledge. 2. Illston, J. M., and Domone, P. L. (2010). Construction materials: Their nature and behaviour (4th ed.). CRC Press. 3. McKay, W. B., and McKay, J. K. (2015). Building construction (Vol. 1–4). Routledge. 4. WoodSolutions.. Technical design guides and resources for timber construction. Retrieved from https://www.woodsolutions.com.au/ 5. SteelConstruction.info. The free encyclopedia for UK steel construction information. Retrieved from https://www.steelconstruction.info/ 6. IS 883: 1994 — Code of Practice for Design of Structural Timber in Buildings (Second Revision) 7. IS 4990: 2011 — Plywood for Concrete Shuttering Work — Specification. 8. IS 2062: 2011 — Hot Rolled Medium and High Tensile Structural Steel — Specification. 9. IS 800: 2007 — General Construction in Steel — Code of Practice. 10. IS 1200 (Part 21): 1973 — Method of Measurement of Building and Civil Engineering Works — Part 21: Cladding and Metal Work.					

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Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05	BARC 050105	Working Drawing I	4	1	0	3	0
Course Overview: This course focuses on the translation of finalized building designs into accurate construction documentation for on-site implementation. Students will develop comprehensive construction drawings that include precise labeling, dimensions, specifications, and detailed annotations. These drawings will serve as a key component of the contract documentation and will be based on the building design completed during the previous semester's design studio. The emphasis is on accuracy, clarity, and adherence to design intent and construction standards.							
Learning Outcomes: - Recall various drawing techniques, building construction methods, and structural systems. - Interpret and translate drawings based on structural and other practical considerations. - Re-create drawings incorporating construction details and structural requirements. - Demonstrate the preparation of execution drawings during the realization of a designed building. - Integrate all drawings prepared for execution purposes.							
Module 1:		Structural Layout Drawings					
		Module Contents - Preparing detailed drawing for layout of the building with respect to the site. - Illustrate and prepare drawings for layout of the foundations. - Preparation of detail layout of the beam and columns, or structural member as per the design.					
Module 2:		Architectural Drawings at Building Level					
		Module Contents - Preparation of detailed floor level plan/s and roof level plan required for the execution of work on the site. - Preparation of drawing giving detail of Section/s and Elevation/s to depict building heights, projections and floor levels.					
Module 3:		Architectural Drawings of Opening					
		Module Contents - Design and prepare detailed drawings of doors, windows, and openings, including material specifications. - Prepare detailed drawings for grills, jail work, and other elements as required for the building.					
Module 4:		Architectural Drawings of Vertical Circulation as Staircase/ Lift etc.					
		Module Contents - Preparation of drawings for the staircase layout, including details and specifications for on-site execution according to the design. - Illustration drawings of handrails, balusters, rail fittings, and related components as per the design.					
Module 5:		Architectural Drawings for Landscape and Site Development					
		Module Contents - Preparation of drawing for the landscape layouts at the building level and at site level as per the design. - Detailing of the site for example different levels on the site, as required for the site					

	development.	
Module 6:	Material Specifications	
	Module Contents • Preparation of detailed drawing of sites and incorporation of other details as per projects and sites • Reading of complete set of working drawings	
Evaluation: Distribution of % of marks		
	Progressive Evaluation	50%
	End term Examination	50%
Learning Resources/References		
1. Ching, F. D. K. (2015). Architectural Graphics (6th ed.). Wiley. 2. Ramsey, C. G., & Sleeper, H. R. (2007). Architectural Graphic Standards (11th ed.). Wiley. 3. Hall, D. J., & Schutze, N. G. (2010). Architectural Graphic Standards for Residential Construction (2nd ed.). Wiley. 4. Wilson, T. K. (2009). Drafting and Design: Basics for Interior Design. Prentice Hall.		

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Compulsory Core Course

Sem	Course No.	Course Title	Credit	L	T	P/S	D
05	BARC 050102	HVAC and Acoustics	2	2	0	0	0
Course Overview: This course offers an essential overview of building services, emphasizing their role in enhancing building functionality and user comfort. It introduces students to heating, ventilation, and air conditioning (HVAC) systems, focusing on their types, architectural integration, and coordination with other services. Additionally, the course covers the fundamentals of acoustical design, exploring the science of sound and the use of materials and systems to achieve optimal acoustic performance in buildings. Taught alongside the Design Studio, the course includes assignments linked to design exercises, promoting practical application and a deeper understanding of service integration in architectural design.							
Learning Outcomes: • Discuss the active and passive components of HVAC systems and their underlying principles. • Explain different types of air conditioning systems, including design and execution phase considerations specific to each. • Identify various interventions and innovations to enhance the energy efficiency of these systems. • Critically analyze the air conditioning systems used in case study buildings. • Apply knowledge of air conditioning systems in current design exercises. • Explain phenomena and principles related to sound propagation and their implications for building design. • Summarize common acoustical defects in auditoriums and methods to avoid or correct them. • Describe different types of noise, their transmission mechanisms, and measures for isolation and control.							
Module 1:	Fundamentals of Heating, Ventilation and Air Conditioning						
	Module Contents • Basic principles, laws, and terminologies related to HVAC. • Psychrometric chart and comfort zone; natural and artificial ventilation. • Evaporative cooling systems in air conditioning; Refrigerant Cycle (Vapour Compression System) and its reversal. • Components of mechanical vapour compression refrigeration systems.						
Module 2:	Types of Air Conditioning Systems and Emerging Trends in HVAC						
	Module Contents • Window and Split Air Conditioners, Packaged Air Conditioners, Direct Expansion Air Conditioning Systems, Central or All-water Air Conditioning Systems. • Selection criteria, design/structural considerations, and energy requirements for the above-mentioned air conditioning systems. • Passive heating and cooling systems, and energy savings through design, operation, and maintenance. • Emerging technologies such as VRV, VRF, Heat Recovery Systems, etc. • Developing air conditioning layouts for current design exercises. • Coordination with other services, architectural, and structural designs. • Case studies and their critical appraisal.						
Module 3:	Introduction to Basics of Acoustics and Noise Isolation and Control						
	Module Contents • Basic laws and terminologies related to Acoustics. • Sound Intensity and Sound Intensity Level. • Sound Absorption, Transmission, Reflection, Diffusion and Diffraction. • Free field conditions and Inverse Square Law for noise reduction with distance. • Noise and its effects, Types of noise and its transmission. • Sound Insulation and Transmission Loss. Speech privacy and noise control in specific situations.						

	• Sound Absorbing Materials – descriptions and characteristics. Methods of sound insulation and control of mechanical noise and vibrations. • Code Provisions.				
Module 4:	Acoustics for an enclosure/ Building design Module Contents • Reverberation Time and its importance for acoustical performance of an enclosure. • Sabin's Equation and its application for designing new auditoriums and correcting RT of existing ones. • Acoustical design of auditorium and other acoustically sensitive enclosures meant for speech, music, lecture, etc. • Common acoustical defects in auditoriums and their remedies. • Properties of materials and their application for acoustical treatment. Shape analysis for different enclosures. • Designing enclosures for variable reverberation times. • Sound Amplification Systems.				
Evaluation: Distribution of % of marks <table> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources / References 1. Bureau of Indian Standards (2016). National Building Code of India 2016 (SP 7) (2 vols.). Bureau of Indian Standards. 2. Grondzik, W. T., and Kwok, A. G. (2019). Mechanical and electrical equipment for buildings. John Wiley and sons. 3. Ananthanarayanan, P. N. (2013). Basic refrigeration and air conditioning. Tata McGraw-Hill Education. 4. Rangwala (2016). Building Construction. Charotar Publishing House Pvt. Ltd. 5. Egan, M. D. (2007). Architectural acoustics. J. Ross Publishing. Drawings from various case study projects to be presented and discussed for better understanding of the subjects.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course Code	Course Title	Credit	L	T	P/S	D
05	BARC 050104	Structural concept in Architecture	2	2	0	0	0

Course Overview:

The course outlines the metamorphosis of various structural concepts and systems during the development of architecture at various times. It also discusses the role of non-conventional innovative structural systems in the contemporary practice of architecture. It also highlights the impact of new materials and structural solutions on the innovative forms of architecture. The course thus aims at enabling students to design innovative non-conventional forms in their architectural design in a feasible manner, with a better understanding of the structural behavior of these forms.

Learning Outcome:

- Identify the concepts of various structural elements and systems.
- Illustrate the use of different structural systems in the building industry.
- Analyze structural geometry based on strength and stability criteria.
- Outline the development of structural forms through the architectural timeline.
- Design effective structural systems to meet complex architectural requirements.
- Apply fundamentals of temporary structural systems for designing disaster mitigation shelters.
- Create integrated systems based on structural models and new materials for modern skyscrapers.
- Appraise built environments according to specific structural systems.

Module 1:	Classification of Structures
	Module Contents • Classification of structures on the basis of their force transmission media. • Discussion of Bulk Active, Vector Active, Surface Active and Force Active structures
Module 2:	Trusses and Space Frames (Vector Active Structure)
	Module Contents • Components of trusses, their classification, and applications in architecture • Long-span trusses: advantages, structural behavior, and architectural uses • Space frames: formation principles and their applications in buildings • Methods of force resolution in 2D truss systems
Module 3:	Shells, Domes and Plate Structures (Surface Active Structures)
	Module Contents • Classification and advantages of arches, shells, and hyperbolic paraboloids • Shells, vaults, and domes: structural concepts, classifications, and architectural applications • Plate structures: definition, types, and their application in architecture • Concept and application of folded plate structures
Module 4:	Tensile and Pneumatic Architecture (Force Active Structures)
	Module Contents

	• Concept of Tensile Structures, • Formation and classification of Tensile structures • Use and examples of various cable structures • Application of cable structures in contemporary architecture • Materials and construction methods for membrane structures • Concept, classification, and application of pneumatic structures				
Module 5:	Structural Systems for Skyscrapers; Pre-stressed Concrete Module Contents • High Rise Buildings: Structural Systems and Application, • Skyscrapers: Structural Concept and Modern Methods of Construction Application, • Case Studies on Structural Systems of Skyscrapers • Concept of prestressing of concrete • Techniques of prestressing - pre-tensioning and post-tensioning				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Ching, FDK. (2014); Building Structures Illustrated: Patterns, Systems, and Design; Wiley Publications 2. Dayaratnam, P. (1982); Prestressed Concrete Structures; Oxford and IBM Publishing Co., New Delhi 3. Schuller, W. (1976); High Rise Building Structures; John Wiley and Sons; New York 4. Otto, F. (1967); Tensile Structures; Vol-I and II, Pneumatic Structures, Cable Structures; MIT Press, London 5. Subramaniam, N. (1983); Principles of Space Structures; Wheeler and Co., Allahabad					

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DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem	Course No.	Course Title	Credit	L	T	P/ S	D
05	BARC 050106	Site Planning and Landscape Architecture	2	2	0	0	0
Course Overview: The course intends to attain knowledge which is required to understand the natural and man-made components that generate the decisions in the planning of any site. The students are introduced to the relationship between built and unbuilt environments and the principles of site planning. Describing the role of landscape architecture for the judicious co-existence of man with nature and its patterns and systems with the help of case examples, landscape principles and design elements.							
Learning Outcomes: • Enable to analyse ecological and geomorphological characteristics of a site • Develop the ability to assess and synthesize site conditions to propose an appropriate site plan • To learn techniques of grading, drainage, circulation, and planting design. • To understand landscape design principles and apply them to propose a landscape design in response to the site context.							
Module 1:		Introduction to the Site Assessment Techniques					
		Module Contents • Understanding Site Physiography: Study of topography, geology, geomorphology, soil characteristics, micro-climate, ecology and habitat, including flora and fauna, surface hydrology, etc. • Data Collection and Site Inventory: Documentation of natural features such as vegetation, soil, and water bodies, and human-made elements such as infrastructure, legal constraints, and zoning regulations. • Spatial Mapping and Terrain Analysis: Mapping of relief, slope evaluation, drainage networks, geological or soil profiles, and vegetation, in relation to the social, cultural, and ecological context of the site. • Technical Skills and Representation: Learning techniques such as soil grading, slope stabilization, runoff calculation, herbarium preparation, and the use of pre-design tools and spatial representation methods. • Site Analysis and Synthesis: Conducting site suitability assessments and developing a comprehensive site development plan based on analytical findings.					
Module 2:		Landscape Design Principles					
		Module Contents • Landscape principles and design elements • Sustainable and environment friendly construction material and technique • Basic detailing and design development of outdoor spaces, such as edges, pathways, courtyards, buffers, street furniture, lighting, fencing, and other landscape elements.					
Module 3:		Historical and contemporary practices					
		Module Contents • Historical overview of garden design and its relationship with the broader context and users. • Understanding various categories of landscapes such as functional (utilitarian), culturally significant (sacred, heritage), modernist, and contemporary landscapes. • Exploring contemporary practices through case studies and the works of eminent landscape architects and designers.					

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources / References

1. McHarg, I. L. (1969). Design with nature. Natural History Press.
2. Laurie, M. (1986). An introduction to landscape architecture. Elsevier.
3. Hubbard, H. V., & Kimball, T. (1917). An introduction to the study of landscape design. Macmillan.
4. Bose, T. K., & Chowdhury, B. (1991). Tropical garden plants in colour. H & A Publishers.
5. Lynch, K. (1962). Site planning. MIT Press.
6. Harris, C. W., & Dines, N. T. (1998). Time-saver standards for landscape architecture: Design and construction data (2nd ed.). McGraw-Hill.
7. LaGro, J. A., Jr. (2008). Site analysis: A contextual approach to sustainable land planning and site design (2nd ed.). Wiley.
8. Simonds, J. O., & Starke, B. (2006). Landscape architecture: A manual of environmental planning and design (4th ed.). McGraw-Hill.

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

SIXTH SEMESTER COMPULSORY CORE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
06	BARC 060101	Architectural Design VI	8	1	0	3	4
Course Overview: This studio revolves around the design complexities of mid-rise to high-rise structures addressing multi-user groups. The studio will focus on different typologies of housing for formal/informal sectors. The subject will integrate with previous learning's from subjects like site planning and landscape, building construction, energy efficient architecture, climatology, and services at the site and building level. The complexities of the project will include detailed calculations for housing including the project formulation exercise. The project will cater to all formal existing site restrictions and byelaws. The project should be integrated with ongoing subjects like Working Drawing where working drawing for a certain part of the project may be attempted. The suggested typologies are group housing, mixed-use housing, condominiums, resorts, specialized living centers and the like. The order of modules may be changed as suitable to design objectives.							
Learning Outcomes: Upon successful completion of this course, students will: • Develop sensitivity towards the existing physical context, and site and building restrictions. • Analyze climate data and develop passive design strategies for mid-rise and high-rise buildings. • Apply knowledge of services at site and building levels. • Apply climate-responsive techniques in the design of small-scale mid-rise buildings. • Forms correlation with previous and ongoing subjects. • Integrate aesthetic, functional, and structural considerations into comprehensive architectural designs.							
Module 1:		Understanding the Context and Physical Settings: Module Content • In this module, students will understand the needs of the user(s), environmental factors, and the relationship between the site and its context. It will connect these elements allowing students to develop a deeper understanding of the user's needs, cultural influences, environmental and site conditions. Students will conduct an in-depth study of the site's context, focusing on both built and unbuilt spaces, and identify the key attributes of the physical environment, such as topography, vegetation, and local climate. Key tasks of this module will include: • Basic site analysis and observation of contextual elements and shape a design story that weaves the user needs with environmental context.					
Module 2:		Defining specific design objectives aligned with user requirements and the analysis of physical context: Module Content • This module focuses on translating the learning's from the previous module into specific design objectives that align with the user program. • Students will analyze the site's topography, climate data, and spatial requirements emerging from activities such as circulation, functionality, standards, data collection, and aesthetic needs. • This module will also emphasize the design's integration with the local climate, focusing on building orientation, materiality, and climate-responsive solutions that will shape the architectural form and spatial arrangement.					

	Study on the user's needs and their requirements will be a major concern. Students could be sensitized (socio-cultural sensitization) through different media viz. documentary, photos, movies, site visits, case studies, etc.
Module 3:	Understanding the Site and Building Level restrictions and implying them to the Design Project with all Services: Module Content - Students will learn about the bye-laws and site-building level restrictions. - Students will also apply the services learnt from the previous and current semesters at building level and site level. Students will be involved with precision block models, study models and site models.
Module 4:	Formulation of Concept, Schematic Design and detailed Area Statement: Module Content - This stage will emphasize the development of ideas for the form, function, and spatial organization of both built and unbuilt spaces. - Students will consider material choices, structural concepts, and the integration of climate-responsive strategies. The schematic design will explore how passive design techniques such as, natural ventilation, solar orientation, and material thermal behavior can be incorporated into the design to enhance both sustainability and user experience. - Implications of the formal restrictions for site and building will be done on the preliminary and conceptual drawings. The detailed calculations for the housing typology will be formulated.
Module 5:	Design Development with Details of Form, Function, Material, and Construction Techniques: Module Content - The preliminary design will be developed on all the previous modules including the area program and the area statement. - The design will convert to architectural drawings with detailed development on circulation, site development, form development, materiality and with the involvement of construction techniques and possible working drawings of a certain block or area.
Module 6:	Design Development with Communication Skills: Module Content - The final module focuses on the refinement and detailed development of the design. Students will develop their preliminary designs into comprehensive proposals, including detailed drawings such as site plan, floor plans, elevations, and sections. These will depict the relationships between interior and exterior spaces, with special attention to site development, response to the topographical character of the site, materiality, vertical and horizontal circulation, passive design strategies, sustainability, and construction techniques. - Students will also explore how these design elements work together to support the overall architectural concept while addressing functional, aesthetic, and environmental concerns and come out with perspective views and the required models at different levels to explain the scheme.

Notes:

- Focuses on complex architectural projects integrating urban context, sustainability, and advanced building systems.
- Emphasizes site planning, regulatory compliance (bye-laws), and conceptual development into architectural language.
- Encourages detailed design resolution, presentation techniques, and critical analysis of user-centric spaces.

Evaluation: Distribution of marks

Progressive Evaluation	50%
End term Examination:	50%

Learning Resources/References (in APA format)

1. Lynch, K. (1984). Site planning (3rd ed.). MIT Press.
2. Hack, G., and Sprague, J. (2018). Site analysis: A contextual approach to sustainable land planning and site design (3rd ed.). Routledge.
3. Bureau of Indian Standards. (2016). National building code of India 2016 (Vols. 1–2). Bureau of Indian Standards.
4. Stein, J. M., and Reynolds, R. E. (2000). Mechanical and electrical equipment for buildings (9th ed.). Wiley.
5. Unwin, S. (2020). Analysing architecture (5th ed.). Routledge.
6. Ching, F. D. K. (2015). Architecture: Form, space, and order (4th ed.). Wiley.
7. Bureau of Indian Standards. National Building Code of India. Retrieved May 9, 2025, from <https://www.bis.gov.in>
8. Dezeen. Retrieved May 9, 2025, from <https://www.dezeen.com>
9. Government of Madhya Pradesh. (1984). Madhya Pradesh Bhumi Vikas Rules, 1984. Retrieved May 9, 2025, from <https://www.naredco.in/notification/pdfs/Bhopal%20Building%20Bye%20Laws.pdf>.

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
06	BARC 060103	Working Drawing II	4	1	0	3	0
Course Overview: The Architectural Drawings need to be detailed on the basis of services layouts and other important features to be used in the designed building to be executed and constructed. The building drawings so prepared become part of the contract documents with proper labeling, dimensioning, specifications, and detailing. Drawings shall be based on Architectural Drawings prepared in Working Drawing- I in the previous semester. The learning of building Materials and construction will be implemented for preparing various drawings. The knowledge gained through WD-I and WD-II will help the students in better understanding the project management aspects. The subject will be taught in congruence with the design studio, and assignments for the subject will be linked to the design exercises to achieve a higher level of learning and understanding the practical application of the same. It will be helpful in detailing the drawings for the subject working drawing-I and understanding the various stages of construction for estimation and costing.							
Learning Outcomes: • Upon successful completion of this course, students will: • Select the appropriate construction details as per the various services. • Illustrate drawings based on the traditional and new materials. • Prepare various details of different construction sections. • Demonstrate the preparation of execution of drawings in the process of realization of a designed building and services. • Integrate all the drawings prepared for the execution purpose.							
Module 1:		Building Services Drawings (External)					
		Module Contents • Water supply source and connections. • Electric supply source and connections. • Sewage disposal and storm water disposal system. • Rainwater harvesting system. • Landscaping details if required.					
Module 2:		Building Services Drawings (Internal)					
		Module Contents • Layouts of kitchen, toilets and other utility spaces along with the specifications of fixtures. • Plumbing layouts of kitchen, toilets etc.					
Module 3:		Specifications of Finishes:					
		Module Contents • Internal Finishes: • Flooring Pattern and its specifications. • White washing/ Wall finishes etc. and its specifications. • Wood Finishes and Fixtures. • Fabrication and its specifications. • Electrical fittings, fixtures and their specifications.					

Module 4:	Specifications of Finishes.				
	Module Contents External Finishes: • Site development which will include the Paving, Roads, Driveways, Pathways etc. and their specifications. • Fabrications like Gate, railings, fencing etc. and their specifications. • White washing/ Wall finishes etc. and its specifications. • Electrical fitting and fixtures and their specifications. • Boundary wall design, fixtures and their specifications.				
Module 5:	Details of Fabrications				
	Module Contents • Different Fabrication like Gate, railings, fencing etc.				
Module 6:	Graphics and Signage.				
	Module Contents • Various types of signage and graphics as and where required. • Preparation of drawings with illustrations. • Site visit and case studies to know the various details. • Data collection from the market survey regarding construction material and detailing.				
Evaluation: Distribution of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination:</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination:	50%
Progressive Evaluation	50%				
End term Examination:	50%				
Learning Resources/References (in APA format) 1. Ching, F. D. K. (2015). Architectural graphics (6th ed.). Wiley 2. Hall, D. J., & Greichel, N. (2010). Architectural graphic standards for residential construction (2nd ed.). Wiley. (Nicholas Greichel is a co-author in later editions.) 3. Ramsey, C. G., & Sleeper, H. R. (2007). Architectural graphic standards (11th ed.). Wiley. 4. Wilson, T. K. (2008). Drafting and design: Basics for interior design. Prentice Hall.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
06	BARC 060102	Estimation, Costing and Specifications	3	2	1	0	0
Course Overview: This course provides students with the foundational knowledge and practical skills required for estimation, costing, valuation, and specification in architectural projects. It covers essential concepts such as quantity surveying, cost analysis, and valuation methods, enabling students to effectively manage project budgets and financial assessments.							
Learning Outcomes: - To understand the principles and methodologies of estimating quantities and costs in building construction. - To develop proficiency in preparing detailed estimates, specifications, and valuation reports. - To familiarize students with standard practices, codes, and schedules used in the construction industry. - To integrate estimation and costing knowledge with architectural design and project execution. - To integrate estimation and costing practices in sustainable and green building projects.							
Module 1:		Introduction to Estimation and Costing:					
		Module Content - Purpose and importance of estimation in architectural projects. - Types of estimates: Preliminary, Detailed, Revised, and Supplementary. - Methods of estimation: Plinth area method, Cubic content method, Service unit method. - Units of measurement and standardization. - Cost estimation in Sustainable and Green Building projects, Analysis of green materials and cost implications					
Module 2:		Quantity Surveying and Measurement Techniques:					
		Module Content - Detailed measurement of building components: Earthwork, Concrete, Masonry, Woodwork, Finishes. - Methods of taking out quantities: Centerline method, long-wall, short-wall method. - Preparation of Measurement Sheets and Abstract Sheets. - Introduction to software tools for quantity take-off.					
Module 3:		Rate Analysis and Costing:					
		Module Content - Understanding direct and indirect costs in construction. - Analysis of rates for various items of work: Materials, Labor, Equipment. - Use of Standard Schedule of Rates (e.g., CPWD SOR). - Preparation of Bill of Quantities (BOQ) and Cost Estimates. - Cost components: Materials, labor, overheads - Rate analysis and rate sheets - Budgeting and financial management in construction projects - Cost control techniques					

Module 4:	Specifications:				
	Module Content • Definition and importance of specifications in construction. • Types of specifications: General, Detailed, and Special. • Writing specifications for various building materials and works. • Understanding BIS codes and standards.				
Module 5:	Valuation:				
	Module Content • Purpose: Sale, purchase, mortgage, insurance, taxation; and principles of valuation in architecture. • Types of valuation: Rental, Capital, Depreciation methods, Open market value, book value, salvage value • Methods of valuation: Comparative, income capitalization, residual method. • Factors affecting the value of a property. Preparation of valuation reports and certificates.				
Module 6:	Case Studies and Practical Applications:				
	Module Content • Detailed analysis of real-world projects • Preparation of a comprehensive estimate for a selected project • Practical exercises using estimation software				
Evaluation: Distribution of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination:</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination:	50%
Progressive Evaluation	50%				
End term Examination:	50%				
Learning Resources/References (in APA format) 1. Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing. 2. Chakraborty, M. Estimating, Costing, Specification and Valuation. 3. Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd. 4. CPWD Standard Schedule of Rates. 5. BIS Codes relevant to building construction and specifications.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
06	BARC 060104	Energy Efficient Architecture	3	2	1	0	0
Course Overview: This course provides a comprehensive exploration into the principles, strategies, and technologies essential for designing Net Zero Energy Buildings (NZEBS). Students will delve into energy-efficient architectural design, passive and active design strategies, and the integration of smart technologies and renewable energy systems. The course bridges theory with practical tools such as energy simulations and audits, empowering students to optimize building performance. With a strong focus on sustainable materials, high-performance envelopes, and cradle-to-cradle thinking, the course prepares students to contribute innovatively to the future of green building design.							
Learning Outcomes: - The ability to decide on building forms and configurations for low-rise, mid rise, and high-rise buildings. - Compare and prioritize design strategies applicable at various scales in site planning and design of building facades, internal configurations, structures and services in view of occupancy types and user program. - Integrate building systems (e.g., renewable energy, energy-efficient HVAC, automation) into cohesive designs that achieve Net Zero Energy goals. - Apply energy modelling, simulations, and performance data to inform design decisions and optimize building systems for maximum energy efficiency. - Be able to design buildings that incorporate smart technologies for efficient energy use and enhanced sustainability.							
Module 1:		Introduction to Energy Efficiency in Buildings and Cradle-to-Cradle Design:					
		Module Content - The impact of building energy consumption on the environment and climate change. - Core concepts such as energy conservation, energy management, and renewable energy. - Introduction to Energy performance in buildings based on codes and standards. - Cradle-to-cradle design and life cycle thinking to material selection and building design. - Introduction to Sustainable frameworks and certifications (LEED, BREEAM) for green building performance.					
Module 2:		High-Performance Building Envelopes, Sustainable Building Materials, and Passive Design Strategies:					
		Module Content - Energy efficient building envelopes that minimize energy loss through walls, windows, roofs, and façades. - Passive strategies like solar orientation, thermal mass, natural ventilation, and shading in building design. - Building materials for sustainability and thermal performance. - Principles of thermal comfort and passive environmental controls.					
Module 3:		Energy Auditing and Energy Simulations:					
		Module Content - Energy audits to identify inefficiencies in building systems and operations. - Introduction to Energy simulation software to evaluate and optimize building performance. - Energy Conservation Measures (ECMs) in both new and retrofitted buildings.					

Module 4:	Building Design for Net Zero:	
	Module Content • Goals and criteria of Net Zero Energy Buildings. • Passive and active systems to reduce overall energy demand and enhance efficiency. • Renewable energy systems (solar PV, wind, geothermal). • Comprehensive design strategies that balance energy consumption with onsite generation.	
Module 5:	Smart Buildings, Building Automation Systems (BAS), and Internet of Things (IoT):	
	Module Content • Energy efficiency and user comfort through automation and intelligent systems. • Introduction to Building Automation Systems (BAS) for lighting, HVAC, and other operational systems. • Introduction to IOT concept and application • Role of technology in enhancing sustainability, user interaction, and predictive maintenance.	
Evaluation: Distribution of marks		
Progressive Evaluation		50%
End term Examination		50%
Learning Resources/References (in APA format)		
1. Hawkes, D., and Forster, W. (Eds.). (2009). Energy efficient buildings: Architecture, energy and environment. Routledge. 2. Al-Sallal, K. A. (Ed.). (2014). Low energy, low carbon architecture: Recent advances and future directions. Springer. 3. Krishnan, A. (Ed.), and [et al.]. (2001). Climate responsive architecture: A design handbook for energy-efficient buildings. McGraw-Hill Education. 4. Ghosh, S., and Dhaka, A. (2014). Green structures: Energy efficiency in buildings. PHI Learning. 5. Hootman, T. (2013). Net zero energy design: A guide for commercial architecture. Wiley. 6. Heywood, H. (2012). 101 rules of thumb for low energy architecture. Routledge. 7. Sayigh, A. (Ed.). (2015). Sustainability, energy, and architecture: Case studies in realizing green buildings. Springer. 8. Green Building Rating Systems. 9. Energy Conservation Building Codes.		

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
06	BARC 060106	Theory of Design	2	2	0	0	0
Course Overview: The course will focus on creating a deep understanding about Architecture and Design from a theoretical perspective. The course will help students to develop a strong design vocabulary, how to communicate their design and the design process. The intent of the course is to give a complete process and background about designing in architecture. Also, the course shall familiarize the students with important architectural practices worldwide and in India.							
Learning Outcomes: Students are expected to learn the Architecture Design process and to improve their ability to theorize architectural issues and ideas for the design process. It is also expected that the students will develop a holistic understanding of how critical theories engage in history and design.							
Module 1:	Elements of Design:						
	Introduction to theory, design, philosophy, aesthetics - chronological overview from Stone Age to Postmodernism. Elements of design: Dot, line, Plane, Scale, Volume, Mass, Color and Texture. Form and its development: Understanding form in nature, and human environment, properties of form, transformation of forms-dimensional transformation, subtractive, additive forms, organization of forms - Articulation of forms.						
	Principles of design:						
	Directional principles - Repetition, Parallelism, Sequence, Alternation, Gradation, Transition, Radiation, Rhythm; Highlighting principles: Concentrism, Contrast, Emphasis; Synthesizing principles: Proportion, Scale, Balance, Harmony, Unity. Analyzing and interpreting built forms and their architectural expressions and meanings. Circulation, movement and organization of space based on principles of design.						
Module 2:	Design Thinking:						
	What is Design and Design Thinking? Design Thinking Models (in design and Architecture), Design Images, Presentations and Tests, Characteristics of Designing, understanding what designers do for Architectural Design Thinking. Thinking techniques, Convergent, Divergent and Lateral Thinking, Analysis and Synthesis.						
	Design Process:						
	Design Process in Architecture: Design as "Problem Solving" and "Multivariate" Activity. Understanding the design process in Architecture, the methodological process in architecture design, various stages of architecture design and how to conduct, literature review, data collection, site analysis, case studies, area programming, concept development, the process of concept development etc.						

Module 3:	Modernism:				
	The principles and philosophy of modernism- in art, design and architecture, worldview, theories and perceptions of time and space, mode of reasoning. Form follows Function, less is more, Metabolism, Brutalism, Minimalism; Discuss Master Architects and their works: Richard Neutra, Philip Johnson, Eero Saarine, Frank Lloyd Wright, Louis Sullivan(Form Follows Function), Walter Gropius (Bauhaus school), Le Corbusier, Ludwig Mies van der Rohe etc.				
	Postmodernism:				
	The principles and philosophy of Postmodernism- in art, design and architecture, worldview, theories and perceptions of time and space, mode of reasoning. Discussing: Richard Meier, Arata Isozaki, Michael Graves, Le Corbusier, Robert Venturi, Charles Moore, Mario Botta, Renzo Piano, Ricardo Bofill, Frank Owen Gehry, Jane Jacobs etc. Introduction to Post Independence (Modern) architecture in India. Discuss: Raj Rewal, Charles Correa, B.V.Doshi, A.P. Kanvinde, Ananth Raje, Louis Kahn, Joseph Allen Stein, U.C Jain, Laurie Baker, Dean D'Cruz, Hafeez Contractor, Nari Gandhi, Hasmukh Patel etc.				
Module 4:	Evaluation of Built Environment:				
	Design Paradigm change and responsibilities of designer (Architect) for the design of built environment to be usable for "All Users". Understanding the "Built" and the "User". Critical Appreciation of the Built Environment to understand the interrelationship of spaces, organization of spaces etc. Case studies in Architecture: evaluation of external and internal built environment, tools to conduct evaluation of built environment, behavioral observation tools, interviews, trace studies, evaluation with audio, video and photographs, annotated diagrams, mental maps, focus groups etc. The tools to convert behavioral observations into numerical values.				
Notes: Respective tutors can plan their teaching plans and distribute the content to lecture content, Group Discussion Content and Self Study content. It is expected to give an Introduction Lecture for all modules covering the overall understanding of the content and selected contents in each module can be delivered through detailed lectures. The remaining can be covered through Case studies, Group discussion/Debates and Self Study.					
Evaluation: Distribution of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination:</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination:	50%
Progressive Evaluation	50%				
End term Examination:	50%				
Learning Resources/References (in APA format) 1. Francis DK Ching, Form Space and Order, 2. Vitruvius, P., and Morgan, M. H. (1960). Vitruvius: The ten books on architecture. New York: Dover Publications. 3. Heidegger, Martin. (1993). Building Dwelling Thinking. Basic Writings. HarperCollins. 4. Robert Venturi, (1966) Complexity and Contradiction in Architecture. New York: The Museum of Modern Art. 5. Merleau-Ponty, M., and In Edie, J. M. (1964). The primacy of perception: And other essays on phenomenological psychology, the philosophy of art, history, and politics. 6. Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester: Wiley-Academy. 7. Smith, K. H. (2012). Introducing architectural theory: Debating a discipline. New York: Routledge. 8. Eisenman, Peter. (1999) Diagram Diaries. New York: Universe.					

9. Le Corbusier. (1986.) *Towards a New Architecture*. Mineola: Dover Publications, Inc.
10. Lefebvre, H. (2004). *Rhythmanalysis space, time, and everyday life*.
11. Unwin, S. (2021). *Analysing architecture: the universal language of place-making* (Fifth edition). Routledge.
12. Frampton, K. (2020). *Modern architecture: a critical history* (Fifth edition). Thames and Hudson Inc.
13. Farrell, T., and Furman, A. N. (2024). *Postmodernism architecture that changed our world* (2nd edition). RIBA Publishing
14. Zumthor, P. (2010). *Thinking architecture*; M. Oberli-Turner and C. Schelbert, Trans.; Third, expanded edition). Birkhäuser.

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
06	BARC 060108	Housing	3	2	1	0	0
Course Overview: This course introduces students to the critical understanding of various aspects of housing design and neighborhood development. It aims to develop an integrated perspective that connects architecture with urban development, covering aspects such as housing design principles, housing policies, development regulations and site planning, urban design considerations, amenities, services and Infrastructural requirements at the neighborhood level. The course will provide clarity for design of housing for various types of typologies that may be useful in conjunction with the Housing Design Studio. This integration aims to enhance practical understanding and application of theoretical concepts in real-world housing scenarios.							
Learning Outcomes: By the end of the course, students will be able to understand housing typologies in relation to the human socio-economic needs. They will be capable of understanding various development norms, space standards and components of neighborhood design. Information pertaining to regulatory bodies, Housing unit calculations, Parking and services requirements and housing finance will make them aware of housing design for various stakeholders including urban poor. Critical appraisal of housing schemes, innovative designs, futuristic designs and context-specific neighborhood designs.							
Module 1:		Introduction to Housing:					
		Module Content • Basic terminologies in housing and Definitions. • Evolution of human habitats, neighborhood and community. • Housing scenario, policies and interventions at national and Global levels. • Characteristics of the Formal and informal settlements.					
Module 2:		Housing Typologies and Principles:					
		Module Content • Relationships between Human needs and housing types. • Housing classification and typologies. • Global and Indian approach for the Public Housing. • Principles of neighborhood design, Site Planning.					
Module 3:		Housing Norms and Development Regulations:					
		Module Content • Basic Terminologies, Density, FAR, Space Standards, bylaws, etc. • Development rules for various housing types, Parking, Facilities and Services norms. • Housing regulatory bodies, RERA, CREDAI, HB, DA, Building and TP permissions. • Housing finance, Affordability, unit cost/area calculations. • Real Estate Market, Factors of housing cost, demand and supply relationships.					
Module 4:		Housing Design and Innovations:					
		Module Content • Evolution and major paradigm shift in Housing Designs. • Impact of technology, material and social advancement. • Contemporary housing, Utopian ideas for futuristic housing designs. • Special Purpose Housing, sustainable, disaster resilient, youth, elderly etc.					

Evaluation: Distribution of marks

Progressive Evaluation	50%
End term Examination:	50%

Learning Resources/References:

- Davidson, F., & Payne, G. (1983). Urban projects manual: A guide to the preparation of projects for new development and upgrading. Liverpool University Press.
- Ingham, J. A. (1971). City slums. Oxford University Press.
- Jain, A. K. (2012). Urban housing and slums. Bookwell Publications.
- Jogalekar, C., & Das, S. K. (1995). Contemporary Indian architecture: Housing and urban development. HUDCO.
- Miglani, O. P. (1987). Urban housing in a developing economy: A study of India. Mittal Publications.
- Schumacher, P. (2004). Digital Hadid: Landscapes in motion. Birkhäuser.
- Yadav, C.S. (1986). Cities and housing: The Indian experience. Concept Publishing Company.

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

FIFTH and SIXTH SEMESTER ELECTIVE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05/06	BARC 0501E5A/ BARC 0601E6A	Advance Computer Application, BIM, AI	2	1	1	0	0
Course Overview: This course explores Building Information Modelling (BIM) and Artificial Intelligence (AI) as transformative tools for architecture, emphasizing conceptual design, parametric modeling, generative AI, and digital construction.							
Learning Outcomes: • Master BIM workflows for conceptual design and project coordination. • Apply AI for generative design, optimization, and predictive analytics. • Design sustainable, resilient buildings using BIM-AI integration. • Adapt global BIM-AI practices to Indian urban and climatic challenges.							
Module 1:		Conceptual Design Using BIM:					
		Module Content • for conceptual design: Massing, spatial planning, and iterative modeling. • Tools: Interface and different workflows for conceptual design. • BIM standards: ISO 19650, India's National BIM Roadmap for early-stage design.					
Module 2:		AI for Design Optimization and Generative Design:					
		Module Content • AI in architecture: Generative design, optimization algorithms, NLP for design inputs. • Parametric AI tools: Concept of Plug-in with examples, AI-driven concept generation. • AI for performance: Energy analysis, day lighting, structural efficiency. • Ethical AI: Bias, accessibility in Indian projects.					
Module 3:		BIM-AI for Construction and Resilience:					
		Module Content • BIM for construction: 4D (scheduling), 5D (cost), clash detection. • AI applications: Construction robotics, site monitoring, predictive maintenance. • Resilience: BIM-AI for disaster preparedness (e.g., monsoon flood modeling, seismic analysis). • Indian challenges: Urban density, cost constraints.					
Module 4:		Advanced BIM-AI Applications and Future Trends:					
		Module Content • Digital twins: BIM-AI for real-time building management. • Emerging tech: AR/VR for BIM visualization, AI-driven urban planning. • Future trends: Autonomous construction, biophilic AI design • Ethics: Privacy, affordability in Indian smart cities.					

Evaluation: Distribution of marks

Progressive Evaluation	50%
End term Examination:	50%

Learning Resources/References:

1. Eastman, C. (2018). BIM Handbook: A Guide to Building Information Modeling. Wiley
2. Deutsch, R. (2019). Superusers: Design Technology Specialists and the Future of Practice. Routledge.

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05/06	BARC 0501E5B/ BARC 0601E6B	Disaster Responsive Architecture	2	1	1	0	0
Course Overview: The course aims to equip students with architectural and urban planning strategies that enhance resilience against natural and human-induced disasters. By integrating scientific knowledge, technological innovations, and sustainable design principles, students will learn to create safe, adaptive, and disaster-resistant built environments.							
Learning Outcomes: • Understand the disasters, cause, impacts and explore disaster mitigation principles in architectural design. • Learn Structural design strategies for disaster resistance, criteria for selection of materials and application of international and national building codes. • Explore architectural strategies for climate induced disaster, sustainable and green infrastructure • Learn regulatory and policy compliances and be incorporated in architecture and planning. • Evaluate case examples of disaster resistant architecture.							
Module 1:		Fundamentals of Disaster-Resistant Architecture:					
		Module Content • Understanding natural and human-induced disasters (earthquakes, floods, cyclones, landslides, fires). • Principles of disaster mitigation in architectural design. • Climate induced disaster, its responsive architecture and adaptation strategies. • Building codes and standards for disaster resilience (NBC, IS codes). • Case studies and Applications					
Module 2:		Earthquake resistant architecture:					
		Module Content • Structural design and material selection: base isolation, damping systems, reinforced structures. • Architectural considerations. • Building Codes and Standards: IS 4326 (1993) Code of Practice, NBC 2016, Global Standards. • Case studies and Applications.					
Module 3:		Flood-resistant architecture:					
		Module Content • Design strategies and material selection: elevated structures, Floating Architecture, Waterproof Foundations, water-resistant materials. • Flood-proof coatings • Drainage systems • Case Studies and Applications.					
Module 4:		Wind and cyclone-resistant structures:					
		Module Content • Structural Design Strategies: aerodynamic forms, Foundations, reinforced walls and roof; material selections. • Architectural considerations.					

	• Building Codes and Standards. • Case Studies and Applications				
Module 5:	Fire safety and emergency response planning: Module Content • Fire Safety Measures and Emergency Response Planning. • Regulatory Standards and Compliance. • Case Studies and Practical Applications.				
Module 6:	Climate induced disaster resistant architecture: Module Content • Heatwave and Wildfire-Resistant Design: Passive cooling techniques, fire resistant materials, green roof and urban forest. • Rising sea level adaptation: floating cities, resilient infrastructure.				
Evaluation: Distribution of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: 1. Rajagopal, S. (1980). Problems of housing in cyclone prone areas (Vol. 2). Chennai: Structural Engineering Research Centre (SERC) 2. Ramani, S. (1980). Disaster management: Advanced course on modern trends in housing (Vol. 2). Chennai: Structural Engineering Research Centre (SERC). 3. Arnold, C. Building configuration and seismic design. 4. Schild, F., & Others. Structural failures in residential buildings.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05/06	BARC 0501E5C/ BARC 0601E6C	Low-Cost Building Techniques	2	1	1	0	0
Course Overview: This course aims to introduce students to cost-effective and alternative construction technologies that promote sustainable and affordable building practices. It emphasizes strategies to reduce overall construction costs, particularly through the efficient use and reduction of building materials. Additionally, the course highlights the important role these technologies play in improving housing methods and minimizing environmental impact, thereby contributing to more responsible and resource-conscious construction practices.							
Learning Outcomes: • Adopt cost effective, innovative and environment-friendly housing technologies for the construction. • Use low-cost housing technologies in comparison with the traditional construction methods. • Apply low-cost construction techniques and equipment.							
Module 1:		Introduction to Low-Cost Building: Module Content • Brief Discussion on the Concept of Low-Cost Building. • Evolution of Low-Cost Building in India and abroad. • Socio-Economic and Environmental Factors. • Government Policies and the Role of NGOs and Community Participation in Low-Cost buildings.					
Module 2:		Low-Cost Building Materials: Module Content • Soil and Mud, Fly ash, Ferrocement, Lime, Fibers, Stone Dust, Boulders and oversize metal, Bitumen, Agricultural by-products (Rice Husk, Bagasse, Banana Fiber, Coconut Coir, Groundnut shell Ash etc) Recycled materials, etc. • Walls - Stabilized and sun-dried earth/mud blocks and bricks (Adobe/ Cob/ Wattle and Daub), Hollow concrete blocks, stone masonry blocks, Ferro-cement partitions etc. • Roofs - Precast R.C. Plank and Joists roof, precast channel roof, Precast L-panel roof, Precast Funicular shells, Ferro cement shells, Filler Slab, SeasalFibre roof, improved country tiles, Jack Arch, Thatch roof etc.					
Module 3:		Low-Cost Building Techniques and Equipment's: Module Content • Techniques - Rat trap bond construction, Precast R.C. and Ferro cement technique, Mud Based Construction. • Low-Cost Sanitation - Waste water disposal system, Grey water recycling and reusing, Low-cost sanitation for rural and urban areas, Ferro cement Drains. • Equipment - Brick molding machine, Stabilized soil block making machine and plants for the manufacturing of concrete blocks.					
Module 4:		Sustainable Aspect of Low-Cost Construction: Module Content • Energy efficiency of low-cost materials and construction, Embodied Energy, Carbon footprint of low cost (local) materials, Climatic comfort of low-cost buildings					

	• Unique maintenance requirement of low-cost buildings and their durability • Costing and economy of low-cost construction • Concept of "Permanent Low-Cost Vernacular Architecture" • Faculty may initiate the study and critical appraisal of a national or an international case-study based on the above aspects				
Note: Teaching pedagogy of this subject should be oriented on more hands-on or practical study-based exercise than pure classroom lecture. Hence, site visits are encouraged					
Evaluation: Distribution of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: 1. Central Building Research Institute. Building dreams in mud for village Wardha (India): Your own house [Manual]. Roorkee, India: CBRI. 2. Central Building Research Institute. Living better with mud and thatch [Manual]. Roorkee, India: CBRI. 3. Central Building Research Institute. Advances in building materials and construction [Manual]. Roorkee, India: CBRI. 4. Housing and Urban Development Corporation Ltd. (HUDCO). (1995). Low-cost housing techniques. New Delhi: HUDCO. 5. Reddy, B. V. V. (2004). Sustainable building technologies. Bangalore: Indian Institute of Science. 6. United Nations Centre for Human Settlements (UN-HABITAT). (1993). Low-cost housing policies and practices in developing countries. Nairobi: UN-HABITAT.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05/06	BARC 0501E5D/ BARC 0601E6D	Intelligent Buildings and Automation	2	1	1	0	0
Course Overview: This course explores intelligent buildings and Building Automation Systems (BAS), focusing on the integration of Internet of Things (IoT), AI, and sustainable technologies in modern architecture. It examines how these systems enhance energy efficiency, user comfort, and maintenance while contributing to disaster resilience through automated safety and real-time monitoring. Students will gain insight into designing smart, adaptive buildings that align with contemporary needs and sustainable development goals.							
Learning Outcomes: • Understand intelligent building principles and BAS technologies. • Design buildings with IoT, AI, and sustainable systems for optimal performance. • Apply resilient automation strategies in Indian contexts. • Use computational tools and global case studies to address local challenges.							
Module 1:		Fundamentals of Intelligent Buildings					
		Module Contents • Definition and evolution of intelligent buildings; Building Management Systems (BMS) and BAS. • Global trends: Net-zero, smart cities, Indian context • Sensors, actuators, and protocols					
Module 2:		Building Automation and IoT/AI Integration					
		Module Contents • BAS for HVAC, lighting, security; energy optimization (demand response, renewables). • IoT: Smart devices, data analytics, cybersecurity. • AI: Predictive maintenance, occupant behavior modeling • Indian applications: Affordable automation for urban/rural settings.					
Module 3:		Sustainability and Disaster Resilience					
		Module Contents • Disaster resilience: Automation for floods, earthquakes, fires (e.g., seismic sensors). • Passive-active system balance; smart materials • Indian challenges: Monsoons, heatwaves, urban density.					
Module 4:		Smart building design and advanced futuristic technologies					
		Module Contents • Parametric design and BIM for smart facades • Emerging tech: Smart glass, self-healing materials, 3D printing. • Future trends: Autonomous buildings, biophilic design. • Ethics: Privacy, accessibility in Indian smart buildings.					

Evaluation: Distribution of % of marks	
Progressive Evaluation	50%
End term Examination	50%
Learning Resources/References 1. Sinopoli, J. M. (2016). Advanced building automation systems. Wiley. 2. Clements-Croome, D. (2018). Intelligent buildings: Design, management and operation (2nd ed.). ICE Publishing. 3. ASHRAE. (2023). ASHRAE guideline 13-2023: Specifying building automation systems. American Society of Heating, Refrigerating and Air-Conditioning Engineers.	

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
05/06	BARC 0501E5E/ BARC 0601E6E	MOOC/SWAYAM/NPTEL/Other Equivalent Course	2	1	0	0	0
Course Overview: The intent of this elective subject is to encourage students to acquire knowledge through direct involvement in diverse online academic programs. It offers the flexibility to explore courses beyond the regular B.Arch. curriculum, allowing students to engage with multidisciplinary subjects that contribute to and enrich the field of architecture. By participating in online courses of their choice, students can broaden their understanding and enhance their professional competencies in areas relevant to architectural practice.							
Learning Outcomes: As per the chosen course							
		Exploration and Identification of Creative Fields To explore allied disciplines which will contribute to the profession of Architecture. The fields can be like any of the listed below: - User Interface Design - Design, Technology, and Innovation - Building Materials and Composites - Concrete Technology - Design of Masonry Structures - Futureproofing with Simple and Advanced Passive Strategies - Role of Craft and Technology in Interior – Architecture - Advanced Computer Application courses - Daylighting in Building Design This is just a suggestive list. The students are free to explore other allied areas which should be approved by the faculty coordinator.					
		Acquiring the Skill/ Knowledge - To undergo the coursework/workshop - To document the process of the course taken - To prepare a report/ portfolio of the work done					
		Demonstration of the Acquired Skill/Knowledge - To demonstrate the learning's of the course - To present the work in a forum					
Note:		Criteria for choosing the elective: - Courses opted for should be certified by recognized universities/forums like MOOC/SWAYAM/NPTEL - The courses chosen by students must be approved by the faculty coordinator or departmental committee. It should be ensured that the selected course aligns with the semester's level of complexity and builds appropriately on previously completed					

	coursework Module contents as per chosen course				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td></td></tr> <tr> <td>End term Examination</td><td></td></tr> </table> Evaluation and Examination as per chosen course and institute policy for such course		Progressive Evaluation		End term Examination	
Progressive Evaluation					
End term Examination					
Learning Resources/References As per chosen course					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
05/06	BARC 0501E5F/ BARC 0601E6F	Elective by department/industry Expert	2	1	1	0	0				
Course Overview: These electives will help students in strengthening their intellectual foundation. In this elective student can choose among the advanced topics offered from the list below of other similar topics as offered by the department. These electives allow students to explore various areas of interest and prepare them for applying this knowledge in future years of study and profession. The list below is not exhaustive and electives beyond the list may also be offered by the faculty: • Urban Morphology and City Form • History of Modern Architecture • Sustainable Urbanism • Smart Cities and Digital Urbanism • Design with nature/ Biomimetic Architecture • Critical Regionalism and Globalization in Architecture • Gender, Space, and Architecture • Architecture and Film • Architecture and Politics • Research Paper Writing • Elective emphasizing philosophy and works of one or more of the celebrated Indian or International Architect											
Learning Outcomes: • As per offered Elective											
Module and content as per offered elective											
Note:											
Evaluation: Distribution of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%										
End term Examination	50%										
Learning Resources/References: • As per offered elective											

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
05/06	BARC 0501E5G/ BARC 0601E6G	Project-based Elective	2	1	1	0	0				
Course Overview: This elective offers students the opportunity to engage in real-world projects as part of the ongoing consultancy or research projects within SPA Bhopal. The course allows students to learn and apply their design skills in a practical, context-driven setting. Procedure for selection of this elective and other modalities related to choices and constraints given to students will be same as other electives. The course will be open to all students, however the faculty offering the elective can mention the minimum and maximum number of students admissible in the elective. Students may work individually or in teams under the mentorship of the faculty offering the elective. As per requirements laid out in the course, students may various task such as Data Collection, preparation of various drawings, conducting research, site studies, conceptual development, and schematic design, design development, and so on as desired as per project. This course bridges academic learning with practical exposure. The elective may be offered in this semester if the knowledge and skills required to attend this elective match the courses previously covered. The schedule of the course must align with the academic calendar.											
Learning Outcomes: The course enables students to learn and apply their design/drawing/detailing skills in a practical, context-driven setting. Other learning outcomes as per offered elective course											
Module 1		Modules as per offered Elective									
Module 2											
Module 3											
Module 4											
Note: Students taking such electives must be given opportunity to pass the Progressive/End-semester/Supplementary examination with number of attempts admissible as per applicable ordinances.											
Evaluation: Distribution of % of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%										
End term Examination	50%										
Learning Resources/References: As per offered Elective											

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

SEVENTH SEMESTER COURSES DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 070101	Architectural Design VII	8	1	0	3	4
Course Overview: This studio this semester will deal with advanced services in multi-functional, multi-storied, complex structures with application of advanced services at building and site levels. The design will include energy efficient buildings with formal site restrictions on large sites. The design projects may include typologies like multi star hotels, multi specialist hospitals, high rise malls, campus design in an urban setting with application of urban development controls, codes and byelaws. The design proposal will be taken up with byelaws, master plan or any other restriction on large sites. The order of modules may be changed as suitable to design objectives. The subject may integrate learnings from previous and on-going subjects like non-conventional building materials, Interior design, Energy Efficient Architecture, Structures, etc. in the form of connected assignments of smaller scale.							
Learning Outcomes: • Upon successful completion of this course, students will: • Demonstrate architectural and composite structural systems and services through the design solutions. • Develop sensitivity towards non-conventional technologies, energy- efficiency and interior design. • Apply knowledge of services at site and building levels. • Participate in team activities. • Build with precision block models, study models and site models. • Form correlation with previous and ongoing subjects. • Integrate aesthetic, functional, and structural considerations into comprehensive architectural solutions. • Communicate through drawings, models and other methods developed to meet various stages.							
Module 1:		Colour theory and its application:					
		Module Content • In this module, students will be sensitized to multi-users, complex high- rise issues and services through documentaries/presentations/etc. The design problem may be introduced using linear-design approach or hidden-curriculum or other design teaching models. Students will visit the site to collect context specific data for getting a better understanding of real-life project details. The collected data will be analyzed and presented. • The above-mentioned teaching models are suggestive, and the faculty may choose other pedagogical approaches for design thinking and initiation process.					
Module 2:		Concept formulation and framing of project requirements:					
		Module Content • This module focuses on translating the learnings from the previous module into specific design objectives that align with the user program. Students will analyse the site's topography, climate data, and spatial requirements emerging from activities such as circulation, functionality, standards, data collection, and aesthetic needs. • This module will also emphasize the design's integration with the local climate, focusing on building orientation, materiality, and climate-responsive solutions that					

	will shape the architectural form and spatial arrangement. Study on the user's needs and their requirements will be a major concern. Students could be sensitized (socio-cultural sensitization) through different media viz. documentary, photos, movies, site visits, case studies, etc.
Module 3:	Preliminary design drawings: Module Content Further approaches for design iterations may also involve common techniques like flow diagrams to explore relations of various spaces, bubble diagrams for locating various zones on site, and as required by the project. Students will try to recreate preliminary drawings for analyzing spaces in all dimensions through block models and other graphics to enable them to connect the complexities of the design problem.
Module 4:	Integration of restrictions, services, structural implications, etc.: Module Content - This stage will emphasize the development of ideas for the form, function, and spatial organization of both the built and unbuilt spaces. Students will consider material choices, structural concepts, and the integration of all necessary services. - The schematic design will explore how passive and active design strategies—such as solar orientation, material thermal behavior, energy efficiency concepts and advanced services can be incorporated into the design to enhance both sustainability and user experience making the design solution practical. Implications of the formal restrictions for site and building will be done on the preliminary and conceptual drawings.
Module 5:	Design Development with representations of previous stages in detailed architectural drawings: Module Content - The design will convert to architectural drawings with detailed development on circulation, site development, form development, materiality and with the involvement of construction techniques and implication of services and structures. - Certain theories of urban design may be applied for co-relating the urban setting during the design development stage.
Module 6:	Final Design Development: Module Content - The final module focuses on the refinement and detailed development of the design. Students will develop their preliminary designs into a comprehensive proposal, including detailed drawings such as site plan, floor plans, elevations, and sections which will be finalized through various informal and formal reviews at individual and group levels. These will depict the relationships between interior and exterior spaces, with special attention to site development, response to the topographical character of the site, materiality, vertical and horizontal circulation, passive and active design strategies, sustainability, and construction techniques and the use of advanced services. Students must prepare a set of working drawings of at least one of the services showing all the details for execution. - Students will also explore how these design elements work together to support the overall architectural concept while addressing functional, aesthetic, and environmental concerns and come out with interior and perspective views, and the required models at different levels to explain the scheme.

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Suggested Learning Resources/References (in APA format)

1. Whitfield, R. (2015). Environmental control systems: Heating, cooling, lighting (2nd ed.). Routledge.
2. Chadderton, D. V. (2013). Building services engineering (6th ed.). Routledge. <https://doi.org/10.4324/9780203728256>.
3. Bureau of Indian Standards. (2016). National Building Code of India 2016 (Vol. 1 and 2). Bureau of Indian Standards.
4. Bureau of Indian Standards. (1987). IS 3362: Code of practice for natural ventilation of residential buildings. Bureau of Indian Standards.
5. Bureau of Indian Standards. (1987). IS 3792: Code of practice for fire safety of buildings (General): Electrical installations. Bureau of Indian Standards.
6. Bureau of Indian Standards. (1991). IS 12332: Code of practice for ventilation of air-conditioned buildings. Bureau of Indian Standards.
7. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). ASHRAE Standards and Guidelines. <https://www.ashrae.org/technical-resources/standards-and-guidelines>.
8. Bureau of Indian Standards. National Building Code of India. <https://www.services.bis.gov.in>
9. U.S. Green Building Council. LEED rating system. <https://www.usgbc.org/leed>

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 070103	Architectural Research Methods	4	2	0	0	2
Course Overview: Students would be able to identify and go in depth into specific and appropriate aspects relating to the discipline of architecture. Students learn how to research a subject area through readings; learn description, analysis, and synthesis of readings; citation of authors in their writing. The importance of the course is also in understanding what constitutes plagiarism research writing and in imbibing the ethics of publication. Literature review is seen as the first step in preparation of understanding research methods which prepares students for writing a paper based on secondary research and literature review and its oral and visual presentation.							
Learning Outcomes: • Conduct a comprehensive literature review using scholarly sources. • Understand and differentiate between various types of research publications. • Demonstrate academic writing skills, including description, analysis, synthesis, and proper citation. • Exhibit awareness of research ethics and plagiarism policies. • Frame a clear research question and design a structured research proposal. • Collaborate effectively in group settings to produce and present a research paper. • Develop leadership and teamwork skills through shared academic responsibilities. • Communicate research findings through visual and oral presentations.							
Module 1		Introduction to Research Resources and Literature Review:					
		Module Content • Differentiate between referenced sources /websites and non-referenced sources. • Identify research papers, newspaper articles, report, and book chapter. • Categories papers within a subject area. • Identifying key authors in a subject area.					
Module 2		Different types of research publications and techniques of writing					
		Module Content • Classification of publications, indexing, publishers, etc. • Understand the structure of a research paper. • Descriptive writing about a paper demonstrating comprehension of subject matter, academic format, research methods and vocabulary. • Analytical writing based on readings.					
Module 3		Ethics in Research:					
		Module Content • Paraphrasing, generative AI, and other tools. • Crediting sources with citations and referencing. • Different referencing styles and software's.					

	• Publication and authorship ethics.				
Module 4	Preparation of the Structure of the Study:				
	Module Content • Framing a focused topic for study based on readings. • Formulate aims and objectives of study. • Prepare a methodology based on literature study. • Identifying research gaps • Present study proposal				
Module 5	Paper-writing Based on the Study:				
	Module Content • Compare and analyze readings. • Discuss with the subject teacher. • Group Discussions • Prepare and Submit Draft Paper				
Module 6	Presenting the Paper:				
	Module Content • Prepare a visual presentation based on written paper and present it in class • Submit Final Paper (Review paper)				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: 1. Smith, K. (2012). Introducing architectural theory: Debating a discipline. Routledge. 2. Walliman, N. (2008). A step-by-step guide for the first-time researcher (2nd ed.). Vistar Publications. 3. Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. Journal of business research, 104, 333-339. 4. Getz, D. (2010). The nature and scope of festival studies. International journal of event management research, 5(1), 1-47.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 070102	Inclusive Design	3	2	0	1	0
Course Overview: Inclusive design is an introduction to the concepts of accessibility and universal design with a particular focus on the implications of ability and disability on usability of the built environment. The students will learn how to apply this knowledge in architecture and interior design. The interdisciplinary collaboration with disability studies, rehabilitation studies and social science research will provide students with an opportunity to learn and develop a wider understanding about the subject.							
Learning Outcomes: - Define inclusive design with a particular focus on the implications of ability and dis-ability on the usability of the built environment, spaces, buildings, and infrastructure. - Comprehend the standards, theories, legislation and principles of accessibility and universal design. - Distinguish between different concepts of accessibility and universal design. - Review the condition of the existing environment for universal access and suggest measures to address those. Apply this knowledge in building design, site planning and interior design.							
Module 1		Basic Concepts:					
		Module Content - Understanding ability and disability and changing approaches towards disability. - An understanding of the definition, evolution and limitations of Universal Design, Accessible Design, and other similar concepts. - Understanding the International Principles of Universal Design and Universal Design India Principles. - Best examples and case studies in Universal Design practice.					
Module 2		Accessibility standards in external and internal built environments:					
		Module Content - Introduction to various accessibility guidelines/standards in India. - Types of disabilities, devices, and controls. - Defining architectural design requirements, classification of buildings and access provisions. - Universal Access provisions for the design elements outside the building; site planning, parking, curbs at footpath, road crossing, public toilet, bus stop, signages etc. - Universal Access provisions for the design elements within the buildings; approach to plinth levels, corridors, entrance and exit, windows, ramps, stairways, lifts, toilets, signages, guiding and warning systems etc.					
Module 3		Universal Access Audit					
		Module Content - Access Audit; definition, purpose and method. - Universal design evaluation methods.					

	Hands-on tutorials in Universal Access Audit in building design, site planning or interiors.				
Module 4	Accessibility Legislation: Module Content - Understanding legislative framework for practice in India and its evolution. - Rights Persons with Disabilities Act -2016, - United Nations Convention for Rights of Persons with Disabilities (UNCRPD), - Accessible India Campaign-2015, - LNOB-Leave No One Behind; key principle of the 2030-Agenda for Sustainable Development and the Sustainable Development Goals (SDGs).				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: Center for Universal Design (CUD). (1997). The principles of universal design. Connell, B. R., Jones, M., Mace, R., Mueller, J., Mullick, A., Ostroff, E., Sanford, J., Steinfeld, E., Story, M., & Vanderheiden, G. Center for Universal Design, North Carolina State University. https://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciples.htm					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 070104	Project Formulation and Appraisal	3	2	0	1	0
Course Overview: This course provides a comprehensive introduction to the fundamental principles of economics with a particular focus on land and property-related applications. It covers the key components of land economics, including financial and demand analysis essential for informed decision-making in real estate and infrastructure projects. Students will learn to compute various money values, perform demand forecasting, and apply standard methods for comparing and evaluating projects. The course also introduces essential concepts and techniques in building and property valuation, equipping students with the analytical tools required for assessing the economic worth of land and developments. Through practical computation and critical appraisal exercises, learners will develop the skills to evaluate land, properties, and projects using financial and valuation methodologies discussed throughout the course							
Learning Outcomes: • Discussion of fundamental elements of economics. • Identification of Components of Land Economics. • Discussion of rules of financial analysis and demand analysis. • Computation of different money values and demand forecasting. • Comparison of projects through evaluation methods. • Discussion of definitions of building valuation. • Computation and analysis of property valuation. • Appraisal and critical assessment of land, properties and projects by using the financial and valuation methods discussed throughout the session.							
Module 1	Introduction to Basics of Economics:						
	Module Content • Elements of economics- Functions of utility, demand, production, cost and profit • Land economics- concept, scope and objectives • Levels of decision making.						
Module 2	Financial Analysis:						
	Module Content • Times values of money • Financing mechanism • Concepts and factors governing cost of capital. • Risk and return						
Module 3	Demand Analysis:						
	Module Content • Concept of Demand forecasting and its common methods-Delphi, Trend projection and Exponential • Uncertainties of demand forecasting• Publication and authorship ethics.						
Module 4	Project - Formulation and Analysis:						
	Module Content • Project constraints • Preparation of DPR (Detailed Project Report) • Project analysis and Ranking						

	• Introduction to project appraisal and feasibility study • Financial Assessment of Project
Evaluation: Distribution of % of marks	
Progressive Evaluation	50%
End term Examination:	50%
Learning Resources/References: 1. Chandra, P. (1995); Projects: Planning, Analysis, Selection, Implementation and Review; Tata McGraw Hill Publishing Company Limited 2. Baumol, W.J. (2000); Economic Theory and Operations Analysis; Prentice Hall of India Private Limited, New Delhi. 3. Taha, H.A. (2017); Operations Research: an Introduction; Pearsons 4. Chakraborty, M. (1995); Estimating, Costing, Specification and Valuation in Civil Engineering. 5. Sengupta, BK., Sen, S.; Readers Volume on Land Economics; ITPI	

DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 070106	Settlement Pattern and Planning	3	2	0	1	
Course Overview: This course provides an overview of the vocabulary and key concepts related to human settlements. It explores the elements, classifications, and typologies of settlements, while also familiarizing students with urban, rural and regional planning concepts and processes. The course focuses on the evolution of cities, humanitarian planning processes, and skill development to identify planning issues in existing areas and propose solutions at a basic level. It will be taught in conjunction with the Design Studio, with assignments linked to design exercises to promote practical application and deeper understanding.							
Learning Outcomes: - The course outcomes aim to equip students with the ability to define various types of settlements based on different criteria, identify settlement elements, and describe settlement pattern principles. - Students will classify the constituents of towns and cities, distinguish between different settlement types, and understand planning concepts and survey techniques. - They will evaluate the development and urbanization status, re-create thematic settlement patterns, and develop local area plans as part of their practical skills development.							
Module 1		Settlement Patterns in Past:					
		Module content - Introduction to urban Planning; Definition, Scope, elements and Components, Issues and opportunities, etc. - Evolution of human settlements: Impact of community structure on physical structure. - Introduction to Ancient cities of river valley civilization. - Settlement patterns of Classic cities, Dark-age and Medieval towns. - Planning efforts and reforms of Neo-classic cities - Impacts of Industrial revolution on city living- factory towns and company towns. - Rural India and urbanization					
Module 2		Settlement Pattern and Town Planning in India:					
		Module content - Indus valley civilization and ancient cities of India, Kashi, Ujjain, Pataliputra etc. Types of disabilities, devices, and controls. - Vedic village, vastu-shastra and Vedic town planning patterns - Development of Medieval cities, Kingdoms and Temple Towns in India - Indian cities during Mughal and British Rule, Old Delhi, Agra, Mysore, Company Towns, Hill stations, industrial cities, port towns, etc. (Indian cities post-Independence).					
Module 3		Universal Access Audit					
		Module content - Beginning of comprehensive city plans, Planning legislations, acts and reforms in post-industrial era - Planning Movements; Health, congestion, Park, city beautiful, Garden city, Linear city, etc. - Planning Theories: Geddesian, Triad, Ekistics, Growth pole, Bid rent, Public Choice, etc. - Land use Models; Concentric zone, Sectoral, Multiple Nuclei, core-frame, - Utopian Ideas of Mumford, Le Corbusier, FL Wright, W. Christeller, C Stein					

	andWright, C A Perry, etc. Recent utopian ideas; 15-minute city, Walking City, Vertical City, etc.				
Module 4	Modern Urban Planning in India: Module content - Planning Issues: Land ownerships, deficient Infrastructure, Environmental Issues, Urbanization, Informal growth, Migration, Uncontrolled development, etc. - Planning issues for rural areas - Modern town Planning approaches; Master Plan process, Plan Types, Participatory and Inclusive planning, etc. - Other Planning Approaches; Urban Regeneration, Satellite town DPRs, TP Schemes, SEZs, TOD, Smart cities, etc. - TP Acts, Development Regulations, URDPFI guidelines, MoUD laws, Role of Planning and Development Agencies, - Beginning of Modern town planning in India, Post independence efforts, Capital cities, Industrial cities, etc. - Urban regeneration, Redevelopment and new horizons for future cities				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: - Gallion, A. B., & Eisner, S. (1967). The Urban Pattern: City Planning and Design (4th ed.). Van Nostrand Reinhold. - Lynch, K. (1960). The Image of the City. MIT Press. - Gyankosh, Urban Planning Concepts and Practices. UGC. Retrieved from https://gyankosh.ac.in/ - Ministry of Urban Development, Government of India. (2014). Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Government of India. - Institute of Town Planners, India (ITPI). (2020). Journal of ITPI, 17(1), 15-30. Institute of Town Planners, India.					

DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 070108	Retail and Interior Design	3	2	0	1	0
Course Overview: The Interior Design course builds upon the foundational spatial, material, and aesthetic principles introduced in earlier semesters, with a focus on designing interior environments that integrate function, experience, and expression. The course emphasizes the synthesis of architectural space-making with interior spatial articulation, materials, detailing, furniture, lighting, and user-centric design strategies. This semester will deal with minute details and construction techniques involved in interior design. The subject may have product design aspects related to interior design. The subject will be integrated into subjects like Design, Graphics, Art Appreciation, BMC and CAD. The subject will further be inclusive of a minor exercise with a small component of the current or any of the previous semester design works. The course will include one major and several exercises in relation to site visits, market surveys, presentations, reports, etc.							
Learning Outcomes: - On completion of the course students will achieve the following objectives: - To develop a comprehensive understanding of interior spatial planning in architectural contexts. - To explore the interplay of materials, textures, colours, lighting, and furniture in shaping interior atmospheres. - To enhance skills in detailed interior drawings, furniture design, and working drawings. - To engage with advanced design problems like adaptive reuse, commercial interiors, or specialized spaces.							
Module 1:		Principles of Interior Design and Ergonomics:					
		Module Content - Development of interior design concepts - a historic review. - Design –Definition, meaning, purpose, Types - Structural and decorative characteristics, classification of decorative design - Naturalistic, conventional, geometric, abstract, historic, biomorphic - Elements of design and space- Line and direction, form and shape, size, colour, light, pattern, texture, and space. - Application of anthropometry and ergonomics to ensure functional spatial layouts, comfortable furniture design and accessibility - Introduction to Retail Architecture					
Module 2:		Colour and lighting:					
		Module Content - Concept of colour - significance of colour in the interiors and exteriors-Dimensions of colour - Hue, value, intensity, Effects of Hue, value and Intensity. - Application of colour harmonies in the interiors and exteriors –Effects of light on colour, - Illusion of colour, psychology of colour, effect of colour on each other. - Importance of lighting – Lighting in interiors – importance, classification based on sources, uses, illumination, factors to be considered in lighting for different areas of house. Artificial lighting - light sources, types and uses of light, specific factors in lighting – measurements of lighting and economy in lighting, psychological aspects of light, Avoidance of glare – Glare its types and prevention. - Lighting accessories – Selection of lamps and lighting fixtures, lighting for various areas and specific activities, modern features in lighting design.					
Module 3:		Furniture, Materials, Construction Techniques and drawings in Interior Design:					
		Module Content - Building materials and finishes - An introduction to various construction techniques in interior design and retail architecture - Details of doors, windows, cupboards, partitions and joineries					

	• Soft furnishings – Meaning, Importance – relationship of furnishings with space, selection and use of furnishings • functional and decorative. • Techniques of architectural presentation drawings in various mediums • Monochromatic shades, Shades and shadows in multi-colored drawings				
Module 4:	Services in Interiors: Module Content • Mechanical and sanitary services – Mechanical systems - Lifts and Escalators. Sanitary services - Water supply within buildings, drainage system for residence, sanitary apparatus. • Acoustics- Definition, requirements of good acoustics, Sound absorption- sound absorbent materials, qualities of acoustic materials, guidelines for good acoustical design. • Air conditioning - Principles of air conditioning system, types of air Conditioning, application in building like apartments and guest rooms, libraries, museums and hospitals, estimation of air conditioning • Electrical services – Electrical system, symbols used, three phase and single phase system, simple electrical layouts, how electrical fixtures are used to enhance interiors • Ventilation- definition, importance, types of ventilation-natural and mechanical, guidelines for natural ventilation. • Ducting and Paneling, False ceiling • Estimating – Definition of estimates, types, unit and mode of measurement, quantity surveying				
Evaluation: Distribution of % of marks					
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Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: 1. DeChiara, J., Panero, J., and Zelnik, M. (2001). Time-saver standards for interior design and space planning (2nd ed.). 2. McGraw-Hill. Panero, J., and Zelnik, M. (1979). Human dimension and interior space: A source book of design reference standards. Whitney Library of Design. 3. Ching, F. D. K., and Binggeli, C. (2012). Interior design illustrated (3rd ed.). Wiley. 4. Binggeli, C. (2013). Materials for interior environments (2nd ed.). Wiley. 5. Gibbs, J. (2005). Interior design: A practical guide. Laurence King Publishing. 6. American Institute of Architects. (2003). Architectural graphic standards for interior design. Wiley. 7. Dezeen. Dezeen. Retrieved May 9, 2025, from https://www.dezeen.com 8. ArchDaily. Retrieved May 9, 2025, from https://www.archdaily.com 9. Design boom. Design boom. Retrieved May 9, 2025, from https://www.designboom.com 10. WGSN Interiors and Lifestyle. Retrieved May 9, 2025, from https://www.wgsn.com					

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

SEVENTH SEMESTER ELECTIVE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 0701E7A	Product Design and Prototyping	2	1	1	0	0
Course Overview: This course introduces architecture students to the scale, logic, and sensibility of product design, where architecture meets the human body. Students explore the craft, utility, form, and storytelling of everyday objects. Emphasis is placed on hands-on material experimentation, ergonomics, prototyping, and the cultural significance of objects. Through short iterative projects and conceptual provocations, students design and prototype artifacts that address needs, desires, and narratives, reflecting the ethos of “designing with intent.” In the later modules students explore product design beyond function, as a medium of agency, meaning, and ethical intervention. Moving from the human-centered to the more-than-human, students will investigate how objects mediate our relationship with bodies, ecologies, cultures, and technologies. The course asks: What does it mean to design in a world of climate urgency, cultural multiplicity, and non-human entanglements? Design becomes both artifact and argument—a way of thinking with materials, engaging with others, and speculating alternative futures. The studio culminates in a designed object that embodies this expanded responsibility and imagination.							
Learning Outcomes: • Understand and apply the language of product design—form, function, ergonomics, and materials. • Critically analyze objects and artifacts in terms of cultural relevance, sustainability, and user interaction. • Translate architectural thinking into object-scale interventions. • Prototype products using hands-on methods such as model making, CNC, laser cutting, and casting. • Communicate ideas using design vocabulary, sketches, diagrams, models, and product narratives. Understand product design as a spatial, cultural, and ecological practice. • Develop inclusive, context-aware objects with sensitivity to more-than-human users and systems. • Explore narrative, ritual, and symbolism through material form. • Prototype with sustainability, modularity, and multisensory interaction in mind. • Curate and communicate design ideas through exhibition and public storytelling.							
Module 1	Understanding Product Design — Scale, Purpose, and Experience:						
	Module Content • Understanding the Vocabulary: Form, function, ergonomics, interface, affordance • Study of iconic products (Eames chair, Le Creuset, Bauhaus lamps, Apple mouse) • Introduction to “Design Thinking” process • Exercise: (Suggestive) • Reverse engineering and redesign of a chosen object/ Form exploration.						
Module 2	Materials, Craft, and Making:						
	Module Content • Exploring Crafts of the region and immersive experience to the Material vocabulary: Wood, metal, plastic, ceramics, composites • Joinery, casting, folding, bending. • Study visits to craft clusters or fabrication labs • Exercise: • Design and make a “functional sculpture” from one primary material						

Module 3	Designing an Object with a Story:				
	Designing an Object with a Story. Students will undertake a single, multi-stage design challenge, Design and prototype a usable product that responds to a specific user, context, or narrative. Emphasis is placed on material exploration, ergonomic precision, and cultural storytelling.				
Module 4	Exhibition Design – Product Showcase:				
	Module Content To conclude the course, students will design and curate an exhibit space Product that showcases their final products and design journeys. Emphasis will be on creating engaging spatial narratives, signage, display techniques, and interaction design				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: - Papanek, V. (1985). Design for the Real World. Thames and Hudson. - Norman, D. (2002). The Design of Everyday Things. Basic Books. - Ashby, M., and Johnson, K. (2009). Materials and Design. Butterworth-Heinemann. - Moggridge, B. (2007). Designing Interactions. MIT Press. - Heskett, J. (2005). Design: A Very Short Introduction. Oxford University Press. - Dormer, P. (1993). Design Since 1945. Thames and Hudson. - Antonelli, P. (Ed.). (2005). Humble Masterpieces. MoMA. - Margolin, V. (2015). World History of Design. Bloomsbury. - Rawsthorn, A. (2018). Design as an Attitude. MIT Press. - Manzini, E. (2015). Design, When Everybody Designs. MIT Press.					

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 0701E7B	Architectural Journalism	2	1	1	0	0
Course Overview: This course introduces students to the emerging field of Architectural Journalism, bridging the gap between design and communication. It focuses on developing the ability to interpret architectural works through written and visual narratives, fostering expressive and precise vocabulary for architectural description. Students will explore the significance of journalism in architecture, engage with various media platforms, and understand ethical considerations and legal frameworks. The course also equips students with skills in descriptive and critical writing, with applications in branding, publishing, and digital content creation, emphasizing the role of architecture in public discourse and media representation.							
Learning Outcomes: • By the end of the course, students will be able to articulate architectural concepts effectively through multiple narrative formats. • They will gain the ability to critically analyze architectural works, construct descriptive and persuasive content for both traditional and digital platforms, and understand the ethical and legal dimensions of architectural journalism. • Students will also be adept at producing journalistic content for blogs, websites, and publications, with an awareness of current trends and professional practices in the field.							
Module 1	Introduction to Architectural Journalism						
	Module Content • Understanding Design Interpretation through written and visual narratives. • Developing an Architectural Vocabulary for expressive and precise communication. • Generating aesthetic imagery in writing by referencing structural elements and visual impressions.						
Module 2	Need, Importance, and modes of Architectural Journalism						
	Module Content • Exploring the professional and theoretical dimensions of architectural journalism. • Identifying media platforms for documentation, reporting, and architectural research (print, digital, audio-visual, etc.). • Code of ethics, basic knowledge in press laws.						
Module 3	Descriptive Writing, writing for brands						
	Module Content • Structure and framework of descriptive writing in architecture. • Writing for blogs and social media in an architectural context. • Creating content for websites and newsletters with a focus on architectural branding.						
Module 4	Critical Writing:						
	Module Content • Format and framework of critical writing in architecture. • Techniques of critical appreciation of architectural works and design philosophies. • Discussion on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists.						

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources/References:

1. Friedlander, E. J., and Lee, J. (2000). Feature writing for newspapers and magazines (4th ed.). Longman.
2. Fuller, D., and Waugh, P. (Eds.). (1999). The arts and sciences of criticism. Oxford University Press.
3. Foust, J. (2005). Online journalism: Principles and practices of news for the web. Holcomb Hathaway Publishers.
4. Harris, M. (2001). Professional architectural photography. Focal Press.
5. Harris, M. (2002). Professional interior photography. Focal Press.
6. Huckerby, M. (2005). The net for journalists: A practical guide to the internet for journalists in developing countries. UNESCO/Thomson Foundation/Commonwealth Broadcasting Association
7. Ward, S. J. A. (2005). Philosophical foundations of global journalism ethics. Journal of Mass Media Ethics, 20(1), 3–21. https://doi.org/10.1207/s15327728jmme2001_2

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 0701E7C	Non-conventional Materials and Techniques	2	1	0	1	0
Course Overview: This course is designed to cultivate critical thinking, contextual awareness, and innovative approaches in the selection of non-conventional materials and construction methods. Emphasizing sustainability, it introduces students to alternative materials and environmentally responsible construction techniques with minimal ecological impact. The curriculum explores emerging innovations such as 3D printing, modular systems, and bio-based composites, alongside the architectural integration of renewable energy sources like solar, wind, biomass, and tidal energy. Drawing inspiration from vernacular and traditional architecture, the course highlights context-sensitive, climate-responsive, and low-impact design practices. It also investigates adaptable and flexible construction techniques tailored to evolving environmental and societal demands. Special focus is placed on region-specific building methods rooted in local materials, skills, and climatic conditions, applicable to both rural and urban settings. The course encourages interdisciplinary learning by integrating concepts from climate-responsive architecture, Building Materials and Construction (BMC), building services, and the architectural design studio.							
Learning Outcomes: - To identify and evaluate various renewable energy resources and their architectural implications. - To understand the scope and application of non-conventional and sustainable materials in contemporary architecture. - To analyze traditional and vernacular building methods for their adaptation in modern sustainable design. - To explore region-specific construction practices tailored to local climate and materials. - To integrate non-conventional techniques with modern technologies and allied disciplines in architectural design. - To develop a critical and innovative approach towards material selection and construction methods in their architectural projects.							
Module 1		Renewable Energy Resources:					
		Module Contents - Renewable Energy Resources: Solar Energy, Biomass Energy, HydroPower Energy, Wind Energy, - Tidal Energy, Biofuel. Global energy scenario. - Implications of Renewable energy sources in Architecture.					
Module 2		Introduction to non-conventional materials and techniques:					
		Module Contents - Understanding non-conventional architecture, vernacular architecture, traditional architecture, etc. - Introduction to non-conventional materials and techniques like: Mycelium, hempcrete, aerogel, graphene, cork, transparent wood, seaweed, 3d printing, modular and prefabricated building techniques, shipping container homes, vacuum insulated concrete etc.					

Module 3	Appropriate Walling - Roofing Materials and Technologies:				
	Module Contents - Types of non-conventional walling techniques: different types of mud walls, compressed earth blocks, compressed stabilized earth blocks, GFRG (Glass Fiber Reinforced Gypsum) Panels, Aerated Autoclaved Concrete (AAC) Blocks, 3D Printed Concrete Walls, Recycled Composite Wall Systems etc. - Advanced Bamboo Applications in Modern Construction: Engineered Bamboo, Integration with Hybrid system, digital fabrication and parametric design, - Types of other Roofs: 3D Printed Roofing Structures, ETFE (Ethylene Tetrafluoroethylene) Membrane Roofing, Green Roofing Systems, Solar Integrated Roofing, Phase Change Material (PCM) Embedded Roofs, Self-healing concrete, filler slab etc. - Types of non-conventional walling techniques: mud walls- adobe, wattle and daub, rammed earth, cob walls, compressed earth blocks, compressed stabilized earth blocks, earth bags etc. - Use of bamboo as building material. - Types of other Roofs: Jack arch roof, Thatch roofing, Filler slab roofing with various filler material, Clay/micro-concrete tiled roofing, etc				
Module 4	Region Specific Non – Conventional techniques:				
	Module Contents - Non - Conventional techniques in general but conventional for a specific region developed in response to the locally available materials and construction techniques in response to the climate of a region in an urban or rural set up may be taken for study. - Students can integrate the same exercise to various allied subjects like climate responsive architecture, BMC, Building Services, etc. Students may also study the works of other architects.				
Module 5	Low-Cost Building Materials:				
	Module Contents - Soil and Mud, Fly ash, Ferrocement, Lime, Fibers, Stone Dust, Boulders and oversize metal, Bitumen, Agricultural by-products (Rice Husk, Banana Fiber, Coconut Coir, Groundnut shell Ash etc) Recycled materials, etc.) - Walls - Stabilized and sun-dried earth/mud blocks and bricks (Adobe/ Cob/ Wattle and Daub), Hollow concrete blocks, stone masonry blocks, Ferro-cement partitions etc. - Roofs - Precast R.C. Plank and Joists roof, precast channel roof, Precast L-panel roof, Precast Funicular shells, Ferrocement shells, Filler Slab, SeasalFibre roof, improved country tiles, Jack Arch, Thatch roof etc.				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References:					
- Harries, K. A., and Sharma, B. (Eds.). (2016). Nonconventional and vernacular construction materials: Characterization, properties, and applications. Woodhead Publishing. - Ghavami, K., Barbosa, N. P., and Zhemchuzhnikov, A. (Eds.). (2014). Non-conventional materials and technologies for sustainable engineering. Trans Tech Publications. - Foust, J. (2005). Online journalism: Principles and practices of news for the web. Holcomb Hathaway					

Publishers.

3. Ghavami, K., Sastano, L., and Fiorelli, J. (Eds.). (2016). Non-conventional materials and technologies for sustainable development. Trans Tech Publications.
4. Frigione, M., and Barroso de Aguiar, J. (Eds.). (2021). Innovative materials for construction. MDPI. <https://www.mdpi.com/books/reprint/3656-innovative-materials-for-construction>
5. Huckerby, M. (2005). The net for journalists: A practical guide to the internet for journalists in developing countries. UNESCO/Thomson Foundation/Commonwealth Broadcasting Association
6. Bhogayata, A. C. (2024). Sustainable construction: Development of eco-efficient concrete with plastic and industrial wastes. CRC Press. <https://www.routledge.com/Sustainable-Construction-Development-of-Eco-Efficient-Concrete-with-Plastic/Bhogayata/p/book/9781032527956>
7. MDPI. (2021). Innovative materials for construction. <https://www.mdpi.com/books/reprint/3656-innovative-materials-for-construction>.
8. Vincent, J. (2021, June 18). Architects are copying nature to make low-carbon buildings. WIRED. <https://www.wired.com/story/biomimetic-architecture>.
9. Harvey, F. (2024, February 15). 'It's almost carbon-negative': How hemp became a surprise building material. The Guardian. <https://www.theguardian.com/environment/2024/feb/15/its-almost-carbon-negative-how-hemp-became-a-surprise-building-material>.
10. Cheng, S. (2025, January 5). These Taiwanese companies are turning waste into building materials. TIME. <https://time.com/7172075/waste-construction-taiwan/>

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
07	BARC 0701E7D	MOOC/ SWAYAM/NPTEL/Other Equivalent Courses	2	1	0	1	0
Course Overview: The intent of this elective subject is to encourage students to acquire knowledge through direct involvement in diverse online academic programs. It offers the flexibility to explore courses beyond the regular B.Arch. curriculum, allowing students to engage with multidisciplinary subjects that contribute to and enrich the field of architecture. By participating in offline/online development courses of their choice, students can broaden their understanding and enhance their professional competencies in areas relevant to architectural practice.							
Learning Outcomes: As pe the chosen course							
		Exploration and Identification of Creative Fields					
		Module Contents To explore allied disciplines which will contribute to the profession of Architecture. The fields can be like any of the listed below: - Architectural Theories and Criticism - Environmental Sociology in Design - Portfolio Design and Graphics - Parametric Design - Graphic Design and Information Design - Visual Communication Design for Digital Media - Construction, detailing and documentation - Design, Technology, and Innovation This is just a suggestive list. The students are free to explore other allied areas which should be approved by the faculty coordinator.					
		Acquiring the Skill/ Knowledge					
		Module Contents - To undergo the coursework/workshop - To document the process of the course undergone - To prepare a report/ portfolio of the work done					
		Demonstration of the Acquired Skill/Knowledge					
		Module Contents - To demonstrate the learning's of the course - To present the work in a forum					
Note:		Criteria for choosing the elective: - Courses opted for should be certified by recognized universities/forums like MOOC/SWAYAM/NPTEL - The courses chosen by students must be approved by the faculty coordinator or departmental committee. It should be ensured that the selected course aligns with the semester's level of complexity and builds appropriately on previously completed coursework - Module contents as per chosen course					

Evaluation: Distribution of % of marks

Progressive Evaluation	
End term Examination	

- Evaluation and Examination as per chosen course and institute policy for such course

Learning Resources/References

- As per chosen course

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
07	BARC 0701E7E	Elective by department/industry Expert	2	1	1	0	0				
Course Overview: These electives will help students in strengthening their intellectual foundation. In this elective student can choose among the advanced topics offered from the list below of other similar topics offered by the department. These electives allow students to explore various areas of interest and prepare them for applying this knowledge in future years of study and profession. The list below is not exhaustive and electives beyond the list may also be offered by the faculty. The list may also include advance skill courses. - Urban Morphology and City Form - History of Modern Architecture - Sustainable Urbanism - Smart Cities and Digital Urbanism - Design with nature/ Biomimetic Architecture - Critical Regionalism and Globalization in Architecture - Gender, Space, and Architecture - Architecture and Film - Architecture and Politics - Research Paper Writing - Elective emphasizing philosophy and works of one or more of the celebrated Indian or International Architect											
Learning Outcomes: Specific Learning outcomes may vary as per elective offered. Overall, in these electives, students are expected to develop the ability to analyze and discuss issues, theories, philosophies, etc. relevant as per elective. Students are also expected to apply conceptual knowledge to real-world design understanding.											
Module and content as per offered elective											
Evaluation: Distribution of % of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%										
End term Examination	50%										
Learning Resources/References: As per offered electives											

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
07	BARC 0701E7F	Project-based Elective	2	1	1	0	0				
Course Overview: This elective offers students the opportunity to engage in real-world projects as part of the ongoing consultancy or research projects within SPA Bhopal. The course allows students to learn and apply their design skills in a practical, context-driven setting. Procedure for selection of this elective and other modalities related to choices and constraints given to students will be same as other electives. The course will be open to all students, however the faculty offering the elective can mention the minimum and maximum number of students admissible in the elective. Students may work individually or in teams under the mentorship of the faculty offering the elective. As per requirements laid out in the course, students may various task such as Data Collection, preparation of various drawings, conducting research, site studies, conceptual development, and schematic design, design development, and so on as desired as per project. This course bridges academic learning with practical exposure. The elective may be offered in this semester if the knowledge and skills required to attend this elective match the courses previously covered. The schedule of the course must align with the academic calendar.											
Learning Outcomes: The course enables students to learn and apply their design/drawing/detailing skills in a practical, context-driven setting. Other learning outcomes as per offered elective course											
Module 1		Modules as per offered elective									
Module 2											
Module 3											
Module 4											
Note: Students taking such electives must be given the opportunity to pass the Progressive/End-semester/Supplementary examination with number of attempts admissible as per applicable ordinances.											
Evaluation: Distribution of % of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%										
End term Examination	50%										
Learning Resources/References: As per offered elective											

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

EIGHTH SEMESTER COMPULSORY CORE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
08	BARC 080101	Professional Training	25				
Course Overview: The course will enable the students to gain the type and range of practical experience that will prepare them for their likely responsibilities immediately after qualifying for the B.Arch. course. The trainee student has the responsibility to use his/her own initiative in making the best use of the opportunities available during the training period and to prepare himself/herself for the profession. The core of the professional training is architectural in nature. The student is expected to become well-versed in the realm of architectural discipline, ranging from the generation of ideas and preparation of drawings to the final execution of the design on site. The document shall provide details of the expected outline of work and other procedures. Mandatory Requirement: The student shall have to undergo Professional Training for a period of at least 16 weeks, in alignment with the academic calendar of the institute.							
Learning Outcome: - To understand and apply the professional aspects of an architecture office/company and the multiple issues involved in the conception, preparation, and execution of a project on site. - To be aware of, or sensitive to, the existence of certain ideas, materials, or phenomena, and to be willing to tolerate them. - To be able to formulate and translate theoretical principles into practice. - To be able to establish practices that demonstrate consistency in acting according to the values he or she has internalized. - To develop skills that help adapt to fit specific requirements. - To be able to design solutions for situation-specific problems.							
Module 1:		Nature of work expected to be done during training					
		Module Contents The architect may expose the trainee to different aspects of professional practice. The tasks may include, but are not necessarily limited to, the following: Preparation of: - Conceptual designs, presentation drawings, etc. - Municipal drawings according to the byelaws - Working drawings and details - Estimates, bills of quantities, and specifications Discussions with: - Clients - Structural consultants - Services consultants - Inspection and management of site Preparation of: - Models, perspectives, photographs, reports, progress charts, etc. Other administrative works					
Module 2:		Content of the training report					

	Module Contents The following contents are to be included in both the intermediate and final submissions: After completion of practical training, the trainee is required to submit a hard copy of the training report. The report should contain: • Office profile • Listing of current projects being undertaken • Project-wise details of work undertaken by the student • The trainee's own assessment and experience regarding the office, work process, projects, etc. All projects listed in the report must correspond exactly with the projects mentioned in the monthly log. Copies of drawings shall be attached as annexures to support the content of the report. Drawing prints must be obtained with the permission of the office and stamped/sealed by the 'Supervisor' or Head of the firm/office.
Module 3:	Elective: Critical Appraisal of a building of national/ International importance -1 Module Contents The trainee is required to write a report choosing any building that has been designed/ executed by the company/ firm, she / he is working for an internship. This can be done through secondary research/data collection. The report should contain: • Explanation/ Justification for the choice of the project. • Fact file of the project- discussion on location, client profile, context (physical, cultural) and legal bindings. • Remarkable features that make the building / complex noteworthy. • Trainee's own assessment and experience about the same. • References used in preparation of the appraisal.
Module 4:	Elective: Critical Appraisal of a building of national/International importance-2 Module Contents The trainee is required to write a report by choosing any building present in the city/town where he/she is working for the internship. This should be done through primary study and user experience analysis. The student is encouraged to select a structure with heritage value. The report should contain: • Explanation/justification for the choice of the project/built structure • Fact file of the project – discussion on location, client profile, context (physical, cultural), and legal bindings • Remarkable features that make the building/complex noteworthy, award-winning, or popular • User experience and design comparison • The trainee's own assessment and experience regarding the structure • References used in the preparation of the appraisal

Scheme Of Assessment					
Progressive total (50% marks)	5% marks	5% marks	5% marks	15% marks	20% marks
	Elective: Critical appraisal of a building of architectural importance designed by the firm/ company that the student is undergoing training. (secondary data)	Elective: Critical appraisal of a building of architectural importance in the city/district of the place of training. (Primary study)	Final Log sheet	Confidential Training Report	Training portfolio
End term- (50% marks)	50% marks End semester Examination Viva Voce				
Evaluation: Distribution of % of marks					
Progressive Evaluation				50%	
End term Examination				50%	
Type Of Office/ Organization					
- In the case of a proprietorship firm, the proprietor shall be a CoA-registered architect or registered with any other international council of architects. - In the case of a partnership or private limited firm, at least one of the partners/directors shall be an architect, and the firm must have one or more architects as a partner, director, employee, or associate. - In the case of a public-sector organization, state or central government office, academic institute, or multinational organization, there must be a dedicated wing for architectural consultancy work. - The said firm/office/organization should be at least three years old. - Apart from the list of architects/firms, the suggested list of eligible organizations may include government colleges/institutions, State Town and Country Planning Boards, Urban Development Authorities, State Housing Boards, Municipalities, Municipal Councils, and Municipal Corporations—provided they have a separate wing for architectural consultancy services					

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL

DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

NINTH SEMESTER
COURSES DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
09	BARC 090101	Architectural DesignIX	10	2	0	3	5
Course Overview: This studio positions the city as a dynamic site of learning, inquiry, intervention, and imagination—where architecture intersects with urbanism, and the spatial meets the social, ecological, and political. Through a design-research process grounded in fieldwork, students engage with urban systems, morphologies, lived experiences, and emergent discourses, culminating in responsive, imaginative interventions. The studio encourages work across scales and typologies, offering a fluid framework where students may choose to develop: A medium-to-large-scale urban design strategy at the precinct or neighborhood level, or a contextually rich architectural insertion as a design response embedded in the urban fabric. The studio invites an exploration of both human and more-than-human urban futures, enabling students to conceptualize design not only as the production of built form but as an act of care, critique, and collective visioning. The studio may also emphasize on Architectural conservation, Sustainability in Design, Landscape Architecture, Inclusive Design, etc. with necessary modifications in the learning outcomes and module contents listed below.							
Learning Outcomes: - Analyze urban systems as layered socio-spatial, ecological, and cultural constructs through direct observation and inquiry. - Evaluate issues of publicness, mobility, informality, spatial justice, and resilience within complex urban contexts. - Synthesize urban readings into coherent structure plans or programmatic design briefs. - Design multi-scalar interventions—urban or architectural—that integrate form, systems, narrative, and place. - Communicate reflective design positions using evocative representation, narrative, and spatial storytelling.							
Module 1:		Urban Inquiry — Reading the City					
		Module Contents - Engage with the city through urban walks, visual analysis, sensory mapping, spatial ethnography - Investigate the urban through multiple lenses: Historicity, Imageability Memory, Everyday life - Introduce theoretical frameworks: space/place (Lefebvre), everyday urbanism (de Certeau), relational space (Massey)					
Module 2:		Systems and Morphology — Landscape, Movement, and Typology					
		Module Contents - Decode infrastructure flows, mobility networks, and ecological systems (blue-green infrastructure) - Study urban typologies: street sections, housing blocks, public spaces, thresholds - Analyze urban rituals, informal economies, and the spatial politics of access - Vocabulary: Networks, Porosity, Urban Grain, Public Interface, Edge Conditions Outputs: - System overlays, typological studies, spatial timelines					

Module 3:	Inferences and Strategic Visioning				
	Module Contents - Derive insights and spatial provocations from earlier modules. Engage with case studies on hybrid typologies and precedent strategies - Curate a personal or collective design agenda framed by a studio manifesto - Vocabulary: Structure Plan, Spatial Strategy, Programmatic Narrative, Scenario Planning Outputs: - Concept diagrams and spatial logics, Program briefs and vision boards				
Module 4:	Pathways of Intervention — Urban Design or Urban Infill				
	Module Contents Choosing one of two design tracks: A. Urban Design Track (Precinct Scale) Develop a structure plan and phased urban design strategy, Address public realm, housing, infrastructure, ecology, and socio-spatial inclusion. Speculate on development futures and spatial governance B. Urban Infill Track (Architectural Scale) Design a hybrid-built form responding to its urban setting (e.g., civic node, transit interface, cultural institution). Explore typological innovation and narrative form-making. Emphasize material, climatic, and social integration. Vocabulary: Urban Block, Assemblage, Interface, Typological Hybridity, Spatial Justice				
Module 5:	Design Development — Systems, Sections, and Narrative				
	Module Contents - Develop experiential sections and spatial sequences. Refine design intentions through form, structure, skin, tectonics, climate, and user flows - Design public thresholds and urban interfaces at multiple scales Outputs: - Drawings at Precinct and Architectural scale - Hybrid drawings (axonometric, exploded, narrative), Material mood boards and interface detailing.				
Module 6:	Final Representation and Reflection				
	Module Contents - Synthesize and communicate the full design narrative, Reflect on methodology, positionality, and ethics of the intervention - Participate in collaborative critique and Public Exhibition Outputs: - Exhibition Design, Portfolio with drawings, models, and storyboards - Final review presentation				
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References - Bhan, G., Srinivas, S., and Watson, V. (2018). Routledge Companion to Planning in the Global South - Mehrotra, R. (2021). The Kinetic City and Other Essays. CEPT Press - Sennett, R. (2018). Building and Dwelling: Ethics for the City. FSG - Lefebvre, H. (1991). The Production of Space. Blackwell					

5. Massey, D. (2005). For Space. Sage
6. Gehl, J. (2011). Cities for People. Island Press
7. Roy, A. (2009). Why India Cannot Plan Its Cities. Planning Theory
8. Habraken, N. J. (1998). The Structure of the Ordinary. MIT Press
9. Koolhaas, R. (1978). Delirious New York. The Monacelli Press
10. Rapoport, A. (1969). House Form and Culture. Prentice Hall

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
09	BARC 090103	Thesis Programming	4	1	0	0	3
Course Overview: The course intends to Raise clear and precise questions, Use abstract ideas to interpret information gathered. Able to conclude with good justification. Test the conclusions against relevant criteria and standards. Gather, assess, record and apply relevant information and incorporate relevant study into document form as a report. Make precise power point presentations of the study and conclusions and gain the ability to criticize and analyze the case studies to reach conclusions. Students will apply the learning from the previous semesters to research a subject area through readings; learn description, analysis and synthesis of readings; citation of authors in their writing; and plan a study and write a paper based on literature review. Through the course, the students will be capable of identifying the research area that will enable them to undertake a thesis project in the forthcoming semester.							
Learning Outcomes: - Organize a study based on literature survey - Identify research methods for study - Identify area of research for thesis - Apply research methods in case study - Present paper in a seminar - Practice Citation Develop ethics of publication							
Module 1:		Structuring the Research					
		Module Contents Research: definitions, characteristics, Types of research: - Qualitative and Quantitative research, Research methods vs. methodology. Need for a theoretical framework.					
Module 2:		Architectural thesis approaches					
		Module Contents - Different types of Architectural theses: -Design-Focused Theses, Research-Focused Theses - Proposed projects and Hypothetical projects. Their examples, their focus areas and challenges.					
Module 3:		Topic Identification					
		Module Contents Conduction of a systematic method to identify research areas. This includes: - Literature Review -Literature search; Types of literature sources; Review of literature: objectives; Steps in literature review, Case studies- Live and literature, Review of case study, and Steps in case study; Finding of research gap. - Thesis domain identification/ finalization.					
Module 4:		Site Identification/ Context or user identification					
		Module Contents					

	- This module will facilitate students to discuss and decide on the pros- and cons of design and research-based thesis. Based on the same, Site or Context / User Identification will be done. Site Identification - Based on the nature of the thesis, site location would be identified. Study to select sites for hypothetical projects; site based on land use map and land suitability. Preliminary Study of the context; physical Characteristics;(Topography, Geology, Vegetation, Existing Structures), Climate and demography. Site area and boundary to be established. If the research domain demands- User study/ product study/ context study will be undertaken in a systematic manner. Sliding and Sliding-Folding Doors — The mechanism in different materials of sliding and pocket doors, including their space-saving benefits and installation requirements. - Collapsible Doors — The design and application of collapsible doors for secure and space-efficient access solutions. - Rolling Shutters — The functionality, materials, and installation methods of rolling shutters, often - for security and weather protection.				
Module 5:	Research Process Module Contents Problem identification and formulation of problem statement; Formulating the aims and objectives, scope and limitations and research questions; Formulating the methodology and methods. Detailed study and finalization of research parameters. Conduction of research- comparative study/ field study/qualitative data collection/ questionnaire survey. Live case study/survey/ direct observation etc; and documentation, review of case study, usefulness of case study to the selected topic; conclusion from case study. Discussion on the raw data and report writing.				
Module 6:	Preparation of Thesis Synopsis Module Contents PowerPoint presentation on the selected topic based on conclusions from case studies and research; preparation of report based on research conducted under various heads. Preparation and presentation of Synopsis for the Architectural thesis to be taken in the next semester.				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References - Becker, H. S. (1986). Writing for social scientists: How to start and finish your thesis, book, or article. University of Chicago Press. - Zeisel, J. (1984). Inquiry by design: Tools for environment-behavior research. Brooks/Cole Publishing Co. - Groat, L., & Wang, D. (2013). Architectural research methods (2nd ed.). John Wiley & Sons. - Turabian, K. L. (1947). A manual for writers of research papers, theses, and dissertations: Chicago style for students and researchers (1st ed.). University of Chicago Press.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Sem	Course No.	Course Title	Credit	L	T	P/ S	D
09	BARC 090102	Architectural Conservation	3	2	1	0	0
Course Overview: This course gives a brief introduction to the subject of Architectural Conservation. It discusses the history, theory and best practices in Architectural conservation. Moving from basic theories, the course touches upon the technical aspects and ethics of conservation. The course culminates with a module on sensitizing the students of architecture towards designing in historic environments.							
Learning Outcomes: - To understand the philosophy and science of architectural conservation - To learn the appropriate methodologies and tools for recording, documentation and inventorying of heritage structures, - To acquire skills for documentation photography, surveys, research etc. - To apply suitable methodology with reference to given context. - To critically evaluate and make assessment of heritage components - To design in a heritage context - To demonstrate respect for built and cultural heritage							
Module 1:		Introduction to Architectural conservation					
		Module Contents - Definition of Conservation - History of Conservation - Justification for Conservation - Conservation ethics (concept of values, Significance, authenticity and Integrity)					
Module 2:		Degrees of Interventions in Historic buildings and Monuments					
		Module Contents - Prevention of Deterioration - Prevention of the existing fabric - Consolidation - Restoration - Rehabilitation - Reproduction - Reconstruction					
Module 3:		Research in Conservation					
		Module Contents - Importance of Research in Conservation - sources of information like books, Archival photographs, Maps, folklore, Mythology, oral tradition and memories - Structuring and interpretation of collected information					
Module 4:		Conservation legislations					
		Module Contents - International and National Charters - Heritage Bye laws - AMASR act - Regulatory Bodies (NMA, ASI, Urban Local Bodies etc), NGOs (International and National) - Understanding of conservation world heritage sites					

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources/References

1. Feilden, B. M. (2003). Conservation of historic buildings (3rd ed.). Routledge.
2. Historic England. (2017). Practical building conservation: Conservation basics. Routledge.
3. Muñoz Viñas, S. (2005). Contemporary theory of conservation. Elsevier.
4. Getty Conservation Institute. (2007). Recording, documentation, and information management for the conservation of heritage places: Guiding principles.

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Sem	Course No.	Course Title	Credit	L	T	P/ S	D
09	BARC 090104	Urban Design	3	2	1	0	0
Course Overview: This course situates architecture within the broader urban realm, emphasizing the reciprocal relationship between built form and its urban context. It equips students to understand and intervene in the urban environment through a lens that integrates spatial, social, cultural, ecological, and regulatory dimensions. Urban Design is explored as a practice that bridges architecture, planning, and landscape, with a strong grounding in theory and a focus on real-world application. Students engage critically with the making of public spaces, transitions between public and private realms, and the spatial configuration of urban form. Through studio-linked assignments, students apply conceptual and analytical frameworks to generate contextually sensitive, inclusive, and ethically responsible urban interventions.							
Learning Outcomes: - Analyze and interpret urban form using spatial, social, and environmental frameworks. - Apply evidence and precedent to develop informed and inclusive design strategies. - Address equity, accessibility, and identity in public space design. - Engage with urban theory to inform ethical, contextual interventions. - Integrate tools and methodologies from living labs and participatory design processes.							
Module 1:		Foundations and Territories of Urban Design					
		Module Contents - This module traces the disciplinary origins of urban design through key thinkers like Sitte, Howard, Lynch, and Jacobs. Krieger's "Territories of Urban Design" helps situate the field between planning, landscape, and architecture. - The city is approached as a palimpsest—layered with historical, regulatory, and spatial logics. Students are introduced to urban elements like streets, blocks, plots, and public spaces. Case studies include Chandigarh, Florence, and the Manhattan Grid.					
Module 2:		Urban Form, Typologies, and Spatial Regulation					
		Module Contents - The module focuses on urban morphology and typo-morphological evolution, focusing on how built forms and public space types adapt over time. - The module covers block patterns, superblocks, mixed-use models, and transit-oriented development. Building codes, zoning, and form-based regulations are analyzed as design tools that shape urban form.					
Module 3:		Human Perception, Public Life, Experience and Place Identity					
		Module Contents This module explores how people perceive and experience urban space. What renders imageability and identity. what is associational value in a public space. Suggestive Concepts like Lynch's imageability, Serial Vision, and Gehl's human-scale urbanism help examine everyday encounters with streets and plazas. Venturi, Scott Brown, and Izenour's Learning from Las Vegas is used to study the symbolism and legibility of commercial and vernacular urban landscapes. Students consider the aesthetics and materiality of place-making.					

Module 4:	Equity, Gender, and Spatial Justice				
	Module Contents • Drawing from Lefebvre's "Right to the City" and Harvey's urban justice frameworks, this module explores the politics of space. • Shilpa Ranade's <i>The Way She Moves</i> addresses how gender shapes access and mobility. K.T. Ravindran's <i>Why Planning Fails</i> critiques top-down approaches and spatial exclusion. • Spivak's <i>Can the Subaltern Speak?</i> introduces a critical lens on voice, agency, and spatial invisibility. Students engage with participatory design methods to understand how urban interventions can include marginal voices.				
Module 5:	Environmental Urbanism and Urban Systems				
	Module Contents • This module focuses on cities as ecological and infrastructural systems. Students study microclimate design, green infrastructure, and walkable, transit-connected urbanism. • The concept of the 15-minute city is introduced alongside car-free zones and shared streets. Case studies from Copenhagen, Singapore, and BARC elona highlight integrated environmental strategies.				
Module 6:	Evidence-Based Design and Living Labs				
	Module Contents • Students explore how design can be guided by empirical data, post-occupancy evaluations, and community input. • The living lab model is introduced as a way to prototype, test, and refine interventions in real-world urban contexts. Digital tools, public surveys, and behavior mapping are explored as methods. • This module also addresses ethical design—who is represented, whose data matters, and how outcomes are measured.				
Evaluation: Distribution of % of marks					
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Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Lynch, K. (1960). <i>The Image of the City</i>. MIT Press. 2. Krieger, A. (2006). <i>Territories of Urban Design</i>. Harvard Design Magazine. 3. Jacobs, J. (1961). <i>The Death and Life of Great American Cities</i>. Random House. 4. Venturi, R., Scott Brown, D., and Izenour, S. (1972). <i>Learning from Las Vegas</i>. MIT Press. 5. Gehl, J. (2010). <i>Cities for People</i>. Island Press. 6. Ranade, S. (2007). <i>The Way She Moves</i>. Economic and Political Weekly. 7. Lefebvre, H. (1991). <i>The Production of Space</i>. Wiley-Blackwell. 8. Ravindran, K. T. (2005). <i>Why Planning Fails</i>. Architecture + Design. 9. Harvey, D. (2012). <i>Rebel Cities</i>. Verso. 10. Spivak, G. C. (1988). <i>Can the Subaltern Speak?</i> in <i>Marxism and the Interpretation of Culture</i>. 11. Carmona, M. et al. (2010). <i>Public Places, Urban Spaces</i>. Routledge.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
09	BARC 090106	Construction Project Management	3	2	1	0	0
Course Overview: Construction is an inherently complex activity, and the increasing scale and intricacy of modern construction projects have made the use of Critical Path Method (CPM) essential across all segments of the industry. In the Indian construction sector, issues such as cost overruns, missed deadlines, compromised quality and safety, and inadequate planning by construction firms are widespread, often resulting in diminished returns and erosion of trust among clients and shareholders. Addressing these challenges necessitates the adoption of robust project management solutions. The role of Project Management in an architect's professional practice can vary significantly based on the nature of consultancy, firm ownership and project typology. Some of the most common roles include: • Office Management: Managing his / her own office and field staff; staffing, allocating space, funds, equipment's, etc. and establishing, managing and promoting one's business. • Design Management: Coordinating with all the stakeholders, consultants and others having a say in the design process to arrive at a final program in a timely and efficient manner. • Project Management: The scope of activities will depend upon the Project Delivery Method being deployed but broadly deals with all the activities concerned with the implementation process subsequent to the preparation of design and construction drawings.							
Learning Outcomes: Understanding the Fundamentals of Project Management. An introduction to Statutory Approvals, Project Delivery Methods and Appraisal Techniques. The know-how required to: • Develop and Manage Project Schedules. • Estimate Resources, Duration and Deliverables. • Apply Financial Management Principles to Projects. • Implement Quality Assurance and Safety Measures. • Navigate Legal and Contractual Frameworks. • Integrate Human Resource and Office Management Practices. • Utilize IT and ERP Tools for Project Administration. • Ability to critically assess an Architect's Role in Project Management.							
Module 1:		Introduction to Construction Project Management					
		Module Contents • What is a Project? • Phases involved in Project life cycle i.e. from inception phase to the post-construction phase. • Project Appraisal. • Project Delivery Methods. • Various stakeholders in the construction industry and their roles and responsibilities. • Introduction to Project Management Knowledge Areas.					
Module 2:		Project Scheduling					
		Module Contents • Preparation of Work Breakdown Structures and Sequencing of Activities. • Resource and Duration Estimating. • Preparation of Schedules (using CPM, PERT, Gantt charts, precedence diagrams, etc)					

	- Monitoring and controlling the schedules. - Computer Applications for preparing and managing schedules. - Preparation of schedule for completion / submission of deliverables related to their current design exercise.				
Module 3:	Financial Management Module Contents - Functions of Financial Management. - The Concept of Time Value of Money. - Techniques of Capital Budgeting. - Cash Flow Statement: Preparation of cost baselines and their analysis. - Earned Value Management.				
Module 4:	Managing Quality and Safety in Construction Module Contents - Evolution of Quality Management, Quality Assurance and Control and ISO requirements. - Introduction to the concept of quality in building design, construction and project management. - Tools for Quality Management. - Introduction to construction site conditions in India. - Impact of a safe working environment on HR performance and their productivity. - Legal, contractual and other guidelines for construction safety.				
Module 5:	Contracts, their Administration and HR Management Module Contents Types of contracts. - Pre-qualification of contractors, preparation of contract documents, evaluation of contract bids and award. - Alternative Dispute Resolution Mechanisms. - Study of CPWD General Conditions of Contract. - Organizing work, staffing, delegation and decentralization. - Human resource management and managing work groups. - IT application in office management and procedure: ERP. - Customer Relationship Management (CRM). - Entrepreneurship Issues in Indian Construction Industry.				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References - Sears, S. K., Sears, G. A., and Clough, R. H. (2010). Construction project management: A practical guide to field construction management. John Wiley and Sons. - Chitkara, K. K. (1998). Construction project management. Tata McGraw-Hill Education. - Taha, H. A. (2013). Operations research: an introduction. Pearson Education India. - Chandra, P. (2019). Financial Management: Theory and Practice, 10e (Vol. 10). McGraw-Hill Education. - Ramaswamy, B.S. (2016). Contracts And Their Management. LexisNexis. - PMI (2021). A Guide to the Project Management Body of Knowledge (Pmbok(r) Guide) - Seventh Edition. Project Management Institute, USA. - CPWD, MES, FIDIC, JCT, ADB, World bank, etc.: General and Special conditions of contract and standard operating procedures. - IS 15883: Construction Project Management – Guidelines.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
09	BARC 90108	Advance Landscape	3	2	1	0	0
Course Overview: The intent of the subject is to provide a comprehensive understanding of natural and modified landscapes, environmental sustainability, and technical documentation in landscape architecture.							
Learning Outcomes: - Students will develop strong observation and communication skills, learn creative landscape mapping, and understand urban and rural environments as dynamic systems influenced by human and natural factors - Students will learn land surface modification techniques, explore green and blue infrastructure, assess watershed management, and apply nature-based solutions to environmental challenges, improving soil, water, and vegetation - Students will gain practical knowledge of construction documentation, mastering landscape drawing sets, symbols, and sheet layouts for grading, drainage, materials, planting, and lighting							
Module 1:		Introduction: Observation and Mapping Interactions					
		Module Contents - Observing the Interactions and Processes in nature: Focuses on observation skills, enhancing verbal, intellectual and written communication skill, and evolving creative graphical tools for mapping. - Draw relation of art with landscape, documenting natural phenomena occurring in nature, exploring sensorial and spatial qualities through landscape. Comprehending Urban and Rural landscapes: To interpret urban and rural landscapes not merely as defined site boundaries, but as dynamic contexts that influence the site. This includes evaluating their broader impact on natural systems—shaped by factors such as population pressure, built density, intensive agriculture, pollution, afforestation, and the state of natural ecosystems.					
Module 2:		Landscape Construction I					
		Module Contents - Land surface Modification: Visualizing landforms, land excavations, (angle of repose, existing and modified contour mapping, cut and fill calculations, grading and drainage drawings); practices of erosion control, slope stabilization, safe disposal of run-off water and drainage, grade stabilization structures, retaining walls, surface and subsurface drains. - Green and Blue infrastructure: Buffers and Riparian green development, ecological/wildlife corridor (Assessment of vegetation along water bodies, impact of vegetation that are native vs nonnative vs invasive on environment etc) Impact of land surface modification on drainage using watershed management (assessment of stream order, stream fragmentation). - Environmental challenges: Case study-based strategies, bioengineering methods and interventions for improving degraded slopes (slope stabilization techniques) , soil (study of soil health, techniques and plants which can help in nutrient exchange, improve fertility etc.), water (water harvesting structures, phytoremediation, constructed wetlands etc.) and vegetation etc using Nature Based Solutions.					

Module 3:	Landscape Construction II	
	Module Contents Study of construction documentation process employed by landscape architects. Landscape drawing set for construction, symbols and sheet layouts (Line out, Grading and drainage layout, construction details, material layout, planting layout, lighting layout etc.).	
Evaluation: Distribution of % of marks		
Progressive Evaluation		50%
End term Examination		50%
Learning Resources/References		
1. Corner, James (1999), Recovering Landscape: Essays in Contemporary Landscape Architecture, publisher Princeton Architectural Press 2. Lassus, Bernard (1998), The Landscape Approach, publisher University of Pennsylvania Press 3. Potteiger, M, Purinton, J (1998), Landscape Narratives: Design Practices for Telling Stories, publisher John Wiley New York 4. Dines, Nicholas; Harris, Charles (1997), Time-Saver Standards for Landscape Architecture 5. Simonds, J.O, (2006), Landscape Architecture, A Manual of Land Planning and Design, publisher Mc Graw 6. Richard Skiba, (2024) Landscape Design and Construction		

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL

DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

TENTH SEMESTER COMPULSORY CORE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
10	BARC 100101	Architectural Thesis	20	2	0	4	14
Course Overview: In the final semester, students undertake a capstone thesis project that synthesizes their architectural education and challenges them to address complex, real-world problems. This course offers two options—Option A: Design Thesis and Option B: Research Thesis, enabling students to align their final work with their individual interests and professional aspirations. - In the Design Thesis, students independently develop a comprehensive architectural project that integrates aesthetic, technical, and functional considerations through a structured design process. Emphasis is placed on contextual analysis, building systems, materials, and human-centered building design. - The Research Thesis option supports students in conducting rigorous academic investigations into significant architectural theories, concerns, or frameworks. Students critically explore topics through structured research methodologies, culminating in academically sound, original findings relevant to building design. - The course encourages independent thinking, critical inquiry, and professional-level competence, equipping students to contribute meaningfully to architectural design, research, and discourse. The thesis topic, scope of work, and deliverables will be finalized by the Thesis Committee.							
Learning Outcomes: Option A: Design Thesis - By the end of the Design Thesis, students will be able to: - Develop a comprehensive architectural design brief based on user needs, site context, and programmatic requirements. - Apply a systematic and iterative design process from concept to detailed development. - Integrate knowledge of structure, materials, building systems, environmental strategies, and human behavior into a cohesive design proposal. - Demonstrate creativity, critical thinking, and problem-solving in generating innovative and contextually appropriate design solutions. - Communicate design ideas effectively through drawings, models, diagrams, and verbal/written presentations. Option B: Research Thesis - By the end of the Research Thesis, students will be able to: - Formulate a clear and researchable architectural question grounded in theory, practice, or contemporary concerns related to building design. - Conduct a comprehensive literature review and identify relevant theoretical and methodological frameworks. - Apply appropriate research methods to analyze data or architectural precedents critically and systematically. - Synthesize findings into coherent arguments or insights with implications for architectural thinking or building design. - Produce a well-structured, academically rigorous thesis document and present findings clearly in both written and verbal formats.							
Module 1:		Synopsis Option A: Design Thesis – Students must submit a synopsis at the end of the previous semester, providing a brief introduction to their proposed design thesis project. The synopsis should outline the project intent, design objectives, and preliminary scope, serving as the foundation for further development during the thesis semester.					

	Option B: Research Thesis – The research thesis synopsis must include a clear statement of objectives, the research problem, proposed methodology, and anticipated outcomes. It should present a concise summary of the topic, highlighting the significance of the issue being addressed, the student's approach to investigation, and the expected contribution to architectural knowledge or practice. Approval of the synopsis is mandatory before students proceed with detailed research or design work.
Module 2:	Precedent Studies and Literature Review Module Contents - Option A: Design Thesis – This module requires students to conduct precedent studies by analyzing built or proposed architectural projects relevant to their chosen design topic that demonstrate unique approaches in form, structure, materials, or technology. The objective is to learn from real-world architectural responses—understanding design processes, challenges, and solutions. Students will critically examine aspects such as spatial organization, functionality, construction systems, materiality, and user experience. - Option B: Research Thesis – Students undertaking the Research Thesis are required to conduct a comprehensive literature review in addition to relevant precedent analysis, where applicable. The literature review should identify gaps in existing knowledge, define the research context, and support the formulation of the research problem and methodology
Module 3:	Site and Context Analysis Module Contents - Option A: Design Thesis – Analysis of the selected site and its surrounding context includes documenting and evaluating physical, environmental, socio-cultural, and regulatory conditions. The objective is to identify key opportunities and constraints that will inform and shape the design response. - Option B: Research Thesis – For the Research Thesis, site and context analysis may be included when relevant to the research focus. If the study involves design-based components or case-specific investigations, students are expected to carry out detailed contextual analyses to support their argument or validate their research findings.
Module 4:	Schematic Design Module Contents - Option A: Design Thesis – In this stage, students are expected to translate their research, site analysis, and conceptual explorations into schematic design proposals. This involves the development of initial design ideas through conceptual drawings, diagrams, physical or digital models, and exploratory sketches. - Option B: Research Thesis – For students in the Research Thesis track, schematic design may be applicable if their research includes design-based inquiry or speculative proposals. In such cases, conceptual drawings or diagrams may be used to explore or illustrate theoretical ideas, test hypotheses, or support research arguments.
Module 5:	Design Development and Detailing Module Contents - Option A: Design Thesis – This module focuses on advancing the schematic design into a fully developed and technically robust architectural proposal. Students are expected to refine spatial zoning, circulation, and functional layout while addressing human ergonomics and programmatic requirements. The design must demonstrate integration of structural systems, material choices, and construction techniques in coordination with architectural expression. - Option B: Research Thesis – For students pursuing the Research Thesis, design

	development and detailing are not typically required unless the research includes a design application or proposal. In such cases, the focus should be on the strategic use of architectural drawings or models to support or test research findings.				
Module 6:	Final Design Submission Module Contents Students are required to present all the submittals for both Option A and Option B (drawings, model, report, paper, etc.) complete in all respects, incorporating comments and suggestions received from the thesis guide and various review members, before the final review panel for the B.Arch. Thesis.				
Notes: Deliverables for Option A and Option B at Various stages will be as per Thesis Manual. Variation in list of deliverables may be considered if approved by the supervisor					
Evaluation: Distribution of % of marks					
<table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References 1. Andrews, R. (2005). <i>Research questions</i>. Continuum-Viva. 2. Booth, W. C., Colomb, G. G., and Williams, J. M. (2008). <i>The craft of research</i> (3rd ed.). The University of Chicago Press. 3. Crouch, C., and Pearce, J. (2012). <i>Doing research in design</i>. Berg Publishers. 4. Groat, L., and Wang, D. (2002). <i>Architectural research methods</i>. John Wiley and Sons. 5. Zeisel, J. (2006). <i>Inquiry by design: Environment/behavior/neuroscience in architecture, interiors, landscape, and planning</i> (Rev. ed.). W. W. Norton and Company. 6. Unwin, S. (2014). <i>Analyzing architecture</i> (4th ed.). Routledge. 7. White, E. T. (2004). <i>Site analysis: A contextual approach to sustainable land planning and site design</i> (2nd ed.). Architectural Media Ltd. 8. Groat, L., and Wang, D. (2013). <i>Architectural research methods</i> (2nd ed.). Wiley.					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Compulsory Core Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
10	BARC 100102	Professional Practices	3	2	1	0	0
Course Overview: This course explores how the architectural profession in India evolved after independence, with a major turning point being the introduction of the Architects Act in 1972. It examines how architecture connects with the wider social, cultural, economic, and political realities of the country. Through this course, students will gain a clear understanding of what it means to practice architecture professionally and ethically in today's world. The focus is on building a strong foundation of integrity, competence, and responsibility. Beyond technical skills, the course encourages future architects, designers, and planners to think about their role in shaping a better society, one that values sustainability, environmental care, social justice, and the well-being of communities.							
Learning Outcomes: - By the end of this course, students will develop a foundational understanding of professional practice in architecture, including effective office management and the legal frameworks governing the profession. - They will be able to identify and interpret relevant laws, analyze the role of ethics and moral judgment in professional decisions, and recognize their responsibilities toward society. - The course encourages students to actively engage with and uphold professional values, respond to social expectations, and advocate for ethical and responsible architectural practice.							
Module 1:		Code of Professional Conduct					
		Module Contents - Introduction to the architectural profession, role of professional bodies, and the Architects Act, 1972 - Duties, liabilities, and relationships of clients, contractors, and other technicians - The Code of Professional Conduct and conditions of engagement for architects - Scale of remuneration for architectural services and modes of payment					
Module 2:		Architect's Office Administration					
		Module Contents - Organization, administration, and management of an architect's office - Architect's team: role of technical professionals (structural engineer, MEP, quantity surveyor, specification writer, etc.) - Architect's team: role of administrative staff (accounts, managers, documentation, records, etc.) - Partnership offices: nature of partnership, registration, and dissolution of firms; statutory obligations - Consortiums, joint ventures, and sub-letting with other consultants					
Module 3:		Tenders and Contracts					
		Module Contents - Types of tenders, tendering process, and contents of tender documents - Types of contracts, execution of contracts, and common issues in contract operations - Types of architectural competitions, Memorandum of Agreement (MoA), Memorandum of Understanding (MoU), and agreements - Contents of contract documents					

	Liaisoning services and permissions from related agencies such as TCPO, Development Authorities, EIA authorities, local administration, Fire Department (Fire NOC), etc.				
Module 4:	Arbitration Module Contents - Types of disputes in architectural services; breach of contract; easement and laws related to works - Arbitration: role and qualities of an arbitrator; overview of the Arbitration Act, 1940 - Arbitration in relation to competitions, valuations, contracts, land disputes, and legal implications				
Module 5:	Valuation Module Contents - Importance of valuation; duties and responsibilities as a registered government valuer - Property values, sinking fund, capitalized cost, year's purchase - Methods of depreciation and different methods of valuation; valuation reports - Mortgage/lease; fixation of rent for private/government, residential, and commercial buildings				
Module 6:	Entrepreneurship and IPR Module Contents - Entrepreneurship in architecture: building design startups and creative practices - Business models and branding strategies for architectural firms - Intellectual Property Rights in design: copyrights, trademarks, and patents in architecture - Protecting and commercializing architectural innovations and designs				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References - Namavati, R. H. (2016). Professional practice. Lakhani Book Depot. - Turner, H. H. (1948). Architectural practice and procedure. B. T. Batsford Ltd. - Indian Institute of Architects (I.I.A.). Articles of agreement, scale of professional charges, competitions. I.I.A. Publications. - Council of Architecture (COA). (1989). Professional code of conduct. https://www.coa.gov.in/					

SCHOOL OF PLANNING AND ARCHITECTURE,
BHOPAL
DEPARTMENT OF ARCHITECTURE



BACHELOR OF ARCHITECTURE
PROGRAMME CURRICULUM
JULY 2024

NINTH and TENTH SEMESTER ELECTIVE
COURSE DETAILS

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
09/10	BARC 0901E9A/ BARC 0101E10A	Sustainable Architecture	2	1	1	0	0
Course Overview: This course introduces principles and practices of sustainable architecture, focusing on environmentally responsive design for advance learners. It emphasizes prioritization, selection, and application of climate-responsive strategies, energy-efficient systems, sustainable materials and technology, water and waste management, and green building standards. Students will also be familiarized with simulation tools. This course also detailed the process of certification for Green Building Rating and compliance with Energy Conservation building Codes.							
Learning Outcomes: - To introduce the principles, strategies, materials and technologies of sustainable design. - To understand and integrate passive and active strategies for energy, water, and waste efficiency. - To introduce green rating systems and performance tools.							
Module 1:		Introduction to Sustainable Architecture					
		Module Contents - Definitions: Sustainability, Green Architecture, Climate Change - Climate Change urbanization and resource depletion - Environmental ethics and responsibility of architects. - Principles and Goals of Sustainable Architecture - Real world Case studies and best practices					
Module 2:		Life Cycle assessment and post occupancy evaluation					
		Module Contents - Life Cycle Assessment (LCA) of materials. - Concept of embodied energy and carbon footprint, green procurement, local sourcing - Post occupancy Evaluation					
Module 3:		Energy Efficiency and Integration of Renewable sources of Energy					
		Module Contents - Energy efficiency in building envelope and services. - Integration of solar, wind, and geothermal systems for harvesting renewable sources of energy					
Module 4:		Green Rating Systems and Energy Conservation building Codes.					
		Module Contents - Detailed process of application and certification for rating systems;(GRIHA, LEED, IGBC, BREEAM etc) - Review of sustainable buildings and Critical analysis of green-certified buildings (Indian and international) - Detailed process of certification for Green Building Rating and compliance with Energy Conservation building Codes.					

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources/References

1. Olgyay, V. (2015). *Design with climate: Bioclimatic approach to architectural regionalism* (Updated ed.). Princeton University Press.
(Original work published 1963)
2. Brown, G. Z., and DeKay, M. (2014). *Sun, wind, and light: Architectural design strategies* (3rd ed.). Wiley.
3. Ching, F. D. K., and Shapiro, I. M. (2014). *Green building illustrated*. Wiley.
4. Kwok, A. G., and Grondzik, W. T. (2018). *The green studio handbook: Environmental strategies for schematic design* (3rd ed.). Routledge.
5. McDonough, W., and Braungart, M. (2002). *Cradle to cradle: Remaking the way we make things*. North Point Press.
6. Hootman, T. (2012). *Net zero energy design: A guide for commercial architecture*. Wiley.
7. Jankovic, L. (2012). *Designing zero carbon buildings using dynamic simulation methods*. Routledge.
8. Keeping, M., and Shiers, D. (2017). *Sustainable building design: Principles and practice*. Wiley-Blackwell.

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
09/10	BARC 0901E9B/ BARC 0101E10B	Digital Design and Fabrication	2	1	1	0	0
Course Overview: The course emphasizes digital fabrication and documentation through iterative design and prototyping with Laser Cutting, CNC Milling, and 3D Printing. Students will master digital modeling, produce CAD-CAM files, operate CNC machines, and document processes in a FabLab setting. The course prioritizes hands-on fabrication, digital documentation, and safe, collaborative maker space practices, integrating global trends and local applications							
Learning Outcomes: By the end of the course, students will: - Master digital modelling and CAD-CAM file preparation for Laser Cutting, CNC Milling, and 3D Printing. - Fabricate and assemble architectural structures using digital fabrication processes. - Produce comprehensive digital documentation (e.g., drawings, process logs, assembly guides). - Translate complex geometries into constructible solutions, optimizing for material and machine constraints. - Operate CNC machines safely and collaboratively in a FabLab, adhering to safety and cleanliness standards. - Apply fabrication strategies to sustainable architectural solutions in India's urban context.							
Module 1:	Foundations of Digital Fabrication						
	Module Contents - Introduction to digital fabrication: Laser Cutting, CNC Milling, 3D Printing. - Digital modeling for fabrication: Interface, curves, surfaces, and basic geometry. - FabLab principles: Safety, cleanliness, and collaborative workflows. - Digital documentation: Process logs, CAD-CAM file basics.						
Module 2:	CNC Milling and Geometry Translation						
	Module Contents - CNC Milling: Machine operation, material selection (e.g., wood, composites). - Translating geometry: From digital models to constructible solutions. - CAD-CAM workflows: File preparation for CNC milling (e.g., toolpaths). - Digital documentation: Technical drawings, milling process records.						
Module 3:	3D Printing and Assembly						
	Module Contents 3D Printing: Printer types, materials (e.g., PLA, resin), and settings. - Designing for assembly: Joints, tolerances, and modular structures. - CAD-CAM for 3D printing: File optimization and slicing. - Digital documentation: Assembly guides, material performance logs.						
Module 4:	Integrated Project and FabLab Mastery						
	Module Contents Combining fabrication processes: Hybrid designs using Laser Cutting, CNC Milling, 3D Printing.						

	• Advanced documentation: Comprehensive portfolios (models, drawings, videos). • Sustainable fabrication: Local materials (e.g., bamboo, recycled plastics) for India. • FabLab collaboration: Optimizing machine use, peer workflows, and ethics.
Evaluation: Distribution of % of marks	
Progressive Evaluation	50%
End term Examination	50%
Learning Resources/References 1. Dunn, N. (2012). Digital fabrication in architecture. Laurence King Publishing. 2. Iwamoto, L. (2009). Digital fabrications: Architectural and material techniques. Princeton Architectural Press. 3. Kolarevic, B. (2003). Architecture in the digital age: Design and manufacturing. Routledge. 4. Auroville Earth Institute. Sustainable fabrication and digital tools [Online resource]. http://www.earth-auroville.com/	

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
09/10	BARC 0901E9C/ BARC 1001E10C	Integration of GIS in Architecture and Planning	2	1	1	0	0
Course Overview: This course introduces students to the fundamentals of planning and the application of Geographic Information Systems (GIS) in understanding, analyzing, and visualizing urban spaces in architectural practices. It emphasizes spatial thinking, data-driven planning, and the integration of geospatial technology in decision-making processes. Students will explore planning theories, spatial data infrastructure, and learn GIS tools to assess urban growth, infrastructure, land use, environment, and socio-economic patterns. The course combines theoretical foundations with hands-on practical exercises using GIS software, enabling students to conduct site-based analyses, map urban/rural phenomena, and support evidence-based architectural and planning solutions. The course plays a crucial role in architecture by providing tools for analyzing site conditions, designing sustainable buildings, and managing urban spaces. It helps architects and planners make informed decisions by integrating spatial data, assessing environmental impacts, and visualizing complex.							
Learning Outcomes: • To impart basic to intermediate knowledge of GIS and its application in Architecture and planning. • To introduce students to the fundamental concepts and processes of urban/rural planning. • To enable students to analyze the site context using GIS as a tool. • To integrate urban design and planning principles with spatial analysis. • To develop understanding of the role of GIS in sustainable and smart city development.							
Module 1:	Fundamentals of Geographical Information System (GIS)						
	Module Contents • Introduction to GIS, Remote Sensing and spatial data • Types of data: Raster and Vector • Map projections and coordinate systems • Data sources: Satellite imagery, Survey data, Census, GPS • Spatial Data Infrastructure (SDI)						
Module 2:	GIS Software and Applications						
	Module Contents • Hands-on practice in GIS software • Data input, editing, attribute tables • Map Design and Layout • Thematic mapping and spatial queries						
Module 3:	GIS in Architecture:						

	Module Content • Site Selection: Students can conduct comparative analysis of different sites based on certain parameters to choose the most suitable site. • Understanding the context: analyzing sites topography, soil type, vegetation, proximity analysis etc. • Design Visualization: Managing spaces within the site. • Environmental impact assessment: To model and assess the potential impact of a building on the environment, including factors like solar radiation, wind patterns, and drainage. • Sustainable design approach: Analyzing site-specific conditions that are energy-efficient, water-conserving, and minimize their overall environmental footprint.				
Module 4:	GIS in Planning Module Contents • Land use and land cover analysis • Site suitability analysis for urban functions • Urban infrastructure and mobility mapping • Hazard and risk mapping using GIS • Case studies on GIS applications in planning and smart cities (e.g., AMRUT, PMAY, NULM, Smart Cities Mission) • Group project: A local urban issue to be studied and analyzed using GIS tools				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td>50%</td></tr> <tr> <td>End term Examination</td><td>50%</td></tr> </table>		Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%				
End term Examination	50%				
Learning Resources/References: 1. Suggested Software: • QGIS (Open Source) • ArcGIS (Licensed) • Microsoft Excel for data analysis 2. Saha, K., and Frøyen, Y. K. (2021). Learning GIS Using Open-Source Software: An Applied Guide for Geo-spatial Analysis. Routledge India, p. 240. DOI: 10.4324/9781003056928, ISBN: 9781003056928. 3. Remote Sensing and Image Interpretation, Thomas M. Lillesand and Kiefer, John Wiley and Sons Ltd., 2001 4. "Geographic Information Systems and Science" – Paul A. Longley et al. 5. "Urban Planning: Theory and Practice" – A.K. Jain 6. Suggested Readings: - Urban and Regional Development Plans Formulation and Implementation Guidelines (URDPFI), MoHUA, 2014 - National Geospatial Policy (India), 2022					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/ S	D
09/10	BARC 0901E9D/ BARC 1001E10D	Disaster Resilience	3	2	1	0	0
Course Overview: This course provides an introduction to the principles, frameworks, and practices of disaster risk resilience. It emphasizes risk assessment, disaster preparedness, mitigation strategies, response coordination, and recovery planning across various natural and human-induced hazards.							
Learning Outcomes: - To introduce students to the concept and framework of disaster risk resilience - To understand the causes, impacts, and spatial dimensions of natural and man-made disasters - To equip students with knowledge on disaster preparedness, mitigation, and resilient planning - To introduce legal, institutional, and policy frameworks related to disaster management							
Module 1:		Fundamentals of Disaster Resilience					
		Module Contents - Theories of disaster, hazard, risk, vulnerability, and resilience - Types of disasters: natural and anthropogenic					
Module 2:		Hazard, Vulnerability, and Risk Assessment					
		Module Contents - Concepts of risk and vulnerability assessment - Techniques for hazard mapping and risk analysis - Structural and non-structural mitigation measures - Community-Based Disaster Risk Reduction (CBDRR)					
Module 3:		Planning and Design for Resilience					
		Module Contents - Disaster frameworks, building regulations, and codes for disaster risk resilience (e.g., Sendai Framework for Disaster Risk Reduction, Disaster Management Act, 2005, State Disaster Management Plans) - Climate-responsive and disaster-resilient architecture (site planning and building-level strategies)					
Module 4:		Disaster Management Framework in India					
		Module Contents - Disaster preparedness and early warning systems - Institutional mechanisms: NDMA, SDMA, NIDM, local authorities - Community engagement and capacity building - Strategies for mitigation, preparedness, and response; damage assessment - Disaster risk management and post-disaster recovery – rehabilitation and reconstruction - Role of temporary shelters and rehabilitation planning					

Evaluation: Distribution of % of marks

Progressive Evaluation	50%
End term Examination	50%

Learning Resources/References

1. Shaw, R. (2009). Disaster risk reduction in South Asia. Emerald Group Publishing.
2. Bureau of Indian Standards. (2016). National building code of India – Part 11: Approach to sustainability. <https://bis.gov.in>
3. Bureau of Indian Standards. IS 1893, IS 4326, IS 13828, IS 13920 – IS codes for earthquake- and cyclone-resistant design. <https://bis.gov.in>
4. United Nations Office for Disaster Risk Reduction. (2015). Sendai framework for disaster risk reduction 2015–2030. <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>
5. Ministry of Home Affairs, Government of India. Disaster management in India. <https://mha.gov.in>
6. National Disaster Management Authority. (2024). Guidelines for different types of hazards (e.g., earthquakes, urban flooding, etc.). <https://ndma.gov.in>
7. State Disaster Management Authorities. (2005). Disaster management manuals. <https://ndma.gov.in/StateDMAs.aspx>
8. Form-Based Codes Institute. Form-based code for disaster risk management (FBC-DRM). <https://formbasedcodes.org>
9. Cony, F. C., & Appropriate Reconstruction and Training Information Centre. (1978). Issues and problems in the prevention of disaster and housing: A review of experiences from recent disasters.

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D
09/10	BARC 0901E9E/ BARC 1001E10E	MOOC/SWAYAM/NPTEL/Other Equivalent Course	2	1	1	0	0
Course Overview: The intent of this elective subject is to encourage students to acquire knowledge through direct involvement in diverse online academic programs. It offers the flexibility to explore courses beyond the regular B.Arch. curriculum, allowing students to engage with multidisciplinary subjects that contribute to and enrich the field of architecture. By participating in offline/online courses of their choice, students can broaden their understanding and enhance their professional competencies in areas relevant to architectural practice.							
Learning Outcomes: As per the chosen course							
		Exploration and Identification of Creative Fields To explore allied disciplines which will contribute to the profession of Architecture. The fields can be like any of the listed below: - Professional Ethics and Responsibility in Architecture - Architectural Practice and Legal Frameworks - Equity, Diversity, and Inclusion in Design - Smart Cities and Urban Technologies - Artificial Intelligence in Architecture - Virtual and Augmented Reality in Design - Ethical Design for Disaster Resilience and Recovery - Future Cities and Architecture - Housing Policy & Planning - Philosophy of Architecture and Design Ethics - Introduction to Urban Planning - GIS and Remote Sensing - Research Methodology for Planning and Architecture This is just a suggestive list. The students are free to explore other allied areas which should be approved by the faculty coordinator.					
		Acquiring the Skill/ Knowledge Module Contents - To undergo the coursework/workshop - To document the process of the course undergone - To prepare a report/ portfolio of the work done					
		Demonstration of the Acquired Skill/Knowledge Module Contents - To demonstrate the learning's of the course - To present the work in a forum					
Note:		Criteria for choosing the elective: Courses opted for should be certified by recognized universities/forums like MOOC/SWAYAM/NPTEL					

	- The courses chosen by students must be approved by the faculty coordinator or departmental committee. It should be ensured that the selected course aligns with the semester's level of complexity and builds appropriately on previously completed coursework - Module contents as per chosen course				
Evaluation: Distribution of % of marks <table border="1"> <tr> <td>Progressive Evaluation</td><td></td></tr> <tr> <td>End term Examination</td><td></td></tr> </table> Evaluation and Examination as per chosen course or institute policy for such courses.		Progressive Evaluation		End term Examination	
Progressive Evaluation					
End term Examination					
Learning Resources/References As per chosen course					

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
DEPARTMENT OF ARCHITECTURE

Elective Course

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
09/10	BARC 0901E9F/ BARC 1001E10F	Elective by department/industry Expert	2	1	1	0	0				
Course Overview: The Electives for final-year B.Arch. students are designed to promote ethics, social responsibility, and a sense of contribution toward the profession. These electives encourage students to critically engage with issues concerning society, the physical environment, and humanity. Through these electives, students are expected to develop empathy and a commitment to sustainable and socially responsive design. The objective is to shape architects who are not only skilled designers but also responsible contributors to the built environment and society at large. Courses related to advance skills may also be included in this list below. The list below is indicative, and electives beyond those mentioned may also be offered: • Architecture for Social Impact • Universal Design • Architecture and Social Justice • Community Participation in Design • Environmental Ethics and Architecture • Cultural Heritage and Identity in Architecture • Humanitarian Architecture • Architecture and the Informal Sector • Sustainability and Social Equity in Urban Design • Architecture and Well-being • Ethnography and Space • Design for the Elderly • Architecture and Spirituality											
Learning Outcomes: • Specific learning outcomes may vary as per the elective offered. • Students are expected to develop a deeper understanding of the cultural, social, and moral dimensions of architecture and the built environment. • They will be able to evaluate the role of architecture in addressing issues of equity, inclusivity, heritage, sustainability, and community engagement. • Students will also be able to create spaces that are not only functional and aesthetically pleasing but are also responsive to diverse human needs.											
Module and content as per offered elective											
Note: The courses chosen by students must be approved by the faculty coordinator or departmental committee. It should be ensured that the selected course aligns with the semester's level of complexity and builds appropriately on previously completed coursework											
Evaluation: Distribution of % of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End term Examination	50%
Progressive Evaluation	50%										
End term Examination	50%										
Learning Resources/References • As per offered elective											

SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL

DEPARTMENT OF ARCHITECTURE

Elective Course for 9th Semester only

Sem.	Course No.	Course Title	Credit	L	T	P/S	D				
09	BARC 0901E9F	Common Pool Elective	2	1	1	0	0				
Course Overview: This course gives an opportunity to students to explore allied disciplines and courses for higher studies. The intent is to introduce the students to some specialized aspects of the higher-level Architecture/ Planning/Design courses. This would be a vertical grouping of the B.Arch. IX th Semester and Masters (III semester) students.											
Learning Outcomes: - To explore allied disciplines and courses for higher studies. - To demonstrate special interest skills as per the course taken. - To synthesize the higher aspects of learning.											
Module 1:		Module Contents									
		If students opt for Common Pool Elective, the students need to choose any one of the electives offered by the common pool from various Departments. List to be revised from time to time as per approved courses: - Architecture I. Multidisciplinary Exploration of Built Environments and Solar Envelopes - Conservation I. Museum Design II. Disaster Management of Cultural Resources - Landscape I. Landscape and City design II. The future cities III. Movement Corridors - Urban Design I. Urban design politics II. Architectural criticism III. City and the arts - Environment Planning I. Water Resource Management II. Energy Auditing and Accounting III. Urban Regional Planning - Urban redevelopment I. Planning for tourism II. Quantitative methods and systems analysis									
Evaluation: Distribution of % of marks <table><tr><td>Progressive Evaluation</td><td>50%</td></tr><tr><td>End Term Examination</td><td>50%</td></tr></table>								Progressive Evaluation	50%	End Term Examination	50%
Progressive Evaluation	50%										
End Term Examination	50%										
Learning Resources/References As per chosen Common Pool Elective											