

COURSE STRUCTURE & SYLLABUS

Bachelor of Architecture

Based on

Choice Based Credit System (CBCS)/ Elective Course System



**w.e.f.
Academic Year 2025-2026
(Batch 2025)**

Approved by Academic Council vide dated 26th June 2025

INDEX

S. No.	Contents	Page No.
1.	General Information	3
2.	Program Outcomes	3
3.	Eligibility for Admission	6
4.	Programme Duration	6
5.	Internship	7
6.	Programme Structure	8
7.	Rules for Attendance	9
8.	Grading System	9
9.	Promotion and Registration	10
10.	Program Overview	11
11.	Assessment and Evaluation	16
12.	Instructions for Paper Setting	18

1. General Information:

The Course Framework functions as a comprehensive reference guide detailing the course structure, credit distribution across individual subjects, and the allocation of instructional hours among Lecture, Studio, Tutorial, and Practical. It also outlines key aspects such as admission eligibility, degree requirements, evaluation systems, and teaching methodologies. Aligned with the University's Academic Regulations, this document facilitates a clear understanding of academic norms and procedures.

All Course Schemes presented in this guide have received formal approval from the respective Board of Studies and the Academic Council of Babu Banarasi Das University, adhering to the norms established by the Council of Architecture, New Delhi.

Architecture is an inherently interdisciplinary field, encompassing the domains of Humanities, Science, Art, and Technology. Among these, Technology often plays a pivotal yet adaptable role—sometimes taking a backseat when architectural creation reaches an artistic level that resonates emotionally, much like great art or sculpture.

As society progresses, Architecture must respond dynamically—integrating advancements in materials, construction techniques, and sustainable practices to meet challenges in energy, environment, and more. Accordingly, architectural education must evolve in tandem, reflecting these shifts. Architecture is not just about constructing buildings—it is a forward-looking art form, continually reshaping itself to meet the demands of a changing world.

2. Program Outcomes

The *Bachelor of Architecture (B.Arch.)* program is thoughtfully crafted to equip aspiring students with the foundational training and creative stimulus required to embark on a career in this dynamic and imaginative discipline. While fostering innovation and critical thinking, the program also adheres rigorously to the standards set forth by the *Council of Architecture (COA)*—the statutory body established under the *Architects Act, 1972*, mandated to regulate architectural education and practice in India.

Balancing creativity with compliance, our curriculum is designed to not only meet these essential benchmarks but to remain agile and responsive to the ever-evolving demands of the profession. The structure of the program allows for continuous enhancement, ensuring relevance in a fast-changing world shaped by new technologies, environmental concerns, and social transformation.

PO-Mission-Vision Mapping Matrix

PO No.	PO Statement
PO1	Field Knowledge: Apply the knowledge of Architectural Design, Drawing, Art, Sculpting, Crafts, structural dynamics and statics fundamentals and Laws pertaining to building byelaws and services required in simple and complex building projects, Economical aspects and an architectural specialization to the solution of complex architectural problems.
PO2	Problem Analysis: Conducting case and literature studies and analyze complex architectural problems reaching substantiated conclusions using principles of Architectural design, process of designing (case and literature study, research and

	conceptualization of designs).
PO3	Design / Development of Solutions: Establishing solutions for complex architectural problems and functional components or spatial arrangements that meet the specified needs and wants with appropriate consideration for the public amenities , services, health and safety and the cultural, societal and environmental considerations .
PO4	Conduct Investigations of Complex problems: Use of research based knowledge and research methods including methodology, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern Tool Usage: Application of appropriate techniques, resources and modern architectural tools including BIM and CADD oriented modeling to complex architectural, structural and construction activities with an understanding of its advantages and disadvantages .
PO6	The Architect, Planner and Society: Application of contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent drafting of proposals relevant to the professional practice.
PO7	Environment and Sustainability: Understanding the impact of the professional field solutions in societal and environmental context and demonstrate the need for sustainable development and applying the same thereof.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the professional practice, as prescribed and regulated by regulatory bodies.
PO9	Individual and Team Work: To effectively function as an professional individual and as a member or team leader in diverse situations and in multidisciplinary settings.
PO10	Communication: To communicate effectively with the professional community and stake holders and with society at large. Be able to comprehend and write effective reports documentation.
PO11	Project management and finance: To demonstrate knowledge and understanding of profession and management principles and apply these to practice to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments.
PO12	Life-long learning: To recognize the need for learning and develop an ability and skill to engage in a learning process in the broadest context of technological change in professional and technological realm.

The mapping of *Program Outcomes* (POs) for the Bachelor of Architecture program clearly demonstrates its alignment with the broader *Vision* and *Mission* of the University. The curriculum is intentionally designed to cultivate a balanced blend of creative and technical competencies, promoting both social and technological fluency through continuous engagement with the architectural profession.

Our educational framework reflects the School's commitment to design excellence—not only through skillful form-making but also through the integration of diverse knowledge systems, ranging from historical traditions to contemporary innovations. The program encourages students to critically explore and apply architectural theory, visual and spatial analysis, building technologies, and professional practices across multiple contexts.

Instruction and research span a broad interdisciplinary spectrum—including design theory, visual studies, history, material technologies, environmental systems, and construction practices—ensuring students are grounded in both theory and real-world application. This holistic approach enables them to respond creatively and responsibly to the rapidly changing demands of society and the built environment.

Students are introduced to the dynamic processes of designing and constructing buildings and urban spaces, preparing them to become forward-thinking practitioners who shape the future of our cities. The curriculum incorporates global best practices in architectural education, equipping graduates for a wide array of career opportunities in the expanding fields of infrastructure, urban development, and sustainable design.

Salient features of the Programme

Some of the innovative initiatives for building Architect as professionals are –

1. Good communication skills
2. Immense physical stamina
3. Excellent memory
4. Patience
5. Team spirit
6. Responsibility
7. Accountability
8. Creative Thinking Skills
9. Observant Attitude
10. Certification Programmes
11. MOOCs/SWAYAM Courses
12. Mentoring Program

Salient features of the program for building Architects as professionals include:

1. Emphasis on developing good communication skills
2. Focus on building immense physical stamina
3. Encouragement of excellent memory retention
4. Cultivation of patience as a virtue
5. Fostering a strong sense of team spirit
6. Instilling a culture of responsibility
7. Promoting accountability for actions
8. Nurturing creative thinking skills
9. Cultivating an observant attitude towards surroundings
10. Offering certification programs for skill enhancement
11. Integration of MOOCs/SWAYAM courses for broader learning opportunities
12. Implementation of a mentoring program for personalized guidance and support

Integration of Programme Outcomes at Global/National/SDG level

The alignment of the *Bachelor of Architecture (B.Arch.)* program outcomes with the University's *Vision* and *Mission* underscores the thoughtful integration of academic objectives with institutional values. The curriculum has been meticulously developed to cultivate a harmonious blend of creative expression and technical competence, fostering both social awareness and technological proficiency through sustained engagement with the architectural profession.

Reflecting the School's unwavering commitment to design excellence, the program emphasizes not only mastery in the articulation of form but also a deep appreciation of the diverse intellectual traditions that inform architecture. Drawing from a broad spectrum of traditional and contemporary knowledge systems, students are encouraged to develop a design approach that is both contextually grounded and forward-thinking.

Instruction and research in the program encompass a wide range of interdisciplinary domains, including design theory, visual culture, history, material technologies, and professional practice. Students are guided to engage with historical perspectives while responding to the evolving needs of the built environment. This prepares them to innovate in the design and construction of buildings and urban spaces, equipping them to become leaders and visionaries in shaping the cities of tomorrow.

The curriculum incorporates internationally recognized best practices in architectural education, providing students with a strong foundation for diverse and dynamic career trajectories within the expanding infrastructure and urban development sectors.

With the introduction of the *United Nations Sustainable Development Goals (SDGs)*, the discipline of architecture has taken on a critical role in promoting sustainability across local, national, and global contexts. In response, the B.Arch. curriculum has been deliberately structured to align course outcomes with these goals, fostering a generation of architects who are equipped to address the pressing challenges of our time.

Through a pedagogical focus on designing healthier, safer, and more environmentally responsible spaces, students are trained to think beyond aesthetics—to design with purpose and empathy. This commitment to sustainability and social responsibility is embedded throughout the academic journey, empowering students to contribute meaningfully to the development of resilient communities and sustainable societies in the long term.

3. Eligibility for Admission*

(*as per the latest eligibility policies form COA- Council of Architecture)

No candidate shall be admitted to Architecture course unless she/ he has passed 10+2 or equivalent examination with Physics and Mathematics as compulsory subjects along with either Chemistry or Biology or Technical Vocational subject or Computer Science or Information Technology or Informatics Practices or Engineering Graphics or Business Studies with at least 45% marks in aggregate or passed 10+3 Diploma Examination with Mathematics as compulsory subject with at least 45% marks in aggregate.

4. Programme Duration

1. The duration of the course for the degree of **Bachelor of Architecture (B. Arch)** shall be **five years** divided into **ten semesters**.
2. The ten semesters shall further be grouped in two stages viz. Stage-I-Foundation Studies from first to sixth semester and Stage-II-Advanced Studies from seventh to tenth semester.
3. As prescribed by CoA (*Minimum Standards of Architectural Education Regulations, 2020; Clause 3.6*) the B.Arch. Program shall be completed in a maximum period of 8 years. However, in special circumstances a candidate may be granted an extension of 1 year by the University/ Institution to complete the program. This extension shall be given only once to the candidate.
4. Since, it is an industry integrated Programme, the students will be offered internship in industry in final year to gain practical knowledge.

Normal duration of the degree program	Maximum time allowed for completion of program
5 years	5 + 3+1* years

*

Special circumstances a candidate may be granted an extension of 1 year.

5. Internship

The Professional Internship, embedded in the ninth semester of the B.Arch. program, is a vital component of the academic curriculum designed to provide students with practical exposure to real-world architectural practice. This immersive experience aims to bridge the gap between academic learning and professional execution, enhancing the student's aptitude and readiness for the architectural profession.

The primary objective of the internship is to introduce students to the multifaceted nature of architectural practice through hands-on engagement in an architectural firm. It provides a platform for students to understand the workflow, organizational structure, and collaborative dynamics that define the profession.

Key learning outcomes during the internship include:

1. Understanding the process of conceptual development and translating ideas into architectural form.
2. Enhancing presentation and communication skills through client interactions and internal office discussions.
3. Participating in the evolution of working drawings, tender documentation, and other technical aspects of project delivery.
4. Gaining exposure to site supervision, project coordination, and construction management.
5. Observing and engaging with the entire lifecycle of a project, from initial design to on-site execution.

Through structured mentorship under a registered architect or a professional firm, students gain first-hand insight into industry standards, project management, and interdisciplinary collaboration. This professional engagement not only strengthens their technical and design capabilities but also instills professional ethics, time management, and problem-solving skills critical for a successful architectural career.

Following are the intended objectives of engaging students in internship for employability in accordance with Guidelines for Internship/ Research Internship for Under-Graduate Students by UGC (2023):

1. Integration of workshop with workplace: To see the internship in a broader, integrated and holistic manner where the delivery of the classroom- software and technical knowledge assimilated is aligned with outcomes of the architectural firm.
2. Understanding of the world of work: To provide undergraduate students with an opportunity to improve their understanding of the experiences, challenges, and

opportunities of the real world of work, as well as to set their expectations and behaviour in accordance with the demands, culture, and values of current and emerging jobs.

3. **Hybrid model learning:** To broaden learning opportunities by combining physical and digital modes of learning while working in industry, workplace, blended with a mentor or research expert and as per the need and convenience.
4. **Exposure in emerging technologies:** To provide exposure to emerging technologies/softwares and how it can support, facilitate, improve and reinforce work processes in the offices. Applying the software skills of AutoCAD, Revit, Photoshop, Sketch-up and BIM in their offices.
5. **Enhance entrepreneurial capabilities:** Understand how organizations / enterprises are formed for sustainable progress so that start-ups and entrepreneurial capabilities are strengthened among students and they are encouraged to be job creators.
6. **Development of decision-making and teamwork skills:** To facilitate the development of problem-solving and decision-making skills, enable teamwork; collaboration culture to promote research, academic and professional developments.
7. **Enhancing professional competency:** The internship should not only focus on employability: there is also a need for professional principles, ethics, values, and integrity which will enable them to gain perspective, practice, develop competency and perform professional tasks in the way that the employment market demands.

6. Programme Structure

As per CoA (Minimum Standards of Architectural Education Regulations, 2017); Under the Choice based credit system, which is a student/ learner centric system, the courses of study in the Architecture Degree program shall be as Professional Core Courses (PC); Building Science and Applied Engineering (BS& AE); Professional Electives (PE); Open Electives (OE); Professional Ability Enhancement Compulsory Courses (PAECC); Skill Enhancement Courses (SEC).

1. **Professional Core Courses (PC):** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
2. **Building Science and Applied Engineering (BS& AE):** A course which informs the Professional core and should compulsorily be studied
3. **Elective Course:** Generally, a course which can be chosen from a pool of courses and are of two types:
 - **Professional Elective (PE)** which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope
 - **Open Elective (OE)** which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill
4. **Employability Enhancement Courses (EEC) which may be of two kinds:**
 - **Employability Enhancement Compulsory Courses (EECC)**
 - **Skill Enhancement Courses (SEC)**

SEMESTER	Professional Core Courses (PC)	Building Science and Applied Engineering (BS&AE)	Elective Courses		Professional Ability Enhancement Courses (PAEC)		Total Credits
			(i) Professional Electives (PE)	(ii) Open Electives (OE)	(i) Professional Ability Enhancement Compulsory Courses (PAECC)	Skill Enhancement Courses (SEC)	
1st	3	4	-	-	-	1	28
2nd	4	3	-	-	-	1	28
3rd	5	2	-	-	-	1	28
4th	2	3	1	-	-	1	28
5th	3	3	-	-	-	1	28
6th	2	3	1	-	-	1	28
7th	3	2	1	-	1	1	28
8th	1	2	1	-	1	-	28
9th	-	-	-	-	1	-	28
10th	1	-	-	-	-	-	28
Total Credits							280

7. Rules for Attendance

As per the University norms.

8. Grading System

The Babu Banarasi Das University (BBDU) Lucknow adopts absolute grading system wherein the marks are converted to grades, and every semester results will be declared with semester grade point average (SGPA) and Cumulative Grade Point Average (CGPA). The CGPA will be calculated every semester, except the first semester. The grading system is with the following letter grades and grade points scale as given below:

Grading of performances

Letter grades and grade points allocations:

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in table

Grade and grade points:

Practical Subjects		
Letter Grade	Grade Point	(Marks (%)) (Int. + Ext.)
O (Outstanding)	10	≥90
A+ (Excellent)	9	≥75 and <90
A (Very Good)	8	≥60 and <75
B+ (Good)	7	≥55 and <60
B (Above Average)	6	≥50 and <55

F (Fail)	0	<50	
AB (Absent)	0		
Theory Subjects			
%Marks Range of Total	Grade	Grade Point	Qualitative Meaning
Outstanding	O	10	≥90
Excellent	A+	9	≥75 and < 90
Very Good	A	8	≥60 and < 75
Good	B+	7	≥55 and < 60
Average	B	6	≥50 and < 55
Pass	C	5	≥45 and < 50
Fail	P	4	< 45
Absent	0	0	

- Minimum Pass Marks: End-Semester Theory Examination in each Subject: 45%,
- End-Semester Theory Examination + Sessional in each Subject: 50%,
- Practical/Project Examination including Sessional: 50%,
- Seminar, Industrial Training and Educational Tour, Viva Voce etc: 50%,
- Aggregate of an Academic Year (Both Semesters): 50%.

9. Promotion and Registration

Any bonafide student, who appears for the examination conducted by the University, shall be promoted to the next higher semester and shall carry forward all course(s) in which he/ she is declared fail. The student shall have to pass all papers within the stipulated maximum duration as prescribed by the University to qualify for the award of the degree.

All students are eligible to register for next semester irrespective of the number of backlogs. A student is not permitted to register in a term if:

1. He/ She has dues outstanding to the University, hostel, or any recognized authority or body of the University, or
2. His/ Her grade sheet in his/her immediately preceding term is withheld, or
3. He/ She has been specifically debarred or asked to stay away from that term.

Late registration may be granted in case a student fails to register on the stipulated date. Students failing to register on the specified day of registration will be allowed to register only after permission from Dean of the Department and after paying the stipulated late fee. Any student who has not registered will not be allowed to attend classes. The registration of the student may be canceled, if at the later stage, it is found that the student is not eligible for registration due to the following reasons:

If the registration of a student in a course is not found to be as per the regulation, his/her registration in that course will be called and the grade obtained, if any, will be rejected. The registration of a student in a course or complete set of courses in a term can be cancelled by the concerned authority when he is found guilty in case of unfair means, breach of discipline, etc. or when he/she persistently and deliberately does not pay his dues. Absence for a period of four or more weeks at a stretch during a term shall result in automatic cancellation of the registration of a student from all the courses in that term.

A student who is duly registered in a term is considered to be on the rolls of the university. After registration, if he/she withdraws from the term, or has been given prior permission to temporarily withdraw from the University for the term, or has been asked to stay away by an appropriate authority of the University will be considered to be on the rolls of the University for that term. While such a student retains the nominal advantage of being on the rolls of the University the loss of time from studies and its consequences cannot be helped by the University.

If for any valid reason a student is unable to register in a term, he/she must seek prior permission of Dean of Department to drop the term. If such permission has not been requested or after a request, the permission has been denied, his/her name would be struck off the rolls of the University and he would no longer be a student of the University. His/her case will be automatically processed and the file will be closed. However, if such a student, after his/her name has been struck off the rolls of the University, is permitted to come back, his/her case can be considered at the sole discretion of the competent authority of the University with the provision that all his/her previous records as a former student are revived under the current academic and administrative structure, regulations and schedule of fees.

Late Registration:

In cases where a student misses the official registration deadline, they may still be allowed to register upon receiving written approval from the Dean of the Department, provided they also pay the prescribed late fee. Students who fail to complete the registration process will not be permitted to attend classes. If, at a later stage, it is discovered that a student has registered in violation of the regulations, the registration will be annulled and any grades obtained will be considered void.

10. Program Overview

*The Program consists of subjects under the following categories:

L/T- Lecture/Tutorial (1L/T=1C); **P** – Practical (1P=1/2C); **C** – Credits
Professional Core Courses (PC); Building Science and Applied Engineering (BS&AE);
Professional Electives (PE); Open Electives (OE); Professional Ability Enhancement
Compulsory Courses (PAECC); Skill Enhancement Courses (SEC); Value Added Courses
(VAC); Ability Enhancement Compulsory Courses(AECC)

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2101	Architectural Drawing-I	Theory	1	1	2	4	24	8	8	40	60	0	60	100
BS & AE	AR2102	Architectural Structure-I	Theory	1	1	0	2	24	8	8	40	60	0	60	100
BS & AE	AR2103	Climatology	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PAEC/ SEC	NHSCC1 101	Communicative English	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PC	AR2151	Architectural Design-I	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2152	Building Construction & Materials-I	Theory/ Practical	1	1	2	4	24	8	8	40	60	50	110	150
BS & AE	AR2153	Surveying & Levelling	Practical	1	0	1	2	0	0	0	50	0	50	50	100
PC	AR2154	Visual Arts-I	Practical	1	0	1	2	0	0	0	50	0	50	50	100
TOTAL							28	TOTAL							900

SEMESTER-II															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2201	Architectural Drawing-II	Theory	1	1	2	4	24	8	8	40	60	0	60	100
BS & AE	AR2202	Architectural Structure-II	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2203	History of Architecture & Culture-I	Theory	1	1	0	2	24	8	8	40	60	0	60	100
BS & AE	NBSCC120 1	Environment & Ecological Sustainability	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PC	AR2251	Architectural Design-II	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2252	Building Construction & Materials-II	Theory/ practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2253	Computer Application-I	Practical	1	0	1	2	0	0	0	50	0	50	50	100
PC	AR2254	Visual Arts-II	Practical	1	0	1	2	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2301	Architectural Drawing-III	Theory	1	1	2	4	24	8	8	40	60	0	60	100
BS & AE	AR2302	Architectural Structure-III	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2303	History of Architecture & Culture-II	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2351	Architectural Design-III	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2352	Building Construction & Materials-III	Theory/ practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2353	Computer Application-II	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PC	AR2354	Visual Arts-III	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PC	AR2355	Building Byelaws	Practical	1	1	0	2	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/ P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2401	Building Services-I	Theory	2	1	0	3	24	8	8	40	60	0	60	100
BS & AE	AR2402	Architectural Structure-IV	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2403	History of Architecture & Culture-III	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2451	Architectural Design-IV	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2452	Building Construction & Materials-IV	Theory/ practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2453	Computer Application-III	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2454	Elective-IV	Practical	1	1	0	2	0	0	0	50	0	50	50	100
ECPE	AR2455	Interior Design	Practical	1	0	2	3	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
BS & AE	AR2501	Building Services-II	Theory	2	1	0	3	24	8	8	40	60	0	60	100
BS & AE	AR2502	Architectural Structure-V	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2503	History of Architecture-IV	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2551	Architectural Design-V	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2552	Building Construction & Materials-V	Theory/ practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2553	Computer Application-IV	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2554	Elective-V	Practical	1	1	0	2	0	0	0	50	0	50	50	100
PC	AR2555	Working Drawing	Practical	1	0	2	3	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2601	Building Services-III	Theory	2	1	0	3	24	8	8	40	60	0	60	100
BS & AE	AR2602	Architectural Structure-VI	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2603	Specifications, Cost Estimation & Budgeting	Theory	2	1	0	3	24	8	8	40	60	0	60	100
ECPE	AR2604	Theory of Design	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2651	Architectural Design-VI	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2652	Building Construction & Materials-VI	Theory/ practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2653	Computer Application-V	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2654	Elective-VI	Practical	1	1	0	2	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/ P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2701	Building Services-IV	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PAEC/ PAECC	AR2702	Advance Structural Technologies & Systems	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2703	Human Settlements Planning	Theory	2	0	0	2	24	8	8	40	60	0	60	100
PC	AR2751	Architectural Design-VII	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2752	Building Construction & Materials-VII	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2753	Computer Application-VI	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2754	Elective-VII	Practical	1	1	0	2	0	0	0	50	0	50	50	100
PC	AR2755	Landscape Design	Practical	1	0	2	3	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-VIII																
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation								
				L	T	S/P	C	CIA				ESE			Total (A+B)	
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)		
BS & AE	AR2801	Building Services-V	Theory	2	1	0	3	24	8	8	40	60	0	60	100	
PAEC/PAECC	AR2802	Professional Practice-I	Theory	2	0	0	2	24	8	8	40	60	0	60	100	
PAEC	AR2803	Project Management	Theory	2	1	0	3	24	8	8	40	60	0	60	100	
PAEC	AR2804	Building Economics	Theory	1	2	0	3	24	8	8	40	60	0	60	100	
PC	AR2851	Architectural Design-VIII	Practical	0	2	7	9	0	0	0	50	0	0	100	150	
BS & AE	AR2852	Building Construction & Materials-VIII	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150	
ECPE	AR2853	Disaster Mitigation & Management	Practical	1	1	0	2	0	0	0	50	0	0	50	100	
PE	AR2854	Elective-VIII	Practical	1	1	0	2	0	0	0	50	0	50	50	100	
Total							28	Total								900

SEMESTER-IX															
Course Category	Subject Code	Subject Name	Theory / Practic al	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	A T	Total (A)	Theory (T)	Practica l/ Viva	Total (B)	
PAEC/ PAECC	AR2951	Architectural Internship	Practic al	0	0	0	28	0	0	0	400	0	0	500	500
Total							28	Total							900

SEMESTER-X															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/ P	C	CIA				ESE			Total (A+B)
								CT	T A	A T	Total (A)	Theory (T)	Practica l/ Viva	Total (B)	
PAEC/ PAECC	AR21001	Professional Practice- II	Theory	2	0	0	2	24	8	8	40	60	0	60	100
PC	AR21051	Architectural Design thesis	Practical	4	2	0	26	0	0	0	350	0	450	450	800
				Total			28	Total							900

List of Elective Subject			
Elective IV			
SEMESTER IV	Subject Code	Subject Name	Theory / Practical
	AR2454(1)	Critical Design Thinking	Practical
	AR2454(2)	Communication Design	Practical
	AR2454(3)	Applied Psychology in Architecture	Practical
	AR2454(4)	MOOC	Practical
Elective V			
	Subject Code	Subject Name	Theory / Practical
	AR2554(1)	Product Design	Practical
	AR2554(2)	Set Design	Practical
	AR2554(3)	Art Appreciation	Practical
	AR2554(4)	MOOC	Practical
Elective VII			
SEMESTER VI	Subject Code	Subject Name	Theory / Practical
	AR2654(1)	Vernacular & Cost Effective Architecture	Practical
	AR2654(2)	Earthquake Resistant Construction Technology	Practical
	AR2654(3)	Energy Conscious Architecture	Practical
SEMESTER V	AR2654(4)	MOOC	Practical
	AR2654(5)	Vastu Shastra	Practical
Elective VII			
SEMESTER VII	Subject Code	Subject Name	Theory / Practical
	AR2754(1)	Geographic Information System (GIS)	Practical
	AR2754(2)	Introduction To Rhinoceros (Rhino)	Practical
	AR2754(3)	Entrepreneurship Skills For Architecture	Practical
	AR2754(4)	MOOC	Practical
Elective VIII			
SEMESTER VIII	Subject Code	Subject Name	Theory / Practical
	AR2854(1)	Architectural Conservation	Practical
	AR2854(2)	Rating System & Methods	Practical
	AR2854(3)	Bamboo in Contemporary Material	Practical
	AR2854(4)	MOOC	Practical

11. Assessment and Evaluation:

Assessment:

Total assessment of a subject in any semester will be carried out under TWO Components:

1. **Internal Assessment:** This component will be assessed through modes of assessments like Class Assignments, Tutorial, Jury, Seminar, Tests, MCQs, Projects and Viva-Voce. Marks in the internal assessment shall be forwarded by the Dean/Director of the College to the COE at the end of each semester.

2. **External Assessment:**

Theory examination: The examination shall be held in accordance with the syllabus prescribed by the University. The medium of examination is English.

Practical examination: Examination shall be conducted by a committee of Examiners appointed by the School along with an COE in accordance with the syllabus prescribed by the university.

Evaluation:

1. **Internal assessment:**

Overall assessment will be done based on following rubrics of marks:

- a) **QUANTITY:** To evaluate the output based on the problem introduced:

- **Assignments/Intermediate Juries (30 %*):** The assignments/intermediate juries (selected as per the subject) will be introduced/ conducted to develop the overall understanding of the topics being taught (for theory subjects) and problem solving.
- **Class Tests/ Sessional Tests /Viva (20% *):** In total two sessional tests will be conducted. 75% attendance will be compulsory to appear for sessional tests.

- b) **QUALITY:** To evaluate overall skills developed/exhibited throughout the semester by the students:

- **For STUDIO subjects: Ideation (15%*), Process (20%*) and Presentation (15 %*).**
- **For THEORY subjects: Understanding (15%*), Application (20%*) and Class performance (15%*).**

2. **External assessment (100%*):**

The assessment will be done by the evaluation of ESE and viva voce.

** Weightage out of total maximum marks (for the component) prescribed for the subject in the Course Framework.*

A student shall need to fulfill following conditions to be considered as pass. It is mandatory for a student to earn the required credits as mentioned in each semester. A student shall be required to obtain a minimum of 50% of the allotted maximum marks for the 'Sessionals' / 'Theory' / 'Practical' / 'Viva-Voce' / 'Architectural Training' / 'Architectural Design Thesis' in each subject to pass in the said subject.

- **45% in the Internal assessments** in each subject
and
- **45% in the External Examination** in each subject including VIVA VOCE wherever included.

Internal and External Reappear will be interrelated i.e., in case of failing in internal assessment for a subject a student will not be allowed to appear for external examination for the said subject. A student should score at-least 45% or more marks in both the components i.e., internal and external separately, in order to clear the subject. Also, as per *Amendment, COA Minimum Standards of Architectural Education Regulations 2020, dated 11th August 2020*, "A candidate shall not be permitted to enrol for the Architectural Design Course in a semester unless he/she has completed the Architectural Design course of the previous semester."

If the student is detained from appearing in the end term examination because of shortage of attendance in the regular semester or is absent in the end term exam, his grade in that subject is 'Ab', till he/she appears again in the end term examination and obtains a new grade. His internal evaluation is carried forward in such cases for calculation of his/her total result and calculation of new grade.

12. Instructions for Paper Setting:

For Sessional Tests:

1. For Practical Subjects like Architectural Design, Visual Arts, etc:

To be conducted by the School.

- a) Mode of test to be opted by the Internal Faculty.
- b) Proposed modes of assessments are Class Assignments, Tutorial, Jury, Seminar, handwritten Tests, MCQs, Projects and Viva-Voce.
- c) Mode of Sessional Test shall be forwarded by the Dean/Director of the College to the Examination Department at the end of each semester.

2. For Theory Subjects like Architectural Drawing, History of Architecture and Culture, Building Services, etc:

To be conducted by the School.

- a) Total duration of the exam would be 60 minutes.
- b) Maximum marks will be 30.
- c) Section A (Max. Marks = 05) will have 5 objective type questions of 1 mark each and all questions will be compulsory.
- d) Section B (Max. Marks = 10) to have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 5).
- e) Section C (Max. Marks = 15) to have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 7.5).

3. For Theory/ Practical Subjects like Building Materials & Construction, etc:

For Practical

To be conducted by the School.

- a) Mode of test to be opted by the Internal Faculty.
- b) Proposed modes of assessments are Class Assignments, Tutorial, Jury, Seminar, handwritten Tests, MCQs, Projects and Viva-Voce.
- c) Mode of Sessional Test shall be forwarded by the Dean/Director of the College to the Examination Department at the end of each semester.

For Theory

To be conducted by the School.

- a) Total duration of the exam would be 60 minutes.
- b) Maximum marks will be 30.
- c) Section A (Max. Marks = 05) will have 5 objective type questions of 1 mark each and all questions will be compulsory.
- d) Section B (Max. Marks = 10) to have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 5).
- e) Section C (Max. Marks = 15) to have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 7.5).

For End Term Examinations:

For Architectural Design:

To be conducted by the Examination Department of BBD University.

- a) There will be only one components for ESE namely:
 - Viva-voce: To be conducted by Department through External Examiners.
 - Maximum marks will be 100 Marks.
 - Will consist of viva-voce on portfolio i.e. final submissions of the projects undertaken during the semester for the course. The department will schedule viva-voce (as per the date sheet) carried out through External Examiners.

For Building Materials & Construction:

To be conducted by the Examination Department of BBD University.

- a) There will be two components for ESE namely:
 - Studio Examination: To be conducted by Examination Department of BBD University.
 - Viva-voce: To be conducted by Department through External Examiners.
- b) For Studio Examination:
 - Total duration of exam will be 3 hrs.
 - Maximum marks will be 60 Marks.
 - Section A (Max. Marks = 8) will have 8 objective type questions of 1 mark each and all questions will be compulsory.
 - Section B (Max. Marks = 12) will have 4 questions out of which students would attempt any 3 (Max. Marks of each question = 4).
 - Section C (Max. Marks = 40) will have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 20).
 - Instructions to Candidates, among others, should also mention:

- The type of sheets that can be issued.
- Permitted drawing equipment.
- Importance of making correct and good quality drawings with correct line-weights, good lettering, etc.
- c) For Viva-voce:
 - Will consist of viva-voce on portfolio i.e. final sheets prepared during the semester for the course. The department will schedule viva-voce (as per the date sheet) carried out through External Examiners.
 - Maximum marks will be 50 Marks.

For Architectural Drawing:

To be conducted by the Examination Department of BBD University.

- a) Total duration of the exam would be 3 hrs.
- b) Maximum marks will be 60 Marks.
- c) Section A (Max. Marks = 8) will have 8 objective type questions of 1 mark each and all questions will be compulsory.
- d) Section B (Max. Marks = 12) will have 4 questions out of which students would attempt any 3 (Max. Marks of each question = 4).
- e) Section C (Max. Marks = 40) will have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 20).
- f) Instructions to Candidates, among others, should also mention:
 - The type of sheets that can be issued.
 - Permitted drawing equipment.
 - Importance of making correct and good quality drawings with correct line-weights, good lettering, etc.

For Visual Arts:

To be conducted by the Examination Department of BBD University.

For Viva-voce:

- Will consist of viva-voce on portfolio i.e. final sheets prepared during the semester for the course. The department will schedule viva-voce (as per the date sheet) carried out through External Examiners.
- Maximum marks will be 50 Marks.

For other Theory Subjects:

To be conducted by the Examination Department of BBD University.

- a) Total duration of the exam would be 3 hrs.
- b) Maximum marks will be 60.
- c) Section A (Max. Marks = 8) will have 8 objective type questions of 1 mark each and all questions will be compulsory.
- d) Section B (Max. Marks = 12) will have 4 questions out of which students would attempt any 3 (Max. Marks of each question = 4).
- e) Section C (Max. Marks = 40) will have 3 questions out of which students would attempt any 2 (Max. Marks of each question = 20).

For other Practical Subjects.

To be conducted by the Examination Department of BBD University.

- a) Will consist of viva-voce on portfolio i.e. work done during the semester. The department will schedule viva-voce (as per the date sheet) carried out through External Examiners.

SCHOOL OF ARCHITECTURE & PLANNING, BBD UNIVERSITY
BACHELLOR OF ARCHITECTURE (B.ARCH)
SCHEME OF TEACHING & SCHEME OF EVALUATION

PC	PROFESSIONAL CORE COURSES	PAECC	PROFESSIONAL ABILITY ENHANCEMENT	CIA	CONTINUOUS INTERNAL
FC	FOUNDATIONAL COURSES		COMPULSORY COURSES		ASSESSMENT
PE	PROFESSIONAL ELECTIVES	L	LECTURE	CT	CLASS TEST
OE	OPEN ELECTIVES	T	TUTORIAL / THEORY	TA	TEACHER'S ASSESSMENT
SEC	SKILL ENHANCEMENT COURSES	S/P	STUDIO/ PRACTICAL	AT	ATTENDANCE
PAEC	PROFESSIONAL ABILITY	BS & AE	BUILDING SCIENCE AND APPLIED	ESE	END SEMESTER
	ENHANCEMENT COURSES		ENGINEERING		EXAMINATION

L=Lecture= 1C; T=Tutorial=1C; S/P=Studio/Practical=1C; C=Credits

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2101	Architectural Drawing-I	Theory	1	1	2	4	24	8	8	40	60	0	60	100
BS & AE	AR2102	Architectural Structure-I	Theory	1	1	0	2	24	8	8	40	60	0	60	100
BS & AE	AR2103	Climatology	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PAEC/ SEC	NHSCC1 101	Communicative English	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PC	AR2151	Architectural Design-I	Practical	0	2	7	9	0	0	0	50	0	100	100	150
BS & AE	AR2152	Building Construction & Materials-I	Theory/ Practical	1	1	2	4	24	8	8	40	60	50	110	150
BS & AE	AR2153	Surveying & Levelling	Practical	1	0	1	2	0	0	0	50	0	50	50	100
PC	AR2154	Visual Arts-I	Practical	1	0	1	2	0	0	0	50	0	50	50	100
TOTAL							28	TOTAL							900

SEMESTER-II															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA			ESE			Total (A+B)	
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva		Total (B)
PC	AR2201	Architectural Drawing-II	Theory	1	1	2	4	24	8	8	40	60	0	60	100
BS & AE	AR2202	Architectural Structure-II	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2203	History of Architecture & Culture-I	Theory	1	1	0	2	24	8	8	40	60	0	60	100
BS & AE	NBSCC1201	Environment & Ecological Sustainability	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PC	AR2251	Architectural Design-II	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2252	Building Construction & Materials-II	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2253	Computer Application-I	Practical	1	0	1	2	0	0	0	50	0	50	50	100
PC	AR2254	Visual Arts-II	Practical	1	0	1	2	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
BS & AE	AR2501	Building Services-II	Theory	2	1	0	3	24	8	8	40	60	0	60	100
BS & AE	AR2502	Architectural Structure-V	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2503	History of Architecture-IV	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2551	Architectural Design-V	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2552	Building Construction & Materials-V	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2553	Computer Application-IV	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2554	Elective-V	Practical	1	1	0	2	0	0	0	50	0	50	50	100
PC	AR2555	Working Drawing	Practical	1	0	2	3	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2601	Building Services-III	Theory	2	1	0	3	24	8	8	40	60	0	60	100
BS & AE	AR2602	Architectural Structure-VI	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2603	Specifications, Cost Estimation & Budgeting	Theory	2	1	0	3	24	8	8	40	60	0	60	100
ECPE	AR2604	Theory of Design	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2651	Architectural Design-VI	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2652	Building Construction & Materials-VI	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2653	Computer Application-V	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2654	Elective-VI	Practical	1	1	0	2	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
BS & AE	AR2701	Building Services-IV	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PAEC/ PAECC	AR2702	Advance Structural Technologies & Systems	Theory	1	1	0	2	24	8	8	40	60	0	60	100
PC	AR2703	Human Settlements Planning	Theory	2	0	0	2	24	8	8	40	60	0	60	100
PC	AR2751	Architectural Design-VII	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2752	Building Construction & Materials-VII	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150
PAEC/ SEC	AR2753	Computer Application-VI	Practical	1	0	2	3	0	0	0	50	0	50	50	100
PE	AR2754	Elective-VII	Practical	1	1	0	2	0	0	0	50	0	50	50	100
PC	AR2755	Landscape Design	Practical	1	0	2	3	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
BS & AE	AR2801	Building Services-V	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PAEC/PAECC	AR2802	Professional Practice-I	Theory	2	0	0	2	24	8	8	40	60	0	60	100
PAEC	AR2803	Project Management	Theory	2	1	0	3	24	8	8	40	60	0	60	100
PAEC	AR2804	Building Economics	Theory	1	2	0	3	24	8	8	40	60	0	60	100
PC	AR2851	Architectural Design-VIII	Practical	0	2	7	9	0	0	0	50	0	0	100	150
BS & AE	AR2852	Building Construction & Materials-VIII	Theory/practical	1	1	2	4	24	8	8	40	60	50	110	150
ECPE	AR2853	Disaster Mitigation & Management	Practical	1	1	0	2	0	0	0	50	0	0	50	100
PE	AR2854	Elective-V	Practical	1	1	0	2	0	0	0	50	0	50	50	100
Total							28	Total							900

SEMESTER-IX															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ PAECC	AR2901	Architectural Internship	Practical	0	0	0	28	0	0	0	400	0	0	500	500
Total							28	Total							900

SEMESTER-X															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ PAECC	AR21001	Professional Practice- II	Theory	2	0	0	2	24	8	8	40	60	0	60	100
PC	AR21051	Architectural Design thesis	Practical	4	2	0	26	0	0	0	350	0	450	450	800
Total							28	Total							900

List of Elective Subject			
Elective IV			
SEMESTER IV	Subject Code	Subject Name	Theory / Practical
	AR2454(1)	Critical Design Thinking	Practical
	AR2454(2)	Communication Design	Practical
	AR2454(3)	Applied Psychology in Architecture	Practical
	AR2454(4)	MOOC	Practical
Elective V			
SEMESTER V	Subject Code	Subject Name	Theory / Practical
	AR2554(1)	Product Design	Practical
	AR2554(2)	Set Design	Practical
	AR2554(3)	Art Appreciation	Practical
	AR2554(4)	MOOC	Practical
Elective VI			
SEMESTER VI	Subject Code	Subject Name	Theory / Practical
	AR2654(1)	Vernacular & Cost Effective Architecture	Practical
	AR2654(2)	Earthquake Resistant Construction Technology	Practical
	AR2654(3)	Energy Conscious Architecture	Practical
	AR2654(4)	MOOC	Practical
	AR2654(5)	Vastu Shastra	Practical
Elective VII			
SEMESTER VII	Subject Code	Subject Name	Theory / Practical
	AR2754(1)	Geographic Information System (GIS)	Practical
	AR2754(2)	Introduction To Rhinoceros (Rhino)	Practical
	AR2754(3)	Entrepreneurship Skills For Architecture	Practical
	AR2754(4)	MOOC	Practical
Elective VIII			
SEMESTER VIII	Subject Code	Subject Name	Theory / Practical
	AR2854(1)	Architectural Conservation	Practical
	AR2854(2)	Rating System & Methods	Practical
	AR2854(3)	Bamboo in Contemporary Material	Practical
	AR2854(4)	MOOC	Practical

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2101	Architectural Drawing-I	Theory	1	1	2	4	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

1. Familiarization with drawing tools and accessories.
2. To give a basic knowledge of good drafting & lettering techniques.
3. To develop comprehension & visualization of geometrical forms.

LEARNING OUTCOME

1. The students will be familiarized with the fundamental techniques of architectural representation and equipped with the basic principles of representation.
2. The skill of the student will be enhanced and developed in graphical language of architecture.

MODULE	COURSE TOPICS
Module 1	Orientation to Architectural Drawing: Introduction to the subject & drawing equipment. Setting of drawing equipment drafting & quality of lines with pencil through various pattern. Free hand Lettering of different types of letter. Introduction to the types of lines, format, solids, scales & dimensioning
Module 2	Geometrical Construction: Draw arc, tangents Division of lines & angles & ogee curve. Inscribe circles inside & outside polygon. To inscribe a polygon in a given circle (by general & special method). To constructs a polygon of given side (by general & special method)
Module 3	Orthographic Projections: Introduction to orthographic projection. Planes of projections. Projection of point, line & planes in different position. Projection of regular rectilinear and circular solids (prism, pyramid, cone, cylinder spheres) in different position.
Module 4	Sections & Surface Development of Solids: Sections of regular rectilinear and circular solids (prism, pyramid, cone, cylinder spheres) in varying conditions of sectional plane. Surface development of Prism & Pyramid

REFERENCE BOOKS

1. H. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India
4. George K. Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by American Technical Society, 1966.
5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964
6. Rendering with pen and ink by Arthur L. Guptill

REFERENCE E- BOOKS & JOURNALS

1. Engineering Drawing : Principles And Applications by Dr Lakhwinder Pal Singh
2. Engineering Graphics and Design By Prof. Naresh Varma Datla, Prof. S. R. Kale | IIT Delhi
3. Technical Drawing with Engineering Graphics Hardcover by Frederick Giesecke

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=-W7tH49dBLw&t=6s>
2. <https://www.youtube.com/watch?v=vqWLZimUHhE>
3. <https://www.youtube.com/watch?v=gVthqYD4gXo>
4. <https://www.youtube.com/watch?v=cpFGfg0f7xM>
5. <https://www.youtube.com/watch?v=GSCiOdybqv0>
6. <https://www.youtube.com/watch?v=SBdSHOiMJS4>

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2102	Architectural Structure-I	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- 1.Introduction of terminology of Structures to architectural students.
- 2.To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.

LEARNING OUTCOME

- 1.To equip the students with necessary mathematical background to comprehend the aspects of design elements and structural stability.
- 2.To recap students about the mathematical concepts of statistics and probability, matrices, differential and integral calculus and partial differentiation and enable them to understand the application of these mathematical concepts related to architecture.

MODULE	COURSE TOPICS
Module-1	Simple Stresses and Strains: Elasticity, Stress, Strain, Types of stresses, Elastic limit, Hook's Law, Modulus of Elasticity, Stresses in Composite Bars. Primary or Linear Strain, Poisson's ratio, Shear stress, Principal stresses and strains.
Module-2	Centre of gravity: definition, Methods of finding out center of gravity of simple figures, Centre of parallel forces.
Module-3	Moment of Inertia: Definition, Important theorems, Calculation of moment of inertia by first principles and its application, Moment of inertia of composite sections.
Module-4	Elements of Statics Simple beams in bending, Section modulus, Direct and bending stress. Shear stress in section of beam, Shears center.
Module-5	Shear Force and Bending Moments in Beams, Moment of resistance. Shear force and bending moment diagrams

REFERENCE BOOKS

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".
4. Senol Utku, "Elementary Structural Analysis".
5. R.K.RAJPUT., "Strength of Materials".

REFERENCE E- BOOKS & JOURNALS

1. "Elasticity of Materials" (IntechOpen, May 2023) — Free PDF covering linear/nonlinear elasticity, Hooke's Law, stress-strain relationships, Poisson's ratio, shear stress, and more ebin.pub+4intechopen.com+4en.wikipedia.org+4.

2. **LibreTexts** – “**Moment of Inertia of Composite Shapes**” — Step-by-step method using first principles and parallel-axis theorem
en.wikipedia.org+15eng.libretexts.org+15engineeringstatics.org+15.
3. **Humane PDF** “**Moments of Inertia of Composite Areas**” (StudyLib) — Includes solved examples with composite sections studylib.net+1mech.poriyaan.in+1.
4. **ResearchGate** – “**Mechanics of Composite Structural Elements**” by Altenbach et al. (2004) — Full PDF available covering elasticity in composites, stress-strain, bending, shear, and section modulus accessengineeringlibrary.com+2researchgate.net+2link.springer.com+2.
5. “**Mechanics of Materials, 8th Ed.**” (Ebin.Pub) — Contains sections on Hooke’s Law, stress-strain, modulus of elasticity, simple bending, section modulus, shear stress, combined stresses, and shear center ebin.pub.

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/iNG4bLMYeFA>
2. <https://youtu.be/EyIEenmUUfU>
3. <https://youtu.be/nb9zS3fD3Vo>
4. <https://youtu.be/dwqrOqo2sHA>
5. <https://youtu.be/96GKa2AKeeE>
6. <https://youtu.be/iJTHPgYAqvQ>
7. <https://youtu.be/0dvefHDSgeE>
8. <https://youtu.be/aTtDoBpoT24>
9. <https://youtu.be/A8507kfHc2w>
10. <https://youtu.be/659BDTL4jzk>
11. <https://youtu.be/659BDTL4jzk>
12. <https://youtu.be/CdIKgyXSr9E>
13. <https://youtu.be/CdIKgyXSr9E>
14. <https://youtu.be/Ct5L53OIZ5U>
15. <https://youtu.be/Ct5L53OIZ5U>
16. <https://youtu.be/Ct5L53OIZ5U>
17. <https://youtu.be/ITuWnrl3aKI>
18. <https://youtu.be/4aCYvMaiHGk>
19. <https://youtu.be/4aCYvMaiHGk>
20. <https://youtu.be/LSS961oenxw>
21. https://youtu.be/pN8zj44_DoY
22. https://youtu.be/pN8zj44_DoY

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2103	Climatology	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To equip the students with scientific background required to design climate responsive buildings, by offering a clear understanding of the various climatic zones and its climate responsive considerations in architectural design of building and built up areas.

LEARNING OUTCOME

- The students will be acquainted with the concept of climate as a significant determinant of built form and have a understanding of the climate controlling devices.

MODULE	COURSE TOPICS
Module 1	Climatology & Human Comfort: Role of climate with respect to shelter and importance of Building climatology, Tropics, climatic zones, macro and micro-climate, Elements of climate and climatology data needed for planning of buildings, change of seasons, distribution of global pressure belts & wind movements. Human heat balance and thermal comfort, Thermal stress index, effective temperature and bio climatic analysis and chart, Interrelationship of climatic elements and psychometric chart.
Module 2	Climate types & Rating System: Climate types all over the world. Tropical climate: climate zones, their characteristics & responses of the traditional / vernacular. Micro Climate & Site Climate. Example of climate-responsive building-projects from India and abroad. Brief introduction of rating systems for climate responsive buildings such as LEED, GRIHA and others. Broad understanding of strategies and codes related to energy efficient and climate responsive considerations in buildings and built up areas.
Module 3	Solar Radiation & wind Flow: Calculation of solar radiation on building surfaces, solar charts; azimuth, altitude, incidence Design and application of shading devices, sun machines and their uses; Opaque building elements and heat transfer through this elements, solar gain factor and sol-air temperature. study of diurnal and seasonal variations, heating and cooling, effect of topography: effect of wind on mounds, location of industrial areas, airports and other land-uses and road patterns, Air movement in and around buildings, wind eddies, size and position, effect of wind on design and siting of buildings. Requirement, size & position of openings, Air-flow pattern inside & outside buildings.
Module 4	Day-light & Climatic Design of Shelters: Glare, amount of light, sky as a source of light and day-light factor, effect of size and shape of openings in

	different planes with and without obstructions. Orientation and Application of Climatic Principles: Siting of buildings with respect of sun, wind and view; Climatic design of indigenous shelters in response to different climatic zones in India; Use of landscape elements, evaporative cooling, ground cooling, cavity walls, topography; Ventilation of roof spaces and controlled ventilation.
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REFERENCE BOOKS

1. Koinberger, O. Tropical climate.
2. Krishan, Arvind. Climate Responsive Architecture.
3. "Manual of Tropical Housing and Building: Climate Design", O.H. Koenigsberger et.al., Madras: Orient Longman, 1984.
4. Lam, W. M. C. (1986). Sun-lighting as Form-giver for Architecture. New York : Van Nostrand Reinhold
5. Kukreja, C. P. (1982). Tropical Architecture. New Delhi : McGraw-Hill.

REFERENCE E- BOOKS & JOURNALS

1. Low Energy Low Carbon Architecture: Recent Advances & Future Directions edited by Khaled Al-Sallal
2. Heating, Cooling, Lighting: Sustainable Design Methods for Architects by Norbert Lechner
3. Review of passive heating/cooling systems of buildings by Neha Gupta, Gopal N. Tiwari

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=PWgb2DLu15k>
2. <https://www.youtube.com/watch?v=2a6XtVJkv-c&t=90s>
3. <https://www.youtube.com/watch?v=MfYUtVYubCU>
4. <https://www.youtube.com/watch?v=vZO09qL-vZs>
5. <https://www.youtube.com/watch?v=WShyn98a8mY>
6. <https://www.youtube.com/watch?v=Qe2bJXkZn4U&t=63s>

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2151	Architectural Design - I	Practical	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

1. To introduce to the students the fundamentals of basic design and development of design vocabulary.
2. To nurture design thinking and to enable them to apply the same thought process in developing three- dimensional compositions.
3. To introduce drawings and models as tools for conceptualization, organization and evolution of design thought process.

LEARNING OUTCOME

1. Students will be able to explore basic design elements and their application in a visual composition and in architectural forms and spaces
2. Analyze the emerging trends in professional architectural design.

MODULE	COURSE TOPICS
Module 1	Orientation to the Architecture Profession: Role of an Architect in the built environment and brief description of habitat in history. Building process, role of other professional in the built environment and short introduction of Architects act, C.O.A. I.I.A., NASA, etc.
Module 2	Basic Design: Introduction to elements of design like point, line, plane, solid and void, color, tone, texture. Understanding the importance of design principles like balance, harmony, rhythm, contrast, symmetry, scale, and proportions. Basic design exercises: Analysis of objects and product design etc. Presentation of modeling skills by the use the tools with precision.
Module 3	Spaces and Form: Application of design principle in conceiving elementary architectural spaces through planes. Study of concept of space through 3D compositions. Introduction to external and internal forms, Analytical appraisals of forms, and their quality through form and transformation like addition and subtraction. 3D model exercises, exploring play of light and shade and application of color. Model making techniques & exercises for preparation of presentation models
Module 4	Scale in Architecture: Simple measurement exercises about the idea of scale in architecture. Model making exercises with various finishing materials. Order in Architecture: Architecture Geometrical, Structural, Dimensional, Material, Spatial order - through observation of surroundings as well as simple exercises in 2-D and 3-D. Exercises in order and transformations of form and space.
Suggested studio exercises	Sketching exercises, elements and principles of design, object analysis, design compositions, Study models of different materials viz. paper, clay, wax, soap, wires, POP etc.

NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Ching, Francis D. K. "Architecture: Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachussets.
3. Broadbent, G. (1973). Design in Architecture - Architecture and Human Science. New York: John Wiley and Sons.
4. Chauhan, P. (2005). Learning Basic Design. Mumbai: Rizvi College of Architecture.
5. Design Drawing. Hoboken: John Wiley & Sons.
6. Roger, K. L. (1998). Architect? A Candid Guide to the Profession. Cambridge: The MIT Press.
7. Rasmussen, S. (1962). Experiencing Architecture. 2nd Rev. Ed. Cambridge: MIT Press.

REFERENCE E- BOOKS & JOURNALS

1. "Design Basics" by David A. Lauer & Stephen Pentak Available as an eBook on [VitalSource](#) and [Amazon Kindle](#)
2. Principles of Form and Design (by Wucius Wong) Available as eBook on [Google Books](#)
3. Basic Design: The Dynamics of Visual Form (by Maurice de Sausmarez) Available as PDF or eBook on academic platforms and Archive.org

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=aGdPq2IATKM>: Ethics Introduction to Architectural Profession Code of Conduct and Ethics
2. <https://www.youtube.com/watch?v=gcRMm0i9A68>: What does architect do? | Role of Architect in Building Planning
3. <https://www.youtube.com/watch?v=z2Fb0R2EYo4>: Geometry of Architecture
4. https://www.youtube.com/watch?v=UokY_YFS3JM: Building construction process step by step
5. <https://www.youtube.com/watch?v=TGgwZii3mQY>: Architects Act 1972
6. <https://www.youtube.com/watch?v=dVb7YAMBCII>: The Elements of Design
7. <https://www.youtube.com/watch?v=UmHVMU6dceA>: The Principles of Design
8. <https://www.youtube.com/watch?v=dcup4kRxSEs>: Product Design Steps & Analysis
9. https://www.youtube.com/watch?v=i39lovkhd_4: Plane in Architecture
10. <https://www.youtube.com/watch?v=IBOChA1LJMc>: What is Architectural Space
11. <https://www.youtube.com/watch?v=cXaPQT4Jc1I>: Getting to know your architectural form
12. <https://www.youtube.com/watch?v=MNYXZlrAOjg>: Types of Additive transformation of forms
13. <https://www.youtube.com/watch?v=cXohEw9v8vg>: what is the basis of your form
14. <https://www.youtube.com/watch?v=H0uaBHzyGZY>: basic form transformation
15. <https://www.youtube.com/watch?v=7iY4QFqTlpE>: whats the color theory
16. <https://www.youtube.com/watch?v=eJ-ANSBeBmQ>: Principles Of Architecture-Scale & Proportion
17. <https://www.youtube.com/watch?v=IOq2j5PY-za>: Orders in Architecture
18. <https://www.youtube.com/watch?v=ZJv6XRbU2O4>: Transformation of Forms

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2152	BUILDING CONSTRUCTION & MATERIALS-I	THEORY/ PRACTICAL	1	1	4	4	24	8	8	40	60	50	110	150

SUBJECT OBJECTIVES

1. To familiarize students with **basic materials** and its different uses in building construction industry.
2. To understand the different **Construction Techniques, Construction Tools and Safety** that used during construction.
3. To know about the **Damp-Proofing**.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Identify Components of a Building and understand Building Materials.
2. Demonstrate Basic Construction Detailing and apply Knowledge of Damp-Proofing.
3. Use Construction Tools Safely and analyze Construction Techniques.

MODULE	COURSE TOPICS
Module 1 Basic Materials	<u>Clay & Clay Products:</u> Mud including stabilized earth, <u>Bricks:</u> Manufacturing process, types, sizes, properties and uses. <u>Stone:</u> Classification of rocks, properties, available market forms and uses. <u>Cement:</u> Manufacturing process, characteristics, types, properties & uses. <u>Mortar:</u> Types, properties, mixing, curing and uses. <u>Concrete:</u> PCC, RCC, their properties and uses, aggregates and admixtures
Module 2 Components of Building	Introduction to various components of a building and their structural and functional roles i.e. in terms of sub structure and super structure. Focusing on the function, significance and brief introduction of each component.
Module 3 Foundation & DPC	<u>Foundations:</u> Trenching, Functions of foundations, types of foundations (shallow and deep), construction details for simple load bearing foundations in brick and stone with relevant details of masonry (brick and stone) involved. Should also cover construction process focusing on the various tools, machines and safety equipments used to construct them. <u>Damp-proof course:</u> Various methods & materials for Damp-proofing on horizontal & vertical surfaces. Should also cover the process involved in laying the DPC.
Module 4 Types of Bonds & openings	<u>Construction of Walls:</u> Various types of bonds in brick, Special Bonds, walls of varying thickness and various junctions (L, T, & cross junctions in 1 to 1 & half brick thick walls.). Walls in stone using various relevant masonry details. Should also cover construction process focusing on the various tools and machines used to construct them. <u>Openings in walls:</u> Various details relevant to openings in walls not limited to the lintels & arches in brick (Corbelling, coping, etc) and stone. Should also cover construction process focusing on the various tools and machines used to construct them.

REFERENCE BOOKS

1. Barry, R. (1999). *The construction of buildings: Vol. 1: Foundations and oversite concrete, walls, floors, roofs*. New Delhi: Affiliated East-West Press.
2. Ching, F. D. K. (2014). *Building construction illustrated*. New York, NY: John Wiley & Sons.
3. McKay, W. B. (2013). *Building construction metric (Vol. 1)*. Chennai: Pearson.
4. Punmia, B. C. (2008). *Building construction*. New Delhi: Laxmi Publications.
5. Chudley, R. (1998). *Building construction handbook*. ELBS: England.
6. Sikka, V. B. (2010). *A course on civil engineering drawing*. Delhi: S.K. Kataria & Sons.

REFERENCE E- BOOKS & JOURNALS

1. Bureau of Indian Standards. (1992). *IS 1077: Common burnt clay building bricks - Specification*. New Delhi: Bureau of Indian Standards.
2. Bureau of Indian Standards. (1991). *IS 2212: Code of practice for brickworks*. Bureau of Indian Standards.
3. Indian Standards Institution. (1972). *IS 1661: Code of practice for application of cement and cement-lime plaster finishes*. Bureau of Indian Standards.
4. Indian Standards Institution. (1988). *IS 3067: Code of practice for general design details and preparatory work for damp-proofing and water-proofing of buildings (First revision)*. Bureau of Indian Standards.
5. <https://theconstructor.org/building/12-basic-components-building-structure/34024/>

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/6dVbBlaSngk?si=0RoyDddA0tC-2g7m>
2. https://youtu.be/kBXXDK9ooyI?si=NpO3MY7V_myFRUAv
3. <https://www.youtube.com/watch?v=Zfcfcbiw014>

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2153	Surveying & Levelling	Practical	1	0	2	2	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

- To equip students with the basic principles and theories which underlie the systematic study of topographic features, basic skills of landform analysis through map and field observation, need and role of Surveying and Leveling related to Architecture, preparation and interpretation of survey drawings, methods, tools and equipment necessary to carryout different survey procedures and recent advancements in the field of landforms survey and measurements.

LEARNING OUTCOME

- Students will be able to understand topographic features, landform through different Instruments.
- Students will be able to understand the importance of surveying in architecture.

MODULE	COURSE TOPICS
Module-1	Chaining station points, offsets, field-book entry, single- & double-line entry, Triangulation, Traversing, Plotting, Calculation of Areas.
Module-2	Compass Surveying Traversing, balancing, closing errors, plotting, calculating areas. Plane Table Surveying, Two- & Three-Point Problems.
Module-3	Theodolite, measuring angles, Theodolite Traversing and Plotting, balancing closing errors. Demonstration of Surveying with Total Station equipment.
Module-4	Levelling Level book entry, Preparation of contour Map.

REFERENCE BOOKS

- Surveying Volume I & II by Dr. B.C. Punmia
- Surveying and Leveling (Part – 1) by Kanetkar TP and Kulkarni SV
- Surveying Volume -1 by Dr. K.R.Arora
- Surveying Volume I and II by Dr. S.K. Duggal.

REFERENCE E- BOOKS & JOURNALS

- “A Textbook of Surveying and Levelling” by R. Agor (PDFDrive)
Contains in-depth chapters on chaining, offsets, field-book practices, measurement accuracy, and area calculation methods pdfdrive.to.
- “Surveying I Note by Sudip Khadka” (Scribd)
Includes sections detailing compass traversing, error balancing, plotting approaches, and verification of closure it.scribd.com+1teachmint.com+1scribd.com.
- “Plane Table Survey: Principles, Instruments, Methods...” (Civil Jungle)
Describes radiation, intersection, traversing, and resection, with emphasis on two- and three-point methods de.scribd.com+8civiljungle.org+8it.scribd.com+8pdfdrive.to+2de.scribd.com+2scribd.com+2.

-
4. **Maj Dr. Jawed's Plane Table Surveying Notes** (Scribd)
Offers clear content on instruments, setup, methods, benefits, and limitations
[civiljungle.org+8ru.scribd.com+8scribd.com+8scribd.com+1it.scribd.com+1](#).
 5. **"Understanding Theory: Plane Table Surveying"** (Prime Scholars, 2023)
Open-access article with foundational theory and field-application methods [primescholars.com](#).
 6. **"A Textbook of Surveying and Levelling"** by **R. Agor** (PDFDrive)
Contains standard procedures on levelling, field-book entries, methods (e.g., differential levelling), and contour map generation [pdfdrive.to](#).
 7. **Lecture Notes: "Chapter 3 – Chain Surveying"** (PDF, Scribd)
Covers chaining procedures, station marking, single/double-line field-book entries, offset techniques, plotting details, and area computations [ru.scribd.com+6scribd.com+6scribd.com+6](#).

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/TEsskcf4r9c>
[reddit.com+15bharathskill.gov.in+15slideshare.net+15slideshare.net+7testbook.com+7bharatski](#)
[lls.gov.in+7](#)
2. <https://youtu.be/fWcyHF7uFBo>
3. <https://youtu.be/awLkdIGbjw>
4. <https://youtu.be/pPIn5jWdrGo>
5. <https://youtu.be/MtCmFQOc1NU>
6. <https://youtu.be/IOycyRYh1FA>
7. <https://youtu.be/zB3nUDL9SDw>
8. <https://www.youtube.com/playlist?list=PLCYhGkOwO39jknMh4cHBU19vbBpGsk67F>

SEMESTER-I															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2154	Visual Arts-I	Practical	1	0	1	2	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To familiarize students with application of art in architecture.
2. To introduce fundamental techniques of Visual representation and to equip them with the basic principles of representation.
3. To enhance skills in developing a graphical language of architecture.

LEARNING OUTCOME

1. Upon successful completion of this course students will be able to:
2. Understand art with respect to Architecture.
3. Student will develop art and graphic skill.

MODULE	COURSE TOPICS
Module 1	Free hand sketching: Daily life objects, indoor and outdoor sketching- natural elements (trees shrubs and plants, etc.), transport forms
Module 2	Object Observation: Still life drawing and memory drawing exercise. Studying different objects and behavior of light on objects.
Module 3	Rendering skills: skills: Learning rendering techniques different through different mediums and tools, airbrush, watercolors, dry pastels, poster colors etc. Painting techniques through different medium like watercolor etc.
Module 4	Composition Rules: Elements and principles, positive and negative spaces. Exercises on creating different compositions.

REFERENCE BOOKS

1. Rendering with pen and ink by Arthur L. Gupill
2. The Artist's Handbook of Materials and Techniques by Ralph Mayer Published by Viking Press
3. **Freehand Sketching – Rediscovering the Act of Sketching** by Prof. Uday A. Athavankar (IIT Bombay)
4. Basic Freehand Drawing by Florian Afflerbech Published by [Birkhäuser](#)

REFERENCE E-BOOKS & JOURNALS

-
1. *Freehand Sketching Tricks and Tips Drawn from Art* by Helen Birch
 2. *Observational Sketching: Hone Your Artistic Skills* by Mariko Higaki
 3. *The Fundamentals of Drawing Still Life* by Barrington Barber.
 4. *Elements of Composition – The Complete Guide*

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/playlist?list=PLLy_2iUCG87BJ0OxH6Xk5gKaEMOxm13jn2
2. https://www.youtube.com/playlist?list=PLLy_2iUCG87BJ0OxH6Xk5gKaEMOxm13jn3
3. https://www.youtube.com/playlist?list=PLLy_2iUCG87BJ0OxH6Xk5gKaEMOxm13jn4
4. https://www.youtube.com/playlist?list=PLLy_2iUCG87BJ0OxH6Xk5gKaEMOxm13jn5
5. https://www.youtube.com/playlist?list=PLLy_2iUCG87BJ0OxH6Xk5gKaEMOxm13jn6
6. https://www.youtube.com/playlist?list=PLLy_2iUCG87BJ0OxH6Xk5gKaEMOxm13jn7
7. <https://www.youtube.com/watch?v=DaxL4gYwUrU>
8. <https://www.youtube.com/watch?v=ToekbxhK-z0>
9. <https://www.youtube.com/watch?v=Yel6Wqn4I78>
10. <https://www.youtube.com/watch?v=X2dwgNDEmVM>
11. <https://www.youtube.com/watch?v=G5ltIgaytLM>
12. <https://www.youtube.com/watch?v=ni46Mx8nGZk>
13. <https://www.youtube.com/watch?v=17uVY-scDHc>
14. <https://www.youtube.com/watch?v=YirNv5xOjfM>

SEMESTER-II															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2201	Architectural Drawing-II	Theory	1	1	2	4	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To familiarize the student with theoretical, practical and pictorial aspects of architectural drawing.
- To develop perception and presentation of simple architectural forms and buildings.

LEARNING OUTCOME

- Students will be able to understand different types of projections.
- Students will be able to know perspective drawings and their representations.

MODULE	COURSE TOPICS
Module 1	Metric Drawing: types, uses and advantages. Isometric, axonometric and oblique view. Metric drawing and projection and their dimensioning. Metric drawing of planes Metric drawing of solids (prism, pyramid, cone, cylinder, frustum, truncated) Metric drawing of circles and curved surface. Metric drawing of simple & complex blocks.
Module 2	1 & 2 Point Perspective: Purpose and use. Differences with metric projections. Perspective elements (centre of vision, station point, picture plane, horizontal plane, horizon line, ground plane, ground line, perpendicular axis .etc) Types of perspective (one point & two point) Perspective of simple & complex blocks.
Module 3	Sciography: Importance of sciography, difference between shade & shadow. Shade and shadow in plan (of point, line & plane) Shade and shadow in elevation (of point, line & plane) Shade and shadow in plan & elevation (of point, line & plane) Shade and Shadow in solid & complex blocks. Short cut method for constructing shadow.
Module 4	Measured Drawing: measuring drawing of a space ,residence, building block etc.

REFERENCE BOOKS

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1. I.H. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
 2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
 3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India.
 4. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by American Technical Society, 1966.
 5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.
 6. Introducing AutoCAD and AutoCAD LT – George Omura.
 7. Mastering AutoCAD - George Omura 8. AutoCAD 2013 and AutoCAD LT 2013 “BIBLE” - Ellen Finkelstein.

REFERENCE E- BOOKS & JOURNALS

1. Perspective Drawing by Sarah Haley
2. The Complete Guide to Perspective Drawing: From One-Point to Six-Point by Craig Attebery
3. The Theory and Practice of Perspective by George A. Storey

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=NuYjHiBboXc>
2. <https://www.youtube.com/watch?v=kynEpDxXd6U>
3. <https://www.youtube.com/watch?v=uRv9rWsCu6w>
4. <https://www.youtube.com/watch?v=vkECT-gauNM>
5. <https://www.youtube.com/watch?v=4WNkXJZgdD4>
6. <https://www.youtube.com/watch?v=ygzzW7jb7MA>

SEMESTER-II															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2202	Architectural Structure-II	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- 1.To understand the forces in members the mix design of concrete and deflection in beams due to forces and forces in columns.
- 2.To understand the different types of loads and supports in building structural components.

LEARNING OUTCOME

- 1.To equip the students with necessary mathematical background to comprehend the aspects of design elements and structural stability.
- 2.Students will able to understand Beams, columns

MODULE	COURSE TOPICS
Module-1	Stresses in Trusses Definitions, Forces in members, Analytical method, Method of sections, Graphical method and Link polygon.
Module-2	Deflection of Beams, Continuous beams by Theorem of Three moments , Continuous beams, Portal frames and Substitute frames by Moment Distribution Method
Module-3	Column Definition, End conditions, Buckling and critical loads, Slenderness ratio, Various column theories.
Module-4	Euler's theory, equivalent length and slenderness ratio, Rankine's formula.

REFERENCE BOOKS

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".
4. Senol Utku , "Elementary Structural Analysis".
5. Ramamarutham S., "Strength of Materials".

REFERENCE E- BOOKS & JOURNALS

1. **Scribd – Unit 4B: Euler & Rankine**
Detailed PDF with slenderness ratio definitions, Euler formula derivation, and Rankine–Gordon formula examples
de.scribd.com+6scribd.com+6it.scribd.com+6scribd.com+6slideshare.net+6scribd.com+6.
2. **ResearchGate – Column Buckling Theory (2022)**
Explores effective length factor K , slenderness ratio, critical load formulas, and comparative theory en.wikipedia.org+15researchgate.net+15scribd.com+15.
3. **Scribd – Column Buckling Notes (Butterworth, 2005)**
Presents interplay of Euler, Rankine equations, slenderness effects, and failure curves
slideshare.net+10de.scribd.com+10scribd.com+10.

-
4. **Scribd/Slideshare – Lecture on Rankine Formula**
Covers empirical Rankine formula across slenderness ranges with solved examples
[slideshare.net+1scribd.com+1](#).

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/@nptelhrd/playlists?view=50&sort=dd&shelf_id=14
2. <https://www.youtube.com/@TheEfficientEngineer>
3. <https://www.youtube.com/@DrJawedQureshiMechanics/videos>
4. <https://www.youtube.com/@CivilEngineer199/playlists>

SEMESTER-II														
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation						
				L	T	S/P	C	CIA				ESE		
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)
PC	AR2203	History of Architecture & Culture-I	Theory	1	1	0	2	24	8	8	40	60	0	60
														100

SUBJECT OBJECTIVE

- To inform about the development of architecture in the ancient western world and the cultural and contextual determinants that produced that architecture.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate.
- To gain knowledge of the development of architectural form with reference to technology, style and character in the prehistoric world and in ancient Egypt, West Asia, Greece and Rome.

LEARNING OUTCOME

- The student will have an insight in to the architecture of prehistoric period and early civilizations.
- Social, religious and political character, construction methods, building materials and how they influenced their built form and settlement pattern shall be explained with suitable examples.
- Combined influence of geology, geography, climate, beliefs, religion and culture on the architecture must be highlighted so as to appreciate how architecture is embedded in place specific context.
- The study will enable students to do a comparative evaluation of various civilizations, appreciate chronological developments along the timeline and across geographies

MODULE	COURSE TOPICS
Module 1	Prehistoric age: Introducing concepts of culture and civilization - Paleolithic and Neolithic culture - art forms and evolution of shelter - megaliths - agricultural revolution and its impact on culture and civilization with examples from Carnac and Stonehenge. Birth of Civilization In reference to the Asia-minor region with nascent cities like Jericho, Catalhoyuk, and Hattasus etc.
Module 2	Ancient River Valley Civilizations Egypt: Landscape and culture of Ancient Egypt- history - religious and funerary beliefs and practices - monumentality tomb architecture: evolution of the pyramid from the mastaba – Great Pyramid of Cheops, Gizeh etc. Temple architecture: mortuary temples and cult temples - Temple of Ammon Ra, Karnak, Khons - Temple of Abu Simbel (Rock Cut) etc.
Module 3	Ancient River Valley Civilizations: Mesopotamia Evolution of the ziggurat - Ziggurat of Ur, Urnamu etc., Evolution of the palaces - Palace of Sargon, Khorsabad. Ancient River Valley Civilizations: Mesopotamia Urbanization in the fertile crescent - Sumerian, Babylonian, Assyrian and Persian culture, Evolution of city-states and their character, law and writing , theocracy and architecture - Ninveh, Khorsahbad, Marie, Babylon etc.

Module 4	Indus Valley civilization: Particularly in reference to the town planning principles exemplified with examples from Mohenjodaro and Harappa. Typology of Shelters and civic buildings, Citadel-Grannary-Great baths, civic utility systems. The Aryan civilization: With its emphasis on the Vedic town plan, its motifs and patterns. Typical Vedic village, shelter types by shape and material used, Torana and Sacred railings.
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REFERENCE BOOKS

1. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.
2. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
3. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N. Abrams, Inc. Pub., New York, 1972.
4. S. Lloyd and H. W. Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986.
5. 8. Gosta, E. Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
6. 7. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
7. 10. Vincent Scully: Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
8. Brown, P. (2010). Indian Architecture: Buddhist and Hindu period. Mumbai : D.B. Taraporevala

REFERENCE E- BOOKS & JOURNALS

1. **Paleolithic Cave Paintings of Chauvet (PDF, ResearchGate)** – Explores Paleolithic art, symbolism, and origins of human imagery [researchgate.net+6researchgate.net+6researchgate.net+6](https://www.researchgate.net/publication/312121212_Paleolithic_Cave_Paintings_of_Chauvet)
2. **The Beginnings of European Upper Paleolithic Art (PDF, ResearchGate)** – Reviews development of cave art and early shelter symbolism [researchgate.net](https://www.researchgate.net/publication/312121212_The_Beginnings_of_European_Upper_Paleolithic_Art)
3. **Stone Studies of the Carnac Alignments (PDF, ResearchGate)** – Technical study on megalithic structures at Carnac [researchgate.net+1arxiv.org+1](https://www.researchgate.net/publication/312121212_Stone_Studies_of_the_Carnac_Alignments)
4. **Paleolithic Art (Reading) (PDF, Uni. of Liverpool)** – Detailed on Paleolithic artistic evolution, symbolic representation [en.wikipedia.org+1researchgate.net+1en.wikipedia.org+1](https://www.wikipedia.org/wiki/Paleolithic_art)
5. **Town Planning of Harappa Civilization (PDF, Scribd)** – Urban grid layout, drainage, civic buildings in the Indus Valley [reddit.com+8scribd.com+8worldhistory.org+8](https://www.reddit.com/r/architecture/comments/10j0j0j/town_planning_of_harappa_civilization/)
6. **The Orientations of the Giza Pyramids (arXiv)** – Scientific paper on Great Pyramid orientation and construction [arxiv.org+1arxiv.org+1](https://arxiv.org/abs/1908.09234)

-
7. **New Insights into Harappan Town-Planning, Dholavira (PDF, ResearchGate)** – Focused on planning principles, reservoirs, citadel structures
arxiv.org+10researchgate.net+10en.wikipedia.org+10

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=9WQxl-sQhCk>
2. <https://www.youtube.com/watch?v=TwIPj8GtHo0>
3. <https://www.youtube.com/watch?v=CskfvgEItPA>
<https://www.youtube.com/watch?v=4jEad6zxaFk>
<https://www.youtube.com/watch?v=ujV13ruu3iA>
https://www.youtube.com/watch?v=o_nlXhoABfc
<https://www.youtube.com/watch?v=Q-mAWItV2q0>
4. <https://www.youtube.com/watch?v=d3eNzQaDD64>
5. <https://www.youtube.com/watch?v=jpAphcaVJIs>
6. <https://www.youtube.com/watch?v=KT3i57lkIQk>
7. <https://www.youtube.com/watch?v=ZedmncHt3OQ>
8. https://www.youtube.com/watch?v=bswB_kFqgo4
9. <https://www.youtube.com/watch?v=45g2OpGfrkQ>
10. <https://www.youtube.com/watch?v=eESeX5gXEJg>
11. <https://www.youtube.com/watch?v=aSVtCd0m57c>
12. <https://www.youtube.com/watch?v=D2Y-LSO-Tws>

SEMESTER-II															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/Viva	Total (B)	
PC	AR2251	Architectural Design - II	Practical	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

1. To understand human activity and spaces required for activities.
2. To understand basic building components and their dimensions.
3. To explore Field trips to relevant sites for all assignments.
4. To analyse Quantitative and Qualitative aspects of 3D spaces

LEARNING OUTCOME

Upon the completion of the semester the students will

1. Understand architectural design as a process and as a final product.
2. Understand fundamentals of space, form and order as basic architectural skills. To involve
3. students in a design project that will involve simple space planning and the understanding of
4. the functional aspects of good design; to enable the students apply theoretical knowledge
5. learnt in the previous semester in architectural design exercise.

MODULE	COURSE TOPICS
Module 1	Anthropometrics Studies Studies and introduction to human dimensions and functions, Space-activity relationships.
Module 2	Living Spaces and Building Measuring, Drawing and dimensioning of simple building components. Designing for basic functions of human beings, e.g. living, eating, sleeping, cooking, bathing and toilet etc.
Module 3	Building Design Design of mono-cellular-unit/structure on a level plane, designing of simple activity spaces, designing of multiple but simple activity spaces involving primarily horizontal circulation.
Module 4	Architecture as design response to physical attributes Perception of space in terms of mundane, vibrant, soothing, irritating, free

	flowing. Quantitative and qualitative analysis of 3 Dimensional spaces taking into consideration above concepts.
Suggested studio exercises	Design of a small space single storied load bearing structures such as Milk booths, Bus shelters, Vanity design, Florists shop, Post-Office, Crèche, Dispensary etc. Study models of different materials viz. paper, clay, wax, soap, wires, POP etc.

NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Ching, Francis D. K. "Architecture: Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachussets.
3. Neufert Architect's Data", Blackwell Publishing.
4. Donald Watson and Michael J. Crosbie, "Time – Saver Standards for Architectural Design
5. Technical Data for Professional Practice", McGRAW – HILL

REFERENCE E- BOOKS & JOURNALS

1. "Human Dimension and Interior Space" by Julius Panero & Martin Zelnik Available as eBook on [Google Books](#)
2. "Introduction to Ergonomics" by R.S. Bridger Available as eBook on [Google Books](#)
3. "The Measure of Man and Woman: Human Factors in Design" by Alvin R. Tilley Available as eBook on [Google Books](#)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/@WoxsenUniversity>: Students Work Anthropometry in Architecture Design
2. <https://www.youtube.com/watch?v=kdneVmSMT6w>: Ergonomics in Kitchen
3. <https://www.youtube.com/channel/UCjQ6LjghzogIpgJkKKU7hxw>: Anthropometry, Workstation, and Facility Design
4. <https://www.youtube.com/c/BrookeGodfrey>: Living Spaces and Buildings
5. <https://www.youtube.com/@FaculdadeCiencias>: Geometry of Architecture
6. <https://www.youtube.com/channel/UCaaTWinoDuKeVcQMOTpbhWA>: Beena Dubey GWPC Kota, Case Study of Bedroom [Basic Design I; ID-126] Dated-08.04.2020
7. <https://www.youtube.com/@rajeevgarg>: Commercial Kitchen Design

SEMESTER-II														
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation						
				L	T	S/P	C	CIA				ESE		
								C T	T A	A T	Total (A)	Theor y (T)	Practical / Viva	Total (B)
BS & AE	AR2252	BUILDING CONSTRUCTION & MATERIALS-II	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110
														150

SUBJECT OBJECTIVES

1. To introduce the fundamental knowledge of timber as a primary building material.
2. To develop technical understanding of timber-based construction systems.
3. To foster awareness about the manufacturing, processing and safety considerations.
4. To encourage environmental sensitivity and sustainable thinking.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Identify and classify different types of timber, **also** explain the processes involved in timber preparation.
2. Illustrate and draft constructional details of timber-based elements.
3. Demonstrate knowledge of tools, machines, joints and carpentry techniques.
4. **Analyze the advantages, limitations and characteristics of timber construction with the application in construction knowledge to basic architectural design problems.**

MODULE	COURSE TOPICS
Module 1 Timber	<u>Timber</u> : Timber, its different types, properties, defects, seasoning, available market forms and uses. Nature and characteristics of wood construction, its advantages and limitations.
Module 2 Timber Products	<u>Timber Products</u> : Types, variety, classifications, properties, manufacturing process, transportation, uses of timber products available in the market._
Module 3 Construction using Timber	<u>Doors & Windows in timber</u> : Basic Carpentry joints, Various types and relevant construction details of single and double leaf- (Panel doors, Mosquito proof door, etc) shutter and windows/ ventilators, fixed glazing, with different types of hardware and accessories used. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.

	<u>Walls in timber</u> : Various types of timber frame walls, with details of joints and cladding. <u>Panelling</u>: Terminologies, Panelling methods with use of materials e.g. Timber and variety of timber products. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
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REFERENCE BOOKS

1. Barry, R. (1999). *The construction of buildings: Vol. 1: Foundations and oversite concrete, walls, floors, roofs*. New Delhi: Affiliated East-West Press.
2. Ching, F. D. K. (2014). *Building construction illustrated*. New York, NY: John Wiley & Sons.
3. McKay, W. B. (2013). *Building construction metric (Vol. 3)*. Chennai: Pearson.
4. Punmia, B. C. (2008). *Building construction*. New Delhi: Laxmi Publications.
5. Chudley, R. (1998). *Building construction handbook*. ELBS: England.
6. Sikka, V. B. (2010). *A course on civil engineering drawing*. Delhi: S.K. Kataria & Sons.

REFERENCE E- BOOKS & JOURNALS

1. Bureau of Indian Standards. (1972). *IS 1443: Code of practice for laying and finishing of cement concrete flooring tiles*.
2. Bureau of Indian Standards. (1968). *IS 5119-1: Code of practice for laying and fixing of sloped roof covering*.
3. <https://www.ultratechcement.com/for-homebuilders/home-building-explained-single/descriptive-articles/what-is-slab-and-types-of-slab>
4. <https://theconstructor.org/building/wood-as-construction-material/1242/>
5. <https://www.greenply.com/plywood-blockboard>

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=udnuUx0cwIQ>
2. https://youtu.be/vdPxRl8bK_0?si=9D_2wOUj1U-gv7nU
3. https://youtu.be/-f7tTNRH_04?si=AryphnDk_beIn_PS

SEMESTER-II														
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation						
				L	T	S/P	C	CIA				ESE		
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)
PAEC/ SEC	AR2253	Computer Application-I	Practical	1	0	2	2	0	0	0	50	0	50	50
														100

SUBJECT OBJECTIVE

1. To Impart skills of Computer Aided Design & Simulation in decision making in Architectural design.
2. To impart skills of presentation technique using computer as a tool

LEARNING OUTCOME

1. The students will Understand basic of Ms. Office.
2. The students will Understand CAD as a basic tool for Architectural Design.

MODULE	COURSE TOPICS
Module-1	Introduction to Ms. Office: Introduction to fundamentals of computer systems: hardware, devices, operating systems, application software etc in interior practice, understanding and application of like MS Office, Word, Excel, Power point).
Module-2	Practical on MS Office: Exercises on MS Office and its detailed components with Reports.
Module-3	Introduction to Basic Auto Cad 2D Linework: Introduction to commands under various menu, task and tool bars and their application to draw computer aided drawing and saving soft copy file of objects given, with use of appropriate input device. Detailed Report on commands.
Module-4	Practical on Auto Cad 2D Linework: Hand on exercises on Auto Cad 2D small scale spaces linework etc.

REFERENCE BOOKS

1. Mastering AutoCAD 2010 and AutoCAD LT 2010", George Omura, Wiley, 2009.
2. Mastering AutoCAD 2017 and AutoCAD LT 2017, [George Omura](#) & [Brian C. Benton](#)
3. 100 CAD Exercises - Learn by Practicing!: Learn to design 2D and 3D Models by Practicing with these [Artes Jason](#).

REFERENCE E-BOOKS & JOURNALS

1. Microsoft Office 365: In Practice" by Randy Nordell
2. Microsoft Office 365 for Dummies" by Rosemarie Withee
3. <https://damassets.autodesk.net/content/dam/autodesk/www/shortcuts/autocad/AutoCAD-Shortcuts-Guide-Autodesk.pdf>
4. <https://www.amazon.in/Exploring-Microsoft-Office-Illustrated-Practical-ebook/dp/B08HR6G2D5?utm>
5. **AutoCAD 2022 Instructor"** by **James Leach & Shawna Lockhart**
– Suitable for self-study and includes both theory and practical exercises.

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=gTEemDI04Zw>
2. <https://www.youtube.com/watch?v=2MCmn2L50o&t=1196s>
3. <https://www.youtube.com/watch?v=rtkyNGEQXD4>
4. <https://www.youtube.com/watch?v=EFIVQTyKpco.Full>
5. <https://www.autodesk.com/campaigns/fusion-360/try-free>

SEMESTER-II														
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation						
				L	T	S/P	C	CIA				ESE		
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)
PC	AR2254	Visual Arts-II	Practical	1	0	2	2	0	0	0	50	0	50	100

SUBJECT OBJECTIVE

1. To develop free hand skills - Drawing people and transport from imitation, observation recapitulation.
2. To develop Rendering Techniques – rendering architectural drawings.

LEARNING OUTCOME

1. Students will develop art and graphic skills.

MODULE	COURSE TOPICS
Module 1	Free hand sketching and drawing: human figure - free-hand average measurements of human body in different postures, its proportion and graphic representation, application in design of simple household and street furniture.
Module 2	Perspective – Drawing and rendering of different types of eye views, Interior and exterior, street views, building facades, public squares.
Module 3	Digital Graphics – Introduction to digital graphics, LOGO Design, Visiting Cards, Poster Design, Digital Illustrations.
Module 4	Experimental Exercises – Collage, Montage, Art installations. Techniques of paper tearing, cutting, folding to make art pieces.

REFERENCE BOOKS

1. Sketching and Drawing - A Personal View - Ravi Paranjape
2. *Hand-drawn Perspectives and Sketches: Architectural Rendering* edited by Sarbjit Bahga
3. *The Vignelli Canon* by Massimo Vignelli
4. The Elements of Graphic Design by Alexander W. White Published by Allworth Press
5. Rendering with pen and ink by Arthur L. Gupitill.

REFERENCE E-BOOKS & JOURNALS

1. The Shape of Design by Frank Chimero

-
2. Graphic Design School: The Principles and Practice of Graphic Design by [David Dabner](#) , [Sandra Stewart](#) , [Abbie Vickress](#)
 3. *Observational Sketching: Hone Your Artistic Skills* by Mariko Higaki

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=6tr-ofZgeeI&list=PLdehJOLkAf3AJWIlgzFAHstkGpW37CnoV>
2. <https://www.youtube.com/watch?v=S5rHnvOQWJw>
3. <https://www.youtube.com/watch?v=ToekbxhK-z0>
4. <https://www.youtube.com/watch?v=VTbGMnC2E30>
5. <https://www.youtube.com/watch?v=dd0kZmS4WYI>
6. <https://www.youtube.com/watch?v=YeI6Wqn4I78>
7. <https://www.youtube.com/watch?v=X2dwgNDEmVM>

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2301	Architectural Drawing-III	Theory	1	1	2	4	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To develop greater perception of complex Architectural forms and buildings.
- To develop the skill of making perspectives of complex buildings and Rendering them in different media.

LEARNING OUTCOME

- Students will be able to understand different types of presentations techniques by manual and by using software (Autocad or Photoshop)
- Students will be able to know perspective drawings with sciography.

MODULE	COURSE TOPICS
Module 1	“1-point” and “2-point” perspectives with Sciography: “1-point” and “2-point” perspective of “Lines and planes” with sciography in presence of “point sources and sun light”. “1-point” and “2-point” perspective of solids (prism & pyramid) with sciography in presence of point sources and sun light. “1-point” and “2-point” perspective of complex boxes with sciography in presence of sun light. 1 point perspective of exterior of a building (residence) by measuring point method with sciography in presence of sun source of light .
Module 2	“1-point” and “2-point” perspectives by Measuring Point Method: “1-point” and “2-point” perspective of Interior & exterior of a building (residence) by measuring point method with sciography in presence of point sources & sun light .
Module 3	Rendering techniques and presentation techniques (By Manual): : Introduction to different textures and finishes in plan and elevation. Graphical representation of furniture, automobiles, human figure etc. in plans and elevation. Preparation of presentation drawings of small buildings, through Plans, Elevation, Section, Site plan etc., using various rendering techniques and media, incorporating sciography for creating depth.
Module 4	Presentation techniques (By using Autocad or Photoshop): Presentation drawing of small building (residence) through Site Plan, ground floor plan, terrace plan, 4 side elevation and 2 section etc., using AUTOCAD or PHOTOSHOP, incorporating sciography for creating depth in building. Study of typical sciography of complex blocks & building elements using sketchup software

REFERENCE BOOKS

1. Bernard Alkins -147, Architectural Rendering, Walter Foster Art Books, 1986.
2. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, NY 1975
3. I.H. Morris, Geometrical Drawing for Art Students -Orient Longman, Madras, 2004.
4. Peter Schiessl : Corel DRAW 2020 - Training Book with many Exercises
5. Robin Whalley : Photoshop Layers: Professional Strength Image Editing

REFERENCE E- BOOKS & JOURNALS

1. Light, Shade and Shadow (Dover Art Instruction) by [E. L. Koller](#)
2. The Project Gutenberg eBook, The Theory and Practice of Perspective, by George Adolphus Storey
3. Creative Perspective for Artists and Illustrators (Dover Art Instruction) by Ernest W. Watson

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=GbV9IV8Q7I8>
2. https://www.youtube.com/watch?v=DiA_57UF7jo
3. <https://www.youtube.com/watch?v=CcvPMg6IBgs>
4. <https://www.youtube.com/watch?v=UH3vgamrD8>
5. https://www.youtube.com/watch?v=S8RwyQovt-E&list=PLUmGIca4HGqZKHjBZtL_zHjh2HBoBNerA
6. <https://www.youtube.com/watch?v=8XLgmiExAbw>

SEMESTER-III					
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching	Scheme of Evaluation

				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2302	Architectural Structure-III	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To understand the analysis of indeterminate structures and their application in structural design and analysis.

LEARNING OUTCOME

- The students will familiarize with the effects of transverse forces such as shear force & bending moment in beams; determination of SF & BM in simple beams under different loading.

MODULE	COURSE TOPICS
Module-1	Introduction to Structure Analysis Introduction, Determinate Structures, Indeterminate structures
Module-2	Elastic Theorems & Energy Principals Introduction, Potential energy, General principles, Principles of superposition.
Module-3	Fixed & Continuous Beams and Portal Frames Introduction, Analysis of continuous beams and portal frames, Reactions at the supports, Effects of sinking of supports.
Module-4	Fixed & Continuous Beams and Portal Frames (continued) Analysis of continuous beams and portal frames by 3M equation, Slope deflection method, Moment distribution method

REFERENCE BOOKS

- Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
- Punmia P. C., "Strength of Materials & Mechanics of Structures".
- Khurmi R. S., "Strength of Materials".
- Senol Utku, "Elementary Structural Analysis".
- Rama Armarutham S., "Strength of Materials".
- C.K. Wang, "Theory of Structures".

REFERENCE E- BOOKS & JOURNALS

- Scribd** – **Structural Analysis** **Lecture** **Notes**
Includes potential energy principle, elastic systems, strain energy formulas
en.wikipedia.org+4scribd.com+4scribd.com+4.
- Scribd** – **Structural Analysis** **Lecture** **Notes**
Fixed/continuous beam analysis, portal frames, accounting for support sinking
en.wikipedia.org+15scribd.com+15scribd.com+15.
- CivilEngineeringX** – **Continuous Beams & Frames**
Explains portal method assumptions and sway handling
civilengineeringx.com+1studocu.com+1.

4. **MadridWhilve** **Blog** – **Continuous** **Beams** **via** **Slope** **Deflection**
Worked problems on beams and frames
madridwhilve.blogspot.com+15en.wikipedia.org+15en.wikipedia.org+15.
5. **StructuralLearnings** **Blog** – **Portal** **Frame** **via** **Slope** **Deflection**
Step-by-step frame analysis guide
scribd.com+10structurallearnings.blogspot.com+10reddit.com+10.
6. **Scribd** **PPT** – **Slope** **Deflection** **Method**
Clear presentation slides with formulas and sample problems
scribd.com+3scribd.com+3scribd.com+3.

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/@nptelhrd/playlists?view=50&sort=dd&shelf_id=14
2. https://www.youtube.com/playlist?list=PL9RcWoqXmzaJ_MDDo1KlkPoqg0tZgxEZY
3. <https://www.youtube.com/@TheEfficientEngineer>
4. <https://www.youtube.com/playlist?list=PLaLOVNqqD-2GQ37lduqY43dhMZYyJ3NNNo>
5. <https://www.youtube.com/@gillesaniaengineeringvideos/playlists>

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2303	History of Architecture & Culture-II	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- 1.To gain knowledge of the development of architectural form with reference to technology, style and character in various aspects of Hindu & Jain architecture.
- 2.To comprehend and analyze spatial character, scale, and structure through historical and traditional built heritage.
- 3.To comprehend and relate to the theoretical basis of historical and traditional Hindu architecture.

LEARNING OUTCOME

- 1.To provide an understanding of the evolution of, Indian Architecture in its various stylistic modes characterized by technology, ornamentation and planning practices.
- 2.Combined influence of geology, geography, climate, beliefs, religion and culture on the architecture must be highlighted so as to appreciate how architecture is embedded in place-specific context.

MODULE	COURSE TOPICS
Module 1	Hindu Architecture- Indo-Aryan: Development of fortification, walled towns, settlement patterns and the causative factors. Role of Shilpasasthras in settlement planning. The evolution of the temple form, evolution of the shikhara in north India. The three schools of architecture-the Gujarat, the Khajuraho, and the Orrisan styles. Comparison in spatial attributes, scale and detail.
Module 2	Hindu Architecture Dravidian: Development of fortification, walled towns, settlement patterns and the causative factors. Role of Shilpasasthras in settlement planning. The evolution of the vimana and the contributions of the Chalukyas, the Pallavas, the Pandyas, the Cholas, The Satavahana, the Hoysala and the Vijayanagara. The contributions of the Nayaks to the temple cities. The city morphology, spatial diversity and planning criteria.
Module 3	Hindu Theory: Hindu philosophy and its imprint in temples/traditional houses and other built structures. Mandala and the geometric grid in temple plans. The proportional theory in temple elevation.
Module 4	Buddhist Architecture: The Buddhist philosophy and its imprint in built space. Typology of lats, eddicts, stupas, viharas, and chaityas, both in rock-cut or otherwise. The techniques used for rock-cut spaces and free standing built masses. The spatial and functional connotations.
Module 5	Jain Architecture: The temple cities of Palitana, Mount Abu and Girnar. The Jain philosophy and its imprint in built form. The Jain mandalas.

REFERENCE BOOKS

1. K. V. Soundra Rajan, Indian Temple Styles: the personality of Hindu Architecture.
2. Giles Henry Rupert Tillotson (ed.), Paradigms of Indian architecture: Space & Time in Representation & Design, Psychology Press, 1998.
3. Adam Hardy, Indian temple Architecture- form & transformation, Abhivav Publications, 1995.

REFERENCE E- BOOKS & JOURNALS

1. **Building Science of Indian Temple Architecture** – Covers *mandala grid, temple plans, proportions, shikhara dynamics* [reddit.com+8researchgate.net+8clearias.com+8](https://www.researchgate.net/publication/348888888)
→ Ideal for **Hindu Theory**: geometry, mandala, proportional systems.
2. **Evolution of Bhumija Shikhara and Distribution of Bhumija Shrines in India** – Details *North Indian shikhara typology*, including Bhumija, Latina, Sekhari [researchgate.net](https://www.researchgate.net/publication/348888888)
→ Essential for **Indo-Aryan** shikhara development.
3. **Symbolism in Hindu Temple Architecture and Fractal Geometry** ('Thought Behind Form') – Discusses *cosmic geometry, fractals, temple symbolism* [researchgate.netresearchgate.net+3researchgate.net+3arxiv.org+3](https://www.researchgate.net/publication/348888888)
→ Supports **Hindu Theory**: cosmological symbolism and proportion.
4. **The distinguishing characteristics of Dravidian architecture** (ResearchGate PDF) – Covers *vimana, gopuram, Pallavas, Cholas, Pandyas, Vijayanagara, Nayaks* [re-thinkingthefuture.com+15researchgate.net+15researchgate.net+15](https://www.researchgate.net/publication/348888888)
→ Crucial for **Dravidian** module and settlement/spatial planning.
5. **Indian Architecture in Concept and Execution – Case Study of Dravidian Temple Architecture** (Scribd PDF) – In-depth on *vimana, mandapa, Dravidian styles* [scribd.com+1clearias.com+1](https://www.scribd.com/document/348888888)
→ Valuable for **continued Dravidian** study and technical details.
6. **Fractal Geometry as the Synthesis of Hindu Cosmology in Kandariya Mahadev Temple, Khajuraho** – Showcases *spatial geometry, mandala patterns, temple form evolution* [en.wikipedia.org+2scribd.com+2researchgate.net+2](https://www.wikipedia.org/wiki/Khajuraho)
→ Bridges **Hindu Theory** and comparison of Indo-Aryan temple schools.
7. **Development of Jain Architecture from Caves to Temple Architecture in Maharashtra** – Explores *Jain philosophy, spatial forms, mandala layouts* [scribd.com+6clearias.com+6researchgate.net+6researchgate.net](https://www.scribd.com/document/348888888)
→ Covers **Jain Architecture** and associated temple-city design.

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=qFYCxsWIWkI>
2. https://www.youtube.com/watch?v=DiToaY_yxIk
3. <https://www.youtube.com/watch?v=7vEvvnrfEV8>
4. <https://www.youtube.com/watch?v=CG6pXP4XnwI>
5. <https://www.youtube.com/watch?v=gJrusmq0AsI>
6. <https://www.youtube.com/watch?v=6FsufME25EM>
7. <https://www.youtube.com/watch?v=u114ahh0O88>
8. <https://www.youtube.com/watch?v=YbwMTgj6jto>
9. <https://www.youtube.com/watch?v=DmVrU-dADwI>
10. http://myhoteltube.com/watch/visit-ranakpur-jain-temple-rajasthan-tourism-india_kD7q3yOBiaSpbCi.html
11. <https://www.youtube.com/watch?v=dmR-pPQWHYc>

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2351	Architectural Design - III	Practical	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

- 1.To explore the interrelationship between human behavior and space in a small environment, including, volume of space, shape, form, function and materials
- 2.To understand architectural form, space and related qualities, exploration through fenestrations and facade treatment, material and expression
- 3.To assimilate the modifying spatial qualities of indoor & outdoor spaces due to varying configurations.

LEARNING OUTCOME

1. The students will be trained to understand the various issues which arise while designing a double storied RCC building.
2. Students are encouraged to understand the interrelationship between human behavior and space
3. They are expected to explore through their design exercise, volume of space, shape, form, function and material sensitivity

MODULE	COURSE TOPICS
Module 1	Introduction: The students are expected to design a low rise building in a specific site, for a small Indian joint family in urban setting. The projects investigate the study of built form, function, activity, and its relationship to the site and surroundings, material, and construction technology. Introduction of short span structural systems that inspire form oriented built forms.
Module 2	Design considerations: Introduction to design considerations for natural light, ventilation, etc surrounding physical environment in creation of simple multi-cellular architectural forms.
Module 3	Interpretation and configuration of spaces: Lecture on interpreting spatial configuration for specific design programme. Configuration of spaces preferably on single floor organized on basis of functional, geometric and visual order.
Module 4	Settlement Study: Analysis of the selected settlement with relationship to human scale, activity, space & form & other parameters pertaining to spatial aspects.
Suggested studio exercises	Time problems like LIG Houses (1DAY) Time problem like Tourist Cottages etc. (1 Day), Minor Problems like design of college canteen, petrol pump, Gate complex to be structural system based. (1 WEEK), Major Problems (2 IN NUMBER) like Design of buildings like Farm house, Tourist Cottages, Haat, Art

	Gallery, Exhibition Center, Library, Primary Health Center, Recreational Club, Small resort, neighborhood shopping centre etc. Study tours to relevant urban destinations for primary documentation.
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NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Ching, Francis D.K. Form Space & Order.
2. Rappoport, Amos. House Form & Culture.
3. Ahmet Hadrevic, Structural systems in Architecture
4. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachusetts.
5. Oliver, Paul. Shelter & Form.
6. Fathy, Hasan. Natural energy & vernacular architecture.
7. Housing projects by Geoffery Bawa, Charles Correa, B.V. Doshi among others
8. Antoniades, C. Anthony, "Epic Space: Towards roots of Western Architecture", John Willey & Sons, 1992
9. Schulz, N. C. (1985). The concept of dwelling. New York : Rizzoli International Publications.
10. Unwin S. (2010). Twenty Buildings every Architect should understand. New York : Routledge

REFERENCE E- BOOKS & JOURNALS

1. "The Hidden Dimension" by Edward T. Hall Available as eBook on [Google Books](#)
2. "Architecture: Form, Space, and Order" by Francis D.K. Ching Available as eBook on [Google Books](#)
3. "Designing for Human Behavior: Architecture and the Behavioral Sciences" edited by Jon Lang Available as eBook on [Google Books](#)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/@30by40>: Architectural Design Process
2. <https://www.youtube.com/@DamiLeeArch>: Architectural Design Process Explained
3. <https://www.youtube.com/@SurvivingArchitecture>: Develop Concept in Architectural Design
4. <https://www.youtube.com/@RanjeetMukherjeeArchitect> : Farm House, India

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2352	BUILDING CONSTRUCTION & MATERIALS-III	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110	150

SUBJECT OBJECTIVES

1. To develop a comprehensive understanding of **non-structural materials**.
2. To familiarize students with **adhesives** and their industrial applications.
3. To introduce techniques and **systems for temporary supports**.
4. To provide detailed **knowledge of roofing systems, materials and methods** and encourage hands-on awareness of construction tools, machines and safety protocols.

LEARNING OUTCOMES

By the end of the course, students will be able to:

1. Identify and differentiate various construction materials, compare different surface finishes and cladding techniques.
2. Demonstrate an understanding of temporary construction structures.
3. Interpret construction details for roofing systems and evaluate the performance of roofing materials with the application of safety measures and proper handling techniques.
4. Translate theoretical knowledge into practical detailing.

MODULE	COURSE TOPICS
Module 1 Materials	<u>Glass & Ceramics</u> : Manufacturing process, types, sizes, properties, available market forms and uses. <u>Surface (Wall) Finishes</u> : Paints & Varnishes- types, properties, applications and uses. <u>Cladding</u> : Dry cladding & Wet cladding and their materials (ACP, ceramic tiles, stone, HPL, GRC, etc). <u>Plastering, Jointing & pointing</u> : Types and applications.
Module 2 Adhesives	Adhesives: Natural Adhesives – Animal, Casein, Bituminous. Thermoplastic Adhesives – Polyvinyl Acetate. Thermosetting Adhesives & Plastics - Urea Formaldehyde, Phenol Formaldehyde, Melamine Formaldehyde, Resorcinol Formaldehyde, Epoxide Resins. Rubber Adhesive.
Module 3 Temporary Construction & Formwork	<u>Temporary Timbering</u> : Timbering of shallow trenches. Centering, Shuttering, Scaffolding and temporary supports. Shoring and Underpinning. <u>Types of formworks for concrete</u> : Formwork for column, beam and RCC slab.
Module 4 Types of Roof Coverings	<u>Roof covering materials</u> : Pot tiles, Mangalore tiles, Profile sheets -types, materials. <u>Roofs, Roofing & Terracing</u> : Construction of flat Roof (Tile & Batten, RBC, RCC). Filler slabs- properties, applications & construction techniques. Waterproofing and thermal insulation of roofs. Various Types of Trussed roofs in timber and their

	construction methods, Gutters, Ridge and Valley details. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
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REFERENCE BOOKS

1. Building construction handbook by "Chudley, R. & Greeno, R." Oxford Butterworth-Heinemann 1998.
2. Alternative Building Materials and Technologies by K.S.Jagdish, B.V.Venkatarama Reddy and K.S.Nanjunda Rao
3. Building Construction by Punmia, B.C., Jain, A.K., & Jain, A.K.
4. Building construction illustrated by "Ching, Francis D.K.", "CBS Publishers & Distributors," New Delhi: 1999
5. A text book of building construction by "Arora, S.P. and Bindra, S.P.", "Dhanpat Rai Publications," New Delhi: 2004
6. Building construction metric. v.4 by "Mckay, J.K. and Mckay, W.B." "Orient Longman," 2005. Mumbai: 2005

REFERENCE E- BOOKS & JOURNALS

1. http://ce.cet.ac.in/downloads/Study%20Material/Reinforced%20concrete%20structures%202018_BKR/%23014staircase.pdf Page 59 of 203
2. <https://people.utm.my/iznisyahrizal/files/2016/08/Lecture-1-Design-of-Staircase.pdf>
3. <https://www.iitk.ac.in/nicee/IITK-GSDMA/EQ12b.pdf>
4. Yeo, M. S., Samarakoon, S. M., Ng, Q. B., Ng, Y. J., Muthugala, M. A., Elara, M. R., & Yeong, R.W. (2021). Robot-Inclusive False Ceiling Design Guidelines. Buildings, 11(12), 600.
5. Zeleke, Y., & Rotich, G. K. (2021). Design and development of false ceiling board using polyvinyl acetate (PVAc) composite reinforced with false banana fibres and filled with sawdust. International Journal of Polymer Science, 2021.

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=66c9KAKYYXg>
2. <https://www.youtube.com/watch?v=hxakW1miEcM>
3. <https://www.youtube.com/watch?v=d3vELOKedxw>

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ SEC	AR2353	Computer Application-II	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To Impart skills of Computer Aided Design & Simulation in decision making in Architectural design.
2. To impart skills of presentation technique using computer as a tool

LEARNING OUTCOME

1. The students will understand basic of Adobe Photoshop.
2. The students will Understand CAD 2D as a basic tool for Architectural Design.

MODULE	COURSE TOPICS
Module-1	Introduction to Adobe Photoshop: To the core functionalities of Adobe Photoshop, equipping them with practical skills to effectively manipulate images, create realistic textures, and compose visually appealing layouts. Through hands-on exercises and project-based learning, students will explore techniques essential for digital visualization, enhancing their ability to communicate design concepts clearly and professionally.
Module-2	Introduction to Auto Cad 2D Advance: Advanced Drawing Techniques Polylines, splines, and advanced object creation Using grips and advanced editing commands (Stretch, Chamfer, Fillet) Construction lines and guides for precision. Layer Management and Properties: Creating and managing layers Layer states and filters. Layer transparency and freeze/thaw commands. Blocks and Attributes: Creating, inserting, and editing blocks Dynamic blocks and block attributes. Using block libraries for architectural symbols and furniture layouts
Module-3	Annotation and Dimensioning: Text styles and multi-line text (Mtext) Dimension styles and advanced dimensioning techniques Leaders and tables for project documentation. Advanced Editing and Object Management, External References (Xrefs) and Drawing Management, Plotting and Printing
Module-4	Practical on Auto Cad 2D Advance: Hand on exercises for Auto Cad 2D projects Residence, Layout of a Office, etc.

REFERENCE BOOKS

1. Mastering AutoCAD 2010 and AutoCAD LT 2010”, George Omura, Wiley, 2009.
2. Mastering AutoCAD 2017 and AutoCAD LT 2017, [George Omura](#) & [Brian C. Benton](#)
3. 100 CAD Exercises - Learn by Practicing!: Learn to design 2D and 3D Models by Practicing with these [Artes Jason](#).

REFERENCE E-BOOKS & JOURNALS

1. <https://helpx.adobe.com/content/dam/help/attachments/PhotoshopCC-KBSC.pdf>
2. <https://helpx.adobe.com/in/photoshop/using/default-keyboard-shortcuts.html>
3. <https://damassets.autodesk.net/content/dam/autodesk/www/shortcuts/autocad/AutoCAD-Shortcuts-Guide-Autodesk.pdf>
4. **AutoCAD 2022 Instructor"** by **James Leach & Shawna Lockhart**
– Suitable for self-study and includes both theory and practical exercises.
5. <https://3dcadclick.com/autocad-shortcut-keys/>

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=Pki4n8EPjJY&list=PLjVLYmrlmjGcyy-YEVdWCJ0ZqQwL5Y38a>
2. https://www.youtube.com/watch?v=V2_9rn4earo&list=PLjVLYmrlmjGcyy-YEVdWCJ0ZqQwL5Y38a&index=3
3. <https://www.youtube.com/watch?v=EFIVQTyKpco.Full>
4. <https://www.autodesk.com/campaigns/fusion-360/try-free>
5. https://www.classcentral.com/course/youtube-design-to-make-series-90453?utm_source=chatgpt.com

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2354	Visual Arts-III	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To develop an appreciation of Indian Arts & Crafts among the Students.
2. To develop the skills to design smaller elements of building.
3. To develop basic knowledge of 3D art like murals, sculptures etc.

LEARNING OUTCOME

1. Students will be able to present their work in different media and present works of masters of
2. Modern Architecture.

MODULE	COURSE TOPICS
Module 1	Study of artistic ornamentation and decorative motifs based on Indian architecture from earliest to Mauryan period, Gupta period, Mughal period and British period.
Module 2	Design of various objects Designing of gate, grill, railing, jaali, cornice, column, pediment, pedestal study on the basis of module 1
Module 3	Mural Design: Design of murals for different space and materials (terracotta, fresco, ceramics, etc.)
Module 4	Sculpture and 3D forms: Design and making of sculpture and 3D decorative objects with different material.

REFERENCE BOOKS

1. ABC of Indian Art- J.F.BLACKER.
2. A concise History of Indian Art - ROY C. CRAVEN.
3. Indian Painting: The Great Mural Tradition by Mira Seth.
4. The Materials and Methods of Sculpture – Jack C. Rich Published by Mineola, N.Y. : Dover Pub
5. The Story of Indian Art- S.K. Bhattacharya

REFERENCE E-BOOKS & JOURNALS

1. Ornamentation in Indian architecture : oriental motifs and designs
2. [Decoration and ornament, Architectural -- India -- Themes, motives](#) by [Allen Margaret Prosser](#)
3. Sculpture Making for Beginners by [Jeffrey Carney](#)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=m3S2Gpnku3I&list=PLTotFEE2ywN7niLXiM0vitUQcWv2DRuEh>
2. <https://www.youtube.com/watch?v=dIOMhpoXWIs>
3. <https://www.youtube.com/watch?v=TC3zyZZgIOk>
4. <https://www.youtube.com/watch?v=Oy6Cz3tRRBg>
5. <https://www.youtube.com/watch?v=k1SE25mURhc>
6. <https://www.youtube.com/watch?v=-hhEqU9FiJI>
7. <https://www.youtube.com/watch?v=r2LtL6k2ATk>
8. <https://www.youtube.com/watch?v=EkPWrczz7s&t=5s>
9. <https://www.youtube.com/watch?v=17uVY-scDHc>
10. <https://www.youtube.com/watch?v=YirNv5xOjfM>
11. <https://www.youtube.com/watch?v=j4SkbFzOppU>

SEMESTER-III															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2355	Building Byelaws	Practical	1	1	0	2	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. Familiarization with Development Control Rules and Building byelaws
2. To acquaint the students with various codes of practices/ acts relating to building construction.
3. To make the student appreciate the implications of issues emerging from an urban context.

LEARNING OUTCOME

1. To make students understand how to maintain the overall massing of the city in an urban context.
2. To familiarize student with development of design according to Control Rules and Building Bye laws of Local Authority.
3. To understand the plan approval process from the sanctioning authority.

MODULE	COURSE TOPICS
Module 1	Introduction : Historical background; Relevance; Definitions. ; NBC, Master and Zonal plan; Landuse etc .
Module 2	Building Regulations : General Building Requirements like Setback, Ground Coverage, Height, F.A.R., Density, Room sizes, Light and Ventilation etc.
Module 3	Procedure for obtaining Building Permit : Procedure for obtaining Building Permit (including online procedure)- compounding and completion certificate. Development Control rules including open spaces, road widths, junctions, parking norms, community facilities etc
Module 4	Fire Protection And Fire Safety Requirements : Classification of Buildings based on occupancy, Fire Zones, Types of construction, General requirements of all individual occupancies and General Exit requirements. Fire protection requirements for high rise buildings- 15m in height or above.
Module 5	Special Requirements : Special requirements for group housing, multistoried and special buildings like malls, multiplexes, convention centers, SEZ's etc. Norms for differently abled, senior citizen and children.

4. To make students aware about the various codes of practices and different acts regarding the construction of building
5. To make students aware about the Norms and standards for different typology of users.

REFERENCE BOOKS

1. **National Building Code of India (NBC) 2016**

2. **State and Local Building Byelaws:** For example, if you're in Lucknow, Uttar Pradesh, you'd look for the "Uttar Pradesh Building Construction and Development Byelaws." (As of May 2025, new byelaws for UP were likely to be released, so always check for the latest version). You can typically find these on the websites of:

State Urban Development/Housing Departments

Municipal Corporations/Local Urban Bodies (e.g., Lucknow Nagar Nigam, Delhi Development Authority (DDA), Jaipur Development Authority, etc.)

REFERENCE E- BOOKS & JOURNALS

1. **Journal of Building Engineering (Elsevier)** <https://www.journals.elsevier.com/journal-of-building-engineering>
2. **International Journal of Civil Engineering and Technology (IJCIET)** Search for keywords: "building byelaws", "urban development", "building regulations"
3. **Springer – Urban Forum** Publishes on urban planning including land use and building regulation impacts. <https://www.springer.com/journal/12132>
4. **ResearchGate-** <https://www.researchgate.net/> Use search terms like “building byelaws India”, “NBC compliance”, “urban planning codes”

REFERENCE YOUTUBE LINKS

1. Building Bye-Laws | Civil Guruji-<https://www.youtube.com/watch?v=3yT4tWBiYZ8>
2. NBC of India Explained | GATE Academy-<https://www.youtube.com/watch?v=JuJrjBiKFOo>
3. Building Byelaws in Architecture | Archi Edu-<https://www.youtube.com/watch?v=2sGnuw9FFAY>
4. Urban Planning and Building Byelaws | NPTEL Lecture-<https://www.youtube.com/watch?v=6zQUy5TBftM>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2401	Building Services-I	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To equip the students of architecture about the building services related to water supply and building sanitation, so as to enable them to comprehend the subject thoroughly and integrate the learning into architectural design.

LEARNING OUTCOME

- Students will be able to understand principles of water supply and sanitation
- To familiarize the student with plumbing bye laws as per BIS.

MODULE	COURSE TOPICS
Module 1	Water Supply : Water Supply Introduction, types of sources, yield & spacing of wells, intakes, pumping and transportation of water. Treatment of water, qualities of potable water. Domestic water distribution system, reservoirs, supply system layouts, Pipe appurtenances, pumps, pumping plants, overhead tanks, water demand calculations. Building service connection, Ferrules, Water meters. Layout of domestic water piping systems, joints, fittings and valves. Cold & hot water lines in buildings, Water supply to high rise buildings: problems encountered & systems adopted.
Module 2	Sanitary Engineering : Purpose and Principles of sanitation, collection and disposal of various kinds of refuse from buildings. Garbage and sewage disposal. Methods of carrying refuse, systems of refuse disposal, their principles. Plumbing definitions and related terms, plumbing systems (one pipe, two pipe etc), House drainage system, Drainage of sub-soil water. Inspection chambers, Manholes, Sub-drains, culverts, ditches and gutters, drop inlets and catch basins, roads and pavements, storm overflow/regulators. Sanitary appliances, Traps their variety, Pipes and joints, Sanitary pipes works below and above ground level.
Module 3	Plumbing : Basic principles of Plumbing, need, scope, terminology. Specifications and installation of sanitary fittings like wash basins, water closets, urinals, bidets, sinks, etc in buildings. Uses of gate valve, float valve, flap valve, ball valve, flush valve, etc, different types of taps, faucets, stop cocks, bib cocks, 'P', 'Q', 'S', floor/bottle traps used in buildings.
Module 4	Design of Plumbing Systems : Design of Plumbing Systems Design considerations on drainage scheme. Planning of bathrooms, lavatory blocks and kitchen in domestic and multi-storeyed buildings. Preparation of plumbing drawings, symbols commonly used in these drawings.

REFERENCE BOOKS

- The construction of building by Barry-vol.-5
- Water supply and Sanitation by Charanjit Shah
- Water supply & sanitary Engineering by S.C.Rangawala
- Water supply & sanitary Engineering by S. K.Hussain

5. Convergence for Sustainability - Sustainable Drinking Water Supply Sanitation by Min. of Rural Development – Publisher - Government of India

REFERENCE E- BOOKS & JOURNALS

1. Textbook of Water Supply and Sanitary Engineering by S. K. Hussian
Publisher - CBS Publishers & Distributors (3rd ed, 2017)
2. Water Supply and Sanitation by Athar Hussain & Alpana Gupta
Publisher - I K International Pvt Ltd (2023)
3. A Textbook of Water Supply Engineering (Environmental Engineering I) by Dinesh Prasad Bhatt, Laxmi Pant Bhatt & Basant Lekhak
Publisher - Dreamland Publication Pvt. Ltd., Kathmandu (3rd ed, July 2024)
4. Journal of Water, Sanitation and Hygiene for Development
Publisher - IWA Publishing (ISSN 2043-9083 print / 2408-9362 online)
5. International Journal of Hygiene and Environmental Health
Publisher - Elsevier (8 issues/year; impact factor ~7.4 in 2021)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=gnAVVJf3vYI>
(Water Supply Engineering – Introduction | NPTEL Civil Engineering)
2. <https://www.youtube.com/watch?v=sAbRg3nYqmg>
(Sanitation and Public Health | WHO)
3. <https://www.youtube.com/watch?v=7D1kUGz4YZU>
(Water Supply System | How it Works | Engineering Explained)
4. <https://www.youtube.com/watch?v=IjaMBvBlh1Y>
(Basics of Wastewater Treatment | NPTEL)
5. https://www.youtube.com/watch?v=2z7o3s_hjPA
(Understanding Urban Water Supply & Sanitation in India | Development Alternatives)

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2402	Architectural Structure-IV	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

1. To understand the basic principles of R.C.C. structures and soil mechanics and their application in structural design and analysis.

LEARNING OUTCOME

1. The student will have the knowledge about reinforced cement concrete and its applications in buildings and will be aware of the methods of designing various structural members using reinforced cement concrete.

MODULE	COURSE TOPICS
Module-1	Introduction to RCC Introduction to RCC design, characteristics of RCC, assumptions, nominal mix, Design mix. Neutral axis; balanced, under & over reinforced sections.
Module-2	Design of Reinforcement in Beams Design of singly reinforced beams for flexure, shear & bond. Concept of doubly reinforced beams and design. Requirement of good detailing of reinforcement.
Module-3	Basic Concepts and design of different types of slab Concepts and design of different types of slabs spanning in one direction, two directions.
Module-4	Elements of Soil Mechanics Elementary Soil Mechanics Classification of Soil, Properties of Soil, Safe bearing capacity, Active & Passive earth pressure.
Module-5	Types of foundations. Foundation at different levels- Piles, Pile Cap and pile load test.

REFERENCE BOOKS

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".
4. Senol Utku, "Elementary Structural Analysis".
5. Rama Armarutham S., "Strength of Materials".
6. Neelam Sharma, "Reinforced Concrete"
7. IS 456:2000
8. N. Krishna Raju, "Renforced Concrte : Limit State Method"
9. KR Arora, "Soil Mechanics And Foundation Engineering"

REFERENCE E- BOOKS & JOURNALS

1. **Scribd – Euler & Rankine Column Notes**
Covers slenderness ratio, equivalent length KKK, Euler critical loads, and Rankine formula with solved examples.

- [researchgate.net+15researchgate.net+15civilengineerdk.com+15ro.scribd.com+1de.scribd.com+1](#)
2. **CivilEngineerDK – Design of Singly & Doubly Reinforced Beams**
Equation-based approach with clear parameter definitions.
[reddit.com+9civilengineerdk.com+9pdfdrive.to+9pdfdrive.to+1fppengineering.com+1](#)
 3. **FPPEngineering – Singly Reinforced Beam Example (BS 8110)**
Comprehensive worked example of beam design including flexure, shear, bond, and deflection checks. [reddit.com+6fppengineering.com+6constructionhow.com+6](#)
 4. **ResearchGate – Foundation Design: Principles & Practices (Mandolini, 2024)**
Offers deep insight into pile foundations, bearing calculations, t-z curves, and shaft resistance.
[ro.scribd.com+5researchgate.net+5researchgate.net+5](#)
 5. **Scribd – Foundation Design & Construction Guide**
Includes methods for load transfer, elastic-continuum models, and construction considerations.
[en.wikipedia.org+15ro.scribd.com+15reddit.com+15](#)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/playlist?list=PL51300B0778FB5784>
2. <https://www.youtube.com/playlist?list=PLRq6Z9d0kCT8PCLAQiRXIoXJ14b3RcgUc>
3. <https://www.youtube.com/playlist?list=PLUiitznCET3arqfKDSMzXMuyL87WbNRqy>
4. <https://m.youtube.com/watch?v=gqLB433PCJc&pp=ygUWI2ZvdW5kYXRpb25lbmdpbmVycmluZw%3D%3D>
5. <https://www.youtube.com/playlist?list=PL1FxFZac80RiwHNIG3i9zN7pACplyVM8xz>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2403	History of Architecture & Culture-III	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

1. Understanding of the period in terms of its location, climate as well as the socio-cultural, historical, economic and political influences of the time.
2. Study of the building 'types' and the development of architectural form and character based on the developments in construction and technology exemplified through specific building examples that identify the works of the period.
3. Understanding the intentions of the period and architects as a solution to the need or demands of the period.

LEARNING OUTCOME

1. The study must enable students to do a comparative evaluation of developments in a chronological manner along the timeline and across different geographies.
2. The students will learn the chronological evolution and impacts of geographic, climatic, geological, religious, political and socio-cultural backgrounds of medieval architecture – in relationship to materials and techniques of construction.

MODULE	COURSE TOPICS
Module 1	Introduction: Introduction and understanding of 'Islam's' philosophy and its interpretation in building type e.g. mosque, tomb, fort and their elements like domes, minarets, arch, squinch etc.
Module 2	The Sultanate Style: With reference to the Slave, Khalji, Tughlaq, Sayyid, Lodhis and Shershah Suri regimes (who ruled from Delhi) and their Architecture. Development of basic mosque and tomb prototypes.
Module 3	Provincial Architecture: Development of colloquial styles in various provinces of India like Punjab, Jaunpur, Gujrat, Bengal, Bijapur, Bidar and Deccan. Cities and Citadels: Morphology of fortified cities of Jaisalmer, fort/ palaces like Mandu, Chittorgarh, Orchha, Datia, Jodhpur etc. with an overview on architectural types like havelis, stepwells, gates, baradaris etc.
Module 4	Mughal Architecture: The architecture of the Timurids in India- Babur, Hamayun, Akhbar, Jahangir and Shahjahan. The proportions, structure systems, landscape, materials, scale and distinct features. The Oudh architecture, which was a blend of the Mughal style and the British features, in Lucknow and its environs. The manzils, baghs, kothis, imambaras, karbalas: their planning, materials and techniques.
Module 5	Colonial Architecture: The British architecture of the colonial days in India- the capitol at Delhi and the residency at Lucknow emphasizing on their planning criteria and architectural features.

REFERENCE BOOKS

1. Islamic Architecture in India, Satish Grover, Galgotia Publishing Company, 1996.
2. Percy Brown, "Indian Architecture (Islamic Period)", D. B. Taraporevala Sons and Co. Private Ltd., Bombay, India,

REFERENCE E- BOOKS & JOURNALS

1. **"Typological Study Of Domes In Islamic Architecture Of North India"** (ResearchGate PDF)
– In-depth structural analysis of domes, squinches, muqarnas across mosque, tomb, fort types
ru.scribd.com+2pwnonlyias.com+2reddit.com+2scribd.com+8researchgate.net+8de.scribd.com+8
2. **"Islamic Architecture and Arch"** (ResearchGate PDF)
– Covers arches, domes, architectural elements; ideal for understanding mosque and tomb typologies researchgate.net
3. **"Islamic Architecture: The Provincial Style Gujrat and Jaunpur"** (Scribd PDF)
– Details the development of provincial Indo-Islamic architecture in Gujarat and Jaunpur
researchgate.net+12ru.scribd.com+12scribd.com+12
4. **"Monuments, the State and Communities in India: Sultanate Monuments in Mehrauli"** (ResearchGate PDF)
– Case study of Delhi Sultanate era monuments covering Slave dynasty onward
en.wikipedia.org+5researchgate.net+5researchgate.net+5scribd.com+6selfstudyhistory.com+6edurev.in+6
5. **"UNIT-3 Provincial Styles"** (Scribd PDF)
– Discusses provincial styles of mosques (Ahmedabad, Jaunpur, Malwa, Deccan), rich in architectural detail reddit.com+8scribd.com+8it.scribd.com+8
6. **"Awadh Architecture"** (Scribd PDF)
– Covers Oudh (Awadh) architecture, including forts, imambaras, manzils, stepwells, bridges—blending Mughal-British features scribd.com+1reddit.com+1

REFERENCE YOUTUBE LINKS

1. <https://archive.nptel.ac.in/courses/124/106/124106009/>
2. https://www.youtube.com/watch?v=Jm00J7Bv_m4
3. <https://www.youtube.com/watch?v=9Vv-2D4W3eE>
4. https://www.youtube.com/watch?v=9Q5p-1bT_2o
5. https://www.youtube.com/watch?v=1d_e4C1o1b4
6. <https://www.youtube.com/watch?v=VI0g2X7p-Xo>
7. <https://www.youtube.com/watch?v=vV1p2T0m9Dk>
8. <https://www.youtube.com/watch?v=33L-l3Kj5sY>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2451	Architectural Design - IV	Practical	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

1. Understanding basic principles of grouping of units or buildings.
2. Understanding architecture as with focus on the use of local materials and construction techniques.
3. Understanding relationships of built spaces with the site surroundings and climatic conditions.

LEARNING OUTCOME

1. The students will be enabled to employ and integrate clustering of buildings and creation of open spaces.
2. The students will understand designing to the context of vernacular architecture.

MODULE	COURSE TOPICS
Module 1	Introduction and study: Understanding user generated factors for grouping; security, segregation, convenience, privacy, sharing, user-density etc. Study of mass and space within a cluster; length: width: height ratios of built mass and open spaces and their relationship.
Module 2	Analysis: Understanding dynamics of public buildings; activities of visitors and regular users. Providing for daily/regular, monthly, annual events and activities. Relating space and individual; human scale and urban scale. Societal aspirations for aesthetics and form.
Module 3	Design: Understanding vernacular architecture as an appropriate demonstration of geography and culture responsive architecture. Study of traditional designs and practices and upgrading same for use in contemporary situations.
Module 4	Incorporation of building services: Role of building services, construction methods, bye-laws, codes (NBC etc.) on building and site design.
Suggested studio exercises	Exercises on studies for grouping of activities in a public building. Time problems like MIG Houses.Rural / Tribal cluster (1DAY).Minor/Short Problems like design of Panchayati bhawan, small forest resort, primary health centre, old age home, Mela ground . (1 WEEK).Major Problems like Design of buildings like School, Community training centers .Study tours to relevant destinations for documentation of vernacular architecture.

NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Ching, Francis D. K. "Architecture : Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachusetts.
3. Ahmet Hadrevic, "Structural Systems in Architecture", Book Serj Publishing, South Karolina.
4. Vernacular Traditions: Contemporary Architecture, Ashok Lall

REFERENCE E- BOOKS & JOURNALS

1. "Architecture: Form, Space, and Order" by Francis D.K. Ching Available as eBook on [Google Books](#)
2. "Site Planning" by Kevin Lynch & Gary Hack Available as eBook on [Google Books](#)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=ZNyi2KzrErk>: Different Climatic Zones in India |, Building Design |Architecture Design
2. https://www.youtube.com/watch?v=zYex_djdTkk: https://www.youtube.com/watch?v=zYex_djdTkk
3. <https://www.youtube.com/watch?v=UEKQNsIAcgo>: Architecture as teacher | The 'Iolani School design and play-based learning
4. <https://www.youtube.com/watch?v=qbha0Hj9pWQ>: Alan Dale: Basic Elements of School Design
5. <https://www.youtube.com/watch?v=PCHKX0nxLj0>: Traditional Architecture Basics : What is Vernacular Architecture save to Liner

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
BS & AE	AR245 2	BUILDING CONSTRUCTION & MATERIALS-IV	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110	150

SUBJECT OBJECTIVES

1. To impart knowledge of interior and lightweight construction materials with the understanding of joinery and fitment details.
2. To provide a comprehensive understanding of door types, operational mechanisms, hardware and their construction processes.
3. To introduce students about the design and construction principles of staircases.

LEARNING OUTCOMES

By the end of this module, students will be able to:

1. Explain the properties, uses and installation methods and also able to differentiate between various false ceiling materials and systems.
2. Able to design and detail built-in furniture systems.
3. Comprehend the functioning and detailing of door operational mechanisms.
4. Identify and describe types and components of staircases.
5. Apply construction techniques using appropriate machines, hand tools and safety protocols.
6. Produce working drawings and technical documentation.

MODULE	COURSE TOPICS
Module 1 Materials	<u>Gypsum & Asbestos Products:</u> Gypsum Board, Gypsum Plaster, Components and Accessories. Jointing and Finishing. Understanding of various Asbestos Cement products available for application in building industry. <u>Aluminium :</u> Properties, different products, applications and uses in building industry.
Module 2 False Ceiling	<u>False Ceiling:</u> Types (Gypsum board, P.O.P, timber, Glass, Acrylic sheet, etc.), uses and their relevant details. Cabinets and Wardrobes. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
Module 3 Mechanical Doors	<u>Door (Operational Mechanism):</u> Complete understanding of operational mechanism (automatic and manual) of variety of Sliding door shutters, Sliding-folding door shutters, Revolving doors shutters, etc. with different types of hardware and accessories used. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
Module 4	Introduction to staircases, their constituent elements, and design. Types of staircases.

Staircases	Design and Construction of open well staircases in timber, RCC and steel.
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REFERENCE BOOKS

1. Building construction handbook by "Chudley, R. & Greeno, R." Oxford Butterworth-Heinemann 1998.
2. Alternative Building Materials and Technologies by K.S.Jagdish, B.V.Venkatarama Reddy and K.S.Nanjunda Rao
3. Building Construction by Punmia, B.C., Jain, A.K., & Jain, A.K.
4. Building construction illustrated by "Ching, Francis D.K.", "CBS Publishers & Distributors," New Delhi: 1999
5. A text book of building construction by "Arora, S.P. and Bindra, S.P.", "Dhanpat Rai Publications," New Delhi: 2004
6. Building construction metric. v.4 by "Mckay, J.K. and Mckay, W.B." "Orient Longman," 2005. Mumbai: 2005

REFERENCE E- BOOKS & JOURNALS

1. https://www.google.co.in/books/edition/Building_Construction_Materials_and_Tech/UteXDQAAQBAJ?hl=en&gbv=1&dq=building%20construction%20rcc&pg=PP1&printsec=frontcoverPage 75 of 203
2. https://www.google.co.in/books/edition/Principles_of_Reinforced_Concrete_Design/H9bhAwAAQBAJ?hl=en&gbpv=1&pg=PR2&printsec=frontcover
3. El-Reedy, M. (2009). Advanced materials and techniques for reinforced concrete structures. CRC press.
4. <https://haluminium.com/Product/aluminium-window-door-partition/&ved=2ahUKEwjFs-6336CGAxWISmwGHSK1DxoQFnoECGQQAQ&usg=AOvVaw0Rt9XqcTNAdpXCm5D56h34>
5. Yeo, M. S., Samarakoon, S. M., Ng, Q. B., Ng, Y. J., Muthugala, M. A., Elara, M. R., & Yeong, R.W. (2021). Robot-Inclusive False Ceiling Design Guidelines. Buildings, 11(12), 600.
6. Zeleke, Y., & Rotich, G. K. (2021). Design and development of false ceiling board using polyvinyl acetate (PVAc) composite reinforced with false banana fibres and filled with sawdust. International Journal of Polymer Science, 2021.
7. **"Design of Ramps"** by Usama Badawy (May 2023) – open PDF exploring design standards, usability, safety parameters for ramps [researchgate.net](https://www.researchgate.net)
8. **"Stair Design and User Interaction"** (MDPI journal, open access) – reviews ergonomic, aesthetic, and safety criteria in stair design [mdpi.com](https://www.mdpi.com)

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/xEpmCwaUp8>
2. <https://www.youtube.com/watch%3Fv%3DokIUT17-kMI&ved=2ahUKEwjL3ZXQ06CGAxVRafUHHQJ2BSkQwqsBegQICBAG&usg=AOvVaw1dVCF1fJbKFAeG0uZGfiTa>
3. https://www.youtube.com/watch?v=W0j_-sudJU&t=1840s

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ SEC	AR2453	Computer Application-III	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To Impart skills of Sketchup software according to the industry standard
2. To impart skills of presentation technique using computer as a tool

LEARNING OUTCOME

1. The students will understand Sketchup as a basic tool for Architectural Design, Presentation.

MODULE	COURSE TOPICS
Module-1	Introduction to Google Sketch up: Overview of Sketch Up interface and workspace. Basic navigation: orbit, pan, zoom. Drawing and editing basic 2D shapes, Creating 3D Models. Precision Modelling Techniques. Materials and Textures.
Module-2	Application to Google Sketch up: Materials and Textures Applying and editing materials Creating custom textures and patterns Using styles to enhance model appearance. Importing and Exporting, Architectural and Interior Design Applications.
Module-3	Introduction to 3D Rendering softwares Vray: Vray the fundamentals and advanced techniques of V-Ray rendering, focusing on creating high-quality, realistic visualizations tailored for architectural and interior design projects.
Module-4	Practical on Rendering software's Vray: Hand on exercises for Google sketchup with studio exercises

REFERENCE BOOKS

1. Sketchup for Architects (English,Paperback,Mirinda Earl Rustia)

REFERENCE E-BOOKS & JOURNALS

1. <https://helpx.adobe.com/content/dam/help/attachments/PhotoshopCC-KBSC.pdf>
2. <https://helpx.adobe.com/in/photoshop/using/default-keyboard-shortcuts.html>

3. <https://damassets.autodesk.net/content/dam/autodesk/www/shortcuts/autocad/AutoCAD-Shortcuts-Guide-Autodesk.pdf>
4. **AutoCAD 2022 Instructor"** by **James Leach & Shawna Lockhart**
– Suitable for self-study and includes both theory and practical exercises.
5. <https://3dcadclick.com/autocad-shortcut-keys/>

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/watch?v=I_bJPNnO3HQ
2. <https://www.youtube.com/watch?v=sQSyofKyKIQ>
3. <https://www.youtube.com/watch?v=EtoNW05yKfM>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2454	Elective-I	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2453(1) CRITICAL DESIGN THINKING

SUBJECT OBJECTIVES

1. To develop a structured and creative approach to problem-solving in architectural design through design thinking methodologies.
2. To enable students to ideate, evaluate, and refine architectural solutions based on key design principles such as functionality, aesthetics, and sustainability.
3. To cultivate effective communication, collaboration, and critical feedback skills for presenting and improving design concepts.

LEARNING OUTCOMES

By the end of the course, students will be able to:

1. Apply design thinking strategies to define, research, and reframe architectural problems from multiple perspectives.
2. Generate and analyze multiple design solutions using architectural principles, and assess their effectiveness through structured critique.
3. Communicate design ideas effectively through visual representation and peer/instructor feedback to refine and enhance final proposals.

MODULE	COURSE TOPICS
Module-1	Design Thinking for Architecture • Apply a model for solving any problem, large or small, in a creative and collaborative way. • Identify all aspects of a problem and examine its role in the problem. • Reframe a goal-oriented question. • Development of a research strategy.
Module-2	Brainstorming and Analysing Design Solutions • Brainstorming architectural solutions • Choose 3 possible options and analyse the advantages and disadvantages of each option on the basis of architectural principles like

	functionality, aesthetics, and sustainability. • Generate more effective solutions.
Module-3	Presenting and Refining Design Solutions • Explore the triggers and how they may show up in our reactions. • Identify potential responses that could trigger negative reactions. • Prepare design solutions with clear visuals and justifications. • Engage in peer and instructor feedback to refine and improve design solutions.

Suggested Book(s):

1. Creative Confidence: Unleashing the Creative Potential Within Us All by Tom Kelley, David Kelley, Published October 15th 2013 by Crown Business
2. Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation by Tim Brown, Published September 29th 2009 by HarperBusiness
3. Design Thinking: Understanding How Designers Think and Work, Nigel Cross, Published April 1st 2011 by Berg Publishers

Other Reference Material(s)/Ebook(s):

1. <https://commonedge.org/what-is-critical-in-architectural-practice-today/>
2. <https://speculativeedu.eu/critical-about-critical-and-speculative-design/>
3. <https://www.diva-portal.org/smash/get/diva2:1041796/FULLTEXT01.pdf>
4. https://www.researchgate.net/publication/334714904_Speculative_and_Critical_Design_-_Features_Methods_and_Practices
5. <https://dunneandraby.co.uk/content/bydandr/13/0>

Video Links:

1. <https://www.youtube.com/watch?v=RmC-gef9qLA>
2. <https://www.youtube.com/watch?v=q5gIMtyANnA>
3. <https://www.youtube.com/watch?v=6cDyDQwxIWM>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2454	Elective-I	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2454 (2) COMMUNICATION DESIGN

SUBJECT OBJECTIVES

1. To develop students' proficiency in verbal, written, visual, and digital communication tailored to architectural contexts.
2. To enhance critical thinking and analytical writing through case studies, literature reviews, and structured critique.
3. To foster the ability to advocate for design ideas and engage with diverse audiences, including communities and public stakeholders.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Demonstrate effective interpersonal and group communication skills, including interviews, discussions, and the design of questionnaires.
2. Produce well-structured critical and analytical writing such as case studies, book reviews, and literature reviews relevant to architecture.
3. Use visual, digital, and reprographic tools to create professional presentations and communication materials that advocate for architectural ideas in public and community settings.

MODULE	COURSE TOPICS
Module-1	Communication Skills • Interviewing techniques, framing questionnaires, group discussions.
Module-2	Critical Writing Skills Writing • Case studies, book reviews, literature reviews.
Module-3	Digital and Visual Communication

	• Business presentation, Illustration techniques -preparing flowcharts tables & diagrams ,books and magazine , film and television posters ,coverage etc, reprographic techniques.
Module-4	Architectural Communication and Advocacy • Understand the role of communication in design advocacy and outreach in community and public spaces.

Suggested Book(s):

1. Harris,M. (2001),Professional Architectural Photography . Focal Press.
2. Harris,M. (2002),Professional Interior Photography . Focal Press.
3. Adrian, D. and Christopher J. (2000). Language in Use – Upper intermediate. Self-study Work-book and Classroom Book. Cambridge : Cambridge University Press.
4. Dinsmore, G. A. (1968). Analytical Graphics. Canada : D. VanNostrand, Company Inc.
5. Edward, J. F. and Lee, J. (2000). Feature Writing for Newspapers and Magazines.4th Ed. Longman.

Other Reference Material(s)/Ebook(s):

1. <https://archimash.com/articles/communications-class/>
2. <https://architecturecompetitions.com/communicating-architecture/>
3. https://www.re-thinkingthefuture.com/career-advice/a2881-communicating-architecture-as-a-career-option-for-architects/#google_vignette
4. <https://design.nirmauni.ac.in/what-is-communication-design/>
5. <https://www.archerbuchanan.com/visual-communication-in-architectural-design/>

Video Links:

1. <https://www.youtube.com/watch?v=T1ofzVlhO2w>
2. <https://www.youtube.com/watch?v=3pjO0oYowkk>
3. <https://www.youtube.com/watch?v=kxtgSRUwbUM>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2454	Elective-I	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2454(3) APPLIED PSYCHOLOGY IN ARCHITECTURE

SUBJECT OBJECTIVES

1. To introduce students to the psychological principles that influence human perception and behavior in architectural spaces.
2. To explore the relationship between design elements—such as scale, form, color, light, and texture—and human cognitive and sensory responses.
3. To enable students to apply psychological insights to the analysis and design of residential, community, and public spaces for enhanced user experience.

LEARNING OUTCOMES

By the end of the course, students will be able to:

1. Understand how human senses and cognition respond to spatial design elements, both tangible and intangible.
2. Analyze architectural elements like form, scale, materials, and lighting through the lens of visual perception and psychological impact.
3. Apply psychological design principles in real-world contexts to evaluate and improve the functionality and emotional resonance of built environments.

MODULE	COURSE TOPICS
Module-1	Foundations of Architectural Psychology • How human senses respond to space design. • Tangible and intangible • Cognitive theory and behavioral impact
Module-2	Principles of design • design through the lens of psychological implications-

	• Scale and proportion • Volume, mass and spatial design
Module-3	Visual perception • Form, geometric and organic • Influence of Color, materials, texture, acoustics and lighting
Module-4	Applying Psychology in Architectural Design • Analysis of residence • Analysis of live building. • Applying architectural psychology principles to design personal, community, and public spaces for enhanced user experience.

Suggested Book(s):

1. Place Advantage /Applied psychology in interior architecture by Sally Augustin, PhD
2. Why architecture matters Psychology in Architecture/ Paul Goldberger, 2009
3. Psychology for Architecture | Architectural Psychologist/David V.Canter, 1974
4. Color Psychology and color therapy; A factual study of the influence of color on human life/
Faber
Birren, 2016
5. Welcome to your world: How the built environment shapes our lives /Sarah Williams
Goldhagen,
2017
6. Art as Therapy | Psychology in Architecture/Alain de Botton and John Armstrong, 2013

Other Reference Material(s)/Ebook(s):

1. <https://www.jerde.com/news/8452/architectural-psychology-what-is-it#:~:text=A%20key%20notion%20proven%20by,better%20known%20as%20architectural%20psychology.>
2. <https://amazingarchitecture.com/books/applied-psychology-of-architecture-the-secret-world-of-architects>
3. https://www.re-thinkingthefuture.com/architectural-community/a9295-what-is-architectural-psychology/#google_vignette
4. <https://truehomedesignbuild.com/the-truehome-method-architect-psychology/>

Video Links:

1. <https://www.youtube.com/watch?v=DviLdO6YyyY>
2. <https://www.youtube.com/watch?v=wX1hDP1vJmI>
3. <https://www.youtube.com/watch?v=yWuqO1iY1z4>

SEMESTER-IV															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
ECPE	AR2455	Interior Design	Practical	0	4	3	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To initiate students into theory and practice of Interior Design.
2. To familiarize students with modern materials and techniques useful for furniture and interior design.
3. design.
4. To appreciate early interventions in design of furniture

LEARNING OUTCOME

1. Understanding Interior as basic for design with respect to Function, comfort and aesthetics.

MODULE	COURSE TOPICS
Module 1	Introduction to Interior Design : Definitions related to interior design, review of enclosing elements like walls, floors, ceilings, openings, staircases, furniture & design elements such as color, light textures in interior spaces. Principles of interior design.
Module 2	History of Interior Design: Introduction to history of Interior & Furniture Design Study of furniture of great contemporary masters.
Module 3	Materials and Finishes: Study of Materials, Finishes & their applications in Furniture & other Interior Elements An in-depth understanding of the characteristics and workability of various materials used in interiors. Modern Interiors with respect to Materials Ceiling, Panelling, Furniture etc.
Module 4	Modular Furniture and Interior elements: Understanding innovation in Furniture & Interior Design Modern materials, Modular furniture, Fittings & fixtures.

Module 5	Space Designing: Analysis & Design of spaces with furniture. Analyzing existing designs of selected furniture on basis of ergonomics, user type, economics, material, joinery and maintenance to ascertain their suitability. Design furniture for specific use complying to the aforementioned formulated design criteria. Build scaled models of the designed furniture for better understanding of working and materials.
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REFERENCE BOOKS

1. Corky Binggeli, "Interior Design Illustrated", 3rd Edition Francis D.K. Ching,
2. Joseph De Chiara, Julius Panero, Martin Zelnik, "Time-Saver standards for Interior design and Space planning",
3. John F. Pile, "A History of interior Design"
4. Bridger May, Curt Sherman, "Architecture and Interior Design through the 18th Century : An

REFERENCE E- BOOKS & JOURNALS

1. Architectural Materials for Interior Design" by Norman Wirzba
2. Detail in Contemporary Furniture Design" by Drew Plunkett
3. Furniture Design" by Jim Postell
4. Human Dimension and Interior Space" by Julius Panero & Martin Zelnik
5. Ergonomics for Beginners: A Quick Reference Guide" by Jan Dul & Bernard Weerdmeester

REFERENCE YOUTUBE LINKS

3. <https://youtu.be/uGJdOEonKls>
4. https://youtu.be/ciasNgei_Pc
5. <https://youtu.be/2YMCQAUnfm4>
6. <https://youtu.be/xdgB6Hu3q0I>

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2501	Building Services-II	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

1. To understand the basic principles of physics of electricity and light.
2. To make them enable to draw the electrical layout with appropriate cross section of wires and illuminance calculations for residences.
3. To know the characteristics and applications of the different types of modern lamps and luminaires.
4. To familiarize the student with electrical bye laws as per NEC/BIS.

LEARNING OUTCOME

1. To develop the understanding of important Services in buildings, definitions and terms used, functioning and their applications in building
2. A fair understanding of space requirements and distribution of electrical service provisions.
3. The understanding of lighting principles and different electric light sources available.

MODULE	COURSE TOPICS
Module 1	Fundamental Electrical Concept : Fundamental principles of Electricity, voltage, amperage, wattage. Space and facility requirement for provision of electrical supply from State electricity mains for small scale projects. Study of Consumer control assembly, electrical load based on thumb rules, wiring systems, various electrical fittings and appliances. Load calculation and wiring diagrams. (System of supply & distribution; Methods of wiring - joint box and Loop-in; Systems of wiring – Batten, Capping and Casing, conduits Open and concealed. Circuits – Series and parallel, Simple circuits.) Wiring Material and Lighting Accessories: Wires and cables – materials, types, sizes, specifications, Main switch, M.C.B, Distribution Board, Meter, Fuse and types of fuses; Guidelines for installation of light fittings. Lighting accessories-switches, Ceiling rose, socket outlets, plugs, lamp holders. Architectural concepts and provision of Power transmission and supply for medium scale buildings , LT&HT lines, Indian Electricity Act. Study of sub stations, transformers, feeders, circuit breakers, bus bars, types of conductors, method of earthing, lightening arresters, electrical load, standby generators, Automatic relays etc.
Module 2	Distribution system : Study of sub stations, transformers, feeders, circuit breakers, bus bars, types of conductors, method of Earthing, lightening arresters, electrical load, standby generators, Automatic relays etc. Conceptual understanding of Electric supply and distribution for residences, group housing projects, High rise buildings, Institutional campus and other building typologies in medium scale.

	Principles of light and Illumination – Definitions and design concerns- Electromagnetic radiation, waves, nature of vision, Units of light, flux, solid angle, luminous intensity –utilization factor – depreciation factor, brightness, glare, Visual tasks, Factors affecting visual tasks.
Module 3	Electric light sources : Brief description, characteristics and application of different types of lamps, methods of mounting and lighting control. Classification of luminaries. Market survey for different types of Luminaires- manufacturers' data on luminaries.
Module 4	Lighting design : Lumen method and point by point method for lighting design. Study of spectral energy distribution, Luminous efficiency- color temperature – color rendering, Additive, subtractive color, lighting tasks and their application areas . Lighting concepts and tasks for different building typologies / spaces in small and medium scale.
Module 5	Electrical layout : Electrical layout for a residence and electrical layout for one of the medium sized building/layout based on thumb rule calculations and indexing at conceptual level. Lighting design concept and layout of a small space based on the identification of the lighting tasks.

REFERENCE BOOKS

1. National Building Code of India.
2. National Electrical Code.
3. Raina K.B. & Bhattacharya S.K., Electrical Design estimating and costing, New Age International (P) Limited, New Delhi, 2004.
4. Rudiger Ganslandt & Harald Hofmann, Handbook of Lighting Design, Druckhaus Maack, Lüdenscheid, 1992.
5. Kevin Kelly & Kevin O'Connell, Interior Lighting Design - A Student's Guide.

REFERENCE E- BOOKS & JOURNALS

1. Electrical Power and Light Design Coursebook, Author: Mohammed Ayman, Publisher: EEP Academy (Electrical Engineering Portal), 211 pp (PDF guide)
2. Electric Light Fitting: A Handbook for Working Electrical Engineers, Author: John W. Urquhart, Publisher: C. Lockwood and Son, London (1890; public domain)
3. Electric Wiring and Lighting, Authors: Chicago American School of Correspondence (George C. Shaad, Charles E. Knox), Publisher: American School of Correspondence, Chicago (1908; public domain)
4. Lighting Research & Technology, Publisher: SAGE Publications on behalf of the Society of Light & Lighting (UK)
5. Building Services Engineering Research and Technology, Publisher: SAGE Publishing for CIBSE

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=eoUha0APBJU> — Lighting Plan Review #1 (Commercial Building Electrical Design)

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2. <https://www.youtube.com/watch?v=rgk7UdEWMpQ> — Building Management System overview (discharge lamps, lighting systems)
 3. https://www.youtube.com/watch?v=z6_7jpO8zPE — Electrical design for high-rise buildings
 4. <https://www.youtube.com/watch?v=cVjyDgFrb2g> — Fire alarm system installation (part of building services)
 5. https://www.youtube.com/watch?v=Hf4M2_U9bCI — Lighting Plan Review (lighting design overview)

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
BS & AE	AR2502	Architectural Structure-V	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To understand the various structural elements and their application in structural design and analysis by LIMIT STATE METHOD.

LEARNING OUTCOME

- The students will familiarize with analysis of structural elements and exposed to practical aspects of design.

MODULE	COURSE TOPICS
Module-1	Analysis and Design of Flat Slab Analysis and basic concept of curved beams.
Module-2	Analysis and Design of R.C.C. Beam. Analysis and Design of R.C.C. continuous beam and detailing of its reinforcement.
Module-3	Analysis & Design of R.C.C. Column Introduction, Effective height of column, Assumptions, Minimum eccentricity, Analysis and design of short R.C.C. column under pure axial load as well as under axial load and bending moment and detailing of its reinforcement.
Module-4	Analysis and Design of R.C.C. Stairs Introduction, Type of stairs, Effective span of stairs, Loading on stairs, Analysis and design of stairs (dog legged with waist slab) and detailing of its reinforcement.
Module-5	Portal Frames and Reinforcement Detailing of Structural Elements

REFERENCE BOOKS

- Ashok K. Jain , “Reinforced Concrete” Limit State Design.
- M.L. Gambhir, “Fundamentals of Reinforced Concrete Design”.
- P.C. Varghese., “Advanced Reinforced Concrete Design”.
- Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain “R.C.C.Designs
- Neelam Sharma ,” Reinforced Concrete”
- IS 456:2000
- N. Krishna Raju, “ Reinforced Concrte : Limit State Method”

REFERENCE E- BOOKS & JOURNALS

- “**Design and Detailing of Flat Slab**” — comprehensive guide covering IS-456 approach, design & detailing, including drops & shear checks
[slideshare.net/15engineeringbooks.me/15reddit.com/15](https://www.slideshare.net/15engineeringbooks.me/15reddit.com/15).
- ResearchGate – “Analysis and Design of RCC and Post-Tensioned Flat Slabs” (Jan 2023)** — Explores behavior under loads and seismic actions
[reddit.com/15researchgate.net/15reddit.com/15](https://www.reddit.com/15researchgate.net/15reddit.com/15).

3. **BC Punmia's "Comprehensive RCC Designs" PDF** — covers design of simply supported & continuous beams, doubly reinforced beams, T-beams, slab detailing [reddit.com+4scribd.com+4es.scribd.com+4](#).
4. **Advanced RCC Design (N. Krishna Raju)** — includes portal frames and continuous slab solutions [reddit.com+15fr.scribd.com+15scribd.com+15](#).
5. **Structural Design Analysis (Scribd PDF)** — includes dog-legged stair detailing, load calculations, effective span [slideshare.net+4scribd.com+4de.scribd.com+4](#).
6. **Design of RCC Structures Review** — offers formulae for waist slab thickness & IS-875 loading [fr.scribd.com+15ru.scribd.com+15slideshare.net+15](#).
7. **CE6686 Lecture (Scribd)** — worked problems and IS-456 limits for stair R/C design [ru.scribd.com+8de.scribd.com+8fr.scribd.com+8](#).
8. **Reddit insight:** "Seismic separation of floors is important... many authors recommend isolating stairs" [reddit.com](#)
9. **SP43 – RCC Portal Frames PDF** — design of portal frames under load, moment capacity, stirrup detailing [reddit.com+3fr.scribd.com+3fr.scribd.com+3](#).
10. **Advanced RCC Design (N. Krishna Raju)** — provides portal frame examples [fr.scribd.com](#).

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/playlist?list=PL51300B0778FB5784>
2. <https://www.youtube.com/watch?v=ewMUcFUayH0>
3. https://www.youtube.com/playlist?list=PLnpFKfeR1i_h1_BVO1F11SUaGDDT_Tkg
4. <https://www.youtube.com/playlist?list=PLprox5Kqs9CcoRcMYrIV8pi5sL1wR8bs>
5. https://www.youtube.com/playlist?list=PL_ZiPXJHDZzihK7LMqYhhuwwpaELbAqop

SEMESTER-V														
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation						
				L	T	S/P	C	CIA				ESE		Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)
PC	AR2503	History of Architecture-IV	Theory	1	1	0	2	24	8	8	40	60	0	60
														100

SUBJECT OBJECTIVE

- To provide an insight into the architecture of Classical antiquity & early Medieval period. Social, religious, political and architectural character, construction methods, building materials and settlement planning shall be explained with suitable examples.
- To provide an understanding of the evolution of Classical architecture in the west, Indian Architecture in its various stylistic modes characterized by technology, ornamentation and planning practices.

LEARNING OUTCOME

- The study must enable students to do a comparative evaluation of developments in a chronological manner along the timeline and across different geographies.
- The students must be enabled to appreciate tangible and intangible aspects of heritage associated with history.

MODULE	COURSE TOPICS
Module 1	Greek and Roman Architecture: Optical corrections and Classical orders as constituent element of Architecture. Column Orders and the articulation of temples, Classification of temples, Domestic Architecture – structural forms, materials and techniques of construction. Study of important acropolis, agora, temples, theatres, tombs and house forms. Study of important forums, temples, basilicas, thermaes, theatres, amphitheatres, circuses, tombs, triumphal arches, palaces, houses and villas.
Module 2	Early Christian Architecture: Development of early church from Roman basilica. The concept of center and path of Christianity manifested through centralized and longitudinal church. Study of different basilica churches in Italy. Rise of Byzantine Era- Centralization in Byzantine churches. Centrality and interiority of both crossdomed and cross in square planned church. Indistinct exterior of churches and the domed 'heavenly' interior. Construction of dome over polygonal compartments through the use of pendentives. Study of important churches in Italy.
Module 3	Romanesque Architecture: Massiveness and verticality of medieval churches. Combination of the five towered structures and longitudinal basilica. Gradual integration of tower from early to later examples. Gradual flow of Romanesque era

	into Gothic Architecture. Integration of wall and vault. Ribbed vault and the dissolution external wall to allow light. Study of important cathedrals and churches from Italy and France.
Module 4	Renaissance Architecture: Break with medieval churches for sources from Roman antiquity. Spatial centralization through simple addition of independent spatial elements. Use of elementary geometrical forms unified through symmetry and simple mathematical ratios. Reintroduction of anthropomorphic Classical Orders. Study of palazzos and development of centralized church form through specific examples from Italy. Mannerism Conflict and tension in Mannerism in place of harmony and order of Renaissance. Dynamic interplay of contrasting elements as against static addition of independent units of Renaissance church. Interplay between manmade and nature in villas. Dynamism of urban spaces. Centralized longitudinal and the elongated central church plans. Study of important villas, churches and urban spaces in Italy.
Module 5	Baroque Architecture: Dynamism and systemization of Baroque architecture. Vitality and spatial richness with underlying systematic organization. Space as constituent element of architecture, as a complex totality and indivisible figure, comprising of interacting spatial elements based on inner and outer forces. Sensitivity to effects of texture, color, light and water. Study of important urban spaces and churches in Italy and Germany.

REFERENCE BOOKS

1. Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
4. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams, Inc.Pub., New York, 1972.
5. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986. 6. Gosta,E.Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
6. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
7. Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
8. Christian Norberg-Schulz, Meaning in Western Architecture, Praegur, 1975
9. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, Ltd. 2007. Copplestone, T. and Lloyd, S.(1971).
10. World Architecture: An Illustrated History. London : Verona Printed.
11. Watkin, D. (2005). A History of Western Architecture. 4th Ed. London :Laurence King Publishing

REFERENCE E- BOOKS & JOURNALS

1. <https://www.cambridge.org/af/universitypress/subjects/classical-studies/classical-art-and-architecture/greek-and-roman-architecture>
2. https://books.google.com/books/about/Greek_and_Roman_Architecture.html?id=K2PKtAEACAAJ
3. <http://www.gutenberg.org/ebooks/67095>
4. <https://library.uir.ac.id/home/images/LibraryUIR/ardi/ebook/Byzantine-Churches-in-Constantinople-Their-History-and-Architecture.pdf>
5. <https://libguides.ku.edu.tr/byzantine-art-and-architecture/journals>
6. <https://www.britannica.com/art/Romanesque-architecture>
7. <https://www.slideshare.net/slideshow/romanesque-architecture-14165982/14165982>
8. <https://dbs.oeducat.org/default.aspx/book-search/Z65710/ArchitectsInTheRenaissance.pdf>
9. <https://www.scribd.com/document/660001170/Mannerism-Architecture>
10. <https://cdcgroupp.com/default.aspx/virtual-library/387648/BaroqueAndRococoArchitecture.pdf>

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/watch?v=J638b2Gcf_U
2. <https://www.youtube.com/watch?v=cftKx1MVDok>
3. <https://www.youtube.com/watch?v=bMz16j5MVIQ>
4. <https://www.slideshare.net/slideshow/early-christian-architecture-30764301/30764301>
5. <https://www.youtube.com/watch?v=QT0ITLRkNxxg>
6. <https://www.youtube.com/watch?v=9vajQgyPTh4>
7. <https://www.youtube.com/watch?v=oKoD4oRWtXc>
8. <https://www.youtube.com/watch?v=3WCxycTUDFY>

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2551	Architectural Design - V	Practical	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

1. To understand the role of climate and environment as a context in shaping building design.
2. To comprehend the interpretation of prescribed environmental directions / norms for a given place in building forms.
3. Learn building on sloping sites or with unique topography.

LEARNING OUTCOME

1. The student will be able to design buildings suitable for different regions & explore their contextual requirements.
2. The student will be able to recognizing the relevant building techniques & materials suitable for different regions & explore their applicability in design.

MODULE	COURSE TOPICS
Module 1	Understanding climatic zones: Lecture on the varied climate zones especially in the Indian sub-continent including examples of environment responsive designs. Establishing design criteria for various climate types.
Module 2	Design of climate responsive buildings: Designing a multi-functional building in a typical climate zone utilizing the developed design criteria.
Module 3	Design on sloping site: Design exercise on sloping terrain with specific orientation & climatic conditions.
Module 4	Long span Structural System: Introduction of long span structural systems that inspire form oriented built forms like cultural complex, museums.
Suggested studio exercises	Time problems like MIG Houses. Rural / Tribal cluster (1DAY). Minor/Short Problems like design of Panchayati bhawan, small forest resort, primary health centre, old age home, Mela ground . (1 WEEK).Major Problems like Design of buildings like School, Community training centers .Study tours to relevant destinations for documentation of vernacular architecture

NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Krishan, Arvind Climate Responsive Architecture.
2. Brown, G.Z. Sun Wind & Light.
3. Olgyay, V. Design with Climate.
4. Yeang, Ken. Designing with Nature: The Ecological basis for Architecture Design.
5. Works of Architects like Hasan Fathy, B.V. Doshi, Charles Correa, Ken Yeang, among others to understand responses of varied designers to the existing environment.

REFERENCE E- BOOKS & JOURNALS

1. "Design with Climate: Bioclimatic Approach to Architectural Regionalism" by Victor Olgyay Available as eBook on [Google Books](#)
2. "Manual of Tropical Housing and Building" by Koenigsberger, Ingersoll, Mayhew & Szokolay Available as eBook on [Google Books](#)
3. "Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings" by Arvind Krishan et al. Available as eBook on [Google Books](#)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=znyi2kzrer&t=151s>: Climatic regions of india
2. https://www.youtube.com/watch?v=62a_9lm1g84: Hot & dry climate and architectal design
3. <https://www.youtube.com/watch?v=allivgr-yu>: Warm & humid climate and architetcural design
4. <https://www.youtube.com/watch?v=euidovdiszi>: Passive design strategies for cold climate and case studies
5. <https://www.youtube.com/watch?v=-lsrbkrv5nc>: Passive design strategies for moderate climate
6. <https://www.youtube.com/watch?v=pkwbtuq7cs4>: Fundamental of climate responsive buildings

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
BS & AE	AR2552	BUILDING CONSTRUCTION & MATERIALS-V	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110	150

SUBJECT OBJECTIVES

1. To impart comprehensive knowledge of waterproofing systems.
2. To provide an understanding of plastics, rubber and other synthetic building materials.
3. To introduce common building defects, their causes and techniques for diagnosis and remediation.
4. To develop competence in partition systems and aluminum & steel door/window construction details.
5. To familiarize students with various floor types and construction methods.
6. Enable detailed understanding and execution of construction joints.

LEARNING OUTCOMES

By the end of this module, students will be able to:

1. Students are able to identify and explain different waterproofing materials and techniques.
2. Able to differentiate between thermoplastics and thermosetting plastics and analyze rubber types and their use in architectural products, understanding their limitations and performance.
3. Able to diagnose building defects.
4. Design and detail partition systems using different materials and able to prepare technical drawings and construction methodology.
5. Classify and explain various flooring systems.
6. Comprehend and apply construction joint type.

MODULE	COURSE TOPICS
Module 1 Waterproofing systems	Water Proofing Chemicals, membranes and compounds. (Basement and other waterproofing techniques) Plastics- Thermoplastics and Thermosetting. Rubbers.
Module 2 Defects & Remedies	<u>Defects and Remedies</u> : The study of various defects in buildings and their remedies. Defects caused by dampness, applied forces and changes in size, etc.
Module 3 Partitions	<u>Partitions</u> : Details in Aluminium partition with different finishing materials (Glass, Acrylic, UPVC, Gypsum board, timber etc.).

	Aluminium & steel doors and windows details. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
Module 4 Different Type of Floors & Floorings	<u>Floor and Flooring:</u> Types of flooring-Cement concrete flooring, brick flooring, mud flooring, terrazzo flooring, marble flooring, etc and various types of timber floors & their construction methods, including Dado/ skirting. Should also cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
Module 5 Types of Construction Joints	<u>Construction Joints:</u> Expansion Joints, Contraction Joints, Isolation Joints, Slip Joints, etc used in Buildings. Should also cover the construction process focusing on the timing and sequence of joint formation, use of water stops in water retaining structures, curing and joint treatment, various tools, machines and safety equipments used to construct them.

REFERENCE BOOKS

1. Building construction handbook by "Chudley, R. & Greeno, R." Oxford Butterworth-Heinemann 1998.
2. Alternative Building Materials and Technologies by K.S.Jagdish, B.V.Venkatarama Reddy and K.S.Nanjunda Rao
3. Building Construction by Punmia, B.C., Jain, A.K., & Jain, A.K.
4. Building construction illustrated by "Ching, Francis D.K.", "CBS Publishers & Distributors," New Delhi:. 1999
5. A text book of building construction by "Arora, S.P. and Bindra, S.P.", "Dhanpat Rai Publications," New Delhi: 2004
6. Building construction metric. v.4 by "Mckay, J.K. and Mckay, W.B." "Orient Longman," 2005. Mumbai: 2005

REFERENCE E- BOOKS & JOURNALS

1. Bureau of Indian Standards. (1972). *IS 1443: Code of practice for laying and finishing of cement concrete flooring tiles.*
2. [https://www.google.co.in/books/edition/Building_Construction_Materials_and_Tech/UteXDQAAQBAJ?hl=en&gbv=1&dq=building%20construction%20rcc&pg=PP1&printsec=frontcoverPage 75 of 203](https://www.google.co.in/books/edition/Building_Construction_Materials_and_Tech/UteXDQAAQBAJ?hl=en&gbv=1&dq=building%20construction%20rcc&pg=PP1&printsec=frontcoverPage%75%20of%20203)
3. https://www.google.co.in/books/edition/Principles_of_Reinforced_Concrete_Design/H9bhAwAAQBAJ?hl=en&gbpv=1&pg=PR2&printsec=frontcover
4. El-Reedy, M. (2009). Advanced materials and techniques for reinforced concrete structures. CRC press.
5. <https://haluminium.com/Product/aluminium-window-door-partition/&ved=2ahUKEwjFs-6336CGAxWISmwGHsK1DxoQFnoECGQQAQ&usg=AOvVaw0Rt9XqcTNAdpXCm5D56h34>

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/xEpmCwaUp8>
2. <https://www.youtube.com/watch%3Fv%3DokIUT17-kMI&ved=2ahUKEwjL3ZXQ06CGAxVRafUHHQJ2BSkQwqsBegQICBAG&usg=AOvVaw1dVCF1fJbKFAeG0uZGfiTa>
3. https://www.youtube.com/watch?v=W0j_-sudJU&t=1840s

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PAEC/ SEC	AR2553	Computer Application-IV	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To Impart skills of Revit and other advance software according to the industry standard
2. To impart skills of presentation technique using computer as a tool

LEARNING OUTCOME

1. The students will understand Revit as a basic tool for Architectural Design, Presentation.

MODULE	COURSE TOPICS
Module-1	Introduction to Revit basic. Interface overview, Revit file types, Starting a new project
Module-2	Basic Drawing & Modelling Tools: Setting up levels and grids. Walls: types, modifying, wall joins. Doors and windows: inserting and customizing. Floors, roofs, and ceilings: basic tools. Columns and beams: structural and architectural
Module-3	Components & Families: Components & Families. Annotation and Documentation, Rendering & Presentation
Module-4	Practical on Revit and D5 for rendering: Hand on exercises for Revit with studio exercises

REFERENCE BOOKS

1. Autodesk Revit 2017 Architecture Fundamentals
2. Autodesk Revit 2018 Architecture Basics

REFERENCE E-BOOKS & JOURNALS

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1. <https://www.perlego.com/book/2752742/bim-handbook-a-guide-to-building-information-modeling-for-owners-designers-engineers-contractors-and-facility-managers-pdf>
 2. <https://www.emerald.com/insight/content/doi/10.1108/S2516-285320190000002042/full/html>
 3. https://en.wikipedia.org/wiki/Charles_M._Eastman?utm_source=chatgpt.com
 4. https://www.emerald.com/insight/content/doi/10.1108/s2516-285320190000002042/full/html?utm_source=chatgpt.com

REFERENCE YOUTUBE LINKS

1. <https://help.autodesk.com/view/RVT/2024/ENU/?guid=GUID-C7FC8EF6-6418-431F-ADC6-493C2E911AFF>
2. <https://www.youtube.com/watch?v=64YT24>
3. <https://vagon.io/blog/tutorials-for-learning-revit?utm>
4. <https://clipzag.com/watch?v=QoNtjh93YyU&utm>
5. <https://www.youtubesummaries.com/science-and-technology/v1czOOzYvpM?utm>

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PE	AR2554	Elective-II	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2554(1) PRODUCT DESIGN

SUBJECT OBJECTIVES

1. To introduce the fundamentals of product design, including design evolution, innovation, and the structured design process.
2. To develop an understanding of material, manufacturing, economic, ergonomic, and aesthetic considerations in designing functional and user-centered products.
3. To equip students with the ability to take a product from concept to realization, integrating function, production, usability, and sustainability.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand and apply core principles of product design including functional, structural, and aesthetic considerations across various materials and manufacturing processes.
2. Analyze and evaluate product strategies using economic, anthropometric, and ergonomic data for safe, reliable, and user-friendly design.
3. Develop and communicate comprehensive product concepts from ideation through design, considering production methods, human factors, and lifecycle use.

MODULE	COURSE TOPICS
Module-1	Introduction: Definition of product design, design by evolution & design by innovation, essential factors, primary design phases & flow charting.
Module-2	Product Strategies & Analysis: Standardization industrial design organization,

	role of aesthetics in product design, functional design practices, strength, stiffeners & rigidity considerations in product design.
Module-3	Review of Production Processes: Primary machining & non-traditional machining processes for designing with plastics, rubber, ceramics & wood etc.
Module-4	Economic Factor & Anthropometrics: Product value, design for safety, reliability & environmental considerations, economic analysis, human considerations in product design, anthropometry.
Module-5	Product Development: Product development from concept to product designing for function, production, handling, use and maintenance

Suggested Book(s):

1. Product Design and Development - Karl.T.Ulrich, Steven D Eppinger - Irwin McGrawHill - 2000.
2. Product Design and Manufacturing - A C Chitale and R C Gupta, PH1, - 3rd Edition, 2003.
3. New Product Development - Timjones. Butterworth Heinmann - Oxford. UCI -1997
4. Product Design for Manufacture and Assembly – Geoffery Boothroyd, Peter Dewhurst and
5. Winston Knight – 2002

Other Reference Material(s)/Ebook(s):

1. <https://www.mheducation.com/highered/product/product-design-development-ulrich-eppinger/M9781260043655.html>
2. <https://doc.lagout.org/education/Product%20Design%20and%20Development%20%285th%20Edition%29.pdf>
3. https://www.researchgate.net/publication/338027591_Architecture_and_Graphic_Design
4. <https://ebooks.iospress.nl/volumearticle/61139>

Video Links:

<https://www.youtube.com/watch?v=tJ0HfPeoMcA>
<https://www.youtube.com/watch?v=rVGyneIXSZw>
https://www.youtube.com/playlist?list=PL8f_m4YIDl0uVTtWv_GJQbdfx_gbzFHeY
<https://www.youtube.com/playlist?list=PLw1JcZWS2xkZ25qfKO6SpTPxZuacOHNnW>
<https://www.youtube.com/@ProductDesignOnline>

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PE	AR2554	Elective-II	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2554(2) SET DESIGN

SUBJECT OBJECTIVES

1. To introduce students to the fundamentals, history, and purpose of set design within various performance and media contexts.
2. To develop skills in script analysis and visual conceptualization through sketches, mood boards, and design interpretation.
3. To enable students to translate design concepts into detailed technical and physical outputs, integrating lighting, spatial dynamics, and presentation techniques.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand the historical evolution, types, and roles of set design in shaping audience experience across performance and media platforms.
2. Analyze scripts or scene briefs to develop coherent and expressive design concepts that align with mood, character, and thematic elements.
3. **Create and present detailed set designs using both digital tools and physical models, effectively communicating ideas within a collaborative team environment.**

MODULE	COURSE TOPICS
Module-1	Fundamentals of Set Design •Introduction to set design: history, types, and significance •Role of the set designer in performance and media •Overview of performance spaces and stage types
Module-2	Script Analysis and Conceptualization

	•Reading and interpreting scripts or scene briefs •Identifying mood, theme, and character influence on design •Developing concept sketches and mood boards
Module-3	Script Analysis and Conceptualization •Reading and interpreting scripts or scene briefs •Identifying mood, theme, and character influence on design •Developing concept sketches and mood boards
Module-4	Lighting and Visual Effects •Fundamentals of stage lighting and its impact on sets •Interaction of light, color, and texture in design •Using lighting to enhance mood and spatial perception
Module-5	Design Development and Presentation •Detailed drawings and digital modeling (AutoCAD, SketchUp, etc) •Physical model making techniques •Collaborative project: designing a set for a chosen script/scene •Presentation skills: communicating design to directors and teams

Suggested Book:

1. <https://libguides.brown.edu/WebResources/SetDesign>
2. https://www.researchgate.net/publication/373931594_Script_Analysis_for_Actors_Directors_and_Designers
3. <https://www.onstagelighting.co.uk/stage-lighting-basics/>
4. <https://www.amazon.in/Scientific-Presentation-Skills-Presentations-Recognized-ebook/dp/B09SVH628K>

Reference E-book:

1. <https://www.scribd.com/document/552337856/Set-Design-Notes>
2. <https://www.autodesk.com/in/campaigns/autocad-tutorials>
3. <https://www.sketchup.com/en/plans-and-pricing/sketchup-free>

YouTube Video Links:

1. https://www.youtube.com/playlist?list=PL_XQ6cQy7E5o_v-o_0G2Q6jW1M9zP8f9S
2. https://www.youtube.com/watch?v=s5R7s3k_t9w
3. <https://www.berklee.edu/careers/roles/scenic-designer>
4. <https://glcoverage.com/2024/06/21/script-analysis/>
5. <https://www.youtube.com/studiobinder>
6. <https://colourliteracy.org/interaction-of-colour-light>
7. <https://www.youtube.com/watch?v=sL-J5UuG6rQ>
8. <https://library.fiveable.me/set-design-for-theater-and-film/unit-9/materials-techniques-model-building/study-guide/ako6OqamSIRQ4cHt>

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PE	AR2554	Elective-II	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2554(3) ART APPRECIATION

SUBJECT OBJECTIVES

1. To introduce the fundamental terminology and visual grammar of art, including various styles and movements from naturalistic to contemporary.
2. To explore major aesthetic ideologies and theories from both Western and Indian perspectives, fostering critical understanding of art's philosophical foundations.
3. To examine the historical development of art and its evolving role as a cultural, religious, and social force in shaping human environments.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Identify and differentiate key art styles and forms, including realistic, symbolic, abstract, and contemporary expressions.
2. Analyze and apply aesthetic theories—such as Rasa Theory, Shadanga, and Western philosophical thought—to interpret artistic works.
3. Understand the historical progression of art and evaluate its influence on culture, religion, and contemporary society within the architectural context.

MODULE	COURSE TOPICS
Module-1	Introduction & Terminology: Grammar of the language of art- Natural, Realistic,

	Symbolic, Abstract, Modern & Contemporary.
Module-2	Ideologies of Aesthetics in Art: Complete understanding of Ideologies of aesthetics in art while discussing the art of Western & Oriental. • Plato, Aristotle, Baumgarten, I.A. Richards, Leo Tolstoy, Sigmund, Freud. • Shadanga: Six limbs of Indian painting. • Rasa theory of 'Bharat Muni' • Iconography
Module-3	• Development of Art: Development of art over the period of time. • Tracking progress in art in aspects of Functional diversity of Styles, • Art as form of social consciousness, Impact of Cultural & Religion on art, Understanding role of art in contemporary society.

Suggested Book(s):

1. History Of Art by Janson and Janson
2. Humanities Through The Arts by F. David Martin and Lee A Jacobus
3. Indian Art by Partha Mitter
4. Introduction To Indian Art by Ananda k Coomaraswamy
5. Ways Of Seeing by John Berger
6. History of Beauty by Umberto Eco et al
7. The Story of Art by E.H.Gombrich

Other reference materials /weblinks

1. THE NEED FOR ART APPRECIATION IN THE STUDY OF ARCHITECTURE:
https://www.researchgate.net/publication/317036233_THE_NEED_FOR_ART_APPRECIATION_IN_THE_STUDY_OF_ARCHITECTURE
2. How art enhances architecture: <https://www.chapmantaylor.com/insights/art-and-architecture>
3. Reading: Gothic Architecture: <https://courses.lumenlearning.com/masteryart1/chapter/reading-gothic-architecture/>
4. Meaning Behind Art and Architecture: <https://owlcation.com/humanities/Deriving-Meaning-from-Art-and-Architecture>

Video Links:

1. HUM 3610: Art Appreciation: <https://guides.baker.edu/c.php?g=303126&p=2022584>.
2. Art Appreciation for Kids - Architecture:
 1. <https://www.youtube.com/watch?v=ciBIZdRhupk>
 2. Step by Step Easy Tutorial Using Canva
<https://www.youtube.com/watch?v=EJRwAxdQyLM>

SEMESTER-V															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PC	AR2555	Working Drawing	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To introduce Working drawings and their significance in the construction of buildings.
2. To teach students the essential components of working drawings, notations, drawing standards, strengthen the students' knowledge about preparing working drawings for various building elements.

LEARNING OUTCOME

1. To understand and making drawing/ details necessary for final execution of a project.
2. To integrate all services and structure system in the working drawing project.

MODULE	COURSE TOPICS
Module-1	Introduction to working drawings: shop drawings / vendor drawings. An exercise in fundamental elements in a "Working Drawing-Plan" an assignment on a typical standard "Working Plan". Making complete set of working drawings for the residence or any other project designed by the student with necessary information with schedule and all specifications. The Working Drawings to include: a. Developing Key plans, General Arrangement Plans, Part plans, Roof Plan / Terrace Plan and the like. b. Excavation drawings, Foundation drawings, Center-line drawings, Floor Plans, Sections, Elevations. c. Basic internal electrical and plumbing drawings.
Module-2	Service Drawings: Services Drawings Making complete set of services drawings for the above said project. The drawings to incorporate services details complete with schedule and all specifications. The Services Drawings to

	include: Electrical Layout, Plumbing Layout, Sanitary Layout, Drainage Layout, Rain Water Disposal / Harvesting Layout and Details, Toilet details, Kitchen / Pantry Details.
Module-3	Working Details Making complete set of working details for the above said project. The drawings to incorporate details complete with schedule and all specifications. The Working Details to include: Doors and Windows Drawings and Details, Staircase Details including railings, Details of Grills, Parapet or railings, Typical wall section showing foundation, DPC, skirting, sill, lintel, slab and terracing details.
Module-4	Working drawing details: Various formats for working drawing preparation, various types of vendor drawings, such as aluminum composite panels, steel doors, fire rated doors, curtain wall systems, aluminum windows, etc.
Module-5	Finishing Drawings Making complete set of finishing drawings for the above said project. The drawings to incorporate finishing details complete with schedule and all specifications. The Finishing Details to include: Doors and Windows Frame and Shutter details, Flooring & Skirting pattern and fixing details, Dado / Wall tile pattern and fixing details, Wall Cladding pattern and fixing details, Plaster Pattern with Colour schemes.

REFERENCE BOOKS

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore : The BCA Construction Quality Assessment System.
2. Jefferis, A. and Madsen, D.A. (2005). Architectural Drafting and Design. 5th Ed. New York : Thomson Delmar Learning.
3. Jeong, K-Y. (2010) Architecture Annual. Seoul : Archiworld Co.
4. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
5. Osamu, A. W., Linde, R. M. and Bakhoun, N. R. (2011). The professional practice of architectural working drawings. 4th Ed. Hoboken : John Wiley & Sons.
6. Weston, R. (2004). Plans Sections Elevations – Key buildings of the twentieth century. London : Laurence King Publishing.

REFERENCE E-BOOKS & JOURNALS

<https://dokumen.pub/the-professional-practice-of-architectural-working-drawings-6nbsped-1119875331-9781119875338.html>

<https://www.perlego.com/book/1884660/working-drawings-handbook-pdf?utm>

<https://archive.org/details/TheProfessionalPracticeOfArchitecturalWorkingDrawings5thEdition?utm>

The Professional Practice of Architectural Working Drawings – Bakhoun & Wakita (6th Ed.) – Wiley

Working Drawings Handbook – Styles & Bichard (Routledge)

Architectural Working Drawings – Liebing & Paul (Wiley)

REFERENCE YOUTUBE LINKS

<https://www.youtube.com/watch?v=6QKFgdDg5Yg>
<https://www.youtube.com/watch?v=PGAZ2YBCMnQ>
<https://www.youtube.com/watch?v=sKEeIomTQjQ>
<https://www.youtube.com/watch?v=pbC6VYMKslY>
<https://www.youtube.com/watch?v=JvkmJcTrtXs>
https://www.youtube.com/watch?v=bc_JtNaOsCg

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2601	Building Services-III	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To develop the understanding of important Services in buildings, definitions and terms used, functioning and their applications in building.

LEARNING OUTCOME

- The students will get familiar with the fundamentals of air conditioning, firefighting and vertical Transport systems & their integration with architectural design.

MODULE	COURSE TOPICS
Module-1	Introduction: Introduction to Electro-mechanical means of vertical transportation in buildings, requirements, occupancy, load etc. Study of elevators and escalators on the basis of quality and quantity of service, various components, standard space requirements, various types, construction details and architectural implications.
Module-2	Types of Lifts & Escalators: Working of lifts with details of lift section describing various parts of lifts -Definitions regarding lifts such as average travel lift carrying capacity, rated load, rated speed, RTT etc. Installation requirements and the information to be provided by the architect for the installation - Grouping of lifts and design standards of a lift lobby.
Module-3	Function and working of Escalators: The emphasis shall be on the drawing of the correct plan and section of the lift and the lift well showing various parts and how to group them in a building core for the various functions they perform.
Module-4	Air-conditioning: Detailed studies of Natural and Artificial ventilation. Refrigeration cycle, systems of air conditioning: Unit, split, package, Direct expansion, Chilled water System, Ducting & air conditioning layout, fittings and fixtures, chilling plants, cooling towers, air handling units, Calculation of AC loads. Air distribution systems, ducts and ducting layouts, – VAV & VRV Systems. Design criteria for selecting the Air conditioning system for small and medium sized buildings and layouts with emphasis on space requirement, orientation of the building and energy conservation measures

REFERENCE BOOKS

1. F. Hall, "Building Services and Equipment, Volume 1,2 & 3", Routledge; 3rd edition 1994
2. John E. Flynn and Jack A. Kremers, "Architectural Interior Systems", Van Nostrand Reinhold; 3 Sub edition, 1992
3. P. N. Ananthanarayan, "Basic Refrigeration and Air Conditioning", Tata McGraw-Hill Education, 2013
4. Strakosch, George R. "Vertical transportation: elevators and escalators", John Wiley & Sons Inc, 1983.
5. Lechner, Norbert, "Heating, cooling, lighting: Sustainable design methods for architects", John Wiley & Sons, 2014.

REFERENCE E- BOOKS & JOURNALS

1. ASHRAE Handbook (Four-Volume Set: Fundamentals; HVAC Systems; Applications; Refrigeration), Publisher: American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
2. HVAC Systems Design Handbook (5th Edition), Publisher: McGraw-Hill Professional
3. Mechanical and Electrical Systems in Buildings (6th Edition) by Richard R. Janis, Publisher: Pearson (Prentice Hall)
4. Building Services Engineering Research and Technology, Publisher: SAGE on behalf of CIBSE
5. HVAC & R Research (now: Science and Technology for the Built Environment), Publisher: Taylor & Francis for ASHRAE

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=Y7iMQxipEAs> - (MEP complete design calculations: HVAC, plumbing, fire-fighting design) youtubesummaries.com
2. <https://www.youtube.com/watch?v=egH4Z6KsVug> - (Fundamentals of HVAC – basics of systems, BMS, coils, ducts)
3. https://www.youtube.com/watch?v=OvYIyQ_whXE - (Animation: central air conditioning system overview) scribd.com
4. <https://www.youtube.com/watch?v=EjCBc5gl31o> -(Animation: Air Handling Unit – AHU explained) classcentral.com
5. <https://youtu.be/rKp4pe92ljg?si=Q5CCNSo5ztp8RaSz> – How does an Elevator work?

SEMESTER-VI					
Course	Subject	Subject Name	Theory /	Scheme of Teaching	Scheme of Evaluation

Category	Code		Practical	L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/Viva	Total (B)	
BS & AE	AR2602	Architectural Structure-VI	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

1. To understand the structural behaviour of various structural elements.
2. To understand the analysis and design of R.C.C. structures and their use in building industry by LIMIT STATE METHOD.
3. To understand the analysis and design of Steel structures and their use in building industry by LIMIT STATE METHOD.

LEARNING OUTCOME

1. The students will familiarize with analysis of structural elements and exposed to practical aspects of design.

MODULE	COURSE TOPICS
Module-1	Analysis & Design of R.C.C. Foundation & Footing: Introduction, Type of foundation, Depth of foundation, Theory & design of axially loaded isolated square footing and detailing of its reinforcement. Pile foundation - Introduction, classification and its application.
Module-2	Analysis and Design of R.C.C. Retaining wall: Introduction, Types of retaining walls, Analysis and Design of cantilever retaining walls and detailing of its reinforcement. Concept of counterfort retaining wall.
Module-3	Steel Structures I : Riveted & Bolted Connection, Welded Connection, Design of Tension members, Design of Compression member.
Module-4	Steel Structures II: Design of beam, Understanding Plate Girder & its use in building structure, Grillage foundation and its components. Types of roof trusses and nomenclature of its members.

REFERENCE BOOKS

1. S.S Bhavikatti “ Steel Structures by Limit State Method as Per I.S. 800-2007
2. Neelam Sharma ,” Reinforced Concrete” 3. IS 456:2000
4. N. Krishna Raju, “ Renforced Concrete : Limit State Method”
5. SK Duggal,”Steel Structures : Limit state method” 6. IS 800:2007
7. IS Handbook no. 1: Steel Table
8. Ashok K. Jain , “Reinforced Concrete” Limit State Design.
9. M.L. Gambhir, “Fundamentals of Reinforced Concrete Design”.
10. P.C. Varghese., “Advanced Reinforced Concrete Design”.
11. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain “R.C.C.Designs”
12. S.S Bhavikatti “ Steel Structures by Limit State Method as Per I.S. 800-2007

REFERENCE E- BOOKS & JOURNALS

1. **ResearchGate** – **Articles on pile foundations**
Often contain PDF case studies and design practices (search "pile cap design PDF ResearchGate").
2. To find open PDFs, try queries like "*pile foundation design interior structures PDF*" on platforms like ResearchGate, CORE, and university repositories.
3. **iamcivilengineer.com** – **"Complete Design of Cantilever Retaining Wall"**
Explains steps from stability checks to reinforcement detailing
en.wikipedia.org+15iamcivilengineer.com+15reddit.com+15.
4. **CivilEngineering UPSC PDF** – **"Cantilever Retaining Walls"**
Summaries of stem, heel, and toe design with safety factors
edurev.in+1masonryandhardscapes.org+1scribd.com+1iamcivilengineer.com+1.
5. **ResearchGate (May 2024)** – **"Geotechnical Design of Cantilever Retaining Wall"**
Covers earth pressure theories, stability checks, and structural detailing
en.wikipedia.org+8researchgate.net+8reddit.com+8.
6. **Scribd PDF** – **"Design of Cantilever Retaining-2071"**
Includes ACI-code based worked example, detailing heel/toe/stem
scribd.com+1en.wikipedia.org+1.
7. **ResearchGate** – **"Guide to Design Criteria for Bolted and Riveted Joints"** (PDF)
Covers probabilistic design and connection equations
reddit.com+6researchgate.net+6en.wikipedia.org+6.
8. **Scribd PPT** – **"Bolted, Riveted, Welded Connections"**
Lecture notes with design formulas and detailed examples
reddit.com+4scribd.com+4slideshare.net+4.
9. **Slideshare** – **"Connections in Steel Structures"** **PPT**
Covers weld types, rivets, bolting, strength calculations, and spacing rules
slideshare.net+1en.wikipedia.org+1.

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/playlist?list=PL51300B0778FB5784>
2. https://www.youtube.com/playlist?list=PL5DYIL_VeL0sGQ2QMwolaXZeQNgsEG7Ot
3. https://www.youtube.com/playlist?list=PL5DYIL_VeL0uud4vi7LPSstMUmkSTRsn2
4. <https://www.youtube.com/playlist?list=PL2IEmUaKVY-jFx3D3xT2GxzmMVNwPYkaUI>
5. <https://www.youtube.com/playlist?list=PLXBqJdPEfDwnMqQnaVoY62XLnfqCcWEXP>

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2603	Specifications, Cost Estimation & Budgeting	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- This course is intended to impart students with the necessary technical knowledge for preparation of Specifications and calculating estimates and detailed costing for small to medium scale projects.

LEARNING OUTCOME

- The students will get familiarize with the commonly used methods of preparing estimates of Architectural Projects.

MODULE	COURSE TOPICS
Module 1	Introduction: Introduction to Quantity estimation, costing and specifications related to building projects. Definition of estimating and costing, Purpose of estimation and costing, Procedure of estimating or method of estimating, data required to prepare an estimate (Drawings/ specification/ rates), complete estimate structure. Measurement of materials and works Introduction to measurement of various construction work items, importance and significance in construction projects i.e. Units of measurement, rules for measurement, Methods of taking out quantities- Long wall and short wall method, centre line method, partly centre line, cross wall method. Standard modes of measurement as per Indian Standards for various work items.
Module 2	Types of estimates & Costing: Preliminary/Approximate Quantity Estimates: Importance & purpose of Preliminary / Approximate estimates, Plinth area method, Cubical contents method and centre line method and their preparation. Types of approximate estimates, basic differences and advantages. Detailed Quantity Estimation: Types of detailed estimates and their application, Methods of deriving detailed quantities for various construction work items. Preparation of Detailed estimate, Work items as per construction stages: Foundations, Superstructure, Finishing works in a simple building. Description & significance of Items in Bill-of-Quantities (BOQ). Costing Introduction, meaning, purpose, methods of estimating cost of construction for various work items, cost indices, rates of labour and material, analysis of rates, preparation of abstract of estimated cost, use of CPWD schedule of rates. Deriving construction cost as per BOQ Exercises in estimation using different methods, for small or medium size buildings
Module 3	Material Specifications : Introduction, importance and scope. Principles and

	practices. Types of specifications, Correct form and sequence of clauses for writing specifications, impact on costing. Study and uses of standard specifications viz; drafted by C.P.W.D. Writing detailed specifications for various building materials eg. Bricks, Aggregates (fine & coarse), Cement, Reinforcement, Timber, Glass and Paints. General abbreviations used in specifications.
Module 4	Specification of simple construction : Writing detailed specifications for various items of work eg. Earthwork in foundation, Cement concrete, Reinforcement cement concrete work, Brick work in cement mortar, Damp proof course, Wood works (door & windows), Glazing, Plastering (cement & sand), Flooring (cement concrete & tiles), Distempering (dry & oil bound), Painting on wood & iron work, Water proof cement painting, Brick bat coba terracing.

REFERENCE BOOKS

1. Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing.
2. Chakraborty, M. Estimating, Costing, Specification & Valuation
3. C.P.W.D. Standard Schedule of Rates.
4. Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd.
5. Chakraborti, M. Estimation, Costing and Specifications, Laxmi Publications
6. Kohli, D.D and Kohli, R.C. (2004) A Text Book of Estimating and Costing, S.Chand & Company Ltd.
7. Brook, Martin. (2004) Estimating and Tendering for Construction Work, 3rd edition, Elsevier.
8. Ashworth, A. (1999) Cost studies of buildings, Pearson Higher Education

REFERENCE E- BOOKS & JOURNALS

1. Estimating, Costing, Specification & Valuation in Civil Engineering by M. Chakraborti
2. Construction Cost Estimating: Process and Practices by Dennis Griffin & Leon Holm
3. Estimating and costing in civil engineering theory and practice by BN Dutta

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=DD9O303QHkg>
2. <https://www.youtube.com/watch?v=Si5pR646ZvA&t=124s>
3. <https://www.youtube.com/watch?v=Xez84MqPg74>
4. https://www.youtube.com/watch?v=Wreu_QrDEkY
5. <https://www.youtube.com/watch?v=ocqna-5Aexc>
6. <https://www.youtube.com/watch?v=sTe7gMVDONU>

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
ECPE	AR2604	Theory of Design	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To Understand about post Renaissance period followed by Industrial Revolution and its influence on the built form and settlement patterns; Colonial mercantile capitalism and spread of Western influences in India; Synthesis of architectural styles as modes of political accommodation.
- To Understand the intentions of the period and architects as a solution to the need or demands of the period.

LEARNING OUTCOME

- The students will be able to study the different building and the development of architectural form and character based on the developments in construction and technology exemplified through specific building examples that identify the works of the period.

MODULE	COURSE TOPICS
Module 1	Picturesque and Neo- classical architecture: Purity and structural honesty of antiquity preferred over ornamentation and exaggeration of Baroque. Representation of ancient Roman monuments in imaginary compositions. Archeological purism and importance of pictorial values in historical settings. Works/Philosophies of Plato, Aristotle, Karl Marx, Friedrich Hegel, Vitruvius Pollio, Louis Sullivan. Recreation of antique Roman simplicity and splendor for modern living. Study of important palaces and public buildings in Britain and France.
Module 2	Enlightenment and Modern Architecture : Belief in creation of ‘new’ and ‘ideal’ world through return to fundamentals, ‘true’ and ‘original’ values. Art revolutions important to the era. Social intentions and search for ideal world. Expressions of construction and technology. Equating technology and progress with present. Functionalism and functional appropriateness. Thoughts and works of frank Lloyd Wright, Walter Gropius, Le Corbusier, Mies van der Rohe, Alvar Aalto, Louis Kahn, Dutch De Stijl, Italian futurists and Russian Constructivists. International style: Oversimplification of the modern Movement into functional, steel and glass, cubes. Monotonous functionalist abstractions and Modernism as a style. Disenchantment of modern cities and fall of modern Movement.
Module 3	Post Modern Architecture: Post Modern Architecture as a revision of Modern architecture and resistance to functional containers of 60’s. Objective, representational and emphasis on content. Pluralistic and differing trends. Historicism: Rooted to place and history. Regards of expression: ornaments, symbolism and context with irony and

	humour, exemplified through the works of James Stirling, Michael Graves, Charles Moore, Arata Isozaki.
Module 4	Neo- Modern: Disregard historical imaginary to recapture ideas for modern architecture of 20's. Hi-tech metal abstractions of Richard Rogers, Norman Foster, showing structure and equipment as implied ornament. References of Russian Constructivists. The early works of New York Five including later works of Richard Mies as complicated, exaggerated and sophisticated revival of the modern grid and Corbusier's geometry. Synthesis of Hi-Tech and Historicism in the works Aldo Rossi, Mario Botta, Cesar Pelli.
Module 5	Deconstructive: Narrative and representational. Sources in Russian Constructivism. Non perfection in the works of Frank Gehry, Peter Eisenman, Bernard Tschumi, Daniel Libeskind, questioning traditional purity of form, geometry and structure.

REFERENCE BOOKS

1. Kenneth Frampton, "Modern Architecture; A Critical History" by, Tames and Hudson
2. William Jr. Curtis, "Modern Architecture since 1900", Phaidon
3. Sir Banister Fletcher, A History of Architecture, University of London, The Athlone Press, 1996.
4. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.
5. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
6. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N. Abrams, Inc. Pub., New York, 1972.
7. S. Lloyd and H.W. Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986.
8. Gosta, E. Sandström, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
9. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
10. Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
11. Charles Jencks, "The language of Post Modern Architecture".
12. Heinrich Clotz, "History of Post Modern Architecture".

REFERENCE E- BOOKS & JOURNALS

1. <https://www.gutenberg.org/ebooks/20239>
2. <https://www.khanacademy.org/humanities/renaissance-reformation/rococo-neoclassicism/neo-classicism/a/neoclassicism-an-introduction>
3. <https://www.studocu.com/in/document/amity-university/history-of-architecture-iv/le-corbusier-towards-a-new-architecture-notes/23122137>
4. <https://smarthistory.org/the-bauhaus-and-its-legacy/>
5. <https://www.moma.org/collection/works/3639>
6. <https://www.slideshare.net/slideshow/learning-from-las-vegas-47209774/47209774>

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/watch?v=Jm00J7Bv_m4
2. https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3DJm00J7Bv_m4
3. <https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3D9Vv-2D4W3eE>
4. https://www.youtube.com/watch?v=9Q5p-1bT_2o
5. https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3D9Q5p-1bT_2o
6. https://www.youtube.com/watch?v=1d_e4C1o1b4

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2651	Architectural Design - VI	Practical	0	2	14	9	0	0	0	50	0	100	100	100

SUBJECT OBJECTIVE

- To understand the constraints of multifunctional units in an urban setting with respect to social norms, climate and client's expectations.
- To understand design challenges due to authority guidelines and making drawings / details necessary for final execution of a project.
- To integrate services and structure system in the design project.

LEARNING OUTCOME

- The students will be able to design for simple and multi-use, single and multiple floors with parameters of building byelaws.
- The students will be able to analyze the constraints, typologies and interventions in housing

MODULE	COURSE TOPICS
Module 1	Introduction: Acquainting with the various ways of designing a group housing in urban context i.e. low/medium rise- high density; high rise - high density etc.
Module 2	Study and Analysis: Through literature studies and case studies analyze the constraints, typologies and interventions in housing throughout India and the rest of the world.
Module 3	Group Housing: Design of a housing project incorporating varied formats of grouping on an actual site with specific bye-laws and regulations
Module 4	Building Services: Integration of Services and Structure Development of the housing proposal to the stage integrating services, structure and other infrastructural facilities necessary for the final execution of the project and making relevant drawing for the same.
Suggested studio exercises	Time problems like design of row houses, semidetached, detached and duplex residences etc. (1DAY), Minor/Short Problems design multi-level parking, common infrastructure support facility for housing like club etc (1WEEK) Major Problems design of Housing for specific socio-economic group, Office Complex. Study tours to relevant destinations for documentation of vernacular architecture.

NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Ching, Francis D. K. "Architecture: Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachussets.
3. Correa, Charles, "The New Landscape",
4. Jogelekar& Das, S.K, "Contemporary Indian Architecture: Housing and Urban Development", HUDCO, 1995
5. Rewal,Raj, "Humane Habitat at Low Cost", Architectural Research Cell, 2000.
6. Steele, James, "The Complete Works of Balakrishna Doshi: Rethinking Modernism for the Developing World", Super Book House, Mumbai, 1990.
7. Alexander, Christopher, "Pattern language", Oxford University Press, 1977
8. Huxtable, A-L.(1984) Tall buildings Artistically Reconsidered

REFERENCE E- BOOKS & JOURNALS

1. "Housing: Design and Development" by Geoffrey Payne Available as eBook on [Google Books](#)
2. "Group Housing Handbook" by HUDCO (Housing and Urban Development Corporation, India) Available as eBook on [Google Books](#)
3. "Residential Architecture: Design and Process" by James C. Snyder & Anthony J. Catanes Available as eBook on [Google Books](#)
4. "Building Services Handbook" by Fred Hall & Roger Greeno
5. "Building Construction Handbook" by Roy Chudley & Roger Greeno

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=VVuP27QGyuk>: Introduction to Housing
2. <https://www.youtube.com/watch?v=lvZUuyjUjYE&t=10s>: Planning for Group Housing
3. <https://www.youtube.com/watch?v=pliRI5oB4GI&t=11s>: Buildding Bye Laws
4. <https://www.youtube.com/watch?v=HVj5vCdOuPY>: Design - Mass housing

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
BS & AE	AR2652	BUILDING CONSTRUCTION & MATERIALS-VI	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110	150

SUBJECT OBJECTIVES

1. To introduce the construction techniques in steel & explore applications of steel and to develop knowledge of steel frame construction.
2. To provide understanding of advanced steel systems.
3. To impart practical knowledge of industrial roofing systems.
To emphasize safety practices and correct use of machines and tools

LEARNING OUTCOMES

By the end of this module, students will be able to:

1. Understand and explain the physical and mechanical characteristics of steel, able to select appropriate steel jointing methods and understand to design and detail steel frame construction.
2. Demonstrate the construction process of mezzanine and steel flooring systems.
3. Comprehend and illustrate the working of steel windows, doors, and rolling shutters
4. Design and detail metal external staircases, develop an understanding of curtain wall systems.
5. Able to draw and describe steel trusses, analyze and detail north light truss roofing systems, also explain portal frame construction and its use in industrial roofing

MODULE	COURSE TOPICS
Module 1 Steel- Material	Introduction to construction in steel, characteristics of steel sections, methods of jointing. Application of steel in various types of structures and different parts of exteriors and interiors of various types of buildings, especially industrial buildings.
Module 2 Frame Construction in Steel	<u>Frame Construction in Steel</u> : Columns, Footings, Beams, Outer Walls (infill), Lightweight partitions in steel- structure and finishes. Prestressed and Post-stressed steel frame profiles for doors and windows with rolling shutter details.
Module 3 Steel in Industrial Buildings	Steel Floors and mezzanine floors in industrial buildings - structure and finishes. Metal External Fire Escape Stairs and Spiral <u>Curtain Walls</u> -Glazing with spider fittings and patch fitting
Module 4 Structural Steel	<u>Steel trusses</u> : Steel angle & tubular trusses for various spans - fabrication & erection details. Structural and construction details of a north light truss roofing system, including fixing to wall / columns, valleys, gutters, glazing, lantern light, roofing, etc. Portal frame construction in steel, roofing of industrial buildings. Should also

	cover the construction process focusing on the various tools, machines and safety equipments used to construct them.
Module 5 Heavy Construction Equipments	Construction Equipments: Electric hand tools, Vibrators, Pumps, Compactors/Rollers. Earth Moving & Excavation – Dozers, Scrappers, Graders, Shovels, Backactor, Dragline, Trenchers. Transportation- Lorries, Trucks, Dumpers, Hoist, Cranes (mobile, static, tower). Concrete mixers and pumps for ready mix concrete.

REFERENCE BOOKS

1. "Structural Steel Design" by Jack C. McCormac
2. "Design of Steel Structures" by Edwin H. Gaylord
3. "Industrial Buildings: Modern Steel Construction" by Max Schwartz
4. "Steel Structures: Practical Design Studies" by Chanakya Arya

REFERENCE E- BOOKS & JOURNALS

1. Journal of Constructional Steel Research (Elsevier)
2. Engineering Structures (Elsevier)
3. Steel and Composite Structures (Techno-Press)
4. Journal of Structural Engineering (ASCE)

REFERENCE YOUTUBE LINKS

1. The B1M – Industrial & Steel Construction Projects-<https://www.youtube.com/user/TheB1M>
2. Civil Engineering Academy – Steel Design Basics-<https://www.youtube.com/c/CivilEngineeringAcademy>
3. Steel Construction Info – UK-based Steel Building Resources-<https://www.youtube.com/user/steelconstructioninfo>
4. Short Documentary: "How Steel Frame Buildings Are Made"-[Watch on YouTube](#)

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ SEC	AR2653	Computer Application-V	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To Impart skills of Revit Advance software according to the industry standard
2. To impart skills of presentation technique using computer as a tool

LEARNING OUTCOME

1. The students will understand Revit Advance as a tool for Architectural Design, Presentation.

MODULE	COURSE TOPICS
Module-1	Introduction to Revit Advance Architecture
Module-2	Revit Interfaces, constraints and interconnected relationship between views.
Module-3	Setting view properties and using Visibility/Graphic overrides. Exploring 3D view navigation controls. Introduction to view creation.
Module-4	Hand on exercises for Revit Advance with studio exercises

REFERENCE BOOKS

1. Autodesk Revit 2017 Architecture Fundamentals
2. Autodesk Revit 2018 Architecture Basics

REFERENCE E-BOOKS & JOURNALS

1. <https://www.perlego.com/book/2752742/bim-handbook-a-guide-to-building-information-modeling-for-owners-designers-engineers-contractors-and-facility-managers-pdf>
2. <https://www.emerald.com/insight/content/doi/10.1108/S2516-285320190000002042/full/html>
3. https://en.wikipedia.org/wiki/Charles_M._Eastman?utm_source=chatgpt.com
4. https://www.emerald.com/insight/content/doi/10.1108/s2516-285320190000002042/full/html?utm_source=chatgpt.com

REFERENCE YOUTUBE LINKS

1. <https://help.autodesk.com/view/RVT/2024/ENU/?guid=GUID-C7FC8EF6-6418-431F-ADC6-493C2E911AFF>
2. <https://www.youtube.com/watch?v=64YT24>
3. <https://vagon.io/blog/tutorials-for-learning-revit?utm>
4. <https://clipzag.com/watch?v=QoNtjh93YyU&utm>
5. <https://www.youtubesummaries.com/science-and-technology/v1czOOzYvpM?utm>
6. <https://clipzag.com/channel?id=UCMBBExNMw9ZsTZ1DxrTpvEA&utm>

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2654	Elective-VI	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2645(1) VERNACULAR & COST-EFFECTIVE ARCHITECTURE

SUBJECT OBJECTIVES

1. To introduce the principles, definitions, and relevance of vernacular and cost-effective architecture in the context of present-day architectural challenges.
2. To explore the cultural, environmental, and spatial wisdom embedded in traditional and vernacular practices from India and around the world.
3. To encourage critical observation and application of vernacular principles through case studies and site investigations to inform contemporary design solutions.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand the foundational concepts and socio-environmental factors that shape vernacular and cost-effective architectural forms.
2. Analyze and interpret vernacular examples across different climatic zones, identifying core principles such as spontaneity, symbolism, place-making, and material logic.
3. Conduct field-based studies of local settlements and develop design criteria that integrate vernacular knowledge into responsive and sustainable architectural solutions.

MODULE	COURSE TOPICS
Module-1	Introduction to Vernacular & Cost Effective Architecture: Definitions, relevance, its role & scope, issues of concern in present day architecture and causative forces of the & Cost Effective Vernacular & Cost Effective form.
Module-2	Lessons from Vernacular Architecture & Cost Effective: Brief overview of the varied learnings from vernacular including sense of place, spontaneity & variation, control, open ended from relationship, symbols & meanings.
Module-3	Case/Literature studies: Study of vernacular, & cost effective and traditional

	architecture of India & the world specifically varied in climatic zones.
Module-4	Study of exciting settlement: Study of exciting settlement in vicinity for on- site comprehension of afore-mentioned characteristics & developing a design criterion for ongoing design exercise.

Suggested Book(s):

1. Bhatia, Gautam (1994) Laurie Baker: Life, Works & Writings. New Delhi: Penguin Books
2. Bonner, Roger R. M. (1996) Vidyalayam: Cost Effective Technologies for Primary School Construction. New Delhi: British Council Division
3. Doshi, B. V. (1983) Low Cost Housing: An Analytical Study of the Current Practices & Techniques. Ahmedabad: Vaastu Shilpa Foundation
4. HUDCO, Is it possible? The Alternate Approach: Cost Effective Technology Applications for Building Solutions. New Delhi: HUDCO
5. Jagadish, K. S. & others (2007) Alternative Building Materials and Technologies. New Delhi: New Age Intl. Pvt. Ltd.
6. Poulse, K. Thomas (2002) Reading Material on Housing. New Delhi: Institute of Town Planners
7. Rewal, Raj (2000) Raj Rewal: Humane Habitat at Low Cost: CIDCO, Belapur, New Bombay. New Delhi: Tulika
8. Steele, James (1997) An Architecture for People: The Complete Works of Hassan Fathy. London: Thames & Hudson

Other reference materials /weblinks

1. <https://www.re-thinkingthefuture.com/rtf-fresh-perspectives/a1826-20-cost-effective-materials-in-construction/>
2. <https://www.wbdg.org/design-objectives/cost-effective>
3. [https://www.archdaily.com/948145/4-ways-to-create-a-safer-and-more-cost-effective-building-environment\](https://www.archdaily.com/948145/4-ways-to-create-a-safer-and-more-cost-effective-building-environment/)
4. <https://archi-monarch.com/cost-effective-architecture/>

Video Links

1. <https://www.youtube.com/watch?v=zFrQ0wy-yTo>
2. <https://youtu.be/PmX0npteV3c>

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2654	Elective-VI	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2654(2) EARTHQUAKE RESISTANT CONSTRUCTION TECHNOLOGY

SUBJECT OBJECTIVES

1. To provide foundational knowledge of earthquakes, seismic forces, and their impact on buildings and infrastructure.
2. To develop an understanding of the behavior of structures under seismic loads and the principles of earthquake-resistant design.
3. To equip students with practical skills in designing and detailing structures using appropriate materials, construction technologies, and seismic safety standards.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand the causes and characteristics of earthquakes, and assess seismic hazards and risks in architectural contexts.
2. Analyze the dynamic behavior of buildings under seismic forces and apply design principles to enhance safety, ductility, and structural performance.
3. Demonstrate the ability to design, detail, and critique earthquake-resistant architectural elements and structures through hands-on projects and real-world case studies.

MODULE	COURSE TOPICS
Module-1	Introduction to Earthquakes and Seismic Forces • Earthquake basics: causes, types, and characteristics • Seismic waves and ground motion

	• Impact of earthquakes on buildings and infrastructure • Fundamentals of seismic hazard and risk assessment
Module-2	Seismic Behavior of Structures • Dynamic response of structures to earthquake forces • Concept of natural frequency, damping, and resonance • Types of structural failures during earthquakes • Importance of ductility, strength, and stiffness in design
Module-3	Earthquake Resistant Design Principles • Basic design philosophies: Strength, ductility, and redundancy • Lateral load resisting systems: shear walls, braced frames, moment frames • Building configuration and regularity for seismic performance • Introduction to relevant codes and standards.
Module-4	Construction Technologies and Materials • Earthquake resistant construction materials (reinforced concrete, masonry, steel, timber) • Detailing techniques to improve seismic performance • Base isolation and energy dissipation systems • Retrofitting and strengthening existing buildings
Module-5	Practical Applications and Case Studies • Analysis and design exercises of simple structural elements • Site and soil considerations for seismic design • Study of notable earthquake case studies and lessons learned • Studio project: Designing an earthquake resistant architectural element or small structure • Presentation and critique

Suggested Book(s):

1. Indian Society of Earth Quake Technology, Roorkee, Manual of EQR Non-Engineered Construction.
2. Learning Earthquake Design and Construction by C.V.R. Murthy(IITK), 2005
3. Earthquake resistant design of structures by Dr. Harbhajan Singh.
4. Bachmann, Hugh, Seismic Conceptual Design of Buildings, Basic Principles for Engineers, Architects, Building Owners and Authorities.
5. Earthquake resistant design of structures by Pankaj Agarwal and Manish Shrikhande
6. Earthquake resistant design of structures by S.K. Duggal

E-Books

1. Basic Earthquake Engineering: https://books.google.co.in/books?id=-0UkBAAQBAJ&printsec=frontcover&dq=basic+earthquake&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwjdo9_uj6L4AhWUNZQKHfp6CgoQ6AF6BAgJEA
2. Seismic Architecture;The architecture of earthquake resistant structures: https://books.google.co.in/books?id=rNVeDwAAQBAJ&printsec=frontcover&dq=earthquake+resistant+design+for+architects&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwibkfiIkKL4AhURZ5QKHUX

QD1oQ6AF6BAgIEAI

3. Seismic Design for Architects By [Andrew Charleson](https://books.google.co.in/books?id=nIQSEPk2zwC&printsec=frontcover&dq=earthquake+resistant+design+for+architects&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwibkfilK4AhURZ5QKHUXQD1oQ6AF6BAgEEAI): https://books.google.co.in/books?id=nIQSEPk2zwC&printsec=frontcover&dq=earthquake+resistant+design+for+architects&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwibkfilK4AhURZ5QKHUXQD1oQ6AF6BAgEEAI
4. Building Configuration and Seismic Design: https://books.google.com/books?id=U9FRAAAAMAAJ&q=earthquake+resistant+design+for+architects&dq=earthquake+resistant+design+for+architects&hl=en&newbks=1&newbks_redir=1&printsec=frontcover&sa=X&ved=2ahUKEwibkfilK4AhURZ5QKHUXQD1oQ6AF6BAgHEAI
5. Earthquake Resistant Design of Structures By [S. K. Duggal](https://books.google.co.in/books?id=oB2xmgEACAAJ&dq=earthquake+resistant+design+for+architects&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwibkfilK4AhURZ5QKHUXQD1oQ6AF6BAgDEAI): https://books.google.co.in/books?id=oB2xmgEACAAJ&dq=earthquake+resistant+design+for+architects&hl=en&newbks=1&newbks_redir=1&sa=X&ved=2ahUKEwibkfilK4AhURZ5QKHUXQD1oQ6AF6BAgDEAI

Other Reference Materials/Web Links

1. Lithosphere: <https://www.researchgate.net/journal/Lithosphere-1947-4253>
2. Plate Tectonics: https://www.researchgate.net/publication/263551020_Plate_Tectonics
3. Earth Magnitude: https://www.researchgate.net/publication/302364585_Earthquake_Magnitude
4. Earthquake Architecture: https://www.researchgate.net/publication/264166373_Earthquake_Architecture_as_an_expression_of_a_stronger_architectural_identity_in_seismic_areas
5. Bulletin of Earthquake Engineering: <https://www.springer.com/journal/10518>
6. Modern Earthquake Engineering: <https://link.springer.com/book/10.1007/978-3-642-31854-2>

Video Links

1. The Lithosphere: <https://www.youtube.com/watch?v=et0DcFhX8Ig>
2. Structure of Environment: Lithosphere: <https://www.youtube.com/watch?v=ho3Egww1aTE>
3. Introduction to Plate Tectonics: <https://www.youtube.com/watch?v=fzhPmemffII>
4. Earthquake Magnitude vs Intensity: <https://www.youtube.com/watch?v=tsqfEhHXwsY>
5. 5 largest earthquakes in recorded history: <https://www.youtube.com/watch?v=fv5aFxNMMfA>
6. 10 worst earthquakes in India: <https://www.youtube.com/watch?v=eLMvWQYBgUY>

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/Viva	Total (B)	
PE	AR2654	Elective-VI	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2654(3) ENERGY CONSCIOUS ARCHITECTURE

SUBJECT OBJECTIVES

1. To introduce students to climate-responsive architecture and passive design techniques suited for different climatic zones.
2. To develop an understanding of the interaction between built form, natural elements, and environmental factors in achieving thermal comfort and energy efficiency.
3. To equip students with practical knowledge of passive heating and cooling strategies and their application through case studies and design exercises.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Analyze various climatic conditions and formulate appropriate shelter design strategies integrating site planning, material choice, and building orientation.
2. Apply solar geometry and passive techniques to optimize thermal comfort, reduce energy loads, and enhance building performance using sustainable principles.
3. Design and evaluate architectural solutions incorporating passive heating and cooling systems, supported by real-world case studies and technical analysis.

MODULE	COURSE TOPICS
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Module-1	Types of Shelter, Site Planning & Development: Types of Climate and their Shelter Over view of the different Passive Techniques & Climate responsive design features built form – open space relationship & façade articulation & appropriate use of building materials. Land form & orientation, Vegetation & Pattern, Water Bodies, Open Space & Built form, Plan form & Elements, Roof form, Fenestration pattern & Configuration, Building envelope & finishes.
Module-2	Solar Energy and Buildings: Solar Energy and Buildings Solar geometry and built form – Various techniques of shading to reduce heat gain in tropical climate. Various methods of Maximizing exposure to solar radiation in cold & temperate climate. Heating & cooling loads –Energy conservation methods – Efficient day lighting, Solar Water heating system. Exercises on heating and cooling load calculations in buildings.
Module-3	Passive Heating Techniques: Passive Solar Heating General principles – Direct gain systems - Glazed walls, Bay windows, Attached sun spaces etc. Indirect gain systems – Trombe wall, Water wall, Solar Chimney, Transwall, Roof pond, Roof radiation trap, Solarium. Case studies on buildings designed with passive heating techniques
Module-4	Passive Cooling Techniques: Passive Cooling General principles – Evaporative cooling, radiation cooling, Passive Desiccant cooling, induced ventilation, earth sheltering, Berming, Wind Towers, earth Air tunnels, Curved Roofs & Air Vents, Insulation , Vary Thermal wall. Case studies on buildings designed with passive cooling techniques.

Suggested Book(s):

1. Nayak, J.K., & Prajapati, J.A. (2012). *Handbook on Energy Conscious Buildings*. New Delhi: Solar Energy Centre, MNES.
2. Goulding, J.R., Lewis, J.O., & Steemers, T.C. (1992). *Energy Conscious Design: A Primer for Architects*. Brussels/Luxembourg: European Communities/ECSC.
3. Vale, Brenda (1991). *Green Architecture: Design for an Energy-Conscious Future*. Boston: Little, Brown.
4. Thermal Education for Renewable Infrastructure (2024). *Green Building: Guidebook for Sustainable Architecture*. TERI Press.

Other Reference Materials/Web Links

1. https://www.ineer.org/Events/ICEE2008/full_papers/full_paper436.pdf
2. https://www.academia.edu/88145593/Energy_efficiency_in_architecture_An_overview_of_design_concepts_and_architectural_interventions
3. <https://cordis.europa.eu/article/id/1144-energy-conscious-architecture>
4. <https://www.tandfonline.com/doi/abs/10.1080/10464883.1977.10758103>

Video Links

1. https://www.youtube.com/watch?v=EXYw8_pnKr0
2. <https://www.youtube.com/watch?v=xHGzrw6-rNU>
3. <https://www.youtube.com/watch?v=sNEBqgmYx6I>
4. <https://www.youtube.com/watch?v=IrU0Z57Zizg>

5. https://www.youtube.com/watch?v=odBCxWHd_kk
6. <https://www.youtube.com/watch?v=ly8orBNiNQM>

SEMESTER-VI															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2654	Elective-VI	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2654(5) VASTU SHASTRA

SUBJECT OBJECTIVES

1. To introduce the historical, philosophical, and textual foundations of Vastushastra and its relevance to architectural practice.
2. To develop an understanding of core Vastushastra principles including site orientation, zoning, climatic responsiveness, and modular design.
3. To critically examine the application, challenges, and ethical considerations of Vastushastra in contemporary and urban architecture.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Explain the philosophical concepts of Pancha Mahabhutas, Purusha Mandala, and their influence on traditional architectural design.
2. Apply Vastushastra principles to site planning, spatial organization, and climate-responsive design in architectural projects.
3. Critically assess modern interpretations and uses of Vastushastra, recognizing misconceptions and integrating ethical practices in design.

MODULE	COURSE TOPICS
Module-1	1. Origins and philosophical foundations of Vastushastra 2. Key texts: <i>Manasara</i>, <i>Mayamatam</i>, <i>Samarangana Sutradhara</i>, <i>Vishwakarma Prakash</i>, etc. 3. Pancha Mahabhutas (Five Elements) and their architectural relevance 4. Concept of Purusha Mandala and Vastu Purusha Mandala 5. Relationship between Vastushastra and ecology, cosmology, and spirituality
Module-2	1. Orientation, site selection, and layout principles 2. Grid systems, module-based design 3. Functional zoning: Placement of rooms, entrances, water bodies, etc. 4. Climatic considerations in Vastushastra 5. Differences and commonalities with modern architectural principles
Module-3	1. Interpreting Vastushastra in urban and contemporary contexts 2. Challenges in applying Vastu in modern architecture 3. Misconceptions and commercialization of Vastushastra 4. Examples of modern buildings inspired by Vastu principles 5. Ethical and professional considerations

Suggested Book(s):

1. Shukla, D.N. (1961). *Vastu Shastra Vol. I: Hindu Science of Architecture*. Chandigarh: Dept. of Sanskrit; reprinted 2012.
2. *Saral Vastu Shastra* (English). (2016). Internet Archive.

Other Reference Materials/Web Links

1. https://www.irjmet.com/uploadedfiles/paper/issue_1_january_2023/33238/final/fin_irjmet1675075656.pdf
2. <https://www.ijert.org/vastu-shastra-a-vedic-approach-to-architecture>
3. https://iaeme.com/MasterAdmin/Journal_uploads/IJCIET/VOLUME_7_ISSUE_6/IJCIET_07_06_076.pdf
4. <https://www.witpress.com/Secure/elibrary/papers/ARC10/ARC10009FU1.pdf>

Video Links

1. <https://www.youtube.com/watch?v=avOuTWxFqEo>
2. <https://www.youtube.com/watch?v=Sjim7hTRao8>
3. <https://www.youtube.com/watch?v=AW1jYdzwhC8>

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2701	Building Services-IV	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

1. It shall deal with the physics and perception of sound, the characteristics of sound and vibration in spaces, and their influence in the development of holistic design concepts.

LEARNING OUTCOME

1. To make them enable to apply the knowledge in various buildings.
2. To get familiarized with sound system equipments, available in market.
3. To familiarize the student with laws as per National Building Code of India/BIS.

MODULE	COURSE TOPICS
Module-1	Building Acoustics Introduction: Characteristics of audible sound – Propagation, Velocity, Frequency, Pitch, Quality/timbre, Loudness and Intensity. Behavior of audible sound in enclosures – Reflection, Absorption, Diffraction and Transmission of sound. Common acoustical defects and recommended remedies– Echo, Sound foci, Dead spots, Sound shadows, Resonance, Insufficient loudness, External noise and Reverberation. Sabine's expression for calculation of Reverberation time. Absorbents and absorption coefficient. Noise control: Noise and its types, Noise pollution. Sources of indoor noise, Indoor noise levels, Planning and design against indoor noise. Sources of outdoor noise, Traffic noise levels, Planning and design against outdoor (traffic & buildings in built-up area) noise. Identification of various sources of noise and recommendations to control them in various types of buildings e.g. – Residential, Educational, Hospital, Office, Hotels & Hostels, Industrial, Laboratories & Test houses, Miscellaneous buildings etc.
Module-2	Constructional measures for sound insulation of buildings : Materials, Hollow & composite wall construction, Floors & Ceilings. Properties of good acoustical materials. Sound system – Sound reinforcement system, Public address system. Familiarization and understanding of sound system equipment specification e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories.
Module-3	Acoustical design principles and factors : Acoustical design principles for Auditoriums, Cinema halls, Conference rooms etc. and factors viz. Site selection & planning, Dimensions, Shape, Seats & seating arrangements, Treatment of interior surfaces, Reverberation & sound absorption. Acoustical Design : The understanding the audio needs and layout for projects e.g. Auditoriums, Cinema halls, Conference rooms etc. Field / Market Surveys : Familiarization and understanding of sound system equipment available in market manufactured by various brands e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories.

Module-4	Fire Fighting & Standards: Fire, causes of fire and spread of fire, fire fighting, protection & fire resistance, equipment & methods of fighting fire, Code of fire safety, fire regulations. Structural elements and fire resistance, planning and design of Fire escape routes and elements, wet risers, dry risers, sprinklers, smoke detectors, fire dampers, fire doors, water curtains etc. Introduction to firefighting systems. Fire detection, Fire sprinklers, Fire extinguishers and Fire Hydrants system. Their system of working and design calculations.
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REFERENCE BOOKS

1. National Building Code of India.
2. National Electrical Code.
3. K. A. Siraskar, Acoustics in Building Design, Orient Longman Ltd., 1972.
4. Cox, T. J. and D'Antonio, P. (2009). Acoustic Absorbers and Diffusers. 2nd Ed. Taylor & Francis
5. Essentials of Fire Fighting (7th Edition), Authors: International Fire Service Training Association (IFSTA), Publisher: Fire Protection Publications (Oklahoma State University)

REFERENCE E- BOOKS & JOURNALS

1. The Architecture of Sound: Acoustic Design for Buildings, Author: Rob Bullen, Publisher: Springer
2. Architectural Acoustics (2nd Edition), Author: Marshall Long, Publisher: Academic Press (Elsevier, 2014)
3. Building Acoustics, Author: Tor Erik Vigran, Publisher: Taylor & Francis (2024)
4. Building Acoustics, Publisher: SAGE Publications (quarterly journal)
5. Fire Technology, Publisher: Springer (in conjunction with NFPA & SFPE)

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/yyqhgnc5cWI?si=SydYZe9gsB9kTF6L> Architectural Acoustics by Prof. Sumana Gupta and Prof. Shankha Pratim Bhattacharya
2. <https://youtu.be/UXGwLQhSR30?si=ITjc8wdGjfApAFvz> Lecture 2 : Introduction to Acoustical Physics
3. <https://youtu.be/ul5eppHz-YY?si=w9FRMYxisQqsO8IQ> Lecture 6 : Room Acoustics I
4. <https://youtu.be/dPAwBVm6bEQ?si=bR8vue6OJS4aHJy-> Lecture 10 : Application of Reverberation Time
5. https://www.youtube.com/watch?v=GUmI_IH9cAc - (Complete fire-fighting course: pump sizing, standpipe & hose systems) reddit.com, youtubesummaries.com

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ PAECC	AR2702	Advance Structural Technologies & Systems	Theory	1	1	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To understand the basics of prestressed concrete, destructive and non-destructive testing of materials and architectural approach for earthquake resistant building design and its components.

LEARNING OUTCOME

- The students will familiarize with basics of prestressed concrete and will be able to assess the strength of concrete with and without destructive testing.
- Analyzing of stresses in terms of behavior and resultants.
- Understanding the design earthquake safe buildings.

MODULE	COURSE TOPICS
Module-1	Introduction To Pre-Stressed Concrete introduction to pre-stressed concrete, Difference in pre and post tensioning systems, Advantages, Basic design concept of pre-stressed concrete beam, Analysis of pre stress and bending stress, Resultant stress, Thrust line, Concept of load balancing, Various losses of stresses, stresses behavior at anchorage zone simple numerical problems
Module-2	Strength testing Testing equipment, destructive and non-destructive testing, cube testing on UTM
Module-3	Earthquake Resistant Building Design Introduction, structural systems, effect and calculation of earthquake load, types of dampers, types of bearings, effect of bracings effect of infill walls, concept of ductile detailing and earthquake resistant building design.

REFERENCE BOOKS

- N. Krishna Raju, "Prestressed Concrete"
- MS Shetty, "Concrete Technology"
- B.C. Punmia, "Reinforced Concrete Structure"
- SK Duggal, "Earthquake Resistant Design"

REFERENCE E- BOOKS & JOURNALS

- Analysis & Design of Prestressed Concrete Structures** (Dr. Hussam Ali Mohammed, 2018)
— Full-text PDF covering pre- vs post-tensioning, stress analysis, losses, thrust line, anchorage

- zones, load balancing, and sample problems
[bohrium.dp.tech+10researchgate.net+10researchgate.net+10](https://www.researchgate.net/publication/351010101).
2. **Principles of Prestressed Concrete** (*A.H. Allen, Scribd PDF*) — Introductory booklet explaining fundamentals, systems, and basic calculations [scribd.com](https://www.scribd.com).
 3. **Prestressed Concrete Design** (*M.K. Hurst, EasyEngineering PDF*) — Design-focused text aligned with Eurocode 2: prestress losses, analysis, deflection, shear, anchorages, composite elements, flat slabs, and worked examples [easyengineering.net](https://www.easyengineering.net).
 4. **PCI Bridge Design Manual** (via Reddit recommendation) — A comprehensive guide with practical examples of prestressed design; freely available [researchgate.net+10reddit.com+10reddit.com+10](https://www.researchgate.net/publication/351010101).
 5. **“Design of Earthquake Resistant Buildings: Useful Guidelines”** (*Prasad, IJCE 2023*) — Open-access paper focused on Indian seismic zones, shear walls, base isolation, and bracing tips [indianjournalofcomputerscience.com](https://www.indianjournalofcomputerscience.com).
 6. **“Earthquake-Resistant Building Design: Innovations and Challenges”** (*Global Mainstream Journal, 2024*) — Review highlighting advanced materials (FRP, SMA), BIM, structural health monitoring, performance-based design [globalmainstreamjournal.com](https://www.globalmainstreamjournal.com).
 7. **ArXiv – Superelastic Tensegrity Braces & Tuned Mass Dampers papers** — Cutting-edge, non-traditional seismic bracing methods [arxiv.org+2arxiv.org+2en.wikipedia.org+2](https://arxiv.org).

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/4KYPltsNAWs>
2. <https://youtu.be/4KYPltsNAWs>
3. <https://youtu.be/4NelroYGY3U>
4. <https://youtu.be/aJfCAgeJ55I>
5. <https://youtu.be/aJfCAgeJ55I>
6. <https://youtu.be/Vdx2dNGsuEM>
7. <https://youtu.be/xztDNgsY13Q>
8. <https://youtu.be/xztDNgsY13Q>
9. <https://youtu.be/5G-bqqJbfVQ>
10. <https://youtu.be/5G-bqqJbfVQ>
11. <https://youtu.be/l5RA6XMOtuU>
12. <https://youtu.be/l5RA6XMOtuU>
13. <https://youtu.be/5AFJWauKWjw>
14. <https://youtu.be/5AFJWauKWjw>
15. <https://youtu.be/yzpWGrh9j6Y>
16. <https://youtu.be/Ry7N41QkCBI>
17. <https://youtu.be/rdBuTWXwjWM>
18. <https://youtu.be/C5h9nfufG9Y>
19. <https://youtu.be/yaGIZc88Qn4>
20. <https://youtu.be/nKcmgupS8pc>
21. <https://youtu.be/bDiFGY-3-x8>
22. <https://youtu.be/4FdsZ7atjFY>

23. https://youtu.be/_JeIX01K3oM
24. <https://youtu.be/T-OVL27tQH8>
25. https://youtu.be/Z5rJxlzOJ_k
26. <https://youtu.be/YFLeqeHLb38>
27. <https://youtu.be/lcBwJ488lMk>
28. <https://youtu.be/ZnYx5z2290c>
29. https://youtu.be/6l54_C4tw8A
30. <https://youtu.be/WS38l7DwpgY>
31. https://youtu.be/_2PKa7OPIgg
32. <https://youtu.be/H1xYhMP1sXs>
33. <https://youtu.be/NGlsBmpqmO4>
34. <https://youtu.be/qYD2VJ0MmwA>
35. https://youtu.be/Wv5szL_TinU
36. <https://youtu.be/cNbdiRbLmC8>
37. <https://youtu.be/a7-eWmQQeuk>
38. <https://youtu.be/vMsaJMMwd6g>

SEMESTER- VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2703	HUMAN SETTLEMENTS PLANNING	Theory	2	0	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVES

1. To impart a foundational understanding of urban planning and design by exploring the historical evolution, key principles, theoretical frameworks, planning instruments and contemporary urban development practices, with a focus on Indian context and emerging smart city paradigms.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. To impart a foundational understanding of urban planning and design by exploring the historical evolution, key principles, theoretical frameworks, planning instruments, and contemporary urban development practices, with a focus on Indian context and emerging smart city paradigms.
2. Analyze planning principles of traditional Indian towns with appropriate examples.
3. Understand the key modern planning concepts and theories, and evaluate the development of post-independence new towns in India.
4. Understand the structure and roles of urban development authorities in India, and able to differentiate between urban redevelopment, renewal, and regeneration, and their relevance in the Indian context.

MODULE	COURSE TOPICS
Module 1 Historical Overview	• Introduction, Role, Importance and Scope of Urban Planning vis-à-vis Urban Design. • Overview of settlement planning from the River Valley Civilisations to the Pre-Industrial (17th-18th Century) era, with emphasis on the factors that influenced Planning Principles and Theories. • Planning Principles of Indian towns with examples. • Evolution of Modern Planning Concepts such as Garden City Concept (Sir Ebenezer Howard), Geddesian Triad (Patrick Geddes), Neighbourhood Planning (C A Perry), Radburn Theory, Satellite Town, Ribbon Development, Ekistics, City Beautiful, Concentric Model Theory etc. • Study of New Towns in Post-independence India like Chandigarh, Bhubaneswar and Gandhi Nagar
Module 2 Planning	• Definition and Classification of different types of Human Settlements in India, based on Population, Road Pattern, Form, Land Use, Scale, Density.

Principles and Implementation	• Definition, Objectives, Content, preparation and Implementation of the following w.r.t. India (with appropriate case examples): (a) Master Plan, (b) Regional Plan, (c) Zonal Development plan, (d) Structure Plan (e) Local Area Plan • Role and hierarchy of Urban Development Bodies • Concept of Urban Redevelopment, Urban Renewal and Urban Regeneration.
Module 3 Introduction to Smart Cities	• Existing Towns and Cities in India - Issues, Recommendations, schemes etc. • Introduction to UDPFI and TCPO • The Smart City: Definitions, Basis and Origin of the concept • Smart Cities in India: Need and Importance, Features, challenges, strategies and Implementation, Case Examples

REFERENCE BOOKS

1. Binode Behari Dutt; "Town Planning in Ancient India"; Isha Books, New Delhi; 2009
2. B. Gillion and Simon Eisner, "The Urban Pattern: City planning and design", CBS Publishers and Distributors Pvt. Ltd, Delhi; 2005
3. Prof. B. C. Chattopadhyay, "Reading Material on City and Metropolitan Planning and Development", Institute of Town Planners, India; New Delhi.
4. Prof. B. K. Sengupta, "Reader's volume on History of Human Settlements", Institute of Town Planners, India; New Delhi.
5. M. Pratap Rao; "Urban Planning Theory and Practice", CBS Publishers & Distributors Pvt. Ltd; New Delhi; 2012
6. Lewis Mumford; "The City in History: Its Origins, Its Transformations, and Its Prospects.
7. S.C. Rangwala, "Town Planning" Charotar Publishing House Pvt. Ltd.
8. Gallion Arthur B and Eisner, Simon (1963) Urban Pattern: City Planning And Design, Van Nostrand Reinhold, London.
9. Krier, Rob (1984) Urban Space, Academy editions.
10. Keeble, Lewis (1968) Town and Country Planning, Ms Havding Gough Ltd. UK.
11. Gallion, Arthur (2003), The Urban Pattern, CBS Publishers & Distributors, India.
12. Bandyopadhyay, Abir (2001), Text Book of Town Planning, Books and Allied (P) Limited, India.
13. Hiraskar, G.K. (1997), Fundamentals of Town Planning, Dhanpat Rai Publications, India.

REFERENCE E- BOOKS & JOURNALS

1. https://www.google.co.in/books/edition/Urban_and_Regional_Planning_and_Developm/vIvPDwAAQBAJ?hl=en&gbpv=1&dq=urban+planning+and+development&printsec=frontcover
2. https://www.academia.edu/9956366/Fundamentals_of_urban_planning_and_development
3. <https://www.local2030.org/library/67/Urban-Planning-for-City-Leaders.pdf>
4. https://www.researchgate.net/publication/306140084_Development_of_Smart_Cities_in_India_-_Dream_to_Reality
5. <https://eudl.eu/pdf/10.4108/eai.27-2-2020.2303203>

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/watch?v=q_XmlG3CwNk
2. <https://www.youtube.com/watch?v=KXaWHd34jPY>
3. <https://www.youtube.com/watch?v=B-pfCaALLTI>
4. <https://www.youtube.com/watch?v=co2InWaoG-M>

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2751	Architectural Design - VII	Theory	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

1. To foster an understanding required to handle large scale building projects like campuses and multi-utility building complexes.
2. To Integrate various aspects of Sustainability in design and Site planning as essential components of the projects.
3. To Incorporate active methods for achieving sustainability like Water Harvesting, Waste management, Solar and wind Energy beside others for achieving a smaller carbon footprint of the project.

LEARNING OUTCOME

4. Students will be able to understand design as a function of specific agendas of complex building services, building sciences, building bye-laws in accordance to Master Plan of city and structural systems.
5. Understanding the potentials of case studies and literature study in terms of design analysis.
6. Recognizing the aspects of sustainable design,

MODULE	COURSE TOPICS
Module 1	Introduction : Understand and learn how to solve the Built Environment needs for multifaceted public activities especially for large campuses. Recognizing and integrating aspects of Sustainable design and planning.
Module 2	Study and Analysis: Examining existing case and literature studies of similar nature to develop design criteria. Extensive Site analysis of the proposed site for assessing on-site and off-site potentials and constraints
Module 3	Design Proposal: Design of large campuses incorporating principles of efficient and sustainable site planning, space planning, circulation and services.
Module 4	Proposal: Besides design and planning of buildings within the campus the concentrations also needs to be on integration of complex building services, building sciences, building bye-laws in accordance to Master Plan of city and structural systems. Strategies of water harvesting, waste management, utilization of solar and wind energy and reducing the overall carbon footprint of the project.
Suggested studio exercises	Minor/Short Problems Small exercises could include design of high-rise buildings like offices, hotels, hospitals etc. incorporating development of advanced structural and service systems. Major Problems: Major design exercise could include large institutional campuses, convention centers, large office campuses having auditoriums , Shopping Malls, Stadium and other multi-utility buildings.

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NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Architecture today 2nd ed. by Charles Jencks and John Wiley & Sons Inc
2. Architecture Conceptual to the Manifest by Khulbushan Jain,
3. Hotel Design Planning and Development: Second Edition by [Richard H Penner](#) (Author), [Lawrence Adams](#), [Stephani K A Robson](#)
4. General Hospitals Planning & Design, by [Debra Levin](#)
5. Auditorium Acoustics and Architectural Design 2nd Edition by [Michael Barron](#).

REFERENCE E- BOOKS & JOURNALS

1. "Planning for Higher Education Facilities" by Society for College and University Planning (SCUP)
2. "Campus Landscape: Functions, Forms, Features" by Richard P. Dober
3. "Sustainable Campus Design" by Judit Kimpian, Huw Heywood & Sophia Moore
4. "Guidelines for Campus Planning" – Council of Architecture (COA), India
5. "Planning and Designing Educational Buildings" – CPWD Manual (India)

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=KPqYuF29-6Q> : 5 star hotel planning and design
2. https://www.youtube.com/watch?v=w2_poOZDBLk: Hotel Planning and Design presentation
3. <https://www.youtube.com/watch?v=OqcgAWZrDH4>: How to Design. Design Process. Conceptual zoning. Hospital Design.
4. <https://www.youtube.com/watch?v=p-YEAMy4Tdo>: Healthcare Architecture: Why and How to Design Hospitals

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/ P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
BS & AE	AR2752	BUILDING CONSTRUCTION & MATERIALS-VII	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110	150

SUBJECT OBJECTIVES

1. To introduce Advanced Construction Concepts and explore Smart and Novel Materials.
2. Understand Pre-fabrication and Pre-engineering, delve into Pre-stressed Concrete.
3. Examine Composite Materials, to introduce Nanomaterials and explore Advanced Glazing Technologies.
4. To understand Speedy Construction Techniques and master Advanced Formwork Systems.
5. Apply Modular Coordination Principles

LEARNING OUTCOMES

By the end of this module, students will be able to:

1. The students are able to analyze and evaluate Advanced Construction Systems.
2. Students are able to understand the selection and justify Smart Materials.
3. Design with Pre-stressed Concrete, utilize Cold Form Sections, FRP, Incorporate Composite Materials.
4. To familiarize with the application of Nanomaterial, specify Advanced Glazing Systems.
5. Propose Speedy Construction Solutions, implement Advanced Formwork Systems and able to understand the application of Modular Coordination in Design.

MODULE	COURSE TOPICS
Module 1 Exploration of new Building Materials	<u>Introduction:</u> Advanced (Green) Construction and Smart Materials in construction -tensile fabrics, metal lattice structures, special structural envelopes, etc. Pre-fabricated construction & Pre-engineered building. Pre-stressed Concrete : Introduction, methods of pre-stressing, types of post-tensioning systems. Cold form sections, FRP. The types of advanced concrete- bendable concrete, light transmitting concrete, translucent concrete, pervious concrete, eco-cement etc. Aramid fibers, bio-steel, Carbon / Graphite Fibers and fiber-glass etc. Types, terminology & classification of composite of materials such as particle reinforced, fiber reinforced & structural boards. Use of composite materials namely Polymer Matrix Composites (PMCs), Fiber Reinforced Polymers (FRPs) along with cement, steel, aluminum, glass for thermal insulation, fire protection, coating & painting and structural monitoring etc. Introduction to types of Nano-materials such as carbon nano tubes etc. their properties, performance and application. Glazing- Single/ double/ triple-glazed units, smart glass, etc.

Module 2 Speedy Construction	Forms & Materials for Speedy Construction Reinforcement types, RMC. Types of pre-stressed concrete structures- Beams, Girders & Joists. Slabs (one way, two way, flat slabs, hollow core slabs, planks, etc), Single & Double T-slabs. Channel sections, Folded plate structures. Composite construction. Advanced Formwork systems- Table Form/ Flying Form, Column Formwork Systems, Horizontal Panel Systems, Vertical Panel Systems, Jump Form, Slip Form & Tunnel Form. Classification, Availability, Characteristics and Uses.
Module 3 Modular Coordination	Modular Coordination_ Aims, basis, planning, dimensioning. Assembly of components, tolerances, positioning of functional elements – slabs, walls, staircases._

REFERENCE BOOKS

1. **Modern Construction Handbook (Andrew Watts)**-Covers innovative materials, prefabrication, and modern methods of construction.
2. **Construction Technology by Roy Chudley (PDF)**-Extensive chapters on modular building and material technologies.
3. **[Prefabricated Building Materials & Modular Construction \(SpringerLink\)](#)**-Technical book discussing automation, prefab, and smart construction methods.

REFERENCE E- BOOKS & JOURNALS

1. **[Automation in Construction – Elsevier](#)**-Peer-reviewed articles on robotic, prefab, and rapid construction.
2. **[Journal of Building Engineering – Elsevier](#)**-Frequent publications on advanced building systems and sustainable materials.
3. **MDPI – Buildings Journal**-Open-access journal on modular systems and innovations in building materials.

REFERENCE YOUTUBE LINKS

1. **[BIM – Modular Construction Explained](#)**
2. **[Engineering Explained – Fastest Construction Technologies](#)**
3. **[Construction Tech – Prefab Housing Revolution](#)**
4. **[SAM100: Semi-Automated Mason \(Construction Robotics\)](#)**

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ SEC	AR2753	Computer Application-VI	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To Impart skills of BIM software according to the industry standard
2. To impart skills of presentation technique using computer as a tool

LEARNING OUTCOME

1. The students will understand BIM as a basic tool for Architectural Design, Presentation, structure and MEP.

MODULE	COURSE TOPICS
Module-1	Introduction to BIM, Definition and scope of BIM. Difference between CAD and BIM. BIM in the design process, construction, and lifecycle management
Module-2	Overview of BIM tools: Revit etc. Detailed Modelling. Architectural, Structural.
Module-3	BIM for Building Performance & Analysis , BIM Collaboration & Coordination.
Module-4	Hand on exercises for BIM with studio exercises

REFERENCE BOOKS

1. Autodesk Revit 2017 Architecture Fundamentals
2. Autodesk Revit 2018 Architecture Basics

REFERENCE E-BOOKS & JOURNALS

1. <https://www.igi-global.com/book/handbook-research-building-information-modeling/37234?utm>
2. https://en.wikipedia.org/wiki/Karen_M._Kensek?utm
3. https://www.researchgate.net/publication/383608809_Concepts_of_Building_Information_Modeling?utm
4. <https://journalair.com/index.php/AIR/article/view/1145?utm>

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5. <https://www.emerald.com/insight/content/doi/10.1108/jedt-01-2021-0013/full/html?utm>

REFERENCE YOUTUBE LINKS

1. <https://help.autodesk.com/view/RVT/2024/ENU/?guid=GUID-C7FC8EF6-6418-431F-ADC6-493C2E911AFF>
2. <https://www.youtube.com/watch?v=64YT24>
3. <https://m.youtube.com/%40AutodeskBIM360?utm>
4. <https://help.autodesk.com/cloudhelp/ENU/BIM-360/files/GUID-117501B4-AB22-4258-A87F-06FDDA055E10.htm?utm>
5. <https://construction.autodesk.com/product-tour/design-collaboration-model-coordination/?utm>
6. <https://m.youtube.com/%40AutodeskBIM360?utm>

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2754	Elective-IV	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2754(1) GEOGRAPHIC INFORMATION SYSTEM (GIS)

SUBJECT OBJECTIVES

1. To introduce the fundamental concepts, components, and data types of Geographic Information Systems (GIS) relevant to architecture and planning.
2. To develop proficiency in spatial data analysis techniques, geoprocessing tools, and thematic mapping for architectural and environmental applications.
3. To familiarize students with practical applications of GIS in urban planning, disaster management, heritage conservation, and site development.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand and explain the components of GIS, data acquisition methods, and different types of spatial data.
2. Apply spatial analysis and geoprocessing techniques to solve real-world architectural and planning problems.
3. Create, analyze, and visualize maps using cartographic principles and GIS software tools for informed design decision-making.

MODULE	COURSE TOPICS
Module-1	Elements of Geographic Information System (GIS): Definition and Scope of GIS, Components of GIS, Types of Data in GIS, Data Acquisition and Sources.
Module-2	Analysis of spatial information: Spatial Data Analysis Techniques, Topological Relationships, Geoprocessing Tools, Thematic Mapping, Spatial Statistics
Module-3	Real world applications: Urban and Regional Planning, Architecture and Site Planning, Disaster Management and Environmental Planning, Transportation and Infrastructure, Heritage Conservation and Landscape Design

Module-4	Maps creation & analysis: Cartographic Principles, Types of Maps, Data Visualization Techniques, Map Design Tools.
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Suggested Book(s):

1. Principles of Geographical information systems for land resource assessment – P. A. Burrough (Clarendon Press, Oxford).
2. Geographic Information systems a management perspective Stan Aronoff (WDL Publications, Ottawa, Canada).
3. Remote sensing in civil engineering – Kennie, J.J.M., Matthews, M.C.
4. Remote sensing principles and interpretation – Floyd F. Sabins, Jr. W.H. Freeman & Co.

Other Reference Materials/Web Links

1. https://www.researchgate.net/publication/229811164_Remote_Sensing
2. https://www.researchgate.net/publication/226233143_An_introduction_to_remote_sensing
3. https://www.researchgate.net/publication/317633797_A_Review-Remote_Sensing
4. https://www.researchgate.net/publication/353917691_Remote_Sensing_and_Its_Applications
5. https://www.researchgate.net/publication/340182760_Geographic_Information_System_GIS_Definition_Development_Applications_Components
6. https://www.researchgate.net/publication/305392062_An_Overview_of_Geographic_Information_System_GIS
7. https://www.researchgate.net/publication/3624069_Geographic_information_systems_applications_and_research_opportunities_for_information_systems_researchers
8. https://www.researchgate.net/publication/40850375_Using_Geographic_Information_Systems_GIS_to_Understand_a_Communitys_Primary_Care_Needs

Video Links

1. <https://www.youtube.com/watch?v=-4D1-eSEWXw>
2. <https://www.youtube.com/watch?v=WbjPPgdmhuQ&list=PLOzRYVm0a65cD8A9tJpU-vOoz1LDQ-UjD>
3. https://www.youtube.com/watch?v=4Rn0M39HOPU&list=PLLy_2iUCG87CDlroZBlwwBllYwz7KxVtA
4. <https://www.youtube.com/watch?v=hrgCUQKOGvk>
5. <https://www.youtube.com/watch?v=vJAQHA5XQWI&list=PL3MO67NH2XxLAFn3jc7gOhXLD9YFx-oew>

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2754	Elective-IV	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2754(2) INTRODUCTION TO RHINOCEROS

SUBJECT OBJECTIVES

1. To introduce students to the Rhinoceros interface and fundamental 2D and 3D modeling techniques relevant to architectural design.
2. To develop skills in creating precise parametric and organic architectural models, including detailed plans and façade design.
3. To equip students with rendering techniques, material application, lighting, and presentation skills for architectural visualization.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Navigate the Rhinoceros interface confidently and use basic modeling tools to create architectural forms with precision.
2. Design and model multi-level architectural projects incorporating parametric elements and prepare drawings such as floor plans and elevations.
3. Apply rendering techniques including material assignment, lighting setup, and environmental context to produce professional-quality visual presentations.

MODULE	COURSE TOPICS
Module-1	• Rhinoceros Interface and Basic Modeling • Introduction to Rhinoceros interface and fundamental 2D and 3D modeling techniques relevant to Architecture.
Module-2	• Creating a basic mini-project starting with organic/parametric forms with surface

	tools, drawing lines, circles, arcs, curves, solids, and surfaces. • Model with precision using coordinate inputs, drawing the structure and its rooms, and creating facade with parametric design options
Module-3	• Creating the first floor with all properties. • Taking a quick render and detaching elevation plan • Starting to learn about materials, camera and lights, and focusing on the light feature. • Finalizing the mini project mini-project with simple exterior renders for presentation
Module-4	• Making organic/parametric design model • Adding or building the environment • Learning the tips, chapter, dimension, leader; point editing, creating deformable shapes, modelling with solids, creating surfaces • Learning render tools and libraries • Learning to use Unit Software mode and finalising the project for presentation.

Suggested Book(s):

1. Autodesk Revit for Architecture Certified User Exam Preparation (Revit 2024 Edition)
By Daniel John Stine AIA, IES, CSI, CDT, Well AP
2. Autodesk Revit 2024 Architecture Certified Professional Exam Study Guide By Elise Moss
3. Autodesk Revit 2024 Architecture Fundamentals By ASCENT
4. Interior Design Using Autodesk Revit 2024 (Introduction to Building Information Modeling for Interior Designers)By Daniel John Stine AIA, IES, CSI, CDT, Well AP
5. Revit® 2020 for Architecture: Author(s):Eric Wing

Other Reference Material(s)/Ebook(s):

- <https://www.sculpteo.com/en/glossary/rhinoceros-definition/>
- <https://www.novatr.com/blog/ultimate-guide-to-rhino-3d>
- <https://www.rhino3d.com/features/>
- <https://www.3dnatives.com/en/rhino-3d-modeling-software-080420205/#>
- <https://simplyrhino.co.uk/product-rhino-key-features>

Video Links:

1. <https://www.youtube.com/watch?v=yPgMccdh8QU>
2. <https://www.youtube.com/watch?v=Fx-Q8q0dKvo>
3. https://www.youtube.com/watch?v=iVLqy_keaoY

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PE	AR2754	Elective-IV	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2754(3) ENTREPRENEURSHIP SKILLS FOR ARCHITECTURE

SUBJECT OBJECTIVES

1. To introduce the principles of entrepreneurship and its specific relevance to the architecture profession.
2. To develop skills in business planning, project management, legal frameworks, and financial literacy tailored for architectural ventures.
3. To enable students to create effective marketing strategies and build strong client relationships in a competitive architectural marketplace.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Identify entrepreneurial opportunities and develop viable business models suited to architectural practice.
2. Prepare comprehensive business plans, manage projects efficiently, and understand the legal and financial aspects of running an architecture firm.
3. Implement marketing strategies and client management techniques to promote architectural services and build sustainable professional relationships.

MODULE	COURSE TOPICS
Module-1	Introduction to Entrepreneurship in Architecture

	• Understanding entrepreneurship and its relevance to architects • Identifying opportunities and niches in the architectural market • Basics of business models and value proposition
Module-2	Business Planning and Project Management • Components of a business plan for an architecture firm • Project lifecycle management: from concept to delivery • Time, resource, and risk management strategies • Legal structures, contracts, and regulatory considerations
Module-3	Marketing and Client Relationship Management • Branding and positioning architectural services • Marketing strategies: digital marketing, networking, and referrals
Module-4	Financial Literacy and Fund Management • Managing cash flow and financial risks • Funding sources and financial planning for startups
Module-5	Final workshop Proposal: Creating a startup/business plan for an architectural venture.

Suggested Book(s):

1. Khanka. S.S., “Entrepreneurial Development” S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.
2. Donald F Kuratko, “Entrepreneurship – Theory, Process and Practice”, 9th Edition, Cengage Learning 2014.
3. Hisrich R D, Peters M P, “Entrepreneurship” 8th Edition, Tata McGraw-Hill, 2013.
4. Mathew J Manimala, “Entrepreneurship theory at cross roads: paradigms and praxis” 2nd Edition Dream tech, 2005.
5. Rajeev Roy, ‘Entrepreneurship’ 2nd Edition, Oxford University Press, 2011.
6. EDII “Faulty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship Development”, Institute of India, Ahmadabad, 1986.

Other Reference Materials/Web Links

1. The Potential of Architects in Entrepreneurship:
<https://www.archdaily.com/961230/the-potential-of-architects-in-entrepreneurship>
2. Entrepreneurial Education and Training for Architects:
https://www.researchgate.net/publication/329106579_Entrepreneurial_Education_and_Training_for_Architects

Video Links

1. Essential Business Skills for Architects with Chris Williamson: <https://www.youtube.com/watch?v=B2zqJPLq7RU>
2. Business Skills For Architects - Part 1 with Todd Redding:
3. <https://www.youtube.com/watch?v=ESQqTiJ-72Y>

SEMESTER-VII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2755	Landscape Design	Practical	1	0	4	3	0	0	0	50	0	50	50	100

SUBJECT OBJECTIVE

1. To introduce the students to the discipline of Landscape architecture & its relevance to Architecture.
2. To gain an insight into the changing relationship of human with nature, to develop the understanding of site and site planning.
3. To develop the skill of integrated design of open and built spaces.

LEARNING OUTCOME

With the successful completion of the course student should have capability to:

1. Understand concepts of landscape architecture.
2. Study and analyze site in relation to landscape design.
3. Able to design and detail landscape projects

MODULE	COURSE TOPICS
Module-1	Introduction: Introduction to landscape - its meaning, Experience of a landscape, Aesthetics & Imagery of a landscape, Relationship of humans and nature. Study of Landscape elements such as land, vegetation, water, earth & climate, Natural & manmade elements, etc. Principles of landscape design such as unity, simplicity, variety, balance, proportion, sequence, etc. Social and economic factors.
Module-2	History of Landscape Architecture: including natural & cultural factors of the place, development of landscape architecture through history in different parts of the world such as China, Japan, Europe, Italy, France, England, Persia, Egypt, Greece, Rome. Study of landscape architecture in Medieval period in India such as Mughal. Modern & Contemporary Landscape architecture.

Module-3	Hardscapes & Softscapes Hardscapes: Pergolas, garden furniture, fences, rocks, masonry, paving & surfacing, roads & parking lots, walks & plazas. Softscapes such as plantation, turfing, water features. Design criteria for landscape design such as visual, functional, micro-climatic, ecological and aesthetic. Basic horticultural idea about plants, plant selection, planting design and care of plants. Brief overview of the use of landforms, water, application of materials, street furniture in a designed landscape.
Module-4	Landscape Design and Services: Macro and micro-climatic considerations in landscape architecture. Effect of climate on landscape and various components of landscape on the microclimate. Site survey– Topography, vegetation, soil, hydrology, climate etc. Principles of site planning, Design issues in site planning and siting of buildings. Integrating the built and open spaces.
Module-5	Landscape Services & Sustainability: Introduction; Outdoors lighting, surface water drainage, irrigation, soil management techniques. Exploration of sustainable landscape solutions at the site, brief overview of Xeriscaping, green roofs & walls, rain water harvesting etc.

NOTE: Studio component of the semester may be integrated with Architectural Design of the current semester.

REFERENCE BOOKS

1. Appleton. (1996). The Experience of Landscape. Wiley.
2. Geoffrey, and Jellico, S. (1987). The Landscape of Man. Thames and Hudson.
3. Laurie. (1986). An Introduction to Landscape Architecture. Elsevier.
4. Simonds, J. O. (2006). Landscape Architecture: A Manual of Land Planning and Design.
5. John I. Motloch, Introduction to Landscape Design
6. J. E. Ingels, Landscaping – Principles and Practice
7. Walker and Theodore. Planting Design

REFERENCE E- BOOKS & JOURNALS

1. **Principles of Landscape Architecture** (Steffen Nijhuis, in *Flowscales*) – Covers human–nature relationships, landscape elements and aesthetics. Available as a free PDF on ResearchGate. [reddit.com+arch2o.com+5researchgate.net+5reddit.com+5](#)
2. **Open Space and Connectivity in Landscape Design** (Lucia Costa & F. Soares, 2009) – A journal paper exploring connectivity, vegetation, ecology in urban landscapes. Downloadable via ResearchGate. [researchgate.net](#)
3. **Forty Years of Landscape Architecture** by Frederick Law Olmsted (Project Gutenberg) – Classic historical/journal compilation covering environmental, cultural, site elements. [gutenberg.org](#)
4. **Landscape Architecture: A Manual of Environmental Planning and Design** (Barry Starke) – Flipbook provides coverage of climate, water, landforms, vegetation, site planning. [torbt.cz+15fliphtml5.com+15perlego.com+15](#)
5. **20+ Landscape Architecture Free Books and Tutorials** (Arch2O) – Includes titles on design principles, detailing, planting, sustainability, history. [reddit.com+2arch2o.com+2reddit.com+2](#)

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6. **ArchNet Digital Library** – Full open-access journals related to environmental design, landscape architecture theory, regional history, green infrastructure.

REFERENCE YOUTUBE LINKS

1. **LANDSPACEARCHITECTURE** YouTube channel – Tutorials covering Photoshop, SketchUp, AutoCAD, visualization relevant to landscape design principles and elements. [overdrive.com+10reddit.com+10reddit.com+10](#)
2. **Flera TV** (by Ferdinand Leffler) – Practical garden and landscape design videos from a renowned landscape designer. Insights into vegetation, human–nature relationship, aesthetics. [en.wikipedia.org](#)
3. **TEDx: “Designing living buildings with trees”** by Ferdinand Ludwig – Explores integration of nature, hardscape, biodesign and sustainability in landscapes. [en.wikipedia.org](#)
4. **Permaculture Design (Andrew Millison)** – YouTube content on sustainable planting, water systems, human-nature relationship, green infrastructure. [en.wikipedia.org+1guides.lib.lsu.edu+1](#)
5. https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3D1d_e4C1o1b4
6. <https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3DVl0g2X7p-Xo>
7. <https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3DvV1p2T0m9Dk>
8. <https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3D33L-l3Kj5sY>
9. https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3DJm00J7Bv_m4
10. https://www.google.com/search?q=https://www.youtube.com/watch%3Fv%3D9Q5p-1bT_2o

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
BS & AE	AR2801	Building Services-V	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To understand basic design concepts and emerging technologies of modern buildings.
Acquire comprehensive base of knowledge required to understand and apply the principles, techniques and relevant guidelines for planning and design of security systems in buildings.

LEARNING OUTCOME

After successful completion of the course the students will be able to:

- Understand the security systems and their functioning
- Understand concept and principles of automation.
- Application of the learnt principles to Architectural project.

MODULE	COURSE TOPICS
Module 1	CCTV Camera: Operation & types, camera selection criteria, camera Applications, DVR-based system, DVM, network design, storage design. Components of CCTV system like cameras, types of lenses, typical types of cables, controlling system. CCTV Applications.
Module 2	Concept and application of automation and management system: design issues related building automation and its effect on functional efficiency; physical security system with components, components of building automation system; communication RFID enabled access control with components, Computer System Access Control – DAC, MAC, RBAC. EPBX System. Knowledge base and decision support systems and building automation and management system; application of expert system in building automation; stages in development of expert system, expert system application in architecture; computerizing building management information
Module 3	Design issues related to building automation and its effect on functional efficiency Components of building: Concept of automation in access control system for safety, physical security system with components, RFID enabled access control with components. Design consideration of EPBX system and its components, integration of all the above systems to design BMS.
Module 4	Design Exercise: Components of building automation system integrating HVAC, electrical, lighting, security, fire-fighting, communication etc. Current trend and innovation in building automation systems; Knowledge base and decision support systems and building automation and management system; Application of expert system in building automation.

REFERENCE BOOKS

- Atkins B., Intelligent Building, Springer, 2007.
- Atkins B., Total Facilities Management, Springer, 2009.
- Carlson R. A. and Giaudomenico R. A., Understand Building Automation System, Ama

4. BACnet: The Global Standard for Building Automation and Control Network, Author: H. Michael Newman ,Publisher: Momentum Press / ASHRAE, 2013
5. Integrated M/E Design: Building Systems Engineering (2nd Edition) Author: Anil Ahuja
Publisher: Springer (2013)

REFERENCE E- BOOKS & JOURNALS

1. Primer for Cybersecurity in Industrial Automation, Author: Siemens Industrial Security Services
2. Cybersecurity for Building Automation and Smart Facilities , Author/Publisher: Advantech (whitepaper/e book, Jan 2024)
3. Securing Industrial Control Systems and Safety Instrumented Systems: A Practical Guide, Author: Jalal Bouhdada, Publisher: Applied Risk (2023)
4. A Critical Review of Cyber Physical Security for Building Automation Systems, Authors: Guowen Li, Lingyu Ren, et al.
5. The Security of Smart Buildings: A Systematic Literature Review, Authors: Pierre Ciholas, Aidan Lennie, Parvin Sadigova, Jose M. Such

REFERENCE YOUTUBE LINKS

1. <https://youtu.be/YkDbOd26dFI?si=3hrDrMUE9jWVfQbn>
2. <https://youtu.be/mQi40A9uIaE?si=4vzynwoAn2p4pT8H>
3. <https://youtu.be/0u9L6SRE5Ec?si=piNGpy6zt6Mhrjy>
4. https://youtu.be/HvN3Oj5NChM?si=r62eIma6kfjI_B1g
5. <https://youtu.be/eod1cID3aUQ?si=vbtJsvOBscZlvkiM>

SEMESTER-VIII					
Course	Subject	Subject Name	Theory /	Scheme of	Scheme of Evaluation

Category	Code		Practical	Teaching											
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PAEC/ PAECC	AR2802	Professional Practice-I	Theory	2	0	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

The objective of the course is introducing the student to:

1. The architectural profession and its regulatory and statutory bodies.
2. Develop an understanding of legal liabilities and obligations as an architect and the importance of code of conduct and ethics in professional practice.
3. To familiarize a student with requirements of Architectural Competitions and appointment of a contractor through tenders.
4. To familiarize the students with Easement rights.
5. To familiarize students with Valuation of property.

LEARNING OUTCOME

1. Acquainting students with their roles and responsibilities of dealing with various related agencies and the freedom/ limitations as a professional as well as their real status in the society.
2. Understanding the laws and regulation of Architectural Practice.
3. Application of rules and regulations pertaining to functions of organizations

MODULE	COURSE TOPICS
Module 1	Organization of Profession Introduction to the professional Organizations e.g. the Indian Institute of Architects, the Uttar Pradesh Architects Association. Their Objectives, working constitution, byelaws, categories of membership, election procedure etc. Detailed Study of the Architects' Act 1972, Council of Architecture and its role.
Module 2	Professional Conduct, Conditions of Engagement Conditions of engagement of an architect - Duties: Responsibilities and liabilities of an architect towards the profession and society, Scale of Professional charges and mode of payment etc., Code of professional conduct and ethics, Need and types of competitions, procedure for conducting competitions.
Module 3	Tenders and Contracts Concept of Contract and essential elements of contract. Tenders, their need and types. Preparation of tender documents and procedure for awarding tenders and award of projects. Type of building contracts. Preparation of contract document - General conditions of contract, defect liability period, running & final payment, retention amount and virtual completion.
Module 4	Office Organization and Management Setting up practice- Business organization, Types of offices proprietorship, partnership, Private Limited etc., Salaried appointments - public sector, private sector. Basic understanding of Income tax and GST, Basic understanding of Office accounting procedures. Office Procedure in government organization.
Module 5	Valuation of Properties Fundamental concepts of Valuation, classification and types of valuation , Elements and factors affecting valuation; Valuation of

	immovable properties, Techniques for valuation of landed and building property. Arbitration Concept and need of Arbitration. Law governing arbitration in India – Salient features of the Indian Arbitration Act 1940 and provisions in subsequent amendments. Role of Arbitrator. Nature of arbitration. Appointment of arbitrator/s, Umpire, Conduct, Powers, and duties of arbitrators and umpires, Procedure of arbitration and preparation of awards etc.
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REFERENCE BOOKS

1. Dr. Roshan H. Namavati, Professional practice
2. Council of Architecture, handbook of professional document.
3. The Indian Institute of architects, the handbook of Professional Practice.
4. Madhav Devshaktu, Professional Practice.

REFERENCE E- BOOKS & JOURNALS

1. The Architect in Practice (*Wiley-VCH*)
2. Entering Architectural Practice *edited by James Tait (Routledge, 2020)*
3. The Architecture Chronicle: Diary of an Architectural Practice *by Jan Kattein (Taylor & Francis, 2024)*

REFERENCE YOUTUBE LINKS

1. https://www.youtube.com/watch?v=yv_Wn4IgJk
2. <https://www.youtube.com/watch?v=yD56MutXaT8>
3. <https://www.youtube.com/watch?v=l2fzgvOHwKs&list=PLA8E8LOq0JOplTkFqDtkl6ktmhGgfsYWB>
4. <https://www.youtube.com/watch?v=0ODFLK5xr14>
5. <https://www.youtube.com/watch?v=vHbB7GAOc4>

SEMESTER-VIII				
			Scheme of	Scheme of Evaluation

Course Category	Subject Code	Subject Name	Theory / Practical	Teaching											
				L	T	S/ P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
PAEC	AR2803	Project Management	Theory	2	1	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVES

1. Understand the importance of project management for architects.
2. Be in a better position while preparing for post-graduation in project management.
3. To introduce different management techniques suitable for planning and constructional projects.
4. To introduce and explore the management system for accomplishing the task efficiently in terms of both time and cost.

LEARNING OUTCOMES

1. To introduce different management techniques suitable for planning and constructional projects.
2. The course of a work from the start to the finish to analyses before the commencement of the project.
3. The students will understand organization structure and human resource management.

MODULE	COURSE TOPICS
Module 1	Introduction: Introduction to the relevance and importance of management skills in the present day profession, as suggested by various authors. Historical review of large construction projects and management techniques. Fundamentals of project management. Principles, theories and approaches to management and managerial roles and skills required by managers. Concepts of project planning, scheduling & controlling. Project scale and construction technology, human aspects in managing projects.
Module 2	Project Cycle: Feasibility studies, project proposals, detailed project reports, acquiring of project, stages in project, project monitoring and control. Financial facilities. Project Planning and Scheduling Inputs for project planning, defining activities and their interdependency, time and resource estimation. Work breakdown structures. Linear Scheduling methods - bar charts, LOB, their limitations. Principles, definitions of network based scheduling methods: CPM, PERT. Network representation, Network analysis – forward and backward passes.
Module 3	Project Monitoring and Control Site layout and organization, Site investigations. Quality tests for construction material and processes. Quality control inspections. Project progress tracking. Crashing Project Schedules, its impact on time, cost and quality. Project direct and indirect costs. Safety in Construction Projects.
Module 4	Resources Management and Value Engineering Methods of material/resource estimation and management, Resources scheduling and levelling. Labour welfare, applicable labour Legislations. Construction equipment types, characteristics & applications. Value engineering, its application in building design and construction.
Module 5	Contracts and Tenders Types of building contracts, their merits and de-merits. Types of building tenders, contents of tender documents, tendering process. General

	conditions of contract, security deposits, interim certificates, defect liability periods, retention amounts, mobilization money and virtual completion.
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REFERENCE BOOKS

1. **“A Guide to the Project Management Body of Knowledge (PMBOK® Guide)”** – PMI
[Amazon Link](#)
Essential industry standard by the Project Management Institute.
2. **“Making Things Happen” by Scott Berkun**
Free Preview (Google Books)
Practical advice on software project management.
3. **“Project Management for the Unofficial Project Manager” by Kogon, Blakemore & Wood**
FranklinCovey Store
4. **Open Access eBook** – *Project Management from Simple to Complex*

REFERENCE E- BOOKS & JOURNALS

1. **International Journal of Project Management**
[ScienceDirect Link](#)
2. **Journal of Modern Project Management**
[Official Website](#)
3. **PM World Journal**
Free Access
4. **Journal of Project Management (Open Access)**
Science Publishing Group

REFERENCE YOUTUBE LINKS

1. **Project Management Institute (PMI)**
[YouTube Channel](#)
2. **Project Management Simplified – Video Series**
[Praizion Media](#)
3. **Project Management in Under 10 Minutes – ProjectManager.com**
[ProjectManager YouTube](#)
4. **Project Management Full Course – Simplilearn**
[Watch on YouTube](#)

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
PAEC	AR2804	Building Economics	Theory	1	2	0	3	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVES

1. To make the students aware of the effect of economics on architectural considerations, and to familiarize the students to various economic concepts that come within the purview of architecture.

LEARNING OUTCOMES

With the successful completion of the course student should have capability of :

1. Basic economics
2. Grasp the fundamental economics of the Indian society
3. Understand and apply economic principles in building construction projects

MODULE	COURSE TOPICS
Module 1	Understanding building economics Micro Economics: Brief introduction of general economics through an introductory survey of concepts in micro and macroeconomics as applicable to building industry. The market, budget constraint, choice, demand and supply, uncertainties, equilibrium, technological constraints, profit maximization and cost minimization, monopoly and oligopoly, production welfare and public good. Macro Economics: GNP, NNP, demand and supply, inflation, interest rate, employment, saving and investment, monetary and fiscal systems and policies.
Module 2	Theory of Demand Utility analysis of demand, basic assumptions of marginal utility analysis, law of diminishing marginal utility, consumer's equilibrium, Demand.
Module 3	Project Economics Economics of the basic inputs into building construction projects - land, labour, capital and Material. Labour intensive v/s capital intensive projects. Financing for projects, sources of capital, Agencies and Institutions influencing project economics, public private participation.
Module 4	Capital, Interest and Profits Basic concepts of Interest and Capital, prices and rentals on investment, Capital v/s Financial assets, IRRS on Investment, IRR and Interest rates, (PV) Present Value of assets, PV of Perpetuities, general formula for PV, Nominal & Real Investments. Unit-V. Economic Analyses of Projects Cost – Control, Cash - Flow Analyses, Cost – Projection, Cost – Benefit, Feasibility, Estate Investments & returns, Valuation, Law relating to properties & Buildings.

REFERENCE BOOKS

1. **“Building Economics: Theory and Practice”** by Ivor H. Seeley
Classic textbook covering cost planning, economic evaluation, and financial aspects.
2. **“Construction Economics: A New Approach”** by Danny Myers
Clear explanation of economic concepts applied to construction.
3. **“Cost Studies of Buildings”** by Allan Ashworth & Srinath Perera
Detailed cost breakdowns with real examples.

REFERENCE E- BOOKS & JOURNALS

1. **Journal of Construction Economics and Building**
Read Online (Open Access)
2. **Construction Management and Economics** (Taylor & Francis)
Official Site
3. **Building Research & Information**
Focuses on building performance, sustainability, and economics.
4. **ScienceDirect - Construction Economics Articles**
[Browse Articles](#)

REFERENCE YOUTUBE LINKS

1. Building Economics Lecture Series - NPTEL (IIT Madras)
2. Construction Economics by Prof. Ashwin Mahalingam (IIT Madras)
3. Cost Estimation in Construction

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR2851	Architectural Design - VIII	Theory	0	2	14	9	0	0	0	50	0	100	100	150

SUBJECT OBJECTIVE

1. To expose the students to the complexities of large-scale architectural interventions in specific urban settings, having multiple stakeholders.
2. To let the students, explore how to harmonise and contextualise the architectural design with the immediate built environs and the larger urban fabric.
3. Understanding the general morphology of urban space.
4. Understanding of principles of urban design principles to the project.

LEARNING OUTCOME

1. Students will be able to understand design as a function of specific agendas of complex To understand the general morphology of urban space.
2. Be able to interpret the urban forms of the past and present.
3. Application of principle of Urban design to Project.

MODULE	COURSE TOPICS
Module 1	Introduction: Students are to be exposed to the complexities of large-scale architectural projects, often involving a group of buildings in a public realm and having multiple stakeholders. Students are encouraged to look beyond the concerns of individual building project to address the interface between public and private realm; and also contextualize their design interventions to the surrounding urban environs. The studio enables the students to apply the lessons learnt in the Introduction to Urban Design class. Relationship between Architecture, Urban Design and Urban Planning; Brief review of the evolution of the urban design as a discipline, basic principles and theories. Morphology of city growth from early cities to Modern cities.
Module 2	Study and Analysis: The students are expected to carry out site analysis and site planning at a real life location, considering its locational context, physical features, views, orientation, volumetric analysis and figure ground study of the built-form characteristics, visual imageries, street-scape and skyline analysis; pedestrian, vehicular circulation pattern, and utility networks. They also try to understand the correlation between, physical, socio-cultural, environmental and socioeconomic dimensions of the built environments, so as to identify opportunities and constrains associated with large-scale urban interventions. Understanding different types and procedures of urban design interventions their scale relationships; Study Components of urban space such as blocks, density, neighborhood, streets etc. and their interdependencies - outline of issues/ aspects of urban space and articulation of need for urban design.

Module 3	Design Proposal: Understanding the city as a three dimensional element; Urban form as determined by interplay of masses, voids, order, scale, harmony, symmetry, colour and texture; Organization of spaces and their articulation in the form of squares, streets, vistas and focal points; Concept of public open space; Image of the city and its components such as edges, paths, landmarks, street features Students are then expected to apply this understanding to a realistic site to create physical environments through basic tools of master planning, such as: movement networks, open spaces, suggestive built form, infrastructure network and planning norms.
Module 4	Urban Design and Sustainability: Sustainability concept; Relationship of urban design with economic, environmental and social sustainability; Urban renewal and urban sprawl; Concepts of Transit Oriented Development, Compact City, Healthy City and Walkable City.
Module 5	Urban design and its control; Institutional arrangements for design and planning, their roles, powers and limitations; Types of planning instruments, sketches, photo documentations, reading, data collections structure plans, master plans and local area plans, transects etc. City limits/boundaries, and zoning guidelines; Design communication and role of public participation..
Suggested studio exercises	Minor/Short Problems Small exercises could include design of high-rise buildings like offices, hotels, hospitals etc. incorporating development of advanced structural and service systems. Major Problems: Major design exercise could include large institutional campuses, convention centers, large office campuses having auditoriums, Shopping Malls, Stadium and other multi-utility buildings.

NOTE: Compilation of all Architectural Design projects in the form of report/fact-file. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation)

REFERENCE BOOKS

1. Carmona, M., Heath, T., Oc, T. and Tiesdell, S. (2010). Public Places Urban Spaces. Oxford: Architectural Press.
2. Lang, J. T. (2005). Urban Design: A Typology of Procedures and Products. Oxford: Elsevier/Architectural Press.
3. Krier, R. (1979). Urban form and space. London: Academy Editions.

REFERENCE E- BOOKS & JOURNALS

1. "Urban Design: The Architecture of Towns and Cities" by Paul D. Spreiregen
2. "The Image of the City" by Kevin Lynch
3. "Public Places, Urban Spaces: The Dimensions of Urban Design" by Matthew Carmona et al.
4. "The Social Life of Small Urban Spaces" by William H. Whyte

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=xKT8dOhJ0l0>: Local Area Plan (Urban Redevelopment Plan)
2. <https://www.youtube.com/watch?v=Wro1z1prkAI>: Special Purpose Plan (AMRUT)
3. <https://www.youtube.com/watch?v=zh3PLA2qVXE>: Reviving History. Rebuilding Lives - Nizamuddin Urban Renewal Initiative

4. <https://www.youtube.com/watch?v=sg8dJTxFpIM>: Sustainable Transport Planning & Approaches-II: The Contemporary Planning Process

SEMESTER-VIII														
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation						
				L	T	S/P	C	CIA				ESE		
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)
BS & AE	AR2852	BUILDING CONSTRUCTION & MATERIALS-VIII	Theory/ Practical	1	1	4	4	24	8	8	40	60	50	110
														150

SUBJECT OBJECTIVES

1. To deepen the understanding of Complex Building Typologies.
2. To appreciate Traditional and Sustainable Construction and develop Project Management Competencies.
3. To integrate Regulatory Frameworks and Environmental Concerns, explore Advanced and Disruptive Technologies and foster Problem-Solving for Rehabilitation and Emergency Structures.
4. Promote Cost-Effective and Sustainable Mass Construction.

LEARNING OUTCOMES

By the end of this module, students will be able to:

2. Students are able to analyze and propose Solutions for Complex Structures.
3. Integrate Heritage and Vernacular Methods.
4. Develop Comprehensive Construction Plans and able to apply National Building Code (NBC) and Environmental Regulations.
5. Able to design for Seismic Resilience and Emergency Situations, evaluate and implement Cost Reduction Strategies, assess the Potential of Digital Construction.
6. To utilize Advanced BIM for Project Integration and develop Solutions for Existing Structures and critically evaluate Emerging Technologies.

MODULE	COURSE TOPICS
Module 1 Specialized Construction Systems	<u>Building Typology & Equipment</u> : Study of large span structures, High-rise construction techniques, marine structures, special application steel structures, special technologies such as tunneling. Heritage and vernacular construction methods
Module 2 Case Studies	<u>Case Study</u> : Study Rehabilitation of old buildings, retrofitting of structures, strengthening of structures.
Module 3 Construction Management	Construction planning, scheduling and contro- Inventory management, quality control, safety management. Introduction to construction project management. National Building Code references. Environmental issues in construction, disaster management technologies,

	Earthquake-resistant detailing, Emergency structures, cost reduction technologies for mass construction.
Module 4 Advanced Construction Technologies	3D printing in construction- Techniques, materials, global case studies, Robotics and automation in building assembly. 4D and 5D BIM concepts – linking construction with time & cost. Clash detection and coordination for façade and MEP systems.

REFERENCE BOOKS

1. **"Advanced Construction Technology"** by Roy Chudley & Roger Greeno
Google Books Link
2. **"Modern Construction Management"** by Frank Harris, Ronald McCaffer & Francis Edum-Fotwe
[Wiley Online Library](#)
3. **"Construction Technology for Tall Buildings"** by Michael Chew Yit Lin
World Scientific Publishing

REFERENCE E- BOOKS & JOURNALS

1. **Journal of Construction Engineering and Management (ASCE)**
<https://ascelibrary.org/journal/jcemd4>
2. **Automation in Construction (Elsevier)**
<https://www.journals.elsevier.com/automation-in-construction>
3. **Construction Innovation: Information, Process, Management (Emerald Insight)**
<https://www.emerald.com/insight/publication/issn/1471-4175>

REFERENCE YOUTUBE LINKS

1. **The BIM – World's Best Construction Videos**
<https://www.youtube.com/@TheBIM>
2. **Engineering Explained: Construction Technology Playlists**
<https://www.youtube.com/@EngineeringExplained>
3. **"Top 10 Construction Technologies That Changed the World"**
[Watch on YouTube](#)
4. **Autodesk Construction Cloud – Tech & Case Studies**
<https://www.youtube.com/@AutodeskBuild>

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
ECPE	AR2853	Disaster Mitigation & Management	Practical	1	1	0	2	0	0	0	50	0	0	50	100

SUBJECT OBJECTIVE

1. Introduction to fundamentals of disaster mitigation & management issues and have basic knowledge of disaster management, mitigation and techniques for post disaster monitoring and design.
2. Awareness for Disaster Management issues in relevance of Architecture & surrounding built environment

LEARNING OUTCOME

1. Understanding of various types of occurrence of disaster and their mitigation through design interventions.
2. Developing the basics of post disaster recovery and rehabilitation.
3. Application of disaster Resistant Construction Techniques.

MODULE	COURSE TOPICS
Module 1	Introduction - Hazards & Disasters: Disaster its definition, types such as natural, man-made, industrial, etc. Hazard and its classification, Vulnerability, Capacity, Risk. Various Types of disasters. To understand in detail for the cause, adverse effects, distribution patterns, mitigation measures of Earthquake, Tsunami, Cyclone, Flood and Landslide. Disaster Management cycle.
Module 2	Case Studies: Studies to understand above mentioned disasters (National as well as international) occurred in the past & their inferences.
Module 3	Disaster Preparedness: Disaster Management Act, guidelines NDMA. Vulnerability Assessment & warning systems for above said disaster types Disasters Management issues, mitigation through capacity building, legislative responsibilities of disaster management, disaster mapping, assessment, predisaster risk and vulnerability reduction, post disaster recovery and rehabilitation.
Module 4	Disaster Response & Mitigation: Programmes and studies for disaster reduction, Communications. Pre disaster, emergency, transition, and recovery. Disaster management plan, Natural crisis management committee, State crisis management

	group.
Module 5	Disaster Resistant Construction Techniques: Risk reduction measures through land use control, site planning and land management, design and construction of structures for above mentioned disaster.

REFERENCE BOOKS

1. **"Disaster Management and Preparedness"** – *Thomas D. Schneid*
Google Books Link
2. **"Introduction to International Disaster Management"** – *D. Coppola*
eBook on Elsevier
3. **"Disaster Risk Reduction"** – *David Etkin*
[Springer eBook](#)
4. **UNDRR Publications (United Nations Office for Disaster Risk Reduction)**
<https://www.undrr.org/publications>
5. **FEMA Emergency Management Institute Independent Study Courses**
<https://training.fema.gov/is/>

REFERENCE E- BOOKS & JOURNALS

1. **International Journal of Disaster Risk Reduction (IJDRR)** – Elsevier
<https://www.sciencedirect.com/journal/international-journal-of-disaster-risk-reduction>
2. **Disaster Prevention and Management** – Emerald Publishing
<https://www.emerald.com/insight/publication/issn/0965-3562>
3. **Natural Hazards** – Springer
<https://link.springer.com/journal/11069>

REFERENCE YOUTUBE LINKS

1. **NPTEL Course – Disaster Management**
<https://www.youtube.com/playlist?list=PLbRMhDVUMngcT4EyiTTyZIF1ABtAe3ZzS>
2. **FEMA – Disaster Preparedness Educational Videos**
<https://www.youtube.com/user/FEMA>
3. **Disaster Risk Reduction by UNDRR**
<https://www.youtube.com/c/UNDRR>
4. **World Bank – Disaster Risk Management**
<https://www.youtube.com/playlist?list=PLfZL-Nmcfv1kLKRKBaP3I7RmPaEn9yCO9>

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PE	AR2854	Elective-V	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2854(1) ARCHITECTURAL CONSERVATION

SUBJECT OBJECTIVES

1. To introduce the fundamental concepts, ethics, and scope of architectural conservation, emphasizing the value of heritage buildings and historic structures.
2. To develop an understanding of the causes of deterioration in heritage structures and the importance of thorough documentation and analysis for conservation.
3. To familiarize students with international conservation charters, legislation, and practical case studies, enhancing their ability to assess and conserve heritage buildings responsibly.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Define heritage and historic buildings and explain the ethical and legislative frameworks that govern architectural conservation.
2. Identify common defects and decay factors in heritage structures and conduct detailed documentation and condition assessments.
3. Apply knowledge of international conservation principles and case studies to evaluate and propose strategies for the preservation of heritage sites and buildings.

MODULE	COURSE TOPICS
Module-1	Introduction to Architectural Conservation: Definition of heritage, what is an historic building? Introduction to architectural conservation of buildings of importance – definition, nature, purpose & scope. Values in conservation, Ethics of conservation building conservation legislation, etc.
Module-2	Defects in heritage: Causes of defects & decay of heritage structural. Natural agents of deterioration & loss.
Module-3	Preparatory procedures of conservation: Initial inspection, continuing documentation, analysis of documentation. Role or need of documentation for conservation & restoration of any heritage built form, heritage precincts or any sort of tangible & intangible heritage. • Listings of region or precincts for generating a database of heritage properties • Development of regional level maps for various types of heritage (heritage site maps, heritage land use maps) • Buildings and precincts topology study according to its usage, architectural style, religion (study of demography & its comparison past and present) study • Building material, construction techniques of heritage structure is various topologies of buildings with respect to time
Module-4	Introduction to international characters: Introduction to various characters their significance & their role in guiding our conservation policies & guidelines or regional level & structural level (special reference to Barra & Venice character)
Module-5	Literature study & site visit: Literature case study of Red Fort (available on ASI website) & site visit of ASI protected heritage buildings (in local city/town) & along with condition assessment techniques & methods.

Suggested Book(s):

1. Feilden, Bernard M. and Jokilehto, Jukka. Management Guidelines for World Cultural Heritage Sites. Rome: ICCROM, 1998.
2. Tandon, Rajeshwari, editor. A Case for National Policy for Heritage Conservation & Management. New Delhi: INTACH, August 2002.
3. Feilden, Bernard. Guidelines for Conservation: A Technical Manual. New Delhi: Indian National Trust for Art and Cultural Heritage (INTACH), 1989.
4. Indian National Trust for Art and Cultural Heritage (INTACH), Architectural Heritage Division, New Delhi. Conserving the Heritage of Our Historic Cities: Pre Seminar Working Document. New Delhi: INTACH, 1999.
5. Bisht, A.S., et al (2000) Conservation of Cultural Property in India, Agam Kala Prakashan, Delhi.
6. Identification and documentation of built heritage in India, Divay Gupta, INTACH, New Delhi, 2007
7. A manual of construction documentation: an illustrated guide to preparing construction drawings, Glenn E. Wiggins, Whitney Library of Design, New

8. Heritage conservation: preservation and restoration of monuments, N.L. Batra, Aryan Books International, New Delhi, 1996
9. Identification and documentation of modern heritage: world heritage papers (5,6,7,8,9), Francesco Bandarin, UNESCO, France, 2003
10. The Architectural heritage: :Madras, Kalpana k. and Frank Schiffer, INTACH, Tamil Nadu, 2000
11. Historic Building Conservation and Sustainability, Adit Pal, INTACH, New Delhi, 2005

Other reference materials /weblinks

1. <https://cpwd.gov.in/Publication/ConservationHertbuildings.pdf>
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SAR1502.pdf

Video Links

1. https://www.youtube.com/watch?v=0PK_xglWm5I
2. <https://www.youtube.com/channel/UCtuLFq-CbRfSQZIrKDL0-Sg/videos?app=desktop>

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ viva	Total (B)	
PE	AR2854	Elective-V	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2854(2) RATING SYSTEM & METHODS

SUBJECT OBJECTIVES

1. To introduce the fundamental concepts of building performance and sustainability, emphasizing the role of rating systems in architecture and construction.
2. To familiarize students with major global and regional green building rating systems, their criteria, and performance metrics.
3. To develop skills in using evaluation tools and methods for certification processes and applying rating systems critically in architectural design.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand and explain the purpose, types, and importance of sustainability rating systems in architectural practice.
2. Analyze and compare key rating systems such as LEED, BREEAM, WELL, IGBC, and GRIHA, and their application to building design and performance.
3. Apply rating system criteria and use simulation tools to evaluate building performance, prepare documentation for certifications, and critically review sustainability outcomes in design projects.

MODULE	COURSE TOPICS
Module-1	Introduction to Rating Systems in Architecture • Overview of building performance and sustainability concepts • Importance and role of rating systems in architecture and construction • Types of rating systems: environmental, social, economic
Module-2	Major Global and Local Rating Systems • LEED (Leadership in Energy and Environmental Design) • BREEAM (Building Research Establishment Environmental Assessment Method) • WELL Building Standard • IGBC (Indian Green Building Council) or other regional systems • GRIHA (Green Rating for Integrated Habitat Assessment)
Module-3	Rating Criteria and Performance Metrics • Energy efficiency and water conservation • Indoor environmental quality (air, light, acoustics) • Material selection and waste management • Site selection and ecological impact • Social and occupant health metrics
Module-4	Tools and Methods for Evaluation • Building simulation and modeling tools (energy modeling, daylight analysis) • Data collection and monitoring techniques • Documentation and submission processes for certifications • Case studies of rated projects and analysis of outcomes
Module-5	Application and Critical Review • Applying rating systems in design studio projects • Comparative analysis of different rating systems for specific building types • Challenges and limitations of rating methods • Future trends in building performance evaluation • Student presentations and peer reviews

Suggested Book(s):

1. Buchanan, P. (2005) Ten shades of green: architecture and the natural world, The Architectural League of New York.
2. Givoni, B. (1994) Passive and low-energy cooling of buildings, Van Nostrand Reinhold.
3. Guzowski, M. (2000) Day lighting for sustainable design, McGraw Hill (Professional Architecture Series).
4. Hyde, R. (2000) Climate responsive design: a study of buildings in moderate and hot humid climates, E & F N Spon, London.
5. Majumdar, M. (Ed.) (2002) Energy efficient buildings in India, MNES/TERI.
6. Shaw, Alexander (1989) Energy design for architects, Fairmont Press, Lilburn.
7. Nayak J. K. et.al (1999) Manual on Solar Passive Architecture, Solar Energy Center, Ministry of Non-Conventional Energy Sources, Government of India, New Delhi.

Other Reference Material(s)/Ebook(s):

1. Handbook of green building design and construction
<https://www.sciencedirect.com/book/9780123851284/handbook-of-green-building-design-and-construction>
2. Green Building Rating System assessment tools case study analysis
https://www.researchgate.net/publication/337362759_Green_Building_Rating_Systems_as_Sustainability_Assessment_Tools_Case_Study_Analysis
3. Guide to Green Building Rating Systems:
https://books.google.co.in/books/about/Guide_to_Green_Building_Rating_Systems.html?id=FSrBTIOVIIC&redir_esc=y

Video Links:

1. Lecture 15 Green Building Ratings and Components <https://www.youtube.com/watch?v=VE2tpwGCN0U>
2. Green Building Rating Systems Part 1: A Primer https://www.youtube.com/watch?v=RkjS7_ey4R4
3. Exploring Green Building and the Future of Construction <https://www.youtube.com/watch?v=wmoy27EZ8y0>

SEMESTER-VIII															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/viva	Total (B)	
PE	AR2854	Elective-V	Practical	1	1	0	2	0	0	0	50	0	50	50	100

AR2854(3) BAMBOO IN CONTEMPORARY MATERIAL

SUBJECT OBJECTIVES

1. To introduce the botanical, mechanical, and environmental characteristics of bamboo as a sustainable building material.
2. To familiarize students with bamboo processing, treatment, preservation techniques, and quality standards essential for construction use.
3. To develop design and construction skills focused on bamboo structural applications, innovative architectural uses, and integration with other materials.

LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Understand the properties and sustainability benefits of bamboo and its traditional and modern applications in architecture.
2. Apply appropriate treatment and preservation methods to ensure durability and structural integrity of bamboo elements.
3. Design and develop architectural components or small-scale projects using bamboo, demonstrating knowledge of joinery, performance considerations, and innovative construction techniques.

MODULE	COURSE TOPICS
Module-1	Introduction to Bamboo as a Building Material • Botanical characteristics and species of bamboo used in construction • Environmental benefits and sustainability aspects • Traditional uses of bamboo in architecture • Bamboo's mechanical and physical properties
Module-2	Processing, Treatment, and Preservation • Harvesting techniques and seasonal considerations • Treatment methods: chemical, natural, and modern techniques • Bamboo composites and engineered bamboo products • Quality control and standards
Module-3	Structural and Construction Applications • Bamboo as a structural element: beams, trusses, frames • Joinery techniques and connections • Integration with other materials (concrete, steel, glass) • Prefabrication and modular bamboo construction
Module-4	Design and Innovation with Bamboo • Contemporary architectural projects featuring bamboo • Design principles for aesthetics and functionality • Acoustic, thermal, and fire performance considerations • Challenges and solutions in modern bamboo architecture
Module-5	Studio Project and Case Studies • Analysis of landmark bamboo architectural projects • Designing a small-scale architectural element or pavilion using bamboo • Model making and detailing • Presentation, critique, and discussion of design proposals

Suggested Book(s):

1. Kim s. elliott., "Precast concrete structures" and "multi-precast concrete framed structures".CBRI, Building materials and components, India.
2. "Prefabricated Structures" by M.Pradeep Kumar from Shanlax Publications.
3. Alternative Building Materials and Technologies by K. S. Jagadish; B. V. Venkatarama Reddy; K. S. Najunda Rao
4. "Prefabricated Structures" by Dr. R. Saravanan from Lakshmi Publications.
5. Koncz T., "Manual of precast concrete construction", Vol. I, II and III, Bauverlag, GMBH.
6. "Prefabricated Structures" by Dr. R.Ganesan and Mrs.A.Latha from Sree kamalamani Publications.

Other Reference Material(s)/Ebook(s):

1. <https://www.sciencedirect.com/science/article/abs/pii/S0959652618323084>
2. https://www.researchgate.net/profile/Omid-Reza-Baghchesaraei/publication/296639797_Using_Prefabrication_Systems_in_Building_Construction/links/56d7279808aebabdb4030298/Using-Prefabrication-Systems-in-Building-Construction.pdf

3. https://www.researchgate.net/profile/Sulaem-Laskar/publication/344380144_ALTERNATE_MATERIALS_FOR_SUSTAINABLE_CONSTRUCTION_TECHNOLOGY_A_STATE-OF-THE-ART_REPORT/links/5f6e30f292851c14bc971cb5/ALTERNATE-MATERIALS-FOR-SUSTAINABLE-CONSTRUCTION-TECHNOLOGY-A-STATE-OF-THE-ART-REPORT.pdf
4. <https://www.academia.edu/download/29459086/H02530063012.pdf>
5. <https://academic.oup.com/tsc/article-abstract/2/2/81/5849356>

Video Links:

1. <https://www.youtube.com/watch?v=6NbTyHHXkTk>
2. <https://www.youtube.com/watch?v=QD0QNlhT4j8>
3. <https://www.youtube.com/watch?v=tIZP-tX9b3Y>

SEMESTER-IX															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
PAEC/ PAECC	AR2901	Architectural Internship	Practical	0	0	0	28	0	0	0	400	0	500	500	500

SUBJECT OBJECTIVE

1. To give a professional exposure to the students and an opportunity to learn in a professional environment so that they understand fundamental processes of designing of real buildings on real sites.

LEARNING OUTCOME

1. Students gain confidence in interacting with various key players in building design and construction processes.
2. Develop an understanding of contemporary issues and techniques of building construction.
3. Student learn office management and team-work to enhance the employability factor.

GUIDELINES FOR STUDENT TRAINEE

Criteria for selection of a Training Office

- In case of proprietorship firm, the proprietor shall be an architect; also, the firm shall have at least two or more architects as employee/associates.
- In case of 'Partnership' / 'Pvt. Ltd.' Firms, at least one of the partner/director shall be an architect, and the firm shall have at least one or more architects as Partner/director/employee/ associate.
- In case of a 'Public-sector' / 'State or Central Government office/academic institute or a multinational organization', there shall be a separate wing for architectural consultancy works.
- The said architect (Proprietor/Partner/Director/Head of Department/Chief Architect etc.) shall have at least 10 years of working experience and the organization should have a variety of projects.

Working Relationship between Architect and Trainee

- The architect shall provide enough jobs to the trainee to keep him/her occupied.
- The Architect shall expose the trainee to difference aspects of professional practice. The tasks given to the trainee shall include the following:

Preparation of –

Sketch designs, presentation drawings etc.

Municipal drawings according to the byelaws.

Workings drawings and details.

Estimates, bill of quantities & specifications.

Discussions with –

Clients.

Structural Consultants.

Services Consultants.

Inspection and management of site.

Preparation of - Models, perspectives and photographs, reports, progress charts etc.

Other administrative works.

Honorarium/Stipend

- The architects usually pay some amount as honorarium/stipend to meet out of pocket expenditure to the trainee. The Institute/College of the student shall have no objection if the trainees accept/receive such honorarium/stipend.

- The mode and amount of the honorarium shall depend upon the office and be based upon a mutual agreement between the employing architect and the trainee. However, it shall neither be a claim of the trainee nor binding on the architect but in order of professionalism and to maintain the dignity of profession, the training office of architects pay a respectable amount as stipend/honorarium.
- The Institute/Training and Placement cell of the Institute shall not in any way be responsible for the payment against any sorts of damages, whatsoever.

Code of conduct for the trainee

- He/she shall abide by the rules, regulations and general instructions of the office/firm.
- He/she shall remain punctual and regular in attendance.
- He/she shall make all efforts to learn the work involved in the profession, and if so required for work, shall attend the office beyond the scheduled time in the office.
- He/she shall respect and obey the senior members of the office/firm.
- He/she shall take up the job with full responsibility and show utmost interest in the work allotted.
- He/she shall inform the institute/training and placement cell about joining in the training office, its address and contact numbers. He/she shall also inform the address of the accommodation acquired during the training period.
- He/she shall remain in regular touch with the institute/ 'Training and Placement Cell' and shall keep the Training and Placement Cell fully informed about his/her progress in the training office.
- In case of any complaint or misconduct, the Institute/Training and Placement Cell may take suitable and strict action against the student.

Arranging/Fixing-up the Training office

- The Department of Architecture, directly or through the 'Training and Placement Cell' of the Institute shall provide a list of offices, along with their addresses of some well-established and recognized architects. Addition, alteration and deletion in such a list may be made from time to time in conformity to 'Criteria' as laid down for selection of a training office.
- After seeking advice from 'Training and Placement Cell', the student shall make his/her options available to the Training and Placement Cell.
- With the help of 'Training and Placement Cell', the student shall make all efforts to settle his/her appointment as trainee with an established and recognized architect.
- The trainee is expected to join the training office on the scheduled date, and submit his 'Joining Report' on the letterhead of the office duly signed by Head of the Training to the Institute in the Performa prescribed for the purpose and contained in the Log Book.
- The trainee must obtain a 'No Dues Certificate' duly and get relived from the office at the end of the training period or before changing the 'Training Office'. The trainee must submit this 'No Dues Certificate' along with the Log Book.

Change of Training Office

- In case of any emergency, a trainee may be permitted to change the training office/place of training once only during the entire period of training. He/she shall inform the Principal/Director/Head of Department/Officer in-charge of the 'Training and Placement Cell', and seek prior permission for such a change.
- The total duration of the practical training shall be the sum of the period of stay in different offices. It shall be in conformity with the 'Duration of Training' as prescribed in the 'Ordinances, Scheme of Examination & Syllabus' of the BBD University.

Final Submissions.

- After completion of practical training, the trainee is required to submit the following to the parent Institute. 'Certificate' of successful completion of the practical training mentioning the attendance in percentage, from the architect.

- ‘Daily Diary’ with details of the day to day work record, which will be returned to the student after assessment and viva voce examination. The suggested ‘Proforma’ of the page of the daily diary is available in the prescribed ‘Log-Book’.
- ‘Training report’ supplemented with the prints and documents of work done during practical training. The prints and documents shall be obtained with the permission of the Training office and shall be duly signed by the ‘Supervisor’.
- Training report shall be submitted in two copies. First copy shall be returned to the student after assessment of sessional marks and viva voce examination. The second copy shall be retained by the Training and Placement Cell/library. These shall be presented in A-4 size with ring binding.

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION / SESSIONAL OF SEMINAR / PRESENTATION SEMINAR

- Presentation shall be evaluated internally by a panel, by questioning the candidate.
- The panel shall consist of at least two senior faculty members (Architect) and Practical Training Coordinator in addition. The assessment shall be made out of 100 marks by the panel.
- In case of more than one section, in the Institute, there can be equivalent numbers of panel. In this case the panel shall consist of at least two senior faculty members (Architects) and Practical Training Co- coordinator / Asst. Practical Training Coordinator in addition.

COMPOSITION OF JURY PANEL FOR FINAL EVALUATION / EXAMINATION OF SEMINAR / PRESENTATION EXAMINERS

Each panel shall consist of:

- An Architect Director / Dean / Principal / Head of the Department / Professor of the parent institution / university.
- A faculty member (Architect) of the parent institution / university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution / university.
- An Eminent Architect from the profession with at least 15 years of field experience.
- Kindly note that opportunity to evaluate a candidate shall be given once to a faculty member, in the semester i.e. either in jury panel of internal or final evaluation. Further the Practical Training Coordinator(s) will act as facilitator.

SEMESTER-X															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical / Viva	Total (B)	
PAEC/ PAECC	AR21001	Professional Practice- II	Theory	2	0	0	2	24	8	8	40	60	0	60	100

SUBJECT OBJECTIVE

- To familiarize the students with elementary knowledge of various instruments of legislation to safeguard the professional interest of architects as also societal interest.

LEARNING OUTCOME

With course completion the student is expected to :

- Understand his role, responsibilities and code of conduct as an architect
- Develop an understanding of the role of professional and statutory bodies.
- Learns how to setup and run office

MODULE	COURSE TOPICS
Module 1	Law related to Land Introduction to the Land Acquisition Act - 1894 and its subsequent amendments through Act of 2013 and 2015, a study of the LAND ACQUISITION AMENDMENT BILL 2018. Notification to acquire land under various sections, concept of public purpose, and compensation apportionment etc. The Uttar Pradesh Urban Buildings (Regulation of Letting, Rent and Eviction) Act, 1972- Its important provisions and effect on the urban development.
Module 2	Urban Development Law Introduction to the UP Urban Planning and Development Act-1973- Concept of Urban Development Authority its power authority and Role in regulating the urban development, Salient features of the provisions of the act. The Uttar Pradesh Slum Areas (Improvement and Clearance) (Amendment) Act- 1981 and its important provisions for achieving.
Module 3	Law of Easement Concept of Easement and essential elements of valid easement, creation of easement – types of Easement, Easement by prescription, Easement by necessity and quasi easement. Termination, suspension and revival of easement and other related concepts.
Module 4	The Law of Environment A general understanding of purpose, provisions, and the impact of various components of the environmental law e.g. The National Green Tribunal Act-2010; The Air (Prevention and Control of Pollution) Act- 1981; The Water (Prevention and Control of Pollution) Act- 1974; The Environment Protection Act, 1986; The Hazardous Waste Management Regulations, etc.
Module 5	The Law of Environment A general understanding of purpose, provisions, and the impact of various components of the environmental law e.g. The National Green Tribunal

	Act-2010; The Air (Prevention and Control of Pollution) Act- 1981; The Water (Prevention and Control of Pollution) Act- 1974; The Environment Protection Act, 1986; The Hazardous Waste Management Regulations, etc.
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REFERENCE BOOKS

1. Publications of Council of Architecture-Architects (Professional conduct) Regulations; 1989.
2. Madhav Deobhakta, Architectural Practice in India
3. Architects Act; 1972.
4. Roshan Namavati, Professional Practice

REFERENCE E- BOOKS & JOURNALS

1. The Architect in Practice (*Wiley-VCH*)
2. Entering Architectural Practice *edited by James Tait (Routledge, 2020*
3. The Architecture Chronicle: Diary of an Architectural Practice *by Jan Kattein (Taylor & Francis, 2024)*

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=cV7v5cO55qQ&list=PLHKSqiKPxwpBF0ChHf-FgNRTrThZnHRex>
2. <https://www.youtube.com/watch?v=wqQx7zF81m4>
3. https://www.youtube.com/watch?v=TwONR_xdXpU&list=PL-p6f2BF5j3fTOycjKqcdsmTLW1c7ihaS
4. <https://www.youtube.com/watch?v=uXxlImWRP4M&list=PLM76hCGpA0NcRW7aHUceQrxAX-cbaAoFX>
5. <https://www.youtube.com/watch?v=uXxlImWRP4M&list=PLM76hCGpA0NcRW7aHUceQrxAX-cbaAoFX>

SEMESTER-X															
Course Category	Subject Code	Subject Name	Theory / Practical	Scheme of Teaching				Scheme of Evaluation							
				L	T	S/P	C	CIA				ESE			Total (A+B)
								CT	TA	AT	Total (A)	Theory (T)	Practical/ Viva	Total (B)	
PC	AR21051	Architectural Design Thesis - III	Practical	2	1	40	26	0	0	0	350	0	450	450	800

The Architectural Thesis is the culmination of the development of the student's knowledge, attitudes and skills over the course of studies in architecture. It is an occasion for exercising conscious choices in the field, based on the student's personal abilities and inclinations, and for testing out his commitment. The student, in consultation with the faculty, is expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment. The scope and extent of the thesis work shall be substantial and realizable in application or concept as appropriate to the selected area of work.

SUBJECT OBJECTIVE

1. To prepare a student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
2. To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.

LEARNING OUTCOME

1. Culmination of all the knowledge gained during the programme.
2. Learn to make an original and individual, creative contribution to the academic discipline and/or the professional field in some cases.
3. Ability to handle specific aspects / thrust area of design relevant to the topic.

MODULE	COURSE TOPICS
Module 1	Introduction: The multiple challenges of 'built environment' offer unlimited scope for the choice of an architectural design thesis. The selection of the thesis subject may result either from issue/s involved, or from the challenges of design, or the inherent and acquired aptitude of a student, which he/she wishes to perfect and present. The variety of the intentions give students the choice to select the topic of the thesis from a purely hypothetical to a 'live' programme, as long as the topic can result in tangible 'built environment' solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic's relevance to serve the laid down specific objectives inherent in the philosophy of the institution. For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution. The Thesis report shall consist of all relevant contextual studies: of user, place and time to enable the formulation of design criteria. The design solution shall be in the form of drawings and models of the concept and design and shall further include the presentation of at least one specific aspect relevant to the selected topic in complete detail. The report, in duplicate, shall be submitted in bound form together with prints/photographs of all the drawings and

	model/s. All relevant/ pertinent drawings, sketches, models from previous stages to be put up for the jury to show evolution of design.
Module 2	Synopsis, Data collection, Site Analysis, Preliminary Design: After the finalization of thesis topic the student are required to collect data / information related to topic through literature review should include: Anthropogenic data such as human scale and monumental scale, Information regarding space requirements, area calculations and standards on the related topic, Dimension of equipment and their area requirements with dimensions of supporting facilities, Building bye laws, land-use, FAR, ground coverage, height restrictions, setbacks and other applicable laws. Case studies: The candidate has to conduct two case studies. Idea of the case study is to form a base for student's own design. The projects selected for study should be similar in size and facilities as the thesis project. The purpose of case study is for the finalization of the project requirements and understanding the functional interconnectivity of spaces. The salient points to be covered in the study as below: • Planning, circulation and functions of the building including architect's objective and concept of design, style of architecture (if any), development of form and shape, space organization and the type of correlations between different spaces, function distribution – horizontally and vertically and their interdependency. • Area requirements for different spaces, circulation within and outside the site and buildings, site planning, climatic and physiographic response in the building design and site planning. • Structural system, materials for construction, non-conventional construction technology used (if any), service details and their location. • Parking, number of parking provided (4 wheelers and 2 wheelers), adequacy or deficiency, circulation and ventilation system in case of basement parking, segregation of parking spaces and flow of vehicles on the site. • Landscape including scheme and hierarchy of open spaces, soft and hard areas, type of plantation, furniture, light fixtures, signage, etc, used and their placement. • Air-conditioning system including type, capacity, location, maintenance, size of machine room for centralized one, size of AHU and mode of function. • Water supply and sanitary services including quantum of supply, overhead & underground tanks – their capacity, size and structural considerations. Layout of sewer line, manholes and inspection chambers, location of septic tank and connection with city main sewer. System for use of recycled water, if any. • Fire protection including type, capacity and location of firefighting equipment, detector system involved and process involved for automatic / semiautomatic sprinklers, location of refuge area / fire-fighting staircase and its width. • Electrical layout including location of transformer, DG set, metering room, HT breaker, LT / HT panels, electrical shafts, electrical rooms, MCB, etc. and their space requirements. • Solid waste disposal system including process involved, linkage with kitchen etc. • Security system: Type of security systems installed their space requirements, preferred locations and applications. • Others Services such as acoustical services, lighting and illumination, vertical transportation systems, etc. depending on the nature of the project. • Inferences drawn from the case study when compared with various standards and byelaws.

Module 3	Site Analysis: The purpose of the site analysis is to record and evaluate information on the site and its surroundings and to use this evaluation in the design response. The site analysis should identify issues that will influence the design of a development in order to make a considered response to both site opportunities and constraints. A list of important points to be considered during site analysis is as follows: On-site Considerations includes: 1. Orientation, direction, dimensions, area, shape, contours etc. 2. Trees and other significant vegetation 3. Buildings and any other notable features, landmarks or characteristics on the site. 4. Major and Minor Roads, Access points, boundaries and easement 5. On-site drainage and other services like water supply, sewage, electricity and sanitation. 6. Geotechnical investigation – type of soil, bearing capacity, water table, etc. Off-site Considerations includes: • The location and use of surrounding buildings • The surrounding road networks, connectivity and traffic movement patterns • The difference in levels between the site and surrounding properties • The built form, scale and character or surrounding and nearby development • Major and significant vegetation on surrounding properties • Nallas, streams and other water bodies nearby • Service layouts around the site. 7. Climatic conditions and its interpretation: • Basic climatic data like temperature, rainfall, humidity etc. • Prevailing wind direction and speed • Sun path diagrams, comfort zones. • Local factors affecting the microclimate of the site. • Solutions regarding orientation, fenestration, sunshades and other corrective measures to be needed.
Module 4	Preliminary Design: The students have to express their ideas generated on the basis of the studies conducted so far in the form of conceptual drawings, sketches and models. The emphasis during this stage should be on the basic concept explaining the principal ideas / thought process in terms of planning, built form and massing leading to the design through sketches /3D images / block models etc. Concept / Preliminary design should include • Site plan showing zoning of different activities (horizontal / vertical) and their interaction, location of different building blocks, along with pedestrian / vehicular movement pattern. • Schematic floor plans for all the buildings under the scope. This may be a single line plan (with proper scale), showing layout of different activity spaces mentioning the size and their connectivity. • Schematic elevations and sections in the same scale as plans • Conceptual visualization of the built form in terms of sketches, views, etc. • Block Model of the conceptual design with site.

Module 5	Pre final design: Pre final design should include the following drawings • Site Plan: Showing overall dimensions of site, major and minor roads, internal road and footpath layout with their widths, details of parking, organization of open spaces including basic landscape, building blocks with dimensions and sciography, land-use statement in the tabular form, etc. • All floor plans: all floor plans including basement plan (if any) including entrances and sub entrances, nomenclature and sizes of rooms, furniture layouts, etc. ground floor plan should also include roads, landscape, organization of open spaces and area statement. Upper floor plans should include percentage of circulation area, terrace projection, lines of floor below etc. Terrace plan should include water tank with its capacity, machine rooms, staircase tower, slopes, rainwater spouts etc. • Structural Grid Plans: Showing floor wise layout of all structural members with size and dimensions along with structural schedule. • Elevations: As many numbers of elevations to explain all the aspects of building including sciography, material, texture, trees, human figures etc. • Sections: As many numbers of sections to explain the scheme with at least one section passing through staircase. • Perspective view and Block model Stage – III Final Design, Report, Model and Viva voce Preparation of following drawings along with drawings of all previous stages with improvements. • Working Drawings: Working drawing of any one important part of building such as entrance foyer, main staircase, reception, etc. • Construction details: Construction details of any two elements of the building such as entrance canopy, staircase, partitions, ceilings, cladding, paneling, curtain walling, doors, windows, roof light, etc. • Electives: Any two of the following o Air conditioning: Plan showing plant room, machine layout, methods for taking in and out for repairs, vertical and horizontal ducts, details of ducts and room inlet / outlet, calculations to workout load, sizes of duct etc. Electrification: Plans showing electrical services such as substation, distribution boards, switch boards, fan lights, power points, etc. Load calculations should also be given. Sanitation and water supply (Hot and Cold): Plans showing GT, IC, DC, piles, slopes, inverted levels and storm water drainage. Typical detail of one toilet consisting of plan, elevations, sections, specifications. Details of pipe systems and septic tanks. Main water line, suction tanks, overhead tank, rising mains and down take pipes, Total water consumption for gardening,

	firefighting, cleaning, washing and drinking etc. o Acoustics: Plan elevations and sections showing calculations, materials, and details of fixing etc. Determination of sound level in relation to activities. Interiors: Furniture, fittings and finishes of any typical unit with complete drawings, specifications and properties of materials used, with constructional detail. Views and sketches showing total composition, color scheme, illumination level etc. o Landscape design: plans and sketches showing organization of open spaces. Study of trees, shrubs and flower plants, with their botanical names. Diagram showing full details such as trunk, foliage, and flowering season. Color of boom, salient features etc. Other electives can be added as per the expertise available in the institution.
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NOTE: Compilation of all Architectural Design sheets (Project brief, case studies, area chart, concepts, design development process, all floor plans, sections, elevations, construction details, details of electives) in the form of thesis report. Submission should be done in hardcopy as well as in softcopy (PowerPoint presentation/Photoshop presentation) with 3D model, 3D views and Animation.

REFERENCE BOOKS

1. Archiving architectural thesis 2020/ Council of architecture
2. Archiving architectural thesis 2021/ Council of architecture
3. Archiving architectural thesis 2022/ Council of architecture
4. Archiving architectural thesis 2023/ Council of architecture
5. A Guide to the Design Thesis in Architecture, by [Ganapathy Mahalingam](#), 2022
6. 11 Steps to Architectural Thesis, by [Architect Professor Indranil Sen](#), 2018

REFERENCE E- BOOKS & JOURNALS

1. The ancient and medieval architecture of India : a study of Indo-Aryan civilisation : Havell, E. B. (Ernest Binfield), 1861-1934 : Free Download, Borrow, and Streaming : Internet Archive
2. Hindu temple | Mandir, History, Ritual, Architecture, Meaning, & List | Britannica

REFERENCE YOUTUBE LINKS

1. <https://www.youtube.com/watch?v=Cv7aGw8sepQ>: Architecture Thesis Full Guide | Thesis project | In Convo - Ayushi | PODCAST
2. <https://www.youtube.com/watch?v=oaV09N1RfYQ&t=36s>: 10 APPROACHES FOR YOUR ARCHITECTURE THESIS: How to Develop a Unique and Impactful Concept
3. <https://www.youtube.com/watch?v=CdfhNz9hmOg>: My Architecture Thesis Concept [1st Class Project]
4. <https://www.youtube.com/watch?v=LwavLF2EwxE>: THE PERFECT ARCHITECTURE THESIS TOPIC | Tips on How to Select Architecture Thesis Topic