GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(Deemed to be University)

BENGALURU . HYDERABAD . VISAKHAPATNAM

Accredited by NAAC with A^{++} Grade

GITAM

REGULATIONS AND SYLLABUS

of

Bachelor of Architecture

(w.e.f. Academic Year 2025-26
for Admitted Batch 2022-23 & 2023-24)

SCHOOL OF ARCHITECTURE

GITAM (Deemed to be University)

Gandhi Institute Of Technology And Management (GITAM)

Vision & Mission of the University

VISION

GITAM will be an exceptional knowledge-driven institution advancing a culture of honesty and compassion to make a difference to the world.

MISSION

Build a dynamic application-oriented education ecosystem immersed in holistic development.

Nurture valuable futures with global perspectives for our students by helping them find their ikigai.

Drive impactful integrated research programmes to generate new knowledge, guided by integrity, collaboration, and entrepreneurial spirit.

Permeate a culture of kindness within GITAM, fostering passionate contributors.

QUALITY POLICY

To achieve global standards and excellence in teaching, research, and consultancy by creating an environment in which the faculty and students share a passion for creating, sharing and applying knowledge to continuously improve the quality of education.

GITAM School of Architecture (GSA)

Vision & Mission of the School

VISION

To be an architecture school of excellence driven by culture, context, and social responsibility for building inclusive and agile human habitats.

MISSION

M 01 Foster a progressive learning environment by promoting critical thinking for designing context-specific built environments.

M 02 Impart multidisciplinary research aptitude through a curriculum based on social responsibility, sustainable built environment, cultural context, and evolving technologies.

M 03 Nurture valuable futures by providing exposure to best practices across the world.

M 04 Sensitise students to universal human values through a culture of empathy and ethics in articulating spaces.

Bachelor of Architecture (B.Arch.)

(w.e.f. academic year 2025-26 admitted batch)

Programme Educational Objectives (PEOs)

PEO 01 Graduates will demonstrate the requisite professional skills, ethics, empathy, and the ability to produce context-specific design solutions for an inclusive built environment.

PEO 02 Graduates will stay cognizant of the latest advancements in construction technology, building materials, design tools, and their applications by engaging in lifelong learning.

PEO 03 Graduates will demonstrate the requisite skills for career advancement by addressing the challenges of the architectural profession with innovative solutions.

PEO 04 Graduates will uphold a multidisciplinary research, critical thinking, and lifelong learning culture and remain agile to evolving architectural trends, technologies, and global challenges.

PEOs Articulation

	PEO 01	PEO 02	PEO 03	PEO 04
M 01	M	H	M	H
M 02	H	M	M	H
M 03	M	H	H	M
M 04	H	L	L	M

H - High Correlation, M - Medium Correlation, L - Low Correlation

Programme Outcomes (POs) & Programme Specific Outcomes (POs)

PO 01 **Knowledge of Architecture:** Work professionally towards synthetic architectural design solutions by incorporating user requirements, and a contextual, technological, sensible and responsible approach towards environmental, historical and cultural contexts.

PO 02 **Problem Analysis:** Utilising the principles of scientific inquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyse, evaluate and apply information systematically in formulating optimum decisions.

PO 03 **Conduct Investigations of Complex Problems:** Design an ethically and methodologically robust research base to identify and analyse problems and to propose solutions that enhance holistic living.

PO 04 **Design Framework:** In addition to universal design and safety, design solutions should be tailored to the particular context, micro-climate, and social requirements, integrated with structural and other building services.

PO 05 **Architecture Ethics:** Work with ethical responsibilities, and analyse critically by imbibing values of practice in the profession and research.

PO 06 **Collaborative work culture:** Work in collaboration with diverse teams in the architectural profession in designing and execution, as well as developing interpersonal and leadership skills.

PO 07 **Design Aids / Technological Systems (Global & Contextual):** Learn, select and apply appropriate techniques, resources, and modern and contemporary architecture-related computing tools with an understanding of the limitations.

PO 08 **Environment and Sustainability:** Understand the real-life situations in architecture and its impact on social, economic and environmental factors.

PO 09 **The Architect and Society:** Apply acquired contextual knowledge that accords societal, environmental, ecological, cultural, and inclusive design to enhance human health & well-being.

PO 10 **Soft Skills:** Develop intellectual, personal and professional abilities through effective communication skills, advanced tools and technology, preparing professional quality graphic presentations, technical drawings/documents and models to engage in lifelong learning.

PO 11 **Project Management and Finance:** Demonstrate knowledge and understanding of project management principles and apply these to one's own work, as a designer and member of a team, to manage projects in multi-disciplinary environments.

PO 12	**Lifelong Learning:** Self-directed and Lifelong Learning: Graduates will acquire the ability to engage in independent and lifelong learning in the broadest context and socio-technological changes. Self-assess and use feedback effectively from the users to identify their needs and satisfy them on an ongoing basis.

PSO 01	Graduates are equipped with competency and skill sets in developing sustainable design solutions for context-specific and inclusive built environments.
PSO 02	Comprehensive knowledge of architecture (Design aptitude, methods & tools, soft skills, project management skills and critical thinking) competencies that students cultivate to enhance their potential for better employability and contribution to the profession.

Regulations

1. Admissions

1.1. Admissions into 5-year B.Arch. (Bachelor of Architecture) programme of GITAM (Deemed to be University) is governed by GITAM (Deemed to be University) admission regulations and as per norms of the Council of Architecture (CoA), New Delhi.

2. Eligibility Criteria

2.1. The candidate needs to qualify for an Aptitude Test conducted either by NTA (i.e., JEE) or the National Aptitude Test in Architecture (NATA) conducted by the Council of Architecture (CoA), New Delhi.

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2.2. The Council of Architecture has revised the eligibility criteria for admission to the 1st Year of the 5-year B.Arch degree course with effective from the academic session 2025-26 as under:

"No candidate shall be admitted to the architecture course unless he/she 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 atleast 45% marks in aggregate, passed 10+3 Diploma examination with Mathematics as compulsory subject with at least 45% marks in aggregate.*
- *passed 10+3 Diploma examination with Mathematics as a compulsory subject with at least 45% marks in aggregate.*"

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2.3. Admissions into B. Arch. will be based on 50% weightage of marks in the qualifying examination and 50% weightage in the National Aptitude Test in Architecture (NATA).

3. Choice-Based Credit System

3.1. The Choice Based Credit System (CBCS) is introduced with effect from the admitted batch of 2017-18, based on UGC guidelines in order to promote:

(a) Student-centred learning

(b) Cafeteria approach

(c) Students to learn courses of their choice

(d) Learning at their own pace

(e) Interdisciplinary learning

3.2. Learning goals/objectives and outcomes are specified, focusing on what a student should be able to do at the end of the program.

4. Structure of the Programme

4.1. The Programme of instruction consists of

4.1.1. A general core programme comprising Basics of Architecture, Building Materials, Building Construction, Architectural Design, Climatology in Architecture, etc.

4.1.2. Structural design program fundamentals related to Surveying, Theory of Structures, Design of Steel and RCC, etc.

4.1.3. Programme Electives that are supportive of the discipline and give expanded scope to the course.

4.1.4. Interdisciplinary Electives, which give interdisciplinary exposure and nurture the student's skills.

4.1.5. Open Electives are of a general nature, either related or unrelated to the discipline.

4.1.6. Undergo Practical Training (PT) in which the student is exposed to practical design problems.

4.1.7. Carry out a design thesis approved by the faculty of architecture and submit a portfolio and report.

4.2. Each academic year consists of two semesters. The curriculum and course content (syllabi) for the B.Arch. course is recommended by the Board of Studies in Architecture and approved by the Academic Council.

4.3. Each course is assigned a certain number of credits, which will depend on the number of contact hours (lectures/tutorials) per week.

4.4. The curriculum of B.Arch. programme is designed to have a total of 284 credits for the award of B.Arch. degree from the admitted batch of 2022-23 onwards.

5. Study Tour

5.1. Students must participate in three mandatory study tours during their 2nd, 3rd, and 4th years, conducted in the even semester.

5.2. The study tour's duration will be 10-15 days, and students shall be accompanied by the nominated faculty.

5.3. Students will have the option to choose from regional or national, or international tours, each with a defined theme.

5.4. Students are required to document the learning outcomes of the study tours, which will be assessed in alignment with the courses of the respective semester.

6. Medium of Instruction

6.1. The medium of instruction (including examinations and project reports) shall be in English.

7. Registration

7.1. Every student must register himself/herself for each semester individually at the time specified by the School / University.

8. Attendance Requirements

8.1. A student whose attendance is less than 75% in all the courses put together in any semester will not be permitted to attend the mid- and end-semester examinations.

8.2. Students whose attendance is between 65% to 74% will be considered as per university norms.

9. Evaluation

9.1. The assessment of the student's performance in theory courses with Semester End Examination (Category A) will be based on two components: Continuous Evaluation (I) (50 marks) and End Term Evaluation (E) (50 marks) in the form of Semester End Examination for category A1 courses and End Semester viva-voce for category A2 courses.

9.2. The assessment of the student's performance in studio courses with an Internal Evaluation (Category B1) will be completely assessed under Continuous Evaluation.

9.3. The assessment of the student's performance in studio courses (Category B2), Design Courses (Category C), Internship (Category D) & Design Thesis (Category E) will be based on two components: Continuous Evaluation (I) (50% marks) and End Term Evaluation (E) component in the form of external viva-voce/jury (E) (50 % marks).

9.4. A student has to secure an aggregate of 45% in the two components of the course put together to be declared to have passed the course, subject to the condition that the student must have secured a minimum of 45% in the Semester-end Examination component of the respective course.

9.5. The pass percentage shall not be less than 45% in any subject and shall not be less than 50 % in the aggregate.

9.6. Details of the assessment procedure are furnished in Table 01.

Table 01. Details of the assessment procedure

Assessment Category	Component of Assessment	Total Marks	Marks Allotted	Mode of Assessment	Scheme of Examination
A	**Theory Courses**				
A1	**Theory Course with Semester End Examination**	100	50 [I]	Continuous Evaluation	An assessment will be conducted at the end of each unit with Ten (10) marks. i. Twenty (20) Marks are allotted for Milestone – I Evaluation on Unit–I and Unit–II comprising of portfolio/assignments/ time bound tests/ quizzes/ reports etc., with minimum of one written test. ii. Thirty (30) Marks are allotted for Milestone–II Evaluation on Unit–III, Unit–IV and Unit–V comprising of portfolio/ assignments/ time tests/ quizzes etc., with minimum of one written test.
			50 [E]	Semester-end Examination	Fifty (50) marks are allotted for the Semester End Examination for all 5 units.
A2	**Theory Course with End Semester Viva-Voce**	100	50 [I]	Continuous Evaluation	An assessment will be conducted at the end of each unit with Ten (10) marks. i. Milestone–I: Portfolio, comprising sheets and assignments shall be evaluated for a total of Twenty (20) marks on Unit–I and Unit–II. ii. Milestone–II: Portfolio, comprising sheets and assignments, shall be evaluated for a total of Thirty (30) marks on Unit–III, Unit–IV and Unit–V.
			50 [E]	End Semester Viva-Voce	Fifty (50) marks are allotted for the Portfolio Assessment and shall be conducted through viva-voce by internal or external examiners.
B	**Studio Courses**				
B1	**Studio courses with Internal Evaluation**	100	100 [I]	Continuous Evaluation	i. Milestone–I: Portfolio, comprising sheets/ model/assignments etc., shall be evaluated for a total of Forty (40) marks. ii. Milestone–II: Portfolio, comprising sheets/ model/assignments etc., shall be evaluated for a total of Forty (40) marks. iii. Summative internal assessment of Portfolio, comprising sheets/ model/assignments etc., shall be evaluated for a total of Twenty (20) marks.
B2	**Studio Course with External Jury**	100	50 [I]	Continuous Evaluation	i. Milestone–I: Portfolio, comprising sheets and assignments, shall be evaluated for a total of Twenty (20) marks. ii. Milestone–II: Portfolio, comprising sheets and assignments, shall be evaluated for a total of Thirty (30) marks.

Assessment Category	Component of Assessment	Total Marks	Marks Allotted	Mode of Assessment	Scheme of Examination
			50 [E]	Jury	External Jury on the End Semester Portfolio by an external examiner.
C	**Design Courses**				
C1	**Basic Design & Visual Arts**	200	100 [I]	Continuous Evaluation	i. Milestone–I: Portfolio, comprising sheets and assignments shall be evaluated for a total of Forty (40) marks. ii. Milestone–II: Portfolio, comprising sheets and assignments, shall be evaluated for a total of Sixty (60) marks.
			100 [E]	Jury	External Jury on the end semester portfolio by an external examiner.
C2	**Architectural Design**	400	200 [I]	Continuous Evaluation	i. Milestone–I: Portfolio, comprising sheets/ assignments, shall be evaluated for a total of Eighty (80) marks. ii. Milestone–II: Portfolio, comprising sheets/ assignments, shall be evaluated for a total of One Hundred and Twenty (120) marks.
			200 [E]	Jury	External Jury on the end semester Portfolio by an external examiner.
D	**Internship**	600	300 [I]	Continuous Evaluation	i. One Hundred and Twenty (120) marks are allotted for Milestone–I evaluation such as portfolio / internal faculty inspection assessment / log record etc. ii. One Hundred and Eighty (180) marks are allotted for Milestone–II evaluation such as portfolio /internal faculty inspection assessment / log record etc.
			300 [E]	Performance Evaluation by principal architect (150)	Marks received in a sealed envelope / official mail from the Principal Architect / Training Officer towards performance evaluation and feedback on the trainee.
				External Jury (150)	One Hundred Fifty (150) marks allotted to the External jury on the work done in the Semester by external examiners.
E	**Design Thesis**	600	300 [I]	Continuous Evaluation	i. One Hundred and Twenty (120) Marks allotted for Milestone–I Evaluation of the Project by Panel Reviews and the Internal Guide. ii. One Hundred and Eighty (180) marks allotted for Milestone–II Evaluation of the Project by Panel Reviews and the Internal Guide.
			300 [E]	External Jury	Three Hundred (300) Marks are allotted for the End Semester External Jury.
M	**Courses offered by other Schools**	100	The Course assessment structure as prescribed by the respective schools.		

I – Continuous Evaluation Marks; E – End Term Evaluation Marks

10. Retotaling, Revaluation & Reappearance

10.1. Retotaling of the semester-end examination answer script of a course is permitted on a request made by the student by paying the prescribed fee as mentioned in the result notification of the announcement of the result.

10.2. Revaluation of the semester-end examination answer script of a course is permitted on a request made by the student by paying the prescribed fees mentioned in the result notification of the announcement of the result.

10.3. A student who has secured an ‘F’ or ‘AB’ Grade in any course (which has an end-term examination component) shall have to reappear in the supplementary examination.

11. Prerequisites For Architectural Design Thesis

11.1. A candidate shall not be permitted to enrol for the tenth semester Architectural Design Thesis/dissertation/project course unless he/ she has successfully completed Practical Training/ Internship.

12. Special Examination

12.1. A student who has completed his/her study period and still has an “F” Grade in not more than 6 courses is eligible to appear for the special examination, which shall be conducted in the summer vacation.

13. Betterment of Grades

13.1. A student who has secured only a pass or second class and desires to improve his/her grades can appear for betterment examination only in theory courses of any semester of his/ her choice, conducted in summer vacation, along with the special examination. Betterment of Grades is permitted “only once” immediately after completing the program of study.

14. Grading System

14.1. Based on the student's performance during a given semester, a final letter grade will be awarded in each course at the end of the semester. The letter grades and the corresponding grade points are as given in Table 03.

Table 03. Details of the letter grades and the corresponding grade points.

Sl. No.	*Grade*	*Grade Points*	*Absolute Marks*
01	**O (Outstanding)**	**10.00**	90 and above
02	**A+ (Excellent)**	**09.00**	80 -89
03	**A (Very good)**	**08.00**	70-79
04	**B+ (Good)**	**07.00**	60-69
05	**B (Above Average)**	**06.00**	55-59
06	**C (Average)**	**05.50**	50-54
07	**P (Pass)**	**05.00**	45-49
08	**F (Fail)**	**00.00**	Less than 45
09	**Ab (Absent)**	**00.00**	-

14.2. A student who earns a minimum of 5 grade points (P grade) in a course is declared to have successfully completed the course and is deemed to have earned the credits assigned to that course, subject to securing a GPA of 5.3 for a Pass in the semester.

15. Grade Point Average

15.1. A Grade Point Average (GPA) for the semester will be calculated according to the formula:

$$\text{GPA} = \frac{\Sigma [C \times G]}{\Sigma C}$$

Where C = number of credits for the course

G = grade points obtained by the student in the course

Semester Grade Point Average (SGPA) is awarded to those candidates who pass in all the semester courses.

15.2. A similar formula is used to arrive at the Cumulative Grade Point Average (CGPA), considering the student's performance in all the courses taken in all the semesters completed up to that point in time.

15.3. The CGPA required for class classification after the programme's successful completion is shown in Table 04.

Table 04. Details of the letter grades and the corresponding grade points.

Sl. No.	*Class*	*CGPA Required*
01	**First Class With Distinction***	≥ 8.0
02	**First Class**	≥ 7.0
03	**Second Class**	≥ 6.0
04	**Pass**	≥ 5.3

** In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester in the first attempt.*

16. Eligibility For the Award of The B.Arch. Degree

16.1. Duration of the programme:

A student is ordinarily expected to complete the B.Arch. programme in ten semesters of five years. However, a student may complete the programme in no more than seven years, including the study period.

16.2. However, the Vice Chancellor may relax the above regulations in individual cases for cogent and sufficient reasons.

16.3. A student shall be eligible for the award of the B.Arch. degree if he/she fulfils all the following conditions.

a. Registered and successfully completed all the courses and projects.

b. Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.

c. Has no dues to the School, Hostels, Libraries, NCC, NSS, etc, and

d. No disciplinary action is pending against him/her.

17. Discretionary Power

17.1. Notwithstanding anything contained in the above sections, the Vice-Chancellor may review all exceptional cases and give his decision, which will be final and binding.

18. Categories of Courses

18.1. Lecture (L)

The teacher delivers the lecture addressing the total strength of the class—all theory courses, such as Building Materials, History of Architecture, etc.

18.2. Tutorial (T)

Hands-on exercises/teaching or instruction, especially of individual or small groups, on respective requirements. E.g., surveying for architects, model-making workshops, etc.

18.3. Studio (ST)

Students work on creative incubation for design synthesis/application of theory inputs on respective workstations. The teacher interacts individually with each student throughout the semester to support the learning process—E.g, Architectural Design, Building Construction, etc.

18.4. Internship (J)

Students undergo practical training in an architectural firm to get acquainted with professional practice. E.g. Practical Training in VIII Semester

Curriculum

I Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR111	**Introduction to Art and Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR113	**Basic Design & Visual Arts I**	1	0	5	0	6	100	100	200	C1 (Jury)
03	AAR115	**Architectural Drawing and Graphics I**	1	0	5	0	6	50	50	100	A1 (05 Hrs)
04	AAR121	**Sketching Workshop**	0	0	3	0	3	100	-	100	B1 (Viva)
05	ACE101	**Engineering Mechanics**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
06	AMT111	**Mathematics for Architects**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
07	AEG111	**Technical Communication**	2	0	0	0	2	50	50	100	A1 (03 Hrs)
08	VDC111	**Venture Discovery**	2	0	0	0	2	100	-	100	M (Viva)
		Total	**14**	**1**	**13**	**0**	**28**	**550**	**350**	**900**	
		Total Hrs/Week	**28**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

II Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR112	**Theory of Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR114	**Basic Design & Visual Arts II**	1	0	5	0	6	100	100	200	C1 (Jury)
03	AAR116	**Architectural Drawing and Graphics II**	1	0	5	0	6	50	50	100	A1 (05 Hrs)
04	AAR118	**Building Construction & Materials I**	3	0	3	0	6	50	50	100	A1 (05 Hrs)
05	ACE102	**Strength of Materials**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
06	AAR126	**Model Making Workshop**	0	1	2	0	3	100	-	100	B1 (Viva)
07	AES201	**Environmental Studies**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
		Total	**13**	**2**	**15**	**0**	**30**	**450**	**350**	**800**	
		Total Hrs/Week	**30**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

III Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE201	**Theory of Structures I**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR201	**Climatology in Architecture**	3	0	1	0	4	50	50	100	A1 (04 Hrs)
03	AAR203	**History of Western Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR104	**Building Materials II**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR217	**Architectural Design I**	1	0	7	0	8	200	200	400	C2 (Jury)
06	AAR219	**Building Construction II**	1	0	4	0	5	50	50	100	A1 (05 Hrs)
07	AAR221	**Computer Applications in Architecture I**	0	0	3	0	3	100	-	100	B1 (Viva)
		Total	**13**	**1**	**15**	**0**	**29**	**550**	**450**	**1000**	
		Total Hrs/Week	**29**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

IV Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE202	**Surveying for Architects**	1	0	2	0	3	50	50	100	A1 (03 Hrs)
02	ACE204	**Theory of Structures II**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
03	AAR212	**History of Eastern Architecture I**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR204	**Water Supply & Sanitation**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR205	**Building Materials III**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
06	AAR216	**Architectural Design II**	1	0	7	0	8	200	200	400	C2 (Jury)
07	AAR218	**Building Construction III**	1	0	4	0	5	50	50	100	A1 (05 Hrs)
08	AAR222	**Computer Applications in Architecture II**	0	0	3	0	3	100	-	100	B1 (Viva)
		Total	**14**	**1**	**16**	**0**	**31**	**600**	**500**	**1100**	
		Total Hrs/Week	**31**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

V Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE301	**Concrete Structures**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR301	**Architectural Acoustics**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
03	AAR303	**Mechanical and Electrical Services**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR315	**History of Eastern Architecture II**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR307	**Site Planning & Landscape Design**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
06	AAR319	**Architectural Design III**	1	0	7	0	8	200	200	400	C2 (Jury)
07	AAR313	**Building Construction IV**	1	0	4	0	5	50	50	100	A1 (05 Hrs)
08		**Open Elective**	3	0	0	0	3			100	M (03 Hrs)
	EOE302	German for Beginners									
	EOE305	French for Beginners									
	EOE317	Personality Development									
	PSYC1002	Introduction To Psychology									
	LANG1181	Introduction To Spanish									
		Total	**19**	**1**	**11**	**0**	**31**	**550**	**550**	**1100**	
		Total Hrs/Week	**31**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

VI Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE302	**Steel Structures**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR302	**Estimating, Costing & Specifications**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
03	AAR316	**Modern & Contemporary Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR308	**Housing**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR312	**Architectural Design IV**	1	0	8	0	9	200	200	400	C2 (Jury)
06	AAR324	**Working Drawing**	1	0	5	0	6	50	50	100	B2 (Jury)
07		**Program Elective**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
	AAR304	Building Economics and Sociology									
	AAR342	Barrier Free Architecture									
	AAR344	Vernacular Architecture									
		Total	**15**	**2**	**13**	**0**	**30**	**500**	**500**	**1000**	
		Total Hrs/Week	**30**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

VII Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR403	**Advanced Services**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR461	**Research Methodology and Seminar**	1	2	0	0	3	100	-	100	B1 (Viva)
03	AAR463	**Architectural Design - V**	1	0	7	0	8	200	200	400	C2 (Jury)
04	AAR419	**Introduction to Human Settlements & Town Planning**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR465	**Building Information Modelling**	0	0	3	0	3	100	-	100	B1 (Viva)
06		**Elective Basket I**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR471	Introduction to Architectural Conservation									
	AAR473	Innovative Approaches in Interior Design									
	AAR475	Elements of Landscape Architecture									
	AAR477	Fundamentals of Circular Economy in Architecture and Construction									
07		**Elective Basket II**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR481	Computational Design and Digital Fabrication									
	AAR483	Fundamentals of Net zero in Built environment									
	AAR485	Building Construction Planning and Scheduling									
	AAR487	Urban Design Theory									
		Total	**10**	**4**	**12**	**0**	**26**	**600**	**400**	**1000**	
		Total Hrs/Week	**26**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

VIII Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR462	**Internship****	0	0	0	**	24	300	300	600	D (Jury)
02	AAR464	**Professional Practice & Building Regulations**	1	1	0	0	2	50	50	100	A2 (Report)
		Total	**1**	**1**	**0**	**	**26**	**350**	**350**	**700**	
		Total Hrs/Week	**26**								

*** Note: Students need to undergo an internship in an architectural firm for the total duration of the semester.*

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

IX Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR551	**Community Design Theory**	1	2	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR561	**Architectural Design - VI (Community Projects Studio)**	1	0	7	0	8	200	200	400	C2 (Jury)
03	AAR563	**Dissertation**	1	5	0	0	6	200	-	200	B1 (Viva)
04	AAR565	**Architectural Detailing**	1	0	2	0	3	100	-	100	B1 (Portfolio Assessment)
05		**Elective Basket I**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR571	Architectural Conservation Planning									
	AAR573	Fundamentals in Furniture Design									
	AAR575	Urban Landscapes									
	AAR577	Integrated Applications of Circular Economy in Architecture and Construction									
06		**Elective Basket II**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR581	Interactive Design									
	AAR583	Sustainable Materials and Construction Techniques									
	AAR585	Building Construction Materials and Equipment Management									
	AAR587	Urban Infrastructure and Housing									
		Total	**6**	**9**	**11**	**0**	**26**	**650**	**350**	**1000**	
		Total Hrs/Week	**26**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

X Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR562	**Design Thesis**	0	0	16	0	16	300	300	600	E (Jury)
02	AAR564	**Thesis Document**	0	1	3	0	4	100	-	100	B1 (Viva)
03		**Elective Basket I**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR572	Architectural Conservation Management									
	AAR574	Lighting Design in Architecture									
	AAR576	Landscape Design Communication									
	AAR578	Circular Cities: Indian and Global Perspectives									
04		**Elective Basket II**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR582	Data Driven Architecture									
	AAR584	Net Zero Assessment and Analysis									
	AAR586	Building Construction Safety, Quality Assurance and Control									
	AAR588	Participatory Planning and Design									
		Total	**2**	**3**	**21**	**0**	**26**	**500**	**400**	**900**	
		Total Hrs/Week	**26**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

Course - PO/PSO Mapping

#	Course Code	Course Name	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
SEMESTER I																
01	AAR111	Introduction to Art and Architecture	H	-	H	-	-	-	M	-	-	-	-	-	-	-
02	AAR113	Basic Design & Visual Arts - I	H	M	H	H	L	L	M	L	H	H	L	H	L	M
03	AAR115	Architectural Drawing and Graphics-I	H	M	H	L	L	M	L	M	L	H	L	M	L	H
04	AAR121	Sketching Workshop	H	-	-	-	-	-	-	-	-	-	-	-	-	H
05	ACE111	Structural Mechanics	L	H	M	L	L	L	L	L	M	L	L	H	M	L
06	AMT111	Mathematics for Architects	M	H	L	L	-	-	-	-	-	L	-	H	-	H
07	AEG111	Technical Communication	-	L	L	L	L	L	-	-	L	H	L	H	-	H
08	IENT1051	Fundamentals of Entrepreneurship	L	M	L	L	L	L	-	L	L	L	L	H	L	L
SEMESTER II																
01	AAR112	Theory of Architecture	H	M	L	M	-	-	-	-	-	-	-	-	-	-
02	AAR114	Basic Design & Visual Arts - II	H	M	-	-	-	-	-	-	-	-	-	-	-	-
03	AAR116	Architectural Drawing and Graphics-II	L	M	L	L	L	L	L	L	L	H	L	H	L	M
04	AAR118	Building Construction & Materials I	H	H	H	L	M	H	H	H	M	H	H	H	H	H
05	ACE112	Strength of Materials	L	H	H	L	L	L	L	L	M	M	L	H	M	L
06	AAR126	Model Making Workshop	H	L	M	-	M	-	L	-	M	L	-	-	L	L
07	AES201	Environmental Studies	L	L	L	L	L	H	H	M	M	L	L	H	L	L
SEMESTER III																
01	ACE211	Theory of Structures	L	H	H	L	L	L	L	L	M	M	L	H	M	L

02	AAR201	Climatology in Architecture	-	-	H	H	H	M	M	M	H	L	L	M	L	M
03	AAR203	History of Western Architecture	H	H	M	L	L	H	M	M	L	M	L	H	H	M
04	AAR104	Building Materials II	H	M	M	M	L	M	M	L	L	M	M	H	M	L
05	AAR217	Architectural Design I	-	H	H	-	-	L	-	-	L	-	-	M	-	-
06	AAR219	Building Construction II	H	M	H	L	L	H	M	L	M	M	L	L	M	L
07	AAR221	Computer Applications in Architecture I	M	-	M	M	H	-	-	-	-	-	-	-	-	H
SEMESTER IV																
01	ACE212	Basics of Surveying Practices	M	L	L	M	M	L	L	L	M	M	L	H	M	H
02	ACE214	Advanced Theory of Structures	L	H	M	L	L	L	L	L	M	L	L	H	M	L
03	AAR212	History of Eastern Architecture I	H	L	H	M	L	H	L	M	H	H	L	H	H	L
04	AAR204	Water Supply & Sanitation	H	M	M	L	M	H	M	M	M	H	L	L	H	L
05	AAR205	Building Materials III	H	H	M	M	L	M	M	L	L	M	M	H	M	L
06	AAR216	Architectural Design II	H	H	H	L	-	H	M	-	H	-	-	M	M	L
07	AAR218	Building Construction III	H	H	M	M	L	H	H	M	M	H	M	H	M	H
SEMESTER V																
01	ACE301	Concrete Structures	M	L	L	M	M	L	L	L	M	M	L	H	M	H
02	AAR301	Architectural Acoustics	L	H	M	L	L	L	L	L	M	L	L	H	M	L
03	AAR303	Mechanical and Electrical Services	H	L	H	M	L	H	L	M	H	H	L	H	H	L
04	AAR315	History of Eastern Architecture - II	H	M	M	L	M	H	M	M	M	H	L	L	H	L

05	AAR307	Site Planning & Landscape Design	H	H	M	M	L	M	M	L	L	M	M	H	M	L
06	AAR319	Architectural Design III	H	H	H	L	-	H	M	-	H	-	-	M	M	L
07	AAR313	Building Construction IV	H	H	M	M	L	H	H	M	M	H	M	H	M	H
08		Open Elective I														
	EOE202	German for Beginners	H	L	L	L	-	-	-	-	-	H	-	H	-	H
	EOE305	French for Beginners	L	-	-	-	-	L	-	-	L	L	-	M	L	L
	EOE317	Personality Development	-	L	L	L	-	L	-	-	L	L	L	H	L	L
PSYC1002		Introduction To Psychology	M	H	L	L	-	L	L	-	-	L	-	L	L	L
LANG1181		Introduction To Spanish	L	-	-	-	-	M	L	-	M	H	-	H	L	H
SEMESTER VI																
01	ACE302	Steel Structures	L	H	M	L	L	L	L	L	M	L	L	H	M	L
02	AAR302	Estimating, Costing & Specifications	M	M	L	L	M	M	L	L	M	L	H	L	L	M
03	AAR316	Modern & Contemporary Architecture	H	H	M	H	L	H	H	H	L	H	M	H	M	M
04	AAR308	Housing	M	H	H	M	L	H	H	M	L	L	M	M	H	L
05	AAR312	Architectural Design IV	H	H	H	H	H	H	M	-	H	M	-	M	H	H
06	AAR324	Working Drawing I	H	M	H	H	M	H	H	M	H	M	H	M	H	M
07		Program Elective I														
	AAR304	Building Economics and Sociology	H	M	M	H	L	H	H	H	L	M	H	H	H	M
	AAR342	Barrier Free Architecture	H	H	H	H	L	H	H	H	L	M	M	H	M	M
	AAR344	Vernacular Architecture	H	M	H	L	-	H	H	L	-	M	-	L	H	-
SEMESTER VII																
01	AAR403	Advanced Services	H	L	L	L	L	H	M	L	H	H	L	M	M	L

02	AAR461	Research Methodology and Seminar	M	L	L	L	H	M	M	H	H	H	M	H	M	H
03	AAR463	Architectural Design V	L	L	M	H	H	L	L	L	H	H	H	H	M	H
04	AAR419	Introduction to Human Settlements & Town Planning	H	H	H	M	M	H	M	M	H	M	L	M	M	M
05	AAR465	Building Information Modelling	L	M	M	H	H	M	M	L	H	H	H	H	M	H
06		Elective Basket I														
	AAR471	Introduction to Architectural Conservation	M	H	H	H	H	H	H	M	M	M	H	M	M	M
	AAR473	Innovative Approaches in Interior Design	H	H	H	M	H	H	H	M	M	H	H	H	M	M
	AAR475	Elements of Landscape Architecture	M	M	L	L	L	M	M	L	L	L	L	H	H	L
	AAR477	Fundamentals of Circular Economy in Architecture and Construction	H	M	M	L	L	M	H	M	L	L	L	H	H	L
07		Elective Basket II														
	AAR481	Computational Design and Digital Fabrication	M	L	L	-	H	-	-	-	L	L	-	M	-	H
	AAR483	Fundamentals of Net zero in Built environment	L	M	L	L	L	M	H	L	-	L	L	L	H	L
	AAR485	Building Construction Planning and Scheduling	H	L	M	L	L	L	M	-	L	L	H	H	L	L
	AAR487	Urban Design Theory	H	H	H	H	L	H	H	L	L	H	M	H	H	L
SEMESTER VIII																
01	AAR462	Internship**	H	M	H	M	M	M	L	L	M	M	M	H	L	M
02	AAR464	Professional Practice & Building Regulations	L	M	L	L	L	H	H	H	H	H	L	H	L	H

SEMESTER IX																
01	AAR551	Community Design Theory	H	H	H	H	L	H	H	L	L	H	H	H	H	L
02	AAR561	Architectural Design – VI (Community Projects Studio)	H	H	H	H	L	H	H	L	L	H	H	H	H	H
03	AAR563	Dissertation	H	H	H	H	L	H	H	L	L	H	H	H	H	H
04	AAR565	Architectural Detailing	H	H	H	M	H	M	M	M	M	H	H	M	L	M
05		Elective Basket I														
	AAR571	Architectural Conservation Planning	H	H	H	H	M	H	H	M	M	M	H	H	M	M
	AAR573	Fundamentals in Furniture Design	H	H	H	H	H	H	H	-	M	H	M	M	H	H
	AAR575	Urban Landscapes	H	H	H	H	L	H	M	L	L	H	H	H	H	H
	AAR577	Integrated Applications of Circular Economy in Architecture and Construction	H	H	H	H	H	H	H	L	L	H	H	H	H	H
06		Elective Basket II														
	AAR581	Interactive Design	M	L	L	-	H	-	-	-	L	L	-	M	-	H
	AAR583	Sustainable Materials and Construction Techniques	L	L	L	L	L	L	H	-	L	L	L	H	H	L
	AAR585	Building Construction Materials and Equipment Management	H	H	H	H	M	H	H	M	L	H	L	L	H	H
	AAR587	Urban Infrastructure and Housing	H	H	H	H	M	H	H	M	L	H	L	L	H	H
SEMESTER X																
01	AAR562	Design Thesis	H	H	H	H	H	L	H	M	L	H	M	M	H	H
02	AAR564	Thesis Document	H	M	M	H	H	L	M	H	M	H	L	H	H	M
03		Elective Basket I														

	AAR573	Architectural Conservation Management	H	H	H	H	M	H	H	M	M	M	H	H	M	M
	AAR574	Lighting Design in Architecture	H	H	H	H	H	H	H	-	M	H	M	M	H	H
	AAR576	Landscape Design Communication	H	H	H	H	M	L	M	M	M	H	L	H	H	H
	AAR578	Circular Cities: Indian and Global Perspectives	H	H	H	H	L	H	H	M	L	H	M	H	H	H
04		Elective Basket II														
	AAR582	Data Driven Architecture	M	L	L	-	H	-	-	-	L	L	-	M	-	H
	AAR584	Net Zero Assessment and Analysis	L	H	L	L	L	L	-	-	-	L	L	H	L	L
	AAR586	Building Construction Safety, Quality Assurance and Control	H	H	H	H	L	H	H	M	M	H	M	H	H	H
	AAR588	Participatory Planning and Design	H	H	H	H	L	H	H	H	H	H	H	H	H	H

H - High Correlation, M - Medium Correlation, L - Low Correlation

Syllabus

I Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR111	**Introduction to Art and Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR113	**Basic Design & Visual Arts I**	1	0	5	0	6	100	100	200	C1 (Jury)
03	AAR115	**Architectural Drawing and Graphics I**	1	0	5	0	6	50	50	100	A1 (05 Hrs)
04	AAR121	**Sketching Workshop**	0	0	3	0	3	100	-	100	B1 (Viva)
05	ACE101	**Engineering Mechanics**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
06	AMT111	**Mathematics for Architects**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
07	AEG111	**Technical Communication**	2	0	0	0	2	50	50	100	A1 (03 Hrs)
08	VDC111	**Venture Discovery**	2	0	0	0	2	100	-	100	M (Viva)
		Total	**14**	**1**	**13**	**0**	**28**	**550**	**350**	**900**	
		Total Hrs/Week	**28**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

AAR111	Introduction to Art and Architecture	L	T	ST	J	C
SDG No. 4,9		3	0	0	0	3

Course Description:
This foundational course explores the intersection of art and architecture, tracing their evolution across cultures and time. Students engage with diverse art forms—painting, sculpture, performing and industrial arts—while analysing the philosophies and works of renowned Indian and international artists. The course emphasises aesthetic sensibility, human perception, and the role of art in shaping architectural expression. It introduces the architect's role in building design, types of drawings, and interdisciplinary collaboration. Through case studies of vernacular architecture, students examine how climate, culture, and materials influence built forms. By the end, learners develop visual literacy, contextual awareness, and technical insight essential for holistic architectural thinking.

Course Objectives:
- To provide students with an understanding of various art forms and the history of art
- To introduce various national and international artists and their works.
- To provide an understanding of the role of art in architecture, aesthetic sensibility, and human perception.
- To provide a basic understanding of the role of an architect in building construction, types of drawings required, and their importance.
- To give a brief idea about how various factors influence architecture, and the study of time-tested vernacular architecture of multiple regions.

Unit 1: Introduction to Art

Role and meaning of art; Different art forms – performing arts, commercial and industrial art. Role of art in architecture. International art movements and their characteristics, leading Artists, and their works. Claude Monet, Wassily Kandinsky, Piet Mondrian, Salvador Dalí, and Henry Moore.

Unit 2: Indian Art – Painting & Sculpture

Introduction to Indian art, Indian paintings (mural and miniature), Works of Indian artists like M.F. Husain, S H Raza, Raja Ravi Varma, Amrita Sher-Gill, Sattiraju Lakshmi Narayana-Bapu. Sculpture in temple architecture. Works of Indian artists like Satish Gujral, Nek Chand, Somenath Hore, Ramkinkar Baij, Sankho Chaudhuri, Bharati Kher.

Unit 3: Art in architecture

Aesthetic sensibility and the sensory influence of physical form. Perception of space - effect of line, shape, form, texture, colour, and light on human perception. Architecture as an Art form; Structure and Aesthetics. Use of art in built space, urban civic art, and street art. Water is used as an art form and art in landscaping.

Unit 4: Introduction to Architecture

Definitions and a general understanding of architecture; Role of an architect in a building project and his relationship with other consultants, contractors, and clients; Knowledge and skills required as inputs. Various courses are to be studied by an architect, and their relevance

to practice; types of architectural drawings are to be prepared by an architect, such as municipal drawings, presentation drawings, working drawings, etc.

Unit 5

Various factors influence a region's architecture; Architecture is a response to social, technological, cultural, and environmental factors. The evolution of shelter forms a response to climate, materials, and construction methods—examples of vernacular architecture in different regions of the world and India.

References

1. R. C. Craven, *Indian Art: A Concise History*. New York, NY: Thames and Hudson, 1997.
2. R. Kumar, Ed., *Essays on Indian Art and Architecture*. New Delhi: Discovery Publishing, 2003.
3. E. R. Fisher, *Buddhist Art and Architecture*. London: Thames and Hudson, 1993.
4. A. Ghosh, Ed., *Jain Art and Architecture*, vol. 1–3. New Delhi: Bharatiya Jnanpith, 1974.
5. J. C. Snyder and A. Y. Catanese, *Introduction to Architecture*. New York: McGraw-Hill, 1979.
6. A. Rapoport, *House, Form and Culture*. Englewood Cliffs, NJ: Prentice-Hall, 1969.
7. A. Khare, *Temple Architecture of Eastern India*. New Delhi: Shubhi Publications, 2005.

Course Outcomes:

- The student will gain an understanding of developing art sensitivity in design.
- The student will learn about various national and international artists.
- Students will understand the human perception of built space and the role of art in architecture.
- The student will gain technical knowledge of the types of drawings and the factors influencing the design of the buildings.
- The student will gain an understanding of how people respond to the climate and various other factors influencing the outcome of various vernacular styles from different regions of the world.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	2	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	2	-	-	-	-	-	-	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: SDG 4, SDG 9	
SDG 4:Focuses on Quality Education **SDG 9:Focuses on building resilient infrastructure, promoting sustainable industrialization, and fostering innovation**	
SDG Justification:	
This Course introduces the students to the materials ,innovations and techniques and how they creatively adopted specific projects. Understanding the various philosophies of famous artists and architects that inspires the students to come with innovative thoughts and novel ideas in design. The knowledge of various proportioning systems helps the students in designing spaces more efficiently.	

AAR113	Basic Design & Visual Arts - I	L	T	ST	J	C
SDG No. 11		1	0	5	0	6

Course Description:

This studio-based course introduces students to the foundational principles of design thinking and visual arts in the context of architecture. Through observation, analysis, and graphical exercises, learners explore design elements, colour theory, Gestalt principles, and pattern generation. The course emphasizes the role of visual perception, materiality, texture, light, and shade in shaping spatial experiences. Students engage with natural and built environments to develop sensitivity to form and composition. By the end, they acquire essential skills in two- and three-dimensional design, colour application, and graphical representation—laying the groundwork for creative, context-responsive architectural solutions that contribute to sustainable and resilient built environments.

Course Objectives

- To introduce students to the fundamentals of design thinking and its significance in the context of architectural and environmental design.
- To develop an understanding of design principles and elements by exploring and analyzing examples from both natural and built environments.
- To familiarize students with colour theory and its application in architectural compositions using various colour schemes.
- To enhance visual perception and analytical skills through the study of visual graphics, Gestalt principles, and pattern generation.
- To cultivate sensitivity to materiality, texture, light, and shade through observation-based exercises and graphical representation.

Course Content

- Introduction to design; Importance of design; Study and appreciation of design examples from natural and man-made environments. Exercises in design elements, design principles, and their application in architectural design.
- Colour theory: Significance of colour in architecture, Colour wheel, Colour shades, and tints. Composition with primary, secondary, and tertiary colours. Composition with complementary, split complementary, and analogous colours.
- Exercises in simple repetitive patterns using grids, flooring patterns, and patterns for architectural elements like grills, gates, etc.
- Visual graphics: Gestalt theories of visual perception, figure and ground relationship and principles of grouping.
- Study of light and shade effects on simple objects.
- Significance of the textural quality of different materials

References:

1. F. D. K. Ching, *Architecture: Form, Space, and Order*, 5th ed. Hoboken, NJ: Wiley, 2019.
2. W. Wucius, *Principles of Two-Dimensional Design*. New York: Dover Publications, 2016.
3. A. Pipes, *Drawing for Designers: Drawing Skills, Concept Sketches, Computer Systems, Illustration, Tools and Materials, Presentation Techniques*, 2nd ed. London: Laurence King Publishing, 2013.
4. K. W. S. Mitchell, *Principles of Design in Architecture*. London: Architectural Press, 2003.

5. J. Itten, *Design and Form: The Basic Course at the Bauhaus and Later*, rev. ed. Hoboken, NJ: Wiley, 2003.
6. R. Krier, *Architectural Composition*. Basel: Birkhäuser, 2010.
7. P. Yee, *Architecture: A Visual History*. London: DK Publishing, 2021.
8. D. A. Hanks, *The Decorative Designs of Frank Lloyd Wright*. Mineola, NY: Dover Publications, 1999.

Course Outcomes

- Students will be able to identify and apply basic design elements and principles in two-dimensional and three-dimensional design exercises.
- Students will demonstrate an understanding of colour theory by creating visually balanced compositions using primary, secondary, tertiary, and complementary colour schemes.
- Students will be able to design simple architectural patterns and motifs suitable for flooring, grills, gates, and other built elements using grid-based systems.
- Students will effectively use Gestalt principles in their compositions and understand figure-ground relationships in visual design.
- Students will demonstrate the ability to observe and represent light, shade, and texture in basic design sketches, enhancing their graphical communication skills

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	1	1	-	-	1	1	-	2	2	-	-	-	-
CO2	3	1	1	-	-	1	1	-	2	2	-	-	-	-
CO3	2	1	1	-	-	1	1	-	2	2	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 11	
SDG11: Make cities and human settlements inclusive, safe, resilient and sustainable	
SDG Justification:	
The coursework sensitises the Architecture students to learn how to design creative, efficient, optimum space planning for the specific user group based on their social, cultural, and geographical context. Usage of resources prudently for the design of the built environment. This will make the human settlements more resilient and sustainable.	

AAR115	Architectural Drawing and Graphics I	L	T	ST	J	C
SDG No. 4		1	0	5	0	6

Course Description:
This course introduces students to the foundational tools, techniques, and conventions of architectural drawing and graphic representation. Emphasising precision and clarity, it covers drafting practices, typography, dimensioning, and the construction of geometric forms. Students learn to represent architectural elements using appropriate symbols, scales, and sheet compositions. Through exercises in orthographic projection and surface development, learners gain spatial understanding and visualisation skills essential for architectural communication. The course cultivates technical proficiency in drawing equipment handling and scaled representation, enabling students to translate design concepts into accurate two-dimensional and three-dimensional drawings—laying the groundwork for advanced architectural documentation and design articulation.

Course Objectives:
- Familiarisation with drawing equipment and drafting techniques.
- To introduce fundamentals of technical drawing and its practice, typography, and dimensioning.
- Imparting skills to develop geometrical construction methods for simple and complex figures
- Introduce the types of scaled drawings and representation of large and small scale project into the drawing sheet
- Introduction to orthographic projection and development of surfaces of various solid forms.

Unit 1: Introduction

- Fundamentals of drawing and its practice, introduction to drawing equipment and its familiarisation, use and handling.
- Title panels and legends.
- Simple exercises in drafting – horizontal, vertical, and angular lines and circles/arcs.
- Line types, line weights, and dimensioning.
- Typography- anatomy of type, styles. Freehand lettering.

Unit 2: Geometrical Construction

- Constructing simple and complex geometrical shapes.
- Methods of drawing regular polygons.
- Conic sections – Involutes, Ogee curve, Continuous arc

Unit 3: Scale Drawing

- Scales and construction of plain scales and diagonal scales.
- Drawing sheet sizes, layouts, and composition.
- Reduction and enlargement of simple shapes

Unit 4: Architectural Symbols

- Representation of building elements, openings, materials, furniture, and accessories

Unit 5: Orthographic Projections - I

- Development of the lateral surfaces of a solid
- Projection of points, lines, planes, and solids.

References

1. B. Gupta and M. Raja Roy, *Engineering Drawing with AutoCAD,* 3rd ed. New Delhi, India: Dreamtech Press, Feb. 2020
2. N. D. Bhatt, *Engineering Drawing*, 53rd ed. Charotar Publishing House, 2016
3. A. L. Guptill, *Rendering in Pen and Ink*. New York, NY, USA: Watson-Guptill Publications, 1976
4. F. D. K. Ching, *Architectural Graphics*, 4th ed. New York, NY, USA: John Wiley & Sons, 2003
5. R. W. Gill, *Perspective-from basic to creative*, London, U.K:Thames & Hudson, 2006
6. H. Barros, E. Termes, M. Purman and S. Tan, *How to draw perspective step by step, Barcelona*, Spain: Page One, 2011

Course Outcomes:

- Handle the equipment in architectural drawing and gain drafting skills.
- Draw various geometrical shapes with respect to architectural building elements.
- Gain technical knowledge in architectural representation and scales.
- Analyze the characteristics of solid forms.
- Apply the concept of projections of different solids.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	1	1	1	1	-	-	1	2	1	-	-	1	1
CO2	3	2	3	1	1	-	-	1	2	1	-	-	1	1
CO3	3	1	2	1	1	-	-	1	2	2	-	-	1	1
CO4	3	3	1	1	1	-	-	2	2	1	-	-	1	1
CO5	3	1	2	1	1	-	-	1	2	1	-	-	1	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 4	
SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
The course provides the tools required for the architecture students to improve their Knowledge and practice of fundamentals in architectural drawing to enhance the quality of their skills in architectural representation of scaled geometrical drawings and 3-D views	

AAR121	Sketching Workshop	L	T	ST	J	C
SDG No. 4		0	0	3	0	3

Course Description:
This workshop-based course introduces students to the techniques and expressive potential of freehand sketching in architectural design. Through hands-on exercises, learners explore various tools, mediums, and rendering methods to depict built elements, natural forms, and everyday objects. Emphasis is placed on line quality, hatching, light and shade, proportion, and spatial composition. Students develop the ability to sketch on-site, translate visual observations into graphic representations, and abstract complex forms with clarity. The course enhances visual communication, fosters design thinking, and builds confidence in presenting architectural ideas through intuitive, context-sensitive graphics—laying a foundation for creative exploration and professional articulation in architectural practice.

Updated Course Objectives:
- To provide students with an understanding of various techniques involved in freehand sketching.
- To impart the ability to draw various elements of the built environment.
- To provide an understanding of the application of sketching in the architectural presentation.
- To make students understand the importance of abstraction and representation through freehand graphics.
- To impart the ability to do on-the spot sketching and translating visualizations into graphics.

Introduction to Sketching & Its uses in architecture, Introduction & Exercises on Different mediums & Tools used in Sketching & Drawing, Understanding STrokes, Lines, Hatches & Rendering techniques, Showing variations in materials by using Different Methods of hatching, Understanding Background & Foreground for sketches.

The students should be made to sketch the following themes as studio exercises, along with inputs like light, shade, proportion, and scale:

- Human figures / Postures
- Furniture
- Street Furniture / Outdoor sculpture
- Objects: Pen, Television, Flowerpot, Teapot, Cups, etc.
- Elements of nature
- Enclosed Spaces in courtyards, Plazas, Chowks
- Buildings
- Canteen & Restaurant.
- Indoor & Outdoor Object Sketching (Physical objects)

References:
1. F. D. K. Ching, *Architectural Graphics*, New Delhi: CBS Publishers & Distributors, 2015.
2. R. W. Gill, *Rendering with Pen and Ink*, United Kingdom : Thames & Hudson, 1984.
3. E. R. Norling, *Perspective Made Easy - A Step-By-Step Method for Learning the Basis of Drawing*, New Delhi: Read Books, 2010.
4. I. Sidaway and . S. Hoggett , *Practical Encyclopedia of Drawing,* Florida: Southwater Publishing, 2015.
5. R. Steur and K. Eissen , *Sketching: The Basics*, Amsterdam: BIS Publishers, 2011.

6. W. Foster , *The Art of Basic Drawing: Discover Simple Step-by-Step Techniques for Drawing a Wide Variety of Subjects in Pencil*, California: Walter Foster, 2005.
7. D. Drazil , "*Ready to sketch like an Architect*," Sketch like an Architect, 2024. [Online]. Available: https://www.sketchlikeanarchitect.com/. [Accessed 29 07 2025].

Course outcomes

- Students would understand various techniques involved in freehand sketching.
- Students would gain the ability to draw various elements of the built environment.
- Students would understand the application of sketching in the architectural presentation.
- Students would learn of abstraction and its representation through freehand graphics.
- Students would gain the ability to do 'on-the spot' sketching and translate visualizations into graphics

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	1	1	-	-	1	1	-	2	2	-	-	-	3
CO2	2	2	1	-	-	1	2	-	2	2	-	-	-	3
CO3	3	1	3	-	-	1	1	-	2	2	-	-	-	3
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 4	
SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
This course provides students with the necessary skills of freehand drawing, which plays an important role in the creative expression of thought and design thinking. This improves communication skills and enables students to express themselves better.	

ACE101	Engineering Mechanics	L	T	ST	J	C
SDG No. 9		2	1	0	0	3

Course Description:
This course introduces students to the core principles of engineering mechanics, focusing on statics, force systems, and equilibrium of rigid bodies. Through analytical methods, learners evaluate plane trusses, compute support reactions, and explore internal forces. The curriculum covers centroid and moment of inertia calculations for simple and composite shapes, along with the fundamentals of dry friction and virtual work. Emphasis is placed on structural idealisation and problem-solving techniques relevant to architectural applications. By the end, students gain foundational knowledge essential for advanced courses in structural analysis and design, enhancing their ability to model, analyse, and interpret mechanical behaviour in built environments.

Course Objectives:
- To gain a clear understanding of statics principles and examine various force systems.
- To evaluate beams and simple plane trusses to compute support reactions and internal forces through appropriate structural analysis techniques.
- To identify the centroid, centre of mass, and centre of gravity for both simple and composite geometric structures.
- To determine area and mass moments of inertia for basic and composite shapes.
- To equip students with a fundamental understanding of dry friction and virtual work principles.

Unit 1

Force Systems in Plane: Principles of Statics – Definitions and examples of various types of force systems – Definition of resultant – Composition and resolution of forces – Moment of a force – Principles of moments of force – Couples – characteristics of a couple – Transformations of a couple – Resolution of a force into a force and couple.

Equilibrium of a Rigid Body: Free body diagrams – Equations of equilibrium of rigid bodies acted on by concurrent and non-concurrent coplanar system of forces.

Unit 2

Introduction to plane trusses, Analysis of simple Plane Truss – Assumptions – Analysis of Truss by Method of joints - Method of sections.

Unit 3

Centroids and Centers of Gravity: Center of gravity of parallel forces in a plane. Centroids and centre of gravity of composite areas and bodies – Distributed Loads on Beams.

Unit 4

Moments of Inertia: Definition – Moments of inertia of areas by integrations. Radius of gyration – Parallel axis theorem– Perpendicular axis theorem - Moments of inertia of the composite regions– Polar moment of Inertia-Mass moment of inertia of simple bodies like disc, cylinder, rod, sphere.

Unit 5

Friction: Introduction- Types of Friction- Laws of Dry Friction- Angle of Friction- Angle of repose- Cone of friction- Problems related to dry friction-Characteristics of dry friction – Problems involving dry friction

Virtual Work: Definition of work and virtual work – Principle of virtual work for a particle and a rigid body – Principle of virtual work for a system of connected rigid bodies.

References:

1. S. S. Bhavikatti, *"Engineering Mechanics"*, New Age International Private Limited, 9th Edition, 2023.
2. James L. Meriam, L. G. Kraige, J. N. Bolton, *Engineering Mechanics Statics and Dynamics*, Wiley India Pvt Ltd., 9th Edition, 2021
3. Ramamrutham, S, *Engineering Mechanics*, New Delhi Dhanpat Rai Publishing Company 2017.
4. S. Timoshenko, D.H. Young, J.V. Rao, Sukumar Pati, *Engineering Mechanics*, McGraw Hill Education, 5th edition, 2017.
5. K. L. Kumar, *Engineering Mechanics*, McGraw Hill Education 4th Edition, 2017.
6. Daniel Kleppner and Robert Kolenkow, *Introduction to mechanics*, New Delhi Wiley, 2nd Edition, 2025.
7. A.K.Tayal, *Engineering Mechanics: Statics and Dynamics*, Delhi Umesh Publications, 14th edition, 2008.

Course Outcomes:

- The student will be able to idealize the structures by using the applications of Engineering Mechanics.
- Better understanding of the higher-level courses like mechanics of solids, Structural Analysis and Steel structures, etc., by students.
- The student will be able to identify, formulate, and solve engineering problems.
- The student will be able to learn basic concepts of centroids and moment of inertia of plane areas.
- The student will be able to solve problems related to trusses, friction and virtual work.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	-	3	3	2	-	-	3	-	-	-	-	1	2	2
CO2	-	3	3	2	-	-	3	-	-	-	-	1	2	2
CO3	-	3	3	2	-	-	3	-	-	-	-	1	2	2
CO4	-	3	3	2	-	-	3	-	-	-	-	1	2	2
CO5	-	3	3	2	-	-	3	-	-	-	-	1	2	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 9	
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
The course provides insights into the required understanding of the construction industry, reinforces the required cognitive skills for innovation, and provides applications in the practical field of architectural professional practice.	

AMT111	Mathematics for Architects	L	T	ST	J	C
SDG No. 4		3	0	0	0	3

Course Description:
This course equips architecture students with essential mathematical tools to interpret, evaluate, and apply quantitative reasoning in design contexts. Core topics include geometry, trigonometry, proportions, linear systems, and statistical analysis, all tailored to architectural applications such as calculating areas, volumes, slopes, and structural layouts. Students explore aesthetic systems like the Golden Ratio and Fibonacci series and learn to model and analyse data relevant to site planning and design decisions. By integrating mathematical logic with architectural thinking, learners develop precision, analytical skills, and a deeper understanding of spatial relationships, enabling them to make informed design choices and support sustainable, data-driven architectural practices.

Course Objectives:

- To provide the basic knowledge in Mathematics required for understanding, interpreting, and evaluating various forms of architectural elements, proportions applied in architectural aesthetics, and data in the architecture design process.

Unit 1: Areas and Volumes

- Surface areas and frustum of complex geometry consisting of primitives: cuboid, coin, pyramid, and cylinder, as well as practical applications of calculating areas and building elements like floors and walls. STaircase -volumes of complex geometry consisting of primitives: cuboid, coin, pyramid, and cylinder.
- Problems of calculating Volume: room, staircase, walls, roofs, irregular polygons. Etc.
- Using the Midordinate rule, Trapezoidal rule, Simpson's rule, Volume of irregular solids, and Prismoidal rule.

Unit 2: Analytical Geometry

- Direction cosines and ratios, Angle between two lines, Equation of planes and Equation of Line, Angle of elevation and depression.
- Trigonometry problems on the staircase, ramps, and different kinds of sloping roofs -Setting out simple building sites, Bay window and curved brickworks, checking a building for square corners, circular arches.

Unit 3: Geometry & Proportions

- Polynomial equations and their application in buildings, Square root proportions, Modular proportions, Derivation of Golden mean, Golden Section, Fibonacci Series, Fractal Geometry

Unit 4 Solution of Linear Systems of Equations

- Direct Methods: Gauss Elimination Method, Gauss-Jordan Method.
- Iterative Methods: Jacobi's Method, Gauss-Seidel Method

Unit 5

- Tally charts, Tables, and graphs -Types of Data: Discrete, Continuous, Raw and group, Averages: Mean, mode, median and variance, Chi-square test, statistical diagrams: Pictorial,

bar, chart, pie chart and line graphs -Histograms, frequency distribution, standard probability models Binomial, Poisson.

References:

1. Arumugam, S.Thangapandi, *Engineering Mathematics,* John Wiley and Sons Ltd - Singapore – 2001(8th Edition)
2. Surinder Singh Virdi and Roy T Baker, *Construction Mathematics,* Elsevier - 2008.
3. B.S.Grewal- Khanna publishers, *Higher Engineering Mathematics,* 43rd edition
4. Mario Livio - The Golden Ratio: The Story of Phi, the Extraordinary Number of Nature, Art and Beauty - Headline Review – 2003
5. Architecture and Mathematics in Ancient Egypt - Corinna Rossi - Cambridge University Press – 2003.
6. Geometry in architecture and building by Hans Sterk, Faculteit Wiskunde en Informatica, Technische Universiteit Eindhoven. Lecture notes.
7. 2nd Quarter Project, Leilehua High School Architects (Using Linear Equations). Assignment.
8. Geometry and the visual arts, Dan Pedoe, Dover Publications, New York.
9. Geometry of Design, Studies in proportions and composition, Kimberly Elam, Princeton Architectural Press, New York.
10. Geometry in Ancient and Medieval India, Dr.T.A.sarasvati Amma, Motilal Banarsidass Publishers Private Limited, New Delhi.
11. Vedic Mathematics: Easy methods in maths, Dr.C.Nagalakshmi, EMESCO books, Hyderabad.
12. The power of limits, Proportional harmonies in nature, art and architecture, Gyorgy Doczi, Shambhala Publications, Inc., Colorado.
13. The thirteen books of Euclid's Elements, T.L.Heath, Cambridge University Press.

Course Outcomes:

- Ability to find the area and volume of simple, complex, and irregular geometrical shapes using various rules.
- Ability to apply trigonometry in architectural designs and site context.
- Ability to apply various proportioning systems for aesthetics in architecture.
- Ability to apply linear equations in constructing lines.
- Ability to analyse and interpret different types of data and representation of the distribution

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	2	-	-	-	-	-	-	-	-	-	2	-	2
CO2	1	2	-	-	-	-	-	-	-	-	-	2	-	2
CO3	1	2	-	-	-	-	-	-	-	-	-	2	-	2
CO4	1	2	-	-	-	-	-	-	-	-	-	2	-	2
CO5	1	2	-	-	-	-	-	-	-	-	-	2	-	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: SDG 4	
SDG Statement: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification: The course fosters foundational mathematical literacy tailored to architectural education, enabling students to engage critically with design data, spatial geometry, and proportioning systems. By embedding quantitative reasoning into the design process, it promotes inclusive and equitable learning outcomes, empowering students to make informed, sustainable decisions in built environments. The integration of mathematical aesthetics and data interpretation supports lifelong learning and interdisciplinary competence essential for future-ready architects.	

AEG111	Technical Communication	L	T	ST	J	C
SDG No.		2	0	0	0	2

Course Description:
This course develops essential communication skills for academic, professional, and technical contexts. Students learn to construct grammatically accurate sentences, expand vocabulary, and master formal writing formats including letters, emails, resumes, and official correspondence. Emphasis is placed on academic and technical writing, enabling learners to draft structured reports, proposals, and research articles. Through practical exercises in information transfer and documentation, students gain proficiency in expressing ideas clearly and professionally. The course empowers learners to communicate effectively across disciplines, enhancing their employability, research capabilities, and collaborative potential in both academic and workplace environments.

Course Objectives:
- To assist learners in using relevant Language Structures and vocabulary in writing.
- To train students to employ effective strategies for formal correspondence such as Letters, Email correspondence, and Resumes.
- To enable students to develop skills in both professional and personal life.
- To help learners record information in a structured manner, like writing Technical and General Reports.
- To improve students Skills in Academic writing, such as drafting Technical proposals and writing Research Articles.

Unit 1

Vocabulary: Words often confused, one-word substitutes, Synonymous words, Pairs of words, Single word substitution
Grammar: Tenses and Aspects, Concord, Common Errors.

Unit 2

Writing Skills: Letter writing, Information transfer- using charts, figures, tables, Official Correspondence-Memorandum, Notice, Agenda, Minutes, Circular letter, job application, Resume writing and Cover letters. E-mail correspondence.

Unit 3

Introduction to Various Types of Correspondence. Business Correspondence- Types of Formal & Informal and Official Letters. Social Correspondence- Invitation to speak, etc.

Unit 4

Academic writing & Technical Writing: - Definition, Types, structure.

Unit 5

Introduction to Basics of Report & Research writing: - Definitions, Types, and format. Technical & Research papers and articles.

References:
1. Dictionary of Pronunciations.
2. Daniel Jones; Phonetics (symbols and transcription)
3. MLA Handbook for Research and Writing.

4. Writing in Architecture Prof. A. Adams.

Course Outcomes:

- Use appropriate vocabulary as per the context and develop grammatically correct sentences in English.
- Create, develop, and write letters for various purposes; transfer information from verbal to non-verbal and vice-versa; draft official (internal/external) correspondence; and design CV along with a cover letter.
- Understand various types of business correspondence and apply the knowledge in business and social correspondence.
- Create, develop, and write technical reports.
- Create, develop, and write research papers and technical proposals.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1														
CO2														
CO3														
CO4														
CO5														

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement:	
SDG Justification:	

VDC111	Venture Discovery	L	T	St	J	C
SDG No. 8		2	0	0	0	2

Course Objectives:

- Discover who you are – Values, Skills, and Contribution to Society.
- Gain experience in actually going through the innovation process.
- Conduct field research to test or validate innovation concepts with target customers.
- Understand innovation outcomes: issues around business models, financing for start-ups, intellectual property, technology licensing, corporate ventures, and product line or service extensions.
- **Only 4**

Unit 1:

Personal Values: Defining your personal values, Excite & Excel, building a Team, Define the purpose for a venture. Four stages: Personal Discovery, Solution Discovery, Business Model Discovery, Discovery Integration.

Unit 2:

Solution Discovery: Craft and mission statement, Experience design, Gaining user insight, Concept design, and positioning, Product line strategy, Ideation & Impact.

Unit 3:

Business Model Discovery: Prototyping solutions, Reality Checks, understand your industry, Types of business models, Define Revenue Models, Define Operating Models.

Unit 4: Solution Design

Discovery Integration: Illustrate business models, validate business models, Define company impact.

Unit 5: Crafting Your Venture Narrative

Tell a Story: Can you make money? Tell your venture story.

References:

1. Personal Discovery Through Entrepreneurship, Marc H. Meyer and Chaewon Lee, The Institute of Enterprise Growth, LLC Boston, MA.
2. Suggested journals: Vikalpa, Indian Institute of Management, Ahmedabad, Journal of General Management, Mercury House Business Publications, Limited Harvard Business Review, Harvard Business School Publishing Co. USA

Course Outcomes:

- Communicate effectively using a range of media.
- Apply teamwork and leadership skills.
- Find, evaluate, synthesize & use information.
- Analyze real-world situations critically.
- Reflect on their professional development.
- Demonstrate professionalism & ethical awareness.
- Apply a multidisciplinary approach to the context.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1														
CO2														
CO3														
CO4														
CO5														

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	ACADEMIC COUNCIL:17-Sep-21
SDG No. & Statement:	
SDG Justification:	

II Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR112	**Theory of Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR114	**Basic Design & Visual Arts II**	1	0	5	0	6	100	100	200	C1 (Jury)
03	AAR116	**Architectural Drawing and Graphics II**	1	0	5	0	6	50	50	100	A1 (05 Hrs)
04	AAR118	**Building Construction & Materials I**	3	0	3	0	6	50	50	100	A1 (05 Hrs)
05	ACE102	**Strength of Materials**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
06	AAR126	**Model Making Workshop**	0	1	2	0	3	100	-	100	B1 (Viva)
07	AES201	**Environmental Studies**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
		Total	**13**	**2**	**15**	**0**	**30**	**450**	**350**	**800**	
		Total Hrs/Week	**30**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

AAR112	Theory of Architecture	L	T	ST	J	C
SDG No. 4, 9		3	0	0	0	3

Course Description:
This course introduces principles of architectural composition, including classical and modern proportioning systems, spatial organization, and form transformations. Students explore the role of ornamentation, polychromy, and lighting in enhancing architectural aesthetics. Material studies focus on brick, timber, stone, concrete, and glass for both structural and visual applications. Nature-inspired design approaches such as biomimicry and biophilia foster ecological awareness. The course also examines philosophies of notable architects and architectural movements like functionalism, cubism, and sustainable design. By the end, learners will demonstrate conceptual clarity, visual literacy, and contextual understanding, preparing them for culturally grounded, innovative architectural expression.

Course Objectives:
- To introduce various proportioning systems, organizing principles of architectural compositions.
- To understand and apply architectural organizing, spatial, and transformational form principles.
- To understand and apply ornamentation, polychromy, and lighting in architectural aesthetics.
- Study various building materials for structural, aesthetical, ornamentation purposes.
- To analyze famous architects' architectural philosophies and concepts in India and abroad.

Unit 1

Proportioning systems in Architecture- Vitruvian man and Golden Section, classical orders, Le Modular of Le Corbusier and Japanese Ken Theory of Proportions. A brief introduction to fractal nature and self-similarity in natural forms. Influence of nature on Architecture - Biophilic Architecture and biomimicry.

Unit 2

Shear Organizing principles of architectural composition – line, plane, volume, datum, axis, symmetry, hierarchy, and rhythm. Different types of spatial organizations of masses - linear, centralized, radial, clustered, grid organization illustrations of buildings. Transformation of forms-rotation, reflection, and translation.

Unit 3

Use and need of ornamentation in architectural design, different types of ornamentation in buildings, Polychromy in architecture. Use of Light in architectural aesthetics.

Unit 4

Use of different materials like brick, timber, stone, concrete, glass for aesthetic and structural purposes.

Unit 5

A brief introduction to the architectural philosophies of notable architects. A brief introduction to architectural movements - Organic architecture, functionalism, structuralism, purism, cubism, hi-tech, and sustainable architecture.

References:

1. F. D. K. Ching, *Architecture: Form, Space, and Order*, 4th ed. Hoboken, NJ, USA: John Wiley & Sons, 2015
2. V. S. Pramar, *Design Fundamentals in Architecture*. New Delhi, India: Somaiya Publications, 1973
3. B. K. Sharma and H. Kaur, *An Introduction to Environmental Pollution*. Meerut, India: Goel Publishing House, 1996
4. P. R. Trivedi, *Encyclopedia of Ecology and Environment*, 15 vols. New Delhi, India: Indian Institute of Ecology and Environment, 2020
5. M. J. Crosbie, *Green Architecture: A Guide to Sustainable Design*. Rockport, MA, USA: Rockport Publishers, 1995
6. K. Lynch, *Site Planning*. Cambridge, MA, USA: MIT Press, 1967

Course Outcomes:

- Ability to identify the spatial organization and underlying proportioning system(s).
- Deeper understanding of the use of spaces, materials, philosophies to suit a specific context.
- Understanding of philosophies of various notable architects.
- Clarity on architecture built structures during different movements(Organic architecture, functionalism, structuralism, purism, cubism)
- Complete understanding of anthropometry.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	1	-	-	-	-	-	-	-	-	-	-	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 4 & 9	
12	
SDG Justification:	
This course introduces the students to the materials, innovations, and techniques and how they are creatively adopted for specific projects. Understanding the various philosophies of famous architects inspires students to come up with innovative thoughts and novel ideas in design. The knowledge of various proportioning systems helps the students design spaces more efficiently.	

AAR114	Basic Design & Visual Arts II	L	T	ST	J	C
SDG No. 4		1	0	5	0	6

Course Description:

This course introduces students to the fundamentals of spatial design by exploring key architectural concepts such as massing, anthropometry, ergonomics, and site-responsive thinking. Through hands-on exercises in two- and three-dimensional composition, students develop an understanding of solids, voids, and form articulation. The course emphasizes contextual awareness—examining how site features and physical factors influence design decisions. By engaging with small-scale structures and culminating in a cottage design exercise, students integrate user needs, environmental considerations, and aesthetic principles. The course empowers learners to conceptualize and visualize built forms holistically, enhancing their ability to design functionally effective, empathetic, and human-centric architectural spaces.

Course Objectives:

- To analyze the importance of massing in the design of built forms.
- To understand the importance of anthropometry and ergonomics in architectural design
- To understand the context of site location and the impact of its features on Architectural Design
- To examine and analyze the design of small structures and redesign them with a human-centric approach
- To design a residential space by assessing the needs of the user groups and their interaction with the space.

Course Content

- Application of the principles of composition in two and three dimensions. Compositions with solids and voids. Exercises in three-dimensional massing, right-angled massing, diagonal massing, and spherical massing.
- Concepts of Anthropometrics and Ergonomics- Study of the human dimensions in various postures related to the dimensioning of everyday utilities like the table, chair, sink, etc.
- Importance of physical factors in architectural design, e.g., orientation, ventilation, adequate protection from rain, dust, insects, etc.
- Design of small structures – street furniture, kiosks, clock towers, milk booth, cycle stand, shop, etc. and objects of interest with respect to form and construction.
- Design a small weekend cottage incorporating all the above concepts.
- Time problem of 5 hours duration.

References:

1. F. D. K. Ching, *Architecture: Form, Space, and Order*, 5th ed. Hoboken, NJ: Wiley, 2019.
2. W. Wucius, *Principles of Two-Dimensional Design*. New York: Dover Publications, 2016.
3. A. Pipes, *Drawing for Designers: Drawing Skills, Concept Sketches, Computer Systems, Illustration, Tools and Materials, Presentation Techniques*, 2nd ed. London: Laurence King Publishing, 2013.
4. K. W. S. Mitchell, *Principles of Design in Architecture*. London: Architectural Press, 2003.
5. J. Itten, *Design and Form: The Basic Course at the Bauhaus and Later*, rev. ed. Hoboken, NJ: Wiley, 2003.

6. R. Krier, *Architectural Composition*. Basel: Birkhäuser, 2010.
7. P. Yee, *Architecture: A Visual History*. London: DK Publishing, 2021.
8. D. A. Hanks, *The Decorative Designs of Frank Lloyd Wright*. Mineola, NY: Dover Publications, 1999.

Course Outcomes:

- Understanding the use and evaluation of massing in building design
- Applying the study of Anthropometry and Ergonomics in Architectural Design
- Evaluate the site parameters which affect a building design
- Designing small-scale structures with a human-centric approach
- Designing a small residential space incorporating all the above outcomes.

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	1	1	-	1	-	-	2	2	-	-	-	-
CO2	2	2	2	2	-	2	-	-	2	2	-	-	-	-
CO3	3	3	3	3	3	-	-	-	2	2	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 4	
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
This course provides fundamentals of drawing & design of both indoor and outdoor spaces that instil a strong foundation for "quality education" in Architecture.	

AAR116	Architectural Drawing and Graphics II	L	T	ST	J	C
SDG No. 4		1	0	5	0	6

Course Description:
This course equips students with foundational competencies in architectural representation, emphasizing orthographic projections, sectional analysis, and solid intersections. Through site-based measured drawing exercises, learners apply manual and digital techniques to produce scaled representations that convey spatial hierarchy and depth. The curriculum introduces isometric, axonometric, and oblique projections to facilitate accurate three-dimensional visualization. Instruction in perspective methods—one-point, two-point, and three-point—develops students' capacity to depict realistic spatial environments. The module on sciography fosters a nuanced understanding of light and shadow in architectural rendering, culminating in expressive presentations using varied media. On completion, students demonstrate precision, clarity, and creative aptitude in technical and representational architectural drawings.

Course Objectives:
- To develop skills in deriving hidden and sectional lines through intersection of two complex objects and through the cross section of any objects.
- To introduce the techniques of representing a scaled drawing through hands-on experience on measurement of existing structures using varying spatial depth.
- To introduce various types of three-dimensional views of simple objects
- To introduce representation of realistic 3D views with different perspective methods.
- To sensitize the rules of composition of 2D and 3D objects using shades and shadow techniques for architectural presentation.

Unit 1: Orthographic Projections - II
- Intersection of solids
- Section of solids

Unit 2: Measured drawing & Architectural Presentation Techniques
- Measured drawing:
  - Scaled drawings of plan, elevation and section.
  - Use of varying line weights & detail to convey a sense of spatial depth in the drawing.
- Architectural Presentation Techniques:
  - Selection of different mediums for Drawing, Formatting & Composition, Different Styles of Text & Mediums, Choice of colours, etc.

Unit 3: 3D views
- Isometric, oblique, and axonometric projections of various solids and simple geometrical composition of solids.

Unit 4: Perspective Views
- Introduction to one point or parallel perspective, two point or angular perspective.
- Introduction to three-point perspective.

Unit 5: Sciography
- Practical examples in the study of shade and shadows, using geometrical solids of various forms and groups of forms, leading to advanced examples of shades and shadows on buildings or parts of buildings.
- Use of pen and ink rendering.

References:

1. B. Gupta and M. Raja Roy, *Engineering Drawing with AutoCAD,* 3rd ed. New Delhi, India: Dreamtech Press, Feb. 2020
2. N. D. Bhatt, *Engineering Drawing*, 53rd ed. Charotar Publishing House, 2016
3. A. L. Guptill, *Rendering in Pen and Ink*. New York, NY, USA: Watson-Guptill Publications, 1976
4. F. D. K. Ching, *Architectural Graphics*, 4th ed. New York, NY, USA: John Wiley & Sons, 2003
5. R. W. Gill, *Perspective-from basic to creative,* London, U.K:Thames & Hudson, 2006
6. H. Barros, E. Termes, M. Purman and S. Tan, *How to draw perspective step by step,* Barcelona, Spain: Page One, 2011

Updated Course Outcomes:

- Demonstrate the ability to draw hidden lines and sectional views of intersecting complex solid using standard projection techniques
- Apply manual and digital drafting tools to produce accurate scaled drawings based on site measurements, incorporating spatial hierarchy and depth.
- Construct axonometric, oblique and isometric drawings of simple architectural forms with precision.
- Illustrate realistic three-dimensional perspectives (one-point, two-point, and three-point) of architectural spaces and built-forms.
- Render architectural drawings with appropriate use of light, shade, shadow, and depth to enhance visual communication and composition quality.

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	1	-	-	2	1	1	-	1	-	-	1	2
CO2	3	2	1	-	-	2	1	1	-	1	-	-	1	2
CO3	3	2	1	-	-	2	1	1	-	1	-	-	1	2
CO4	3	1	1	-	-	2	1	1	-	1	-	-	1	2
CO5	3	1	1	-	-	2	1	1	-	1	-	-	1	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 4	
SDG No. 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
AD&G-II teaches fundamentals of drawing & design communication that instil a strong foundation for "quality education" in Architecture. The representation of the built-form provides a clear understanding of using spaces with accuracy, livable condition along with right to basic services, amenities and infrastructures.	

AAR118	Building Construction & Materials I	L	T	ST	J	C
SDG No. 9		3	0	3	0	6

Course Description:

This foundational course introduces students to construction materials, structural systems, and early architectural practices in India. Emphasis is placed on understanding the physical and aesthetic properties of materials such as brick, stone, lime, and mortar, alongside their historical and cultural significance. Students gain exposure to measured drawing methods and basic structural elements through site-based exercises. The course covers principles of brick and stone masonry, load-bearing techniques, and foundational systems, cultivating technical competence in building processes. Historical modules explore construction typologies from the Indus Valley to Buddhist and Hindu temples, highlighting socio-cultural influences and material evolution. By course completion, students demonstrate applied knowledge in selecting materials and interpreting construction techniques.

Course Objectives:

- Understanding socio-cultural, architectural, and town planning aspects of Indus Valley Civilisation
- Understanding construction techniques in rock cut architecture; designing of built environment reflecting Buddhist lifestyle and philosophy.
- Understanding the design development and evolution from rock-cut to structural typologies; knowledge of temple prototypes using various construction techniques and materials like stone, brick, etc.
- Understanding mathematical and geometrical attributes for ornamentation and aesthetic expression on North Indian Temples.
- Understanding the development of structural techniques evolved in South Indian temple construction.

Unit 1: Building materials

Study of basic building materials like brick, stone, cement, lime, sand, and mortar with respect to their classification, composition, and general idea about their chemical properties, physical properties, structural strength, and aesthetic qualities. Introduction to building materials as described in the Indian architectural context. Emphasis should be on developing an understanding of choosing appropriate building materials in a given situation.

Note: All the students should do a Market Survey on the above-listed building materials, and a detailed report of the study should be submitted

Unit 2:

Measured drawings and Introduction to Super and Sub-Structure. Introduction to basic elements and components of buildings and their importance. A brief discussion on the stepwise process of building a structure. Basics of the section of the G+1 building. Soils – Types and Properties.

Unit 3: Brick Masonry

Elementary construction methods explaining basic principles of load bearing structures. Types of bricks, bats, and closers, etc. Various types of bonds, English and Flemish brick bonds, stopped ends, quoins, piers, corbelling, damp proof course, windowsills, thresholds, copings, mortar joints and pointing, junctions, jambs for various thicknesses.

Unit 4: Stone Masonry

Dressing of stones, STone walls, rubble work, ashlar work, masonry joints, windowsills, plinth, cornices, copings, surface finishes.

Unit 5: Simple Foundations & Plinth

Need for foundations, preliminary design criteria. Details of brick and stone footings for load-bearing walls of various thicknesses. Plinth filling details and Damp-Proof Course.

References:

1. S. P. Bindra and S. P. Arora, *Building Materials and Construction*. Delhi, India: Dhanpat Rai Publication, 2019
2. W. B. McKay, *Building Construction*, Volume 1. London, U.K.: Longman Group Ltd., Pearson Longman, 1970.
3. S. C. Rangwala, *Building Construction*. Anand, India: Charotar Publishing House Pvt. Ltd., 2016.
4. Sushil Kumar, *Building Construction*. Delhi, India: Standard Publishers Distributors, 2014.
5. B. Punmia, A. K. Jain and A. K. Jain, *Building Construction*, New Delhi: Laxmi Publications, 2016.
6. S. Sharma, *Textbook of Building Construction*, New Delhi: S.Chand , 2015.
7. R. Barry, *Construction of Buildings*, London : ELBS & Granada, 1980.

Course Outcomes:

- To develop conceptual knowledge of building materials and help understand construction materials, such as bricks, stone, cement, and concrete, and their application in the building industry.
- The course gives an understanding of a building's basic structural systems and components and a step-by-step construction procedure for a load bearing structure.
- The course gives an understanding of principles of masonry, brick masonry and applications.
- The course gives an understanding of the principles of stone masonry and its applications.
- The course gives an understanding of the importance of substructure, the types of simple foundations for load-bearing structures, and the importance of the plinth for a building.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	2	3	3	3	1	3	2	3	3	2
CO2	3	3	3	2	2	3	3	3	1	3	2	3	3	2
CO3	3	3	3	3	3	3	2	3	1	2	1	3	3	2
CO4	3	3	3	3	3	3	2	3	1	2	1	3	3	2
CO5	3	3	3	3	3	3	2	3	1	2	1	3	3	

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 9	
SDG No. 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
The course provides insights into the required understanding of construction procedures in the building industry, reinforces the required cognitive skills for innovation, and provides applications in the practical field of architectural professional practice.	

ACE102	Strength of Materials	L	T	ST	J	C
SDG No. 10		2	1	0	0	3

Course Description:

This course introduces the fundamental principles of strength of materials, equipping students with the analytical skills to evaluate the mechanical behavior of structural elements under various loading conditions. Key topics include stress-strain relationships, thermal deformation, and elastic properties of materials. Students construct shear force and bending moment diagrams for different beam types and apply concepts of stress transformation using graphical methods. The curriculum further explores bending and shear stresses in beams, and the torsional behavior of circular bars. By course completion, students demonstrate the ability to analyze and design basic structural components with an understanding of internal stresses, deformation characteristics, and strength parameters relevant to load-bearing systems.

Course Objectives:

- To understand the basic concepts of stress and strain in materials.
- To analyse and construct shear force diagrams and bending moment diagrams for various types of beams.
- To understand the concept of transformation of stresses on the inclined planes, determination of principal planes and principal stresses.
- To analyse flexural and shear stresses in beams.
- To understand torsional behavior in circular bars and angle of twist.

UNIT 1

Introduction, stress, strain, stress-strain relationships for Mild steel bar, Hooke's law, Poisson's ratio; thermal strain and deformation; deformation of axially loaded bars. Relationship between modulus of elasticity and modulus of rigidity; dilatation and bulk modulus.

UNIT 2

Shear Force and Bending Moment Diagrams: Constructing Shear Force diagrams and bending moment diagrams for simply supported beams; cantilever beams and overhanging beams.

UNIT 3

Transformation of stresses in two-dimensional problems; principal stresses in two-dimensional problems; Mohr's circle for two-dimensional problems; construction of Mohr's circle by graphical method.

UNIT 4

Bending stresses in beams: Introduction; basic assumptions; elastic flexure formula; application of flexure formula, combined direct and bending stresses.

Shear stresses in beams: Introduction; shear flow; shear stress formula for beams; Shear stress in beam flanges.

UNIT 5

Torsion: Introduction; application of the method of sections; torsion of circular elastic bars – basic assumptions, the torsion formula, design of circular bars in torsion for strength, angle of twist of circular bars.

References

1. RS Khurmi & N Khurmi, *A Textbook of Strength of Materials*, S. Chand Publishing, 26th Edition, 2019.
2. R. K. Bansal, *A Textbook of Strength of Materials*, Laxmi Publications, 6th edition, 2018.
3. Rattan, S. S., *Strength of Materials*, McGraw Hill Education, 3rd Edition, 2018
4. H. J. Shah, *Mechanic of Structures,* Vol. I, Charotar Publishing House Pvt. Ltd.; 32nd Edition 2017.
5. R. Subramanian, *Strength of Materials*, Oxford University Press; 3rd edition, 2016
6. S. Ramamrutham, R. Narayanan, *Strength of Materials*, New Delhi Dhanpat Rai Publishing Company (P) Ltd. 18th Edition, 2014.
7. Beer, Ferdinand P, *Mechanics of Materials*, New Delhi Tata McGraw-Hill Education, 5th edition, 2011.

Course Outcomes:

- Learn the concept of the mechanical behaviour of deformable bodies under loads.
- Draw the Shear force diagram and bending moment diagram.
- Calculate the stresses on inclined planes and principal planes.
- Calculate the bending and shear stress across the cross-section of the beam.
- Calculate shear stress, the shaft diameter, and the power transmitted using the torsional formula.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	-	3	2	1	-	-	3	-	-	2	-	2	3	1
CO2	-	3	2	1	-	-	3	-	-	2	-	2	3	1
CO3	-	3	2	1	-	-	3	-	-	2	-	2	3	1
CO4	-	3	2	1	-	-	3	-	-	2	-	2	3	1
CO5	-	3	2	1	-	-	3	-	-	2	-	2	3	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 9	
SDG No. 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
Empowers students with technical skills and design insight to build sustainable, safe structures responsive to communities, heritage, and environment.	

AAR126	Model Making Workshop	L	T	ST	J	C
SDG No. 4,9		0	1	2	0	3

Course Description:
This course introduces students to model-making techniques as essential tools for architectural representation and communication. Emphasizing geometric understanding, scale, and texture, learners develop conceptual, block, and massing models using varied materials such as paper, mount board, POP, clay, thermocole, and softwood. Students engage with conventional and digital fabrication tools including carpentry equipment, CNC cutting, and 3D printing. The curriculum focuses on material simulation, surface expression, and lighting techniques to prepare high-quality presentation models. Photography in built models is incorporated to enhance visual documentation. Upon completion, students demonstrate technical and aesthetic proficiency in scaled model-making, effectively translating design intentions into tangible forms across academic and professional contexts.

Course Objectives:
- Understanding Geometry in model making through paper and other media.
- Understanding the importance of model making using conceptual models, block models and massing models.
- Representation of texture in models through different mediums and materials, photography in model making.
- Understanding scale in model making.
- Introduction to model making: - Need; role of scale-models in design; general practices

Essentials of model making: Materials available for model making such as papers, mount boards, Plaster of Paris (POP), clay, thermocole, softwood, etc. Understanding of various tools and machines employed. Introduction to various carpentry tools.

Techniques of scale-modelling: Use different scales, templates, measuring aids; conventions followed.

Preparing presentation models involves simulation of various materials and textures such as wood, glass, aluminium, steel, bricks, roofing tiles, flooring, corrugated sheets, etc. Photography in built models, using lighting and natural background.

Carpentry & Joinery: Introduction to various carpentry tools and production of simple joints used in joinery.
Overview of 3D Printing and CNC Cutting
Photography in built models, using lighting and natural background.

References:
1. N. Dunn, *Architectural Modelmaking*, 2nd ed. London, U.K.: Laurence King Publishing, 2014.
2. M. Werner, *Model Making*, 1st ed. New York, NY, USA: Princeton Architectural Press, 2011.
3. A. Simitch and V. Warke, *The Language of Architecture: 26 Principles Every Architect Should Know*, 1st ed. Beverly, MA, USA: Rockport Publishers, 2014.
4. W. Knoll and M. Hechinger, *Architectural Models: Construction Techniques*, 1st ed. Boston, MA, USA: Birkhäuser, 2007.

5. M. Driscoll, *Model Making for Architects*, 1st ed. Ramsbury, U.K.: The Crowood Press, 2013.
6. A. Schulz, *Architectural Photography: Composition, Capture, and Digital Image Processing*, 3rd ed. Berlin, Germany: dpunkt.verlag, 2015.
7. D. Neat, *Model-making: Materials and Methods*, 1st ed. Ramsbury, U.K.: The Crowood Press, 2008.

Course Outcomes:

- Understand the need and necessity of model making.
- Importance of model making as a communication tool for Architects.
- Preparation of scaled models and presentation models.
- Understanding different mediums used for model making
- Understand different categories of models and their importance.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	2	2	-	2	2	2	2	2	2	-	-	1	1
CO2	2	2	2	-	2	2	2	2	2	2	-	-	1	1
CO3	3	3	3	-	-	2	2	2	3	3	-	-	1	1
CO4	2	2	1	-	-	1	2	2	3	1	-	-	1	1
CO5	3	3	2	-	-	2	2	1	1	1	-	-	1	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 4, 9	
SDG No. 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all **SDG No. 9:** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
This course provides fundamentals of model making to visualise in a 3-dimensional perspective that influences their thought process and understanding in Architecture. It gives them a scope to innovate and adapt to various new materials and technology.This helps the students in design visualization and design development besides keeping up with the technological innovations.	

AES201	Environmental Studies	L	T	ST	J	C
SDG No.:12, 13, 15, 16		3	0	0	0	3

Course Description:

This multidisciplinary course introduces students to the critical interrelations between environment, society, and sustainable development. Core themes include natural resource exploitation, ecosystem structure and biodiversity conservation, types and impacts of pollution, and disaster risk management. Students examine social and ethical dimensions of climate change, urban sustainability, and environmental legislation. The curriculum fosters ecological awareness through case studies, fieldwork, and documentation of environmental assets and degraded sites. Emphasis is placed on individual responsibility, IT applications in environmental health, and enforcement of protective acts. By course completion, learners develop the capacity to critically analyze ecological challenges, advocate sustainable practices, and engage with environmental policies and community-level interventions.

Course Objectives:

- Damage and exploitation of natural resources.
- Concepts of ecosystems, biodiversity, and solid waste management.
- Fundamentals of disaster management.
- Environmental ethics, climate change, global warming, etc.
- Role of IT in the environment and human health.

Unit 1 Multidisciplinary nature of environmental studies & Natural Resources:

Multidisciplinary nature of environmental studies: Definition, scope, and importance. Need for public awareness: Natural Resources: Renewable and non-renewable resources. Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on the forest and tribal people. Water resources: Use and over-utilisation of surface and groundwater, floods, drought, conflicts over water, dams- benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertiliser-pesticide problems, waterlogging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, and alternative energy sources. Case studies. Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion, and desertification. Role of an individual in the conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit 2 Ecosystems and Biodiversity, and its conservation:

Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers.Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the Forest ecosystem.Grassland ecosystem.Desert ecosystem. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity and its conservation. Introduction – Definition: genetic, species and ecosystem diversity. Biogeographically classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option

values. Biodiversity at global, National and local levels. India is a mega-diverse nation. Hot spots of biodiversity.Threats to biodiversity: habitat loss, poaching of wildlife, and man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.

Unit 3 Environmental Pollution:

Definition: Cause, effects and control measures of: Air pollution. Water pollution. Soil pollution. Marine pollution. Noise pollution. Thermal pollution. Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquakes, cyclones, and landslides.

Unit 4 Social Issues and the Environment:

From Unsustainable to Sustainable development: Urban problems related to energy. Water conservation, rainwater harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case Studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, and the holocaust. Case Studies. Wasteland reclamation.Consumerism and waste products.

Unit 5

Human Population and the Environment and Environment Protection Act and Fieldwork: Population growth, variation among nations. Population explosion – Family Welfare Programme. Environment and human health. Human Rights. Value Education.HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and Human Health. Case Studies. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act. Issues involved in the enforcement of environmental legislation. Public awareness. Fieldwork. Visit a local area to document environmental assets.River/forest/grassland/hill/mountain. Visit a local polluted site: Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hill slopes, etc

References:

1. Bharucha, *Textbook of Environmental Studies for Undergraduate Courses*, Hyderabad, India: Universities Press, University Grants Commission, 2005.
2. Joseph, *Environmental Studies*, New Delhi, India: Tata McGraw-Hill Publishing Company Limited, 2009.
3. Kaushik and C. P. Kaushik, *Textbook of Environmental Studies*, New Delhi, India: New Age International Publishers, 2007
4. Agarwal, *Environmental Biology*, Bikaner, India: Nidi Publishers Ltd., 2001.
5. Brunner, *Hazardous Waste Incineration*, New York, USA: McGraw-Hill Inc., 1989.
6. De and K. De, *Environmental Science*, New Delhi, India: New Age International, 2009.
7. Karpagam, *Environmental Economics*, New Delhi, India: Sterling Publishers, 1991.
8. Tiwari, *Concept of Environmental Management*, Delhi, India: Bharat Book Bureau, 1992.

Course Outcomes:

- Demonstrate awareness of overexploitation and sustainable management of natural resources.
- Identify alternate and renewable resources to support ecologically balanced development.
- Explain the structure, function, and significance of ecosystems and biodiversity.

- Evaluate environmental pollution and propose individual-level prevention strategies.
- Interpret key environmental legislations and their role in addressing ecological challenges.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	-	-	3	3	-	-	-	-	-	-	2	-
CO2	3	3	2	-	3	3	-	-	-	-	-	-	2	-
CO3	3	-	-	-	3	-	2	2	-	-	1	-	3	2
CO4	3	-	-	2	3	3	3	2	2	2	-	2	3	-
CO5	3	-	-	-	3	2	2	2	2	2	2	3	2	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 12, 13, 15, 16	
SDG 12 : Ensure sustainable consumption and production patterns SDG 13 : Take urgent action to combat climate change and its impacts SDG 15 : Protect, restore and promote sustainable use of terrestrial ecosystems SDG 16 :Promote peaceful and inclusive societies and build effective institutions	
SDG Justification:	
● Emphasizes understanding overexploitation and choosing sustainable alternatives—closely tied to CO 1 and CO 2. ● Aligns with CO 4: empowering students to act individually against pollution, fostering climate-conscious behavior. ● Supports CO 3 and CO 5 through biodiversity awareness and ecosystem comprehension for long-term ecological health. ● Matches CO 5: understanding environmental legislations cultivates civic awareness and engagement with institutional processes.	

III Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE201	**Theory of Structures I**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR201	**Climatology in Architecture**	3	0	1	0	4	50	50	100	A1 (04 Hrs)
03	AAR203	**History of Western Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR104	**Building Materials II**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR217	**Architectural Design I**	1	0	7	0	8	200	200	400	C2 (Jury)
06	AAR219	**Building Construction II**	1	0	4	0	5	50	50	100	A1 (05 Hrs)
07	AAR221	**Computer Applications in Architecture I**	0	0	3	0	3	100	-	100	B1 (Viva)
		Total	**13**	**1**	**15**	**0**	**29**	**550**	**450**	**1000**	
		Total Hrs/Week	**29**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

ACE211	Theory of Structures I	L	T	ST	J	C
SDG No. 9		2	1	0	0	3

Course Description:
This course introduces methods to analyze deflections in statically determinate beams and fixed beams under various loads. It covers continuous beam analysis using the theorem of three moments, slope deflection, and moment distribution methods. Students also learn column stability concepts through Euler's theory, Rankine-Gordon, and Secant formulae, enabling accurate structural assessment of beams and columns.

Course Objectives:
- To determine the deformations in a statically determinate beams using the moment area method and Macaulay's method.
- To analyze Fixed beams for different loading conditions.
- To analyze continuous beams using Theorem of three moments, and slope deflection method.
- To analyze continuous beams using the Moment Distribution method.
- To find the buckling load of a column subjected to an axial and critical load.

UNIT 1

Deflection of Statically Determinate Structures: Beams use double integration and moment area methods.

UNIT 2

Shear force and bending moment diagrams for fixed beams subjected to a) Uniformly Distributed loads, b) Point loads

UNIT 3

Analysis of three span continuous beams using the theorem of three moments and Slope deflection method.

UNIT 4

Analysis of three-span continuous beams using the Moment distribution method.

UNIT 5

Columns and Struts: Euler's theory –end conditions, Rankine - Gordon formula - eccentrically loaded columns - Secant formula.

References:
1. R C Hibbeler, *Structural Analysis*, Pearson Education, 10th Edition, 2022
2. Kenneth M. Leet, Chia-Ming Yang, *Fundamentals of Structural Analysis*, McGraw-Hill College; 6th Edition, 2020.
3. S S Bhavikatti, *Structural Analysis-I*, Vikas Publishing House Pvt Ltd, 5th Edition, 2021
4. C S Reddy, *Basic Structural Analysis*, McGraw-Hill Education, 3rd Edition, 2017
5. Chandramouli, *Structural Analysis I: Analysis of Statically Determinate Structures*, Chennai. Yes Dee Publishing Pvt. Ltd., 1st Edition, 2015

6. Dr. R. Vaidyanathan, Dr. P. Perumal, *Structural Analysis (Vol. I)*, Laxmi Publications, 4th edition, 2019.

Course Outcomes:

- Analyse and compute beam deflections using the double integration method and moment area method for statically determinate structures.
- Interpret and construct shear force and bending moment diagrams for fixed beams subjected to various loading conditions.
- Evaluate the behaviour of continuous beams using the theorem of three moments and apply this knowledge to structural design.
- Apply the moment distribution method to determine shear force and moments in multi-span beams.
- Utilise the slope deflection method to determine shear force and moments in continuous beams.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	3	3	3	1	1	1	1	2	1	1	2	3	1
CO2	1	3	3	3	1	1	1	1	2	1	1	2	3	1
CO3	1	3	3	3	1	1	1	1	2	1	1	2	3	1
CO4	1	3	3	3	1	1	1	1	2	1	1	2	3	1
CO5	1	3	3	3	1	1	1	1	2	1	1	2	3	1

H - High Correlation, M - Medium Correlation, L - Low Correlation

APPROVED IN:	
BOS: 04-June-25 (21st BOS)	**ACADEMIC COUNCIL: 09-May-25**
SDG No. & Statement: 9	
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
Equips students to design efficient, resilient structures. Encourages innovation in material usage and modeling techniques—key to improving infrastructure quality and durability.	

AAR201	Climatology in Architecture	L	T	ST	J	C
SDG No. 7,11,12,13 15		3	0	1	0	4

Course Description:
This course introduces students with the fundamental principles of climate and its vital role in shaping sustainable and comfortable built environments, by examining global and regional climatic factors, it fosters an understanding of how environmental conditions influence architectural design decisions. It integrates scientific knowledge with design application, empowering students to respond effectively to diverse climatic challenges through passive design strategies.
It also emphasizes climate-responsive design strategies tailored for hot-dry, warm-humid, and composite climates—ensuring that learners are equipped to create energy-efficient and thermally comfortable spaces across diverse geographical contexts.
This course aims to build competency in interpreting climate data, with a focus on practical application by applying this understanding to design buildings that harmonize with their environmental context, particularly in tropical and composite regions.

Course Objectives:
- To provide and understand global climate factors, climate elements, and thermal comfort.
- To acquaint students with the principles behind the design of solar shading devices.
- To provide an understanding of the principles of Heat Transfer through building materials.
- Principles of Ventilation and Daylighting.
- To provide an overview of design considerations in various climatic zones.

UNIT 1: Climate and Thermal Comfort
- Global climatic factors, elements of climate, classification & characteristics of tropical climates, site climate.
- Thermal balance of the human body, Thermal comfort indices.
- Relation of climatic elements to comfort, Bioclimatic chart.

UNIT 2: Solar Geometry & Design of Solar Shading Devices
- Apparent movement of the sun and sun path diagram.
- Solar angles, Shadow angles, Solar shading masks.
- Significance of building orientation
- Effect of Landscaping on Microclimate Modification

UNIT 3: Heat Flow through Materials
- Thermal quantities – heat flow rate, conductivity (k-value)& resistivity
- Conductance through a multi-layered body, surface conductance, transmittance of wall and roof, Residential Envelope Transmittance Value (RETV) – calculation of U-value;
- Periodic heat flow, Time lag and decrement factor.

UNIT 4: Ventilation and Daylighting

VENTILATION
- Air movement in and around buildings
- Basic objectives of ventilation

- Ventilation due to the stack effect
- Ventilation due to the pressure effect
- Combined ventilation due to pressure and stack effect
- Operable Window-to-Floor Area Ratio (WFR).

DAYLIGHTING

- Sources of light, significance of daylight
- Classification of Daylight, Daylight Factor and Sky Component.
- Daylighting in Tropics, hot, dry climates, and warm, humid climates
- Visible Light Transmission (VLT)

UNIT 5: Design Principles for Different Climates

- Building design & layout planning considerations for various climates
- Climatic design criteria for:
    - Hot and dry climate
    - Warm and humid climate
    - Composite climate

References:

1. O.H. Koenigsberger and others, *Manual of Tropical Housing and Building – Part I – Climatic Design*, Longmans, London, 1980.
2. B.Givoni, Man, *Climate and Architecture*, Applied Science, Banking, Essex, 1992.
3. Victor Olgyay, AladárOlgyay, *Design with climate: bioclimatic approach to architectural regionalism*, Princeton University Press, 1963.
4. M.Evans – *Housing, Climate and comfort* – Architectural Press, London, 1980.
5. Donald Watson and Kenneth Labs., *Climatic Design* – McGraw-Hill Book Company – New York – 1983
6. M. DeKay and G. Z. Brown, *Sun, Wind & Light: Architectural Design Strategies*, 3rd ed., Hoboken, NJ: Wiley, 2014.
7. Bureau of Energy Efficiency, *Energy Conservation Building Code 2017*, New Delhi: Bureau of Energy Efficiency, Ministry of Power, Government of India, 2017
8. Bureau of Energy Efficiency, *Eco-Niwas Samhita 2018: Energy Conservation Building Code for Residential Buildings (Part I: Building Envelope)*, New Delhi: Ministry of Power, Government of India, 2024.

Course Outcomes:

- The student will gain an understanding of the various climate elements that affect the design of buildings.
- The students will be able to design different types of shading devices.
- Students will be able to select appropriate building materials to reduce heat flow through buildings.
- Students will be able to design openings for appropriate ventilation and lighting.
- Design buildings in various climates for human comfort.

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	1	2	1	2	3	1	1	3	1	3	3	2
CO2	3	3	3	3	3	2	3	1	1	3	1	2	3	3
CO3	3	3	3	2	1	2	3	1	1	2	1	2	3	1
CO4	3	3	3	2	2	2	3	1	1	2	1	2	3	2
CO5	3	3	3	3	2	3	3	1	1	3	1	2	3	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 20-May-22 (15th BOS)	**ACADEMIC COUNCIL: 17-Jun-22**
SDG No. & Statement: 7,11,12,13, and 15	
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all **SDG 11:** Make cities and human settlements inclusive, safe, resilient and sustainable **SDG 12:** Ensure sustainable consumption and production patterns **SDG 13:** Take urgent action to combat climate change and its impacts **SDG 15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity	
SDG Justification:	
Climate-responsive, culturally rooted buildings reduce carbon footprint while respecting local identity and traditions. They harness indigenous knowledge to enhance environmental resilience and occupant well-being. Integrating these approaches aligns architecture with global sustainability and equity goals	

AAR203	History of Western Architecture	L	T	ST	J	C
SDG No. 4, 5, 10, 11, 13, 16		3	0	0	0	3

Course Description:
This course offers a chronological exploration of architectural development from prehistoric times through the Renaissance period. It introduces students to cultural, religious, and technological contexts that shape early architectural expressions across ancient civilizations including Egypt, Mesopotamia, Greece, Rome, and Europe. This course aids students to understand characteristics, features, structural systems, spatial organization, building typologies, and notable examples that laid the foundation for architectural thought and design practices throughout history which can be used by the students to understand the core features of any area.
This course aims to develop a critical understanding of architectural heritage and its lasting influence on contemporary architecture, with a focus on practical application by enabling students to use the knowledge in Architectural Design, and other industry projects

Course Objectives:

- To understand the relationship between belief systems and the built environment during the Egyptian era, we will focus on the formative development stage of construction techniques.
- To understand the evolution of various building typologies and settlements based on socio-cultural & socio-economical zoning strategies depending upon administrative purposes during Mesopotamian times.
- To understand the process of designing buildings and built environments with specific design principles and importance for aesthetic appeal during the Greek era.
- To understand the design approach process, focusing on the evolution of construction techniques with engineering applications and interior design during the Roman era.
- To understand the evolution of the church form, the importance of applying suitable scale and proportion, and the use of art in architecture in buildings during the Renaissance period.

UNIT 1: Development of prehistoric and historic architecture Egyptian Architecture

- Characteristic features
- Secular Architecture
- Mastabas. Example: Mastaba of Thi, Sakkâra
- Pyramids. Example: Step pyramid of Djoser (Zoser), Sakkâra, Bent pyramid of Dahshur, Great pyramid of Cheops, and Gizeh.
- Temples. Example: Temples of Khons, Karnak, and the Temple of Abu Simbel

UNIT 2: Ancient West Asiatic Architecture

- Characteristic features
- Sumerian Architecture, Ziggurats.Example: White Temple Warka
- Babylonian Architecture.Example: City of Babylon
- Assyrian Architecture.Example: City of Khorsabad
- Persian Architecture.Example: City of Susa

UNIT 3: Classical Greek Period

- Characteristic feature of Aegean Architecture
- Hellenic period and Hellenistic period
- Greek orders.Example: Doric, Ionic, and Corinthian

- The Acropolis at Athens. Example: Parthenon, Propylaea.
- Theatre, Stadium, and Agora

UNIT 4: Classical Roman Period

- Characteristic feature of Etruscan and Roman Architecture
- Roman Orders. Example: Doric, Ionic, Corinthian, Tuscan, and Composite
- Temples.Example: Temples of Saturn and Pantheon
- Basilica of Trajan, Baths (Thermae) of Caracalla
- Amphitheatre.Example: Coliseum
- Forum, Circus, Triumphal arch, Aqueduct, Bridge, Road Sewer, and Fountain

UNIT 5: Early Christian to Renaissance Period

- Early Christian period
  - Characteristic feature
  - Basilican Churches.Example: ST. Peter, Rome
- ByzantinePeriod
  - Characteristic feature, Example: Hagia Sophia
- RomanesquePeriod
  - Characteristic Feature
  - Example: Pisa Cathedral complex
- GothicPeriod
  - Early Gothic style and Late Gothic style. Example: NotreDame, Paris
- RenaissanceArchitecture
  - Introduction to Renaissance, Baroque Architecture, etc.

Updated References:

1. B. Fletcher, *A History of Architecture*, London: The Antholone Press, University of London, 1986.
2. S. Lloyd and H. W. Muller, *History of World Architecture – Series*, London: Faber and Faber Ltd., 1986.
3. P. Hiraskar, *The Great Ages of World Architecture*, Mumbai: Dhanpat Rai Publishing.
4. T. Wilkinson, *Thames & Hudson Dictionary of Ancient Egypt*, London: Thames & Hudson, 2008.
5. M. Biris, *Neoclassical Architecture in Greece*, Los Angeles: Getty Publications, 2001.
6. S. Grundmann, *The Architecture of Rome*, London: Axel Menges, 2007.
7. S. Servida, *The Story of Renaissance Architecture*, Munich: Prestel, 2011.
8. H. Frankfort, *The Art and Architecture of the Ancient Orient*, New Haven: Yale University Press, 1995.

Course Outcomes:

- The course provides an understanding of the relation of belief systems and built environment during the Egyptian era.
- The course provides an understanding of reflection of socio-cultural & socio-economic factors on settlement zoning and building design in Mesopotamian times.
- The course provides an understanding of the importance of application of aesthetics and design principles in buildings during the Greek era.
- The course provides an understanding of the evolution of construction techniques reinforced with the then engineering applications during the Roman era.

- The course provides an understanding of the evolution of the church form; and the importance of balancing scale and aesthetics in building.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO2	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO3	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO4	3	2	3	2	2	2	3	1	3	2	1	2	2	2
CO5	3	3	3	2	2	2	3	2	3	2	1	2	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
● **SDG 4 – Quality Education** ● **SDG 5 – Gender Equality** ● **SDG 10 – Reduced Inequalities** ● **SDG 11 – Sustainable Cities and Communities** ● **SDG 16 – Peace, Justice and Strong Institutions** ● **SDG 13 – Climate Action**	
SDG Justification:	
The course promotes quality education by building historical consciousness and critical understanding of ancient architectural typologies, techniques, and spatial politics. Through exploration of city planning and monumental architecture, it addresses the roots of sustainable urbanism and institutional design, indirectly tackling climate responsiveness, inclusivity, and social equity. Students are equipped to analyse how ancient societies met human needs through architecture—contributing to broader global goals of equity, resilience, and cultural continuity in the built environment.	

AAR104	Building Materials II	L	T	ST	J	C
SDG No.: 4, 9, 12		3	0	0	0	3

Course Description:
This course introduces students with the materials used in the construction industry, while focusing on their properties, classifications, applications, and durability. This course teaches students both traditional and modern materials, including ferrous and non-ferrous metals, various types of concrete and additives, timber, clay products, and lime that are used in the construction industry.
This course fosters a clear understanding of building materials fundamental to safe, sustainable, and cost-effective construction with a focus on practical application.
Students learn to understand the practical usages of materials such as steel, concrete, timber and they get an idea of how these materials are used during the construction process. Students also learn innovative ways of usage of these materials.

Updated course Objectives:

- To understand the composition, properties and applications of various Ferrous Metals and alloys of Non-Ferrous metals.
- To understand the composition and grades of concrete and its application in the construction industry.
- To know the different types of additives and mixtures in concrete.
- To understand the types of timber, its applications and defects.
- To understand the properties of clay and mud products and lime and their application.

UNIT 1

Ferrous Metals: Pig iron, cast iron, wrought iron – types, properties, steel – properties, types and uses of steel in construction, properties of mild steel and hard steel, defects in steel.
Nonferrous Metals and Alloys: Aluminium, copper, lead, nickel, and important alloys like brass, bronze, etc. – Brief description of uses. Corrosion of both ferrous and non-ferrous metals – types and preventive measures.

UNIT 2

Concrete: Compositions and grades of concrete. Various steps in concrete construction – batching, mixing, transporting, compacting, curing, shuttering, jointing. Lightweight concrete, ready-mix concrete, and precast concrete.

UNIT 3

Use of Additives and Mixtures in Concrete: Water repellent, Waterproofing compounds, Accelerators, Air entraining agents. Hardeners, Workability increasing agent/plasticiser, Fly ash. Their availability and uses.

UNIT 4

Timber: Structure, Defects in Timber, Decay of Timber, Qualities of Timber for construction. Seasoning, storage and preservation of Timber.

UNIT 5

Clay Products and Mud: Tiles, their properties, and use - terra-cotta, earthenware, stoneware, porcelain, vitreous. Mud – its stabilisation and uses.

Lime: Classification of lime. Fat and hydraulic lime – properties and use.

References:

1. B. C. Punmia, Ashok K. Jain, and Arun K. Jain, *Building Construction*, 12th ed. New Delhi, India: Laxmi Publications Pvt. Ltd., 2023
2. S. P. Bindra and S. P. Arora, *A Text Book of Building Construction*, [latest edition]. Delhi, India: Dhanpat Rai Publications, 2005
3. W. B. McKay, *Building Construction: Metric*, vols. I–III, 5th ed. London, U.K.: Sterling (Orient BlackSwan), 1992
4. A. Lyons, *Materials for Architects and Builders: An Introduction*, [latest edition]. London, U.K.: Arnold, 1994
5. P. Singh, *Engineering Materials : including building materials*, New Delhi,: S K Kataria and Sons, 2013.
6. S. Duggal, *Building Materials*, Delhi,: New Age, 2012.

Course Outcomes:

- Familiar with ferrous and non-ferrous metals and their properties, defects and methods of preventing them from damage
- Able to understand the characteristics, use and applications of concrete.
- Able to understand the use of additives and mixtures in concrete.
- Familiar with properties and characteristics of timber and their uses in building construction.
- Familiar with properties and uses of clay-product, mud and lime in the construction industry and traditional building.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	-	2	-	-	-	2	-	-	-	-	3	2	1
CO2	3	-	2	-	-	-	2	-	-	-	-	3	2	1
CO3	3	-	2	-	-	-	2	-	-	-	-	3	2	1
CO4	3	-	2	-	-	-	3	-	-	-	-	3	2	1
CO5	3	-	2	-	-	-	3	-	-	-	-	3	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 4: Quality Education SDG 9: Industry, Innovation, and Infrastructure SDG 12: Ensure sustainable consumption and production patterns	
SDG Justification:	
This course comprises promoting the selection and use of sustainable, durable, and environmentally responsible building materials. It covers the properties, processing, and performance of traditional and modern construction materials produced from industry through	

innovation and discoveries, as well as their impact on durability, waste reduction, resource efficiency, and long-term sustainability in architectural practice.

AAR217	Architectural Design - I	L	T	ST	J	C
SDG No.11		1	0	7	0	8

Course Description:
This course introduces students to the fundamentals of architectural design, emphasizing user-centric planning, functional relationships, and environmental considerations. It fosters skills in spatial organization using anthropometric and ergonomic principles. Students explore design concepts through tools like proximity charts and bubble diagrams, solving major and minor design problems, and conclude with detailed submissions and a final external viva voce.

Course Objectives:

- To understand the importance of functional relationships of spaces for different user groups.
- To understand the formulation of a design concept.
- To understand the basic climatic data and its application in Design
- To develop skills in spatial planning using anthropometrics, proxemics, and ergonomic principles.
- To integrate functional, aesthetic, and environmental considerations in the design of small-scale public and semi-public spaces.

The design issues to be addressed:

- Formulations of concept.
- Analysis of space proximity studies with the help of Proximity charts
- Design methodology through bubble diagrams.
- Application of anthropometrics in space planning.
- Interior volumes and space articulation through different sources.
- Integration of form and function.

The list of suggested topics to be covered as design problems:

Major Design Problem:
Residence for Professionals, Kindergarten school, Primary health centre, etc.

Minor Design/Time Problem:
Doctor’s clinic, Small cafeteria, Walk-in Provisional store, etc.

Viva voce
Final external Viva-Voce on all the design assignments done in the semester

Note: At least one major design exercise and one minor design/time problem should be given. The final submission shall necessarily include a model for at least one of the design problems.

Updated References:

1. J. Panero and M. Zelnik, *Human Dimension & Interior Space: A Source Book of Design Reference Standards.* New York, NY, USA: Watson-Guptill, 1979.
2. E. Neufert, *Architects’ Data*, 3rd ed. Oxford, UK: Blackwell Science, 2000.
3. J. Callender, *Time-Saver Standards for Building Types*, 4th ed. New York, NY, USA: McGraw-Hill, 2001.

4. E. T. White, *Site Analysis: Diagramming Information for Architectural Design*. Tallahassee, FL, USA: Architectural Media Ltd., 1983.
5. M. DeKay and G. Brown, *Sun, Wind, and Light: Architectural Design Strategies*, 3rd ed. Hoboken, NJ, USA: Wiley, 2014.
6. M. DeKay and G. Brager, *Experiential Design Schemas*. Novato, CA, USA: ORO Editions, 2023
7. G. Broadbent, *Design in Architecture: Architecture and the Human Sciences*. London, UK: Wiley, 1973.

Course Outcomes:

- Understand the Concept evolution.
- Understand the design approach.
- Understand the correct orientation of the building for optimum comfort.
- Formulate the design by considering the proximity.
- Understand the importance of activity analysis in determining space requirements.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO2	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO3	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO4	3	2	3	2	2	2	3	1	3	2	1	2	2	2
CO5	3	3	3	2	2	2	3	2	3	2	1	2	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 11 – Sustainable Cities and Communities | SDG 13 – Climate Action	
SDG Justification:	
This course centres on the design of safe, inclusive, and climate-resilient environments directly supporting SDG 11's aim of making human settlements sustainable; Applying climatic data and sustainable design strategies in architectural planning helps reduce greenhouse emissions and fosters resilience, echoing SDG 13's mandate to take urgent action combatting climate change.	

AAR219	Building Construction II	L	T	ST	J	C
SDG No. 04		1	0	4	0	5

Course Description:
This course introduces students with an in-depth understanding of the fundamental elements that constitute a building's structural and functional framework, focusing on components such as lintels, arches, doors, windows, staircases and carpentry joints.
It helps students to understand how these components are integrated into architectural design and construction.
This course fosters foundational skills in construction detailing and material application for key building elements with a focus on practical application, students learns to understand architectural joinery and how the elements are constructed, they get an idea of Site Execution and Supervision. Practical exposure is emphasized through studio-based construction detailing and market research.

Course Objectives

- To understand in general and detail about various types of lintels and arches, respective applications.
- To develop an understanding both in general and detail about the available typologies of doors, shutters and context-specific applications.
- To develop an understanding both in general and detail about the available typologies of windows, shutters and context-specific applications.
- Orientation about wooden carpentry and joinery. To sensitize the ability to choose context applicable joinery type in various applications.
- To develop an understanding on types of staircases and factors influencing the design of staircases etc.

UNIT 1

Lintels and Arches: lintels of wood, stone, brick; arches: terms defined, forms of arches, arches classified on centers, shapes and materials, i.e., segmental, semi-circular, elliptical, three centered, flat and relieving arch, etc., rough and gauged arch.

UNIT 2

Doors: Definition of terms, Types of doors, Battened/ledged/Braced door, Flush door, Panelled door, Venetian door, Glazed. Etc. Collapsible doors, Revolving doors, Rolling shutters.

UNIT 3

Windows: Types of windows, Details of a window, Casement window, top, and bottom hung glazed, pivoted, louvred window, corner, bay window, Glazed windows, Ventilators.

UNIT 4

Carpentry and joinery: Terms defined, mitring, ploughing, grooving, rebating, veneering. Various forms of joints in woodwork include lengthening joints, bearing joints, halving, dovetailing, housing, notching, tusk and tenon, etc.

UNIT 5

Staircases: Layout and its construction details, Different elements of staircase, Types of staircase, Details of various types of a staircase in wood, RCC, and steel.

References:

1. W.B. MacKay, '*Building Construction*', Vol. 1,2,3,4, Longmans, U.K. 1981.
2. B. C. Punmia; *Building Materials and Construction.*Laxmi Publications Pvt Ltd, New Delhi,1993.
3. Bindra & Arora; *Building Materials and Construction*.
4. Francis D. K. Ching, *Building Construction Illustrated VNR*, 1975.
5. R.Barry. *The Construction of Buildings*. Vol. 1-Vol. IV, The English Language book society, Crospy Lockwood staples, London.

Updated Course Outcomes

- Understand the functions and application of various types of lintels and arches in construction
- Understand the different types of doors and their specific uses
- Understand the different types of windows and their specific uses
- Be familiar with the different wood joineries and carpentry works
- Be familiar with types of staircases and context-specific design strategies

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	1	2	-	-	2	1	-	-	3	-	1	2	1
CO2	3	2	2	-	-	2	1	-	-	2	-	1	2	1
CO3	3	2	2	-	-	2	1	-	-	3	-	1	2	1
CO4	3	2	2	-	-	2	1	-	-	3	-	1	2	1
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 04	
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
Learning the required fundamentals in construction techniques and appropriate applications in design and in professional practice.	

AAR221	Computer Application in Architecture I	L	T	ST	J	C
SDG No. 4, 9, 11, 12, 13		0	0	3	0	3

Details of tasks to be determined each semester by the individual instructor.

Course Description: This course introduces students to the fundamental and advanced applications of Computer-Aided Design (CAD) in architectural drafting. It is designed to build essential digital drafting skills, equipping students with the technical know-how to transform architectural ideas into precise two-dimensional documentation.
This course plays a crucial role in bridging manual design exploration with professional architectural documentation.
By the end of the semester, students will be equipped to produce industry-standard 2D architectural drawings, a foundational requirement in both academic design presentation and real-world practice.

Course Objectives:

- **To introduce the fundamentals of Computer-Aided Design (CAD)** and familiarize students with the CAD interface and basic operations.
- **To develop skills in advanced 2D sketching** using drawing aids, editing tools, and geometric constraints.
- **To enable students to apply dimensioning techniques** including basic, geometric, and tolerancing methods, with an understanding of styles and system variables.
- **To train students in professional presentation techniques**, including viewports, layout management, hatching, and plotting.
- **To provide hands-on experience in architectural 2D documentation**, translating design concepts into detailed CAD drawings for real-world application.

Creating two-dimensional architectural drawing with special emphasis on presentation and visualisation using Computer Aided Design (CAD) applications.

- Introduction to CAD.
- Getting started with CAD.
- Starting with advanced sketching.
- Working with drawing aids.
- Editing sketched objects.
- Creating text and tables.
- Basic dimensioning, geometric dimensioning and tolerancing.
- Editing dimensions.
- Dimension styles, multi-leader styles and system variables.
- Adding constraints to sketches.
- Model space viewports, paper space viewports and layouts.
- Template drawings.
- Plotting drawings.
- Hatching drawings.
- Working with blocks.

Practice and prepare 2D documentations based on class projects in the previous semester in Architectural Designs.

References:

1. J. A. Leach and S. Lockhart, *AutoCAD 2024 Instructor*. SDC Publications, 2024.
2. D. Muccio, *AutoCAD 2024 for the Interior Designer*. SDC Publications, 2024.
3. S. Tickoo, *AutoCAD 2023: A Problem-Solving Approach*. CADCIM Technologies, 2023.
4. T. M. Shumaker *et al.*, *AutoCAD and Its Applications: Basics 2024*. Goodheart-Willcox, 2024.
5. A. Soriano, *SketchUp 2024 Hands-On: Basic and Advanced Exercises*. Packt Publishing, 2024.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

- **Demonstrate proficiency in using CAD tools** to create, edit, and manage 2D architectural drawings.
- **Apply advanced sketching and drawing aids** to produce accurate and visually organized design layouts.
- **Integrate text, dimensions, and tables** effectively into architectural documentation, following standard conventions.
- **Generate presentation-ready drawing sheets** with proper viewports, layouts, hatching, and plotted outputs.
- **Prepare complete 2D documentation for architectural projects**, based on prior design studio work and semester-based assignments.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	-	-	-	-	3	-	-	-	-	-	-	-	-	3
CO2	-	-	-	-	3	-	-	-	-	-	-	-	-	3
CO3	-	-	-	-	3	-	-	-	-	-	-	-	-	3
CO4	-	-	-	-	3	-	-	-	-	-	-	-	-	3
CO5	-	-	-	-	3	-	-	-	-	-	-	-	-	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
● **SDG 4 – Quality Education** ● **SDG 9– Industry Innovation & Infrastructure** ● **SDG 11–Sustainable Cities and Communities** ● **SDG 12 – Responsible Consumption and Production** ● **SDG 13 – Climate Action**	
SDG Justification:	
The Computer application In Architecture-I subject empowers students with essential digital design skills, enhancing their employability in architecture and engineering sectors. It fosters innovation in infrastructure planning and supports the creation of sustainable, space- and	

energy-efficient buildings. Computer application encourages precision in design, reducing material waste and promoting responsible resource use. Overall, it contributes to building smart, resilient, and eco-friendly urban environments.

IV Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE202	**Surveying for Architects**	1	0	2	0	3	50	50	100	A1 (03 Hrs)
02	ACE204	**Theory of Structures II**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
03	AAR212	**History of Eastern Architecture I**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR204	**Water Supply & Sanitation**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR205	**Building Materials III**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
06	AAR216	**Architectural Design II**	1	0	7	0	8	200	200	400	C2 (Jury)
07	AAR218	**Building Construction III**	1	0	4	0	5	50	50	100	A1 (05 Hrs)
08	AAR222	**Computer Applications in Architecture II**	0	0	3	0	3	100	-	100	B1 (Viva)
		Total	**14**	**1**	**16**	**0**	**31**	**600**	**500**	**1100**	
		Total Hrs/Week	**31**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

ACE202	Surveying for Architects	L	T	ST	J	C
SDG No. 10		1	0	2	0	3

Course Description:

This course introduces the fundamental principles and techniques of surveying, a critical aspect of civil engineering and architectural site development. It focuses on basic methods including chain, compass, plane table, and theodolite surveying, as well as levelling and contouring. Students will also gain preliminary exposure to advanced surveying equipment such as Total Stations, GPS, and Auto Levels. The practical component reinforces field application, enabling students to measure, compute, and analyze survey data effectively for design and planning.

Course Objectives:

- To understand linear measurement principles, apply chaining techniques, and solve obstacles using relevant equipment and calculations.
- To learn prismatic compass usage, bearings, declination, and error balancing in field traversing and data correction.
- To conduct angular measurements, execute theodolite traverses, and apply error balancing for precise site analysis.
- To perform field mapping using plane table and leveling methods; adjust instruments and interpret elevation data effectively.
- To analyze contour characteristics, apply interpolation methods, and explore GPS, Total Station, Auto-Level tools for documentation

UNIT 1

Chain Surveying: Principles of surveying, linear measurements, equipment required, obstacles in chaining, problems.

UNIT 2

Compass Surveying: Prismatic compass, components and uses, reduced and whole circle bearings, magnetic declination, local attraction, compass traversing & balancing the closing error, problems

UNIT 3

Theodolite Surveying: Theodolite has temporary adjustments, measuring horizontal and vertical angles, Theodolite traversing, balancing the closing error

UNIT 4

Plane table Survey: Equipment and methods of plane table survey
Levelling: Dumpy level, temporary adjustments, reduction of levels, height of instrument and rise & fall methods, errors in levelling, profile levelling, cross-sectional levelling, problems

UNIT 5

Contouring: Contouring consists of the characteristics of contour lines, direct and indirect methods of contouring, interpolation of contours, and uses of contours.
Modern surveying equipment: Total Station, GPS, and Auto-Levels. (Preliminary information and use.).

Lab Experiments

- Offsets and Obstacles in chaining.
- Distance between two inaccessible points using compass.
- Compass traversing-closing error.
- Determination of reduced levels – height of instrument method.
- Determination of reduced levels – rise & fall method.
- Measurement of horizontal angles by method of repetition.
- Determination of height of an object when base is accessible.
- Determination of height of an object when base is not accessible.
- Demonstration of total station, GPS and Auto Level.

References:

1. Satheesh Gopi, R Sathikumar, N Madhu, *Advanced Surveying:* Total Station, GPS, GIS, Remote Sensing, Drone, and Hydrographic Surveying, 3rd Edition, Pearson Education, 2025
2. M. Chandra, *Higher surveying, 4th Edition*, New Age International (P) Limited, Publishers, 2024
3. P. K. Garg, *Introduction to Surveying and Geomatics Engineering*, CBS Publishers & Distributors Pvt. Ltd. 2024.
4. Punmia, B.C., *Surveying (Volume I*), 18th Edition, Laxmi Publications (P) Ltd, 2024
5. Punmia, B.C., *Surveying (Volume II),* 17th Edition, Laxmi Publications (P) Ltd, 2024
6. Russel C. *Brinker and Roy Minnick,* The Surveying Handbook, CBS Publishers & Distributors Pvt. Ltd. 2020
7. K. R. Arora, *Surveying Volume - 1*, 17th Edition, Standard Book House, Delhi, 2019

Course Outcomes:

- Perform linear measurements and solve chaining problems using surveying principles and appropriate field equipment.
- Apply compass surveying techniques to determine bearings, correct errors, and balance traverses effectively.
- Measure angles and execute traversing with proper theodolite adjustments, addressing and balancing closing errors.
- Conduct plane table and levelling surveys, reducing levels accurately while managing errors and terrain variations.
- Generate contour maps and demonstrate preliminary understanding of Total Station, GPS, and Auto-Level usage.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	1	1	2	2	1	1	1	2	2	1	1	2	3
CO2	2	1	1	2	2	1	1	1	2	2	1	3	2	3
CO3	2	1	1	2	2	1	1	1	2	2	1	3	2	3
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

H - High Correlation, M - Medium Correlation, L - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 9-Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
SDG Justification: Equips students to gather accurate site data, enabling durable and context-aware infrastructure aligned with terrain and environmental factors.	

ACE204	Theory of Structures II	L	T	St	J	C
SDG No. 9		2	1	0	0	3

Course Description:

This course builds on foundational structural analysis concepts, focusing on the behavior and analysis of indeterminate structures. Students will explore arches, suspension bridges, and cables, as well as advanced analytical methods like Kani's and Moment Distribution methods. The course also introduces the analysis of stresses in structural elements like thin and thick cylinders, providing students with practical skills applicable to real-world engineering problems in buildings and bridges.

Course Objectives:

- To understand structural behavior of arches, focusing on three-hinged and two-hinged arches subjected to various loading conditions.
- To analyse stresses in suspension and cable bridges, considering different support levels and determining cable length under loads.
- To understand the concepts and structural behaviour of indeterminate structures by using Kani's method.
- To understand the concepts and structural behaviour of portal frames by using the Moment distribution method.
- To understand the concepts of elastic and plastic analysis of beams.

UNIT 1

Arches: Introduction to arches, analysis of three-hinged and two-hinged arches subjected to concentrated loads and uniformly distributed loads (rolling loads and influence lines not included)

UNIT 2

Suspension and Cable bridges: Stresses in loaded cables with supports at the same and different levels—length of cable.

UNIT 3

Analysis of three-span continuous beams using Kani's method.

UNIT 4

Moment distribution method: Analysis of single-story, single-bay portal frames under gravity and lateral loads.

UNIT 5

Plastic Analysis: Introduction, upper and lower bound theorems, shape factor, collapse loads for beams (simply supported, fixed and two span continuous beams).

References:

1. R C Hibbeler, *Structural Analysis*, Pearson Education, 10th Edition, 2022
2. S S Bhavikatti, *Structural Analysis-I*, Vikas Publishing House Pvt Ltd, 5th Edition, 2021

3. Kenneth M. Leet, Chia-Ming Yang, *Fundamentals of Structural Analysis*, McGraw-Hill College; 6th Edition, 2020.
4. Dr. R. Vaidyanathan, Dr. P. Perumal, *Structural Analysis (Vol. I)*, Laxmi Publications, 4th edition, 2019.
5. C S Reddy, *Basic Structural Analysis*, McGraw Hill Education, 3rd Edition, 2017
6. Chandramouli, *Structural Analysis I: Analysis of Statically Determinate Structures*, Chennai Yes Dee Publishing Pvt. Ltd., 1st Edition, 2015
7. T.S. Thandavamurthy, *Structural Analysis*, 2/e, Oxford University Press, 2011.

Course Outcomes:

- Analyse the two and three-hinge arches
- Analyse the Cables in Suspension Bridges
- Analyse the statically indeterminate continuous beams using Kani's method.
- Attain knowledge about stresses in thin and thick cylinders.
- Calculate shape factor for different sections & also collapse load for beams.

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO2	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO3	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO4	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO5	3	2	3	1	1	3	2	1	2	2	1	1	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 9-Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation	
SDG Justification:	
Students learn how to analyze structural systems, material behavior, and load paths, enabling them to design buildings that stand up to both everyday stresses and extreme events (e.g., earthquakes, wind loads.	

AAR212	History of Eastern Architecture I	L	T	ST	J	C
SDG No. 11		3	0	0	0	3

Course Description:

This course introduces the evolution of Eastern architectural traditions, focusing on India's ancient to medieval periods. It explores the socio-cultural and urban planning characteristics of the Indus Valley Civilization, followed by an in-depth study of Buddhist rock-cut architecture and its symbolic spatial organization. It further examines the progression of Hindu temple architecture—its typologies, symbolism, materiality, and structural techniques—across North, South, and Central India. Emphasis is placed on understanding regional temple styles, construction methods, and the aesthetic language of ornamentation, preparing students to critically engage with historical contexts and their influence on built form.

Course Objectives:

- Understanding socio-cultural, architectural, and town planning aspects of Indus Valley Civilisation
- Understanding construction techniques in rock cut architecture; designing of built environment reflecting Buddhist lifestyle and philosophy.
- Understanding the design development and evolution of Hindu temples from rock-cut to structural typologies; knowledge of temple prototypes using various construction techniques and materials like stone, brick, etc.
- Understanding mathematical and geometrical attributes for ornamentation and aesthetic expression on North Indian Temples.
- Understanding the development of structural techniques evolved in South Indian temple construction.

UNIT 1: Indus Valley Civilisation

Socio-cultural aspects, building resources, building techniques and processes. Architectural and town planning aspects in Indus Valley towns like Mohenjo-Daro, Harappa, and Lothal.

UNIT 2: Buddhist architecture

Rock cut Architecture – STupas, Chaityas, Viharas, SThambas; Sanchi STupa, Sarnath stupa, Chaitya hall at Karle, cave temples in Ajanta and Ellora, Nalanda University.

UNIT 3: Hindu Temple Architecture

Development of temple with examples like Kailasanath temple at Ellora, Ladh Khan temple complex at Aihole, Kankali Devi temple at Tigawa, Mundeshwari temple at Bihar, Dashavatara temple at Deogarh, Brick temples of Bhitargaon.

UNIT 4: South Indian Temple Architect

- Pallava: Pancha Rathas and Shore temple at Mahabalipuram, Vaikuntha Perumal Temple at Kanchi.
- Chola – Brihadeeswara temple, Gangaikonda Cholapuram temple, Airavatesvara Temple.
- Pandya – Temple town of Madurai, Meenakshi Amman Temple complex at Madurai.
- Vijayanagar – Virupaksha Temple and Vithala Temple at Hampi. Architecture in Hampi with Islamic influence (Royal centre), Srirangam temple complex.

UNIT 5: North Indian Temple Architecture and Vesara Style

- Orissa: Linga Raja temple, Konark Sun Temple, Jagannath temple.
- Khajuraho Group of temples: Kandariya Mahadev Temple.
- Dilwara Jain Temple Complex at Mount Abu
- Modhera Sun Temple in Gujarat.
- Rajputana temples: Sastra Bahu Mandir (Sas-bahu mandir) at Gwalior.
- Vrindavan - Govind Dev temple, Madan Mohan temple.
- Bengal - Bishnupur temples.
- Vesara Style: Hoysaleshwara Temple at Halebidu, Chennakesava Temple at Belur, Pattadakal Temple complex.

Updated References:

1. P. Brown, *Indian Architecture (Buddhist and Hindu), Vol. 1*, Bombay: D. B. Taraporevala Sons & Co., **1942**
2. J. A. Fergusson, *A History of Indian and Eastern Architecture*, London: John Murray, **1876**; revised edition **1891**.
3. S. Grover, *The Architecture of India: Buddhist & Hindu*, Sahibabad (Distt. Ghaziabad): Vikas Publishing House, **1980**
4. G. Michell, *The Hindu Temple*, London
5. A. Khare, *Temple Architecture of Eastern India*, New Delhi: Shubhi Publications, **2005**.
6. H. Sterlin, *Architecture of World: India*, Taschen, Germany, ISBN 3-8228-9658-6. **1996**

Course Outcomes:

- The course gives a necessary understanding of built environment, socio-cultural, architectural, and town planning aspects of Indus Valley Civilisation
- The course provides an understanding of construction techniques and design of the built environment reflecting Buddhist lifestyle and philosophy.
- The course provides an understanding of Hindu temples' design, development and evolution from rock-cut to structural typologies.
- The course explains mathematical and geometrical attributes for ornamentation and aesthetic expression on North Indian Temples.
- The course provides an understanding of the development of South Indian temple construction.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	1	1	-	-	2	-	-	-	3	-	2	2	-
CO2	3	1	1	-	-	2	-	-	-	3	-	2	2	-
CO3	3	1	1	-	-	2	-	-	-	3	-	2	2	-
CO4	3	1	1	-	-	2	-	-	-	3	-	2	2	-
CO5	3	1	1	-	-	2	-	-	-	3	-	2	2	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: SDG 11	
Make cities and human settlements inclusive, safe, resilient, and sustainable	
SDG Justification: The course supports SDG 11 by exploring historical models of sustainable urbanism through ancient Indian architecture. It emphasizes community-centered planning, durable materials, and culturally inclusive spaces, as seen in temple towns and Buddhist complexes. This understanding equips students to design future cities that are resilient, respectful of heritage, and rooted in sustainable and context-responsive architectural practices.	

AAR204	Water Supply and Sanitation	L	T	ST	J	C
SDG No.6		3	0	0	0	3

Course Description:

This course introduces the principles and practices of water supply and sanitation systems relevant to architectural design. It covers the sources and treatment of potable water, domestic water distribution systems for both low-rise and high-rise buildings, and hot and cold water layout planning in compliance with energy-efficient standards such as Eco-Niwas Samhita 2021. The course also explores sewerage systems, stormwater drainage, and sanitation practices including design of septic tanks and drainage layouts. Students gain an understanding of plumbing terminology, sanitary appliances, and Indian standards and model bylaws governing building sanitation. With a focus on practical application, students learn to integrate water supply and sanitary systems into architectural designs, preparing detailed layouts for residential and multi-storey buildings.

Updated Course Objectives:

- To identify and explain the sources of water, standards of potable water, and basic sanitation principles, along with relevant terminologies in plumbing and drainage systems.
- To illustrate and demonstrate domestic and high-rise building water supply and distribution systems, including hot and cold water layouts, overhead tanks, and energy-efficient pumping as per Eco-Niwas Samhita 2021.
- To design basic water supply, sewage, and stormwater drainage layouts for residential and multi-storied buildings using Indian Standards and model bylaws.
- To analyze the characteristics of sewage, and the hydraulic principles involved in the design of sewers, septic tanks, and house drainage systems including flow rates, gradients, and material specifications.
- To integrate plumbing and sanitation solutions into architectural designs, ensuring to meet spatial requirements, and user needs

UNIT 1 Water Supply

Sources of water supply, standards of purity and treatment of water, qualities of potable water. Domestic water distribution system, various kinds of water meters, capacity of overhead tanks and pumping plants required, calculation of water consumption. Domestic water piping systems. Cold and hot water distribution within the building: Layout of water supply lines in a domestic house. Water supply to high rise buildings: problems encountered, and systems adopted. Energy Efficient Pumping Systems as per Eco-Niwas Samhita 2021 recommendations.

UNIT 2 Sewerage

Characteristics of sewage, Quantity of sewage and storm water, infiltration, runoff calculation, Manning's formulae, partial flow diagram. Design of Sewers, shapes of sewers, factors affecting the design of sewers. Materials and joints used in sewer systems. Sewage treatment-(Purification), Disposal of sewage from isolated building, sewage breakdown. Details of a Septic tank, capacity calculation, spatial requirements.

UNIT 3 Sanitation

Basic principles of sanitation and disposal of various kinds of waste matter from buildings. Brief description of various systems of sewage disposal and their principles. Plumbing definitions and related terms, plumbing systems (one pipe, two pipe, etc), House drainage system, Drainage of sub-soil water. Manholes, Sub drains, culverts, ditches and gutters, drop inlets and catch basins, roads and pavements, storm overflow/regulators.

UNIT 4 Plumbing and Sanitary Appliances

Specifications and sketches of sanitary fittings like wash basins, water closets, urinals, bidets, sinks, etc., for buildings. Uses of different valves like gate valves, float valves, flap valves, ball valves, flush valves, etc, various types of taps, faucets, stop cocks, bib cocks, and 'P', 'Q', 'S', floor and bottle traps used in buildings.

UNIT 5 Design of Plumbing Systems

Design considerations on drainage schemes. Preparation of plan, including planning of bathrooms, lavatory blocks, and kitchens in domestic and multistoried buildings.

Indian standards for sanitary conveyance. Model bylaws regarding sanitation of buildings. House/service connection. Manholes and septic tanks in relation to buildings. Intercepting chambers, inspection chambers, and their proper location and ventilation of sewers. Laying and testing of the sewer. Gradients used in laying of drains and sewers, and respective sizes.

NOTE: The treatment of the course will be mainly descriptive, along with tutorial assignments related to the architectural designs already prepared by the students, and also planning and layout of water supply and sewerage system plans

References:

1. B. C. Punmia, *Water Supply and Sanitation*. New Delhi, India: Laxmi Publications, **1995**.
2. S. C. Rangwala, *Water Supply and Sanitary Engineering*. Anand, India: Charotar Publishing House, **2014**.
3. C. S. Shah, *Water Supply and Sanitation Engineering*. New Delhi, India: Galgotia Publications, **1998**.
4. B. S. Birdie, *Water Supply and Sanitary Engineering*. Delhi, India: Dhanpat Rai and Sons, **2010**.
5. Bureau of Indian Standards, *National Building Code of India*. New Delhi, India: BIS, **2016**.
6. Bureau of Energy Efficiency, *Eco-Niwas Samhita 2021 – Code Compliance and Part-II: Electro-Mechanical and Renewable Energy Systems*. New Delhi, India: Ministry of Power, Govt. of India, **2021**

Course Outcomes:

- Clarity on reuse, recycling and reducing of portable water.
- Understanding of different water distribution systems.
- Enhanced understanding about sewerage and types of drainage at city level.
- Required basic skills to design plumbing systems suitable for different sizes of buildings.
- Deep understanding on various plumbing and sanitary fixtures.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	1	2	3	2	2	1	1	1	1	2	2	1
CO2	3	2	1	2	1	2	2	1	1	1	1	2	2	1
CO3	3	2	1	2	1	2	2	1	1	1	1	2	2	1
CO4	3	2	1	2	1	2	2	1	1	1	1	2	2	1
CO5	3	2	1	2	1	2	2	1	1	1	1	2	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 20-May-22 (15th BOS)	**ACADEMIC COUNCIL: 17-Jun-22**
SDG No. & Statement:6	
SDG NO. 6: Ensure availability and sustainable management of water and sanitation for all.	
SDG Justification:	
This course supports SDG 6 by enabling students to design efficient water supply and sanitation systems that ensure clean water access and safe waste disposal. It adheres to national standards, promotes environmentally responsible architectural practices that contribute to public health and urban resilience.	

AAR205	Building Materials III	L	T	ST	J	C
SDG No. 12		3	0	0	0	3

Course Description:
This course offers an in-depth study of advanced building materials, emphasizing their properties, manufacturing processes, and architectural applications. Students explore polymers, plastics, and composite materials used in modern construction, including thermosetting and thermoplastic types. The course covers laminates, veneers, MDF and HDF boards, and introduces various types of architectural glass with their functional and aesthetic properties. Additionally, students study the composition and application methods of paints, distempers, lacquers, varnishes, and polishes. The curriculum concludes with an overview of miscellaneous materials such as asbestos, cork, rubber, and insulation products. A market survey project enriches students' understanding of real-world material usage and performance.

Course Objectives:
- Study of properties and uses of Plastics, polymers and composite materials
- Study of properties, manufacturing and uses of Laminates and Veneers
- Study of properties, manufacturing and uses of Glass and its types.
- Study of properties, manufacturing and uses of Paints, and Distempers.
- Study of properties and applications of miscellaneous materials.

UNIT 1

Plastics: Polymer types, thermo setting and thermo plastics, resins, common types of mouldings, plastics fabrication, polymerization and condensation, plastic coatings. Composite materials, classification, properties and uses - linoleum, plastic coated paper, polythene sheets, reinforced plastic, plastic laminates and Poly Vinyl Chloride (PVC).

UNIT 2

Laminates and Veneers: Resin bonded plywood, types of laminates, laminated wood, insulating boards and other miscellaneous boards, veneers from different varieties of timber, their characteristics and uses, Medium Density Fibre (MDF) and High Density Fibre (HDF) boards.

UNIT 3

Glass: Sheet glass, plate glass, float glass, wired glass, laminated glass, obscured glass, coloured glass, heat absorbing glass, etched glass, stained glass, tinted glass, glass block - their sizes and uses. Glazing putty.

UNIT 4

Paints and Distempers: Compositions of paints and their uses. Writing specifications for whitewashing, distempering, cement-based paints, oil emulsion paints, enamel paints. Uses of tar paints, aluminium paints.
Lacquers, Polishes and Varnishes: Method of application for lacquers, polishes and staining varnishes.

UNIT 5

Miscellaneous Materials: Properties and uses of Asbestos, cork, felt, mica, rubber, gypsum, sealants, heat and sound insulation materials.

Note: All the students should do a Market Survey on the above listed building materials and a detailed study report should be submitted.

References:

1. B. C. Punmia; Building Materials and Construction.Laxmi Publications Pvt Ltd, New Delhi,1993
2. Bindra & Arora; Building Materials and Construction.
3. W.B. McKay, 'Building Construction', Vol. 1,2,3, Longmans, U.K. 1981.
4. B. C. Punmia, Ashok K. Jain, and Arun K. Jain, *Building Construction*, 12th ed. New Delhi, India: Laxmi Publications Pvt. Ltd., 2023
5. S. P. Bindra and S. P. Arora, *A Text Book of Building Construction*, [latest edition]. Delhi, India: Dhanpat Rai Publications, 2005
6. W. B. McKay, *Building Construction: Metric*, vols. I–III, 5th ed. London, U.K.: Sterling (Orient BlackSwan), 1992
7. A. Lyons, *Materials for Architects and Builders: An Introduction*, [latest edition]. London, U.K.: Arnold, 1994

Course Outcomes:

- Classification, Properties and Uses of Plastics as a Building Material
- Types, Properties and Uses of Laminates and Veneers as a Building Material
- Types, Properties and Uses of Glass as a Building Material
- Various methods of application of paints, lacquers, polishes and staining varnishes
- Properties and Uses of miscellaneous materials like asbestos, cork, felt, etc.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	2	1	-	2	1	1	2	-	-	2	1
CO2	3	2	2	2	1	-	2	1	1	2	-	-	2	1
CO3	3	2	2	2	1	-	2	1	1	2	-	-	2	1
CO4	3	2	2	2	1	-	3	1	1	2	-	-	2	1
CO5	3	2	2	2	1	-	3	1	1	2	-	-	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 12	
Ensure sustainable consumption and production pattern	
SDG Justification:	
This course comprises promoting the selection and use of sustainable, durable, and environmentally responsible building materials. It covers the properties, processing, and performance of traditional and modern and conventional construction materials, as well as their impact on durability, resource efficiency, and long-term sustainability in architectural practice.	

AAR216	Architectural Design - II	L	T	ST	J	C
SDG No.:3, 11, 13		1	0	7	0	8

Course Objectives:

- Develop the ability to study and interpret user requirements in relation to site context, including functional zoning, environmental factors, and spatial hierarchies.
- Train students to plan and integrate horizontal and vertical circulation systems, open spaces, parking, and access points for seamless movement and connectivity.
- Enable students to design responsive environments considering income levels, privacy needs, territoriality, and patterns of social interaction.
- Equip students to select and integrate appropriate building materials, structural systems, and basic services into architectural design proposals.
- To make the students aware and equip them with the skills to design aligned with relevant building-byelaws, codes, and standards

The design issues to be addressed:

- Organisation of functional activities in relation to user requirements and the site.
- Relating the horizontal and vertical circulation system, open spaces, parking, etc.
- Responding to socio-economic factors such as income levels, privacy, territoriality, interaction, etc.
- Consider materials, structure, and services related to the design proposal.
- Integration of plan forms and three-dimensional compositions.

The list of suggested topics to be covered as design problems:

Major Design Problem:
Primary School, Youth hostel, Residential apartment complex, Shopping Complex, etc.

Minor Design/Time Problem:
Artists' Exhibition Space, Fishermen's house, showrooms, etc.

Viva voce
Final external Viva-Voce on all the design assignments done in the semester

Note: At least one major design exercise and one minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the problems.

References:

1. Time savers standards, Neufert's Architects data.
2. B. Lawson, *How Designers Think: The Design Process Demystified*, London: Routledge, 2005.
3. S. F. Miller, *Design Process: A Primer for Architectural and Interior Design*, New York: Van Nostrand Reinhold, 1995.
4. A. Tarwani, *Studio Proceedings: Recognition of Through Memory Mapping: Lateral Strategies for Architectural Design Studios*, New Delhi: Metro Books, 2019.
5. O. H. Koenigsberger, *Manual of Tropical Housing and Building Climate Design*, Hyderabad: University Press Pvt. Ltd., 2016.

6. J. J. Maisel, B. Megan, and E. Smith Korydon H. Steinfeld, *Inclusive Design: Implementation and Evaluation*, New York: Routledge, 2018.
7. M. Brawne, *Architectural Thought: The Design Process and the Expectant Eye*, Oxford: Architectural Press, 2005.
8. C. Day, *Consensus Design: Socially Inclusive Process*, Oxford: Architectural Press, 2003.

Course Outcomes:

- Students will develop design concepts integrating user needs with site opportunities and constraints.
- Students will justify design decisions using circulation studies and movement flow diagrams.
- Students will propose design solutions enhancing privacy, territoriality, user interaction, and inclusivity.
- Students will select appropriate structural systems and integrate basic building services
- Students will identify and interpret relevant building bye-laws and NBC provisions.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	3	3	-	1	2	-	3	-	-	1	2	1
CO2	3	1	3	3	-	3	1	-	3	-	-	2	2	1
CO3	2	3	3	3	-	3	3	-	3	-	-	2	2	1
CO4	2	3	3	3	-	2	2	-	3	-	-	2	2	1
CO5	2	3	3	3	-	1	1	-	3	-	-	1	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 3-Good Health and Well-being - Ensure healthy lives and promote well-being for all. SDG 11-Sustainable Cities and Communities - Make cities and human settlements inclusive, safe, resilient, and sustainable. SDG 13-Climate Action - Take urgent action to combat climate change and its impacts.	
SDG Justification:	
This course equips students to design built environments that are socially inclusive, climatically responsive, and compliant with safety regulations.	

AAR218	Building Construction III	L	T	ST	J	C
SDG No. 6, 7, 9, 11, 12, 13		1	0	4	0	5

Course Description:

This course provides students with an in-depth understanding of advanced building construction techniques and detailing. It covers structural elements from foundations to superstructures with a focus on the construction methods of various types of foundations including raft, pile, and grillage systems. Students learn damp-proofing, waterproofing, and termite-proofing techniques essential for building durability. The course explores different flooring materials and finishes, types of roofing systems, and roof coverings, including rainwater drainage details. In addition, it offers detailed study of wood framing, including joists, girders, trusses, and structural connections. Practical exposure is emphasized through studio-based construction detailing and market research.

Course Objectives:updated

- To understand the various parts of building elements from substructure to superstructure and their construction details.
- To expose the student to various types of foundations and their construction details.
- To expose the student to various types of floorings and their construction details.
- To expose the student to various types of roofs, roof coverings and their construction details.
- To expose the student to various types of Damp proofing, Water proofing, Termite proofing and their construction details.
- To expose the student to various wood framing details.

UNIT 1

Foundation & Basement: Wall foundation, isolated and combined foundation in RCC, Raft foundation, grillage foundation, pile foundation and its types. Construction detail of basement wall, retaining wall, floor and foundation.

UNIT 2

Damp-Proofing: Definition, causes, and effects of dampness. Materials, general principles, and methods of damp-proofing.

Water-Proofing: Definition, reasons and preventive measures for water leakage. Water-proofing of flat roofs. Methods for water-proofing: finishing, bedding concrete and flooring, mastic asphalt and jute cloth, use of water-proofing compounds.

Termite-Proofing: Definition, general principles and methods of termite-proofing

UNIT 3

Flooring: Types of flooring, methods of laying, furnishing of floors with different floor finishes like cement, coloured cement, mosaic, terrazzo, tiles, etc. special consideration for rubber, linoleum, and PVC flooring, flagstone Flooring, parquet flooring.

UNIT 4

Roofs: Types of roofs, parts of roof and roof truss. Flat roof with wood and RCC, simple jack arch roof, various types and spans of timber and steel roof truss.

Roof Coverings: Technical terms, classification, various types of roof coverings. Rainwater gutter details.

UNIT 5

Wood Framing Detail: Details of a joist, Girder, Bridging, Floor platform, Truss joints, different connections.

Textbooks:

1. S.C.Rangwala, *Building Construction*, Charotar Publishing House Pvt. Ltd, India, 2010.

References:

2. W.B. MacKay, *Building Construction*, Vol. 1,2,3 Longmans, U.K. 1981.
3. B. C. Punmia; *Building Materials and Construction*, Laxmi Publications Pvt Ltd, New Delhi,1993.
4. Bindra, S.P. and Arora, S.P., *Building Materials and Construction*. Dhanpat Rai Publications, New Delhi.

Course Outcomes:

- Understand various types of foundations used in construction.
- Understand different methods to protect the life of buildings using various proofing techniques.
- Know the types of flooring finishes through market study
- Understand the types of roofing and their details
- Understand the methods of construction details of wooden buildings.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	1	3	-	-	-	1	-	-	-	-	-	2	2
CO2	3	1	3	-	-	-	1	-	-	-	-	-	2	2
CO3	3	1	3	-	-	-	1	-	-	-	-	-	2	2
CO4	3	1	3	-	-	-	1	-	-	-	-	-	2	2
CO5	3	1	3	-	-	-	1	-	-	-	-	-	2	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 6,7,9,11,12 and 13	
SDG 6-Ensure availability and sustainable management of water and sanitation for all. SDG 7-Ensure access to affordable, reliable, sustainable and modern energy for all. SDG 9-Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. SDG 11-Make cities and human settlements inclusive, safe, resilient and sustainable.	

SDG 12-Ensure sustainable consumption and production patterns. SDG 13-Take urgent action to combat climate change and its impacts.
SDG Justification:
The course promotes effective water management through waterproofing, enhances energy efficiency, encourages innovative and resilient construction techniques, fosters sustainable and durable communities, advocates the use of eco-friendly materials, and supports climate-resilient building practices.

AAR222	Computer Application In Architecture II	L	T	ST	J	C
SDG No.		0	0	3	0	3

Course Description:
This course builds on students' proficiency in 2D drafting to introduce them to advanced 3D modeling techniques using Computer-Aided Design (CAD). It emphasizes technical drawing and three-dimensional representation of architectural elements, enhancing spatial understanding and drawing precision. Students will learn to apply advanced CAD features such as external references (Xrefs), block attributes, object grouping, UCS, and 3D solid modeling. The course integrates practical tasks such as isometric projections, sheet layout preparation, and 2D-to-3D conversion, enabling students to produce detailed architectural documentation. Emphasis is placed on productivity-enhancing techniques and real-world application through hands-on exercises and previous-semester design integration.

Course Objectives:

- To introduce concepts of 3d to the students who are already proficient in 2D
- To learn advanced concepts and commands in CAD
- Make them understand how to draw views in terms of objects and buildings as a whole
- It incorporates advanced features, commands, and techniques for creating and managing drawings in a more productive way.
- Hands-on exercises throughout the courseware and explore how to implement these methods to increase productivity.

Working on basic operations of three-dimensional architectural drawing with special emphasis on advanced Computer Aided Design (CAD) applications.

- Defining block attributes.
- External references.
- Advanced drawing options.
- Grouping and advanced editing of sketched objects.
- Data exchange & object linking and embedding.
- Technical drawing with CAD.
- Isometric drawings.
- The user coordinate system (UCS).
- Three-dimensional (3D) Modelling in CAD.
- Creating solid models.
- Modifying 3D objects.
- Editing 3D objects.

Practice and prepare 2D documentations based on class projects in the previous semester in Architectural Designs.

Details of tasks are to be determined each semester by the individual instructor.

References:

1. J. A. Leach and S. Lockhart, *AutoCAD 2024 Instructor*. SDC Publications, 2024.
2. D. Muccio, *AutoCAD 2024 for the Interior Designer*. SDC Publications, 2024.
3. S. Tickoo, *AutoCAD 2023: A Problem-Solving Approach*. CADCIM Technologies, 2023.

4. T. M. Shumaker *et al.*, *AutoCAD and Its Applications: Basics 2024*. Goodheart-Willcox, 2024.
5. A. Soriano, *SketchUp 2024 Hands-On: Basic and Advanced Exercises*. Packt Publishing, 2024.

3D - Sketchup Software

1. Soriano, *SketchUp 2024 Hands-On: Basic and Advanced Exercises*, Packt Publishing, 2024..

Course Outcomes:

- Understand the use of Xref and attribute commands.
- Draw site plan according to the prescribed format.
- Understand the method of producing architectural drawings using Auto-Cad
- Convert 2D drawings to 3D view.
- Prepare the sheet layouts.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	1	1	-	-	-	2	3	-	-	3	1	3
CO2	1	1	3	3	-	-	-	1	2	-	-	2	1	3
CO3	1	1	1	1	-	-	-	2	3	-	-	3	1	3
CO4	1	1	3	3	-	-	-	1	2	-	-	2	1	3
CO5	1	1	3	3	-	-	-	1	2	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
● **SDG 4 – Quality Education** ● **SDG 5 – Gender Equality** ● **SDG 7 – Affordable and Clean Energy** ● **SDG 9– Industry Innovation & Infrastructure**	
SDG Justification:	
In summary, this subject empowers future architects with the digital competencies to design **sustainable, innovative, and inclusive built environments**, directly supporting global SDG objectives.	

V Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE301	**Concrete Structures**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR301	**Architectural Acoustics**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
03	AAR303	**Mechanical and Electrical Services**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR315	**History of Eastern Architecture II**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR307	**Site Planning & Landscape Design**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
06	AAR319	**Architectural Design III**	1	0	7	0	8	200	200	400	C2 (Jury)
07	AAR313	**Building Construction IV**	1	0	4	0	5	50	50	100	A1 (05 Hrs)
08		**Open Elective****	3	0	0	0	3			100	M (03 Hrs)
	EOE302	German for Beginners									
	EOE305	French for Beginners									
	EOE317	Personality Development									
	PSYC1002	Introduction To Psychology									
	LANG1181	Introduction To Spanish									
		Total	**19**	**1**	**11**	**0**	**31**	**550**	**550**	**1100**	
		Total Hrs/Week	**31**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

ACE301	Concrete Structures	L	T	ST	J	C
SDG No. 9		2	1	0	0	3

Course Description:

This course introduces students to concrete structural design's fundamental concepts, emphasizing theoretical understanding and practical application. Core topics include the stress-strain behaviour of steel and concrete, principles of working stress and limit state methods, and the design of structural elements such as beams, slabs, columns, and footings under various loading conditions. The course aims to develop analytical and design skills for safe and efficient structural systems. By the end, students will be proficient in designing structural components for flexure, shear, torsion, and compression, equipping them with critical competencies for advanced structural engineering practice.

Course Objectives:

- To study the stress-strain behavior of steel and concrete
- To understand the concept of working stress and limit state methods
- To gain the knowledge of limit state design for flexure, shear, torsion, bond and anchorage
- To understand the behavior of slabs when subjected to transverse loads.
- To understand the behavior of columns subjected to eccentric load and the design of isolated foundations.

UNIT 1

Loading standards as per IS 875, grades of steel and concrete, introduction to working stress, ultimate load and limit state methods.

Working stress method: Assumptions, flexure of RCC beams of rectangular section, under reinforced, balanced and over-reinforced sections, analysis and design of singly reinforced beams of rectangular sections using working stress method.

UNIT 2

Limit State Method: RCC beams of rectangular sections under flexure, under reinforced, balanced and over-reinforced sections, analysis and design of singly and doubly reinforced beams of rectangular sections.

UNIT 3

Shear and Bond: Limit state of collapse in shear, types of shear failures, calculation of shear stress, types of shear reinforcement, design for shear in beams.

UNIT 4

Slabs: Classification of slabs, design of one way simply supported slab, analysis and design of two way slabs using IS code method.

UNIT 5

Columns: Short columns, minimum eccentricity, column under axial compression, analysis and design of axial columns. Footings: Introduction of Isolated Square Footings

References:

1. Pillai and Menon, *Reinforced Concrete Design*, 4/e, Tata McGraw Hill, 2022.
2. Krishna Raju, *Design of Reinforced Concrete Structures*, 4th Edition, CBS Publishers & Distributors Pvt., Ltd. 2016.
3. N. Subramanian, *Design of Reinforced Concrete Structures*, Oxford University, 2014.
4. P.C. Varghese, *Limit State Design of Reinforced Concrete*, 2/e, Prentice Hall of India,2013
5. A.K. Jain, *Reinforced Concrete – Limit State Design*, 7/e Standard book house, 2012.
6. Syal, I.C, *Reinforced Concrete Structures*, 5th edition, S Chand Publishing, 2012.
7. V.N. Vazirani and M.M. Ratwani, *Design of Reinforced Concrete Structures*, Sixteenth edition Khanna Publishers, 2008.

List of IS Codes:

8. IS 456:2000: Plain and Reinforced concrete code of practice
9. SP-16: For Design of Columns only

Course Outcomes:

- Acquire knowledge on different design philosophies & design the RCC rectangular beam using Working Stress Method (WSM).
- Design the RCC rectangular beam using Limit State Method (LSM).
- Design for shear & learn concept of bond, development length & anchorage
- Design one-way and two-way slab design.
- Design the short column & isolated square footings.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	3	3	1	1	3	1	2	2	3	1	1	2	1
CO2	1	3	3	1	1	3	1	2	2	3	1	1	2	1
CO3	1	3	3	1	1	3	1	2	2	3	1	1	2	1
CO4	1	3	3	1	1	3	1	2	2	3	1	1	2	1
CO5	1	3	3	1	1	3	1	2	2	3	1	1	2	1

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:9	
SDG No-9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
Teaches resilient design principles, sustainable materials, and innovative construction techniques essential for modern infrastructure.	

AAR301	Architectural Acoustics	L	T	ST	J	C
SDG No. 9		3	0	0	0	3

Course Description :
This course provides an in-depth understanding of sound behaviour and its influence on indoor and outdoor human environments. Core topics include architectural acoustics, room acoustics, auditorium design, electro-acoustical systems, environmental noise control, and acoustical materials. The course emphasizes the physics of sound, its measurement, propagation, and control through design and material applications. It also explores the impact of noise on users and how to mitigate it using effective planning and design strategies. Students will learn to analyse noise sources, design for optimal acoustical performance in varied settings, and select suitable materials—developing critical skills for acoustical design in architecture.

Course Objectives:

- To introduce acoustics and its effects on human and their environment.
- To explain acoustical environment with behaviour of sound in an enclosed and open spaces.
- To introduce fundamental of electro acoustics and its application in enclosed and open area.
- To help analyze the types of noise sources and design principles for reduction of noise.
- To expose the student to the implication of acoustical materials in indoor and outdoor areas..

UNIT 1

Sound Engineering
Introduction to architectural acoustics - Characteristic and measurement of sound, frequency, intensity, decibel scale, auditory range, effects of sound on humans, loudness.

Room Acoustics
Acoustics and acoustical environment. Behavior of sound in an enclosed space. Principles of geometrical acoustics, reverberation and reverberation time calculations – Sabine’s formula and its interpretation, dead and live rooms.

UNIT 2

Design of Auditorium
Size, shape, sitting arrangement design criteria for speech and music, acoustical defects in an auditorium, sound foci and dead spots, acoustical correction design and modification techniques.

Open air Acoustics
Free field propagation of sound, absorption from air and natural elements, effect of barriers, effect of landscape elements, thermal and wind gradient. Design of open-air theatre and planning of building. Reduction of noise by screening

UNIT 3

Electro-acoustics
Introduction of Electro-acoustical systems, Unidirectional and Stereophonic sound system, Digital and Surround-sound systems, Design criteria for Theatres, Motion picture halls, Multiplexes, Home Theatre System, Conference Room..

UNIT 4

Environmental Noise Control:

Noise sources, air borne and structure borne sound, NC curve, Propagation of noise of mechanical operation and impact noise, sound transmission through wall and partition, Vibration isolation – control of mechanical noise, floating floor, wall, ceiling treatment.

Design Principles- reduction of noise at the source, Reduction of noise near the source. Application of sound absorption material, Reduction of noise by Town Planning and Regional Planning consideration.

UNIT 5

Acoustical Material:

General description of acoustical materials - acoustical tiles, fibreboard, resonator absorption unit absorber, carpets, acoustical plaster, resilient packing composite materials, etc. – Their use, selection criteria and construction.

References:updated

1. A. B. Wood, *A Textbook of Sound*, India: Maxwell Press, 2021.
2. T.M. Yarwood, *Acoustics*, London: Macmillan & Co., Limited, 1953.
3. D. Templeton, *Acoustics in the Built Environment*, Massachusetts: Butterworth-Heinemann, 1998.
4. J. E. Moore, *Design for Good Acoustics and Noise Control*, New York: Scholium International, Inc, 1988.
5. M. Siraskar, *Acoustics in Building Design*, Hyderabad: Sangam Books Ltd , 1979.
6. L. L. Doelle, *Environmental Acoustics*, New York: MGH Publications, 1972.
7. R. J. Peters, B. J. Smith and M. Hollins, *Acoustics and Noise Control*, Oxfordshire: Routledge, 2011.

Course Outcomes:

- To understand sound engineering and its application in Architecture.
- To relate acoustics and acoustical environment with behaviour of sound in an enclosed and open space.
- To recall the fundamentals of electro acoustics and understand its application.
- To identify the types of noise sources and design principles for reduction of noise.
- Able to select acoustical materials for indoor and outdoor application.

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	-	-	-	-	2	-	-	1	-	2	2	1
CO2	3	3	3	-	-	-	2	-	2	1	-	2	2	1
CO3	3	-	1	-	-	-	1	-	1	1	-	2	2	1
CO4	3	1	2	-	-	1	1	-	1	1	-	2	2	1
CO5	3	1	2	-	-	2	1	-	2	1	-	2	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
Architectural acoustics course is about sound, its behaviour in enclosed and outdoor spaces and reduction of indoor & outdoor noise. The course provides understanding of acoustical material and its innovative use for the acoustical environment.	

AAR303	Mechanical and Electrical Services	L	T	ST	J	C
SDG No. 7, 9		3	0	0	0	3

Course Description :

This course introduces students to essential mechanical and electrical systems in buildings, with a focus on design integration, functionality, and energy efficiency. Core topics include electricity and wiring systems, lighting and illumination design, ventilation and air-conditioning systems, thermal insulation techniques, and vertical transportation. Emphasizing the relevance of sustainable design, the course aligns with ECBC and Eco-Niwas Samhita 2021 guidelines. It aims to equip students with the knowledge to plan and design building services for comfort, safety, and performance. Upon completion, students will be able to design service layouts, select appropriate systems and materials, and apply energy-efficient solutions in residential and commercial buildings.

Course Objectives :

- To introduce the basics of electricity and wiring systems within domestic and commercial buildings.
- To introduce the fundamentals of lighting and lighting design.
- To explain the fundamentals of ventilation & various air- conditioning systems
- To introduce the basics of thermal insulation & types of materials.
- To explain the various means of vertical transportation system and their functioning.

UNIT 1: Electrical Services

Basics of electricity- single/three phase supply-protective devices in electrical installations-Earthing for safety-Types of earthing-Types of wires, wiring systems & their choice -Planning electrical layout for a building-Main and distribution boards. Layout of substation. Power backup system, Electric Vehicle Charging systems, Energy Efficient Electrical Systems as per Eco-Niwas Samhita 2021 recommendations.

UNIT 2: Lighting & Illumination

Lighting: Classification of lighting, artificial light sources, Spectral energy distribution, luminous efficacy, Design of modern lighting- Lighting for stores, schools, hospitals and house lighting, Permanent Supplementary Artificial Lighting of Interiors (PSALI), Energy Efficient Lighting Systems for both indoor and outdoor as per ECBC and Eco-Niwas Samhita 2021 recommendations.

Illumination: Principles of illumination- visual tasks- Factors affecting visual tasks-Luminous flux, Candela, solid angle illumination-utilization factor-depreciation factor-Laws of illumination.

UNIT 3: Ventilation

Definition and necessity, Requirements of air changes for different building occupancies, Functional requirements of Ventilation systems, Systems of Ventilation, Mechanical/Artificial Ventilation. Ventilation systems for basements, Energy Efficient Ventilation Systems as per Eco-Niwas Samhita 2021 recommendations.

UNIT 4: Air-Conditioning and Thermal Insulation

Thermal insulating materials and their coefficient of thermal conductivity, general methods of thermal insulation: Thermal insulation of roofs, exposed walls. Thermal insulation materials as per ECBC Recommendations

Principles of air conditioning, air cooling, different systems of ducting and distribution, essentials of air–conditioning system. Energy Efficient Air Conditioning Systems as per Eco-Niwas Samhita 2021 recommendations.

UNIT 5: Vertical transportation

Building design and vertical transportation, Demand for vertical transportation

- Lift and Escalators: types, uses, functioning, automatic control system.
- Plans & sections to explain different parts of lifts and escalators.
- Planning for vertical transportation, industry standards and capacity calculations.
- Energy Efficient Lift systems as per Eco-Niwas Samhita 2021 recommendations.

References:

1. D. Philips, *Lighting in Architectural Design*., New York: McGraw Hil, 1964.
2. G.K.Lal, *Elements of Lighting*, London,: Faber and Faber,, 1969
3. R. H. a. J.D.Kay, *The lighting of buildings*, London: 1969, Faber and Faber
4. Philips, *Lighting in Architectural Design*, New York: McGraw Hill, 1964.
5. L. A. Bon Henderson, *I.E.S. Handbook*, NC: Illuminating Engineering Society, 2011.
6. E. Ambrose, *Heat Pumps and Electric Heating*, New York: John Wiley and Sons Inc, 1968
7. *NBC, Handbook for Building Engineers in Metric Systems*, New Delhi: National Building Organisation, 1966
8. B. o. E. Efficiency, The Eco Niwas Samhita (ENS), New Delhi: Bureau of Energy Efficiency, 2024

Course Outcomes:

- The students understand the basics of Electricity and the wiring system.
- The students understand the Fundamentals of Lighting, Lighting design and Energy Efficient Lighting Systems.
- The students understand various types of mechanical ventilation systems.
- The students understand various concepts of Thermal Insulation and air conditioning systems and their applications.
- An understanding of the vertical transportation system in a building.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	1	2	3	2	2	1	1	1	1	2	2	1
CO2	3	2	1	2	1	2	2	1	1	1	1	2	2	1
CO3	3	2	1	2	1	2	2	1	1	1	1	2	2	1

CO4	3	2	1	2	1	2	2	1	1	1	1	2	2	1
CO5	3	2	1	2	1	2	2	1	1	1	1	2	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 20-May-22 (15th BOS)	**ACADEMIC COUNCIL: 17-Jun-22**
SDG No. & Statement: SDG 7,9	
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification:	
The course work sensitizes the Architecture students to learn various energy efficient Mechanical, Electrical, Lighting Systems and latest innovative technologies in services that can be adopted in various types of buildings.	

AAR315	History of Eastern Architecture - II	L	T	ST	J	C
SDG No. 11		3	0	0	0	3

Course Description :
This course explores the evolution of Indo-Islamic and post-Islamic architecture in India, tracing its development from the Sultanate to the colonial era. Core themes include the architectural styles of the Delhi Sultanate, provincial Sultanates, the Mughal Empire, and the post-Mughal Nawabi and Rajputana periods, concluding with Indo-Saracenic and colonial influences. The course aims to help students understand the cultural, political, and technological contexts that shaped diverse building typologies such as mosques, tombs, forts, palaces, and gardens. By the end, students will gain analytical skills to interpret historical architectural forms, spatial planning, construction techniques, and stylistic elements within India's rich architectural heritage.

Course Objectives:

- To understand the rise of Indo Islamic Architecture in India, different building types and elements in Indo Islamic Architecture.
- To understand the Imperial style of Islamic architecture in India under Delhi sultanate.
- To understand the provincial Indo-Islamic styles, their characteristics and building typologies such as mosques, tombs and forts of various parts of India.
- To understand the architectural accomplishments by the Mughal rulers in the built environment.
- To understand the post-Mughal synthesis of diverse architectural elements in Nawabi, Rajputana architectural styles; influences of colonial architecture in India and Indo-Saracenic style.

UNIT 1 Introduction – Rise of Indo-Islamic Architecture

- Components of Mosque
- Types and features of tombs
- Influences of Indo-Islamic Architecture in India, use of arches, vaults, domes, squinches, pendentives, jaalis, minarets, etc.
- Special features - use of landscape, water bodies and types of Islamic gardens with case examples.

UNIT 2 Indo-Islamic Architecture: Imperial Style of Sultanate Period

- Slave Dynasty: Qutub Complex, Adhai din ka Jhompra, Sultan Ghari, Balbun Tomb.
- Khilji dynasty – Alai Darwaja, Alai Minar.
- Tughlaq Dynasty: Tughlaqabad fort, Ghiyasuddin Tughlaq tomb, Feroz Shah Kotla, Khirki Masjid.
- Sayyid & Lodi dynasty - Sayyid tombs & Lodi tombs.

UNIT 3 Indo-Islamic Architecture: Provincial Style of Sultanate Period

- Punjab: Tomb of Hazrat Shah Rukn-e-Alam
- Bengal: Adina Mosque, Eklakhi tomb, Firoz Minar
- Jaunpur: Atala Masjid, Lal Darwaza Masjid, Jami Masjid.
- Gujarat: Jami Masjid, Cambay, Miya Khan Chisti, Champaner Fort, Secular structures like Rani ka vav, etc.
- Malwa: Jami Mosque Complex, Jahaz Mahal.

- Bijapur: Gol Gumbaz, Ibrahim Rouza.
- Golconda: Golconda fort, Qutub Shahi tombs, Charminar.

UNIT 4 Mughal Architecture

- Babur: Kabuli Bagh Mosque, Panipat, Babri Mosque.
- Humayun: Purana Qila, Humayun's Tomb, Tomb of Sher Shah Suri at Sasaram.
- Akbar: Agra Fort, Fatehpur Sikri, Akbar's tomb at Sikandra.
- Jahangir: Tomb of Itmad-ud-Daula, Mughal Gardens, Shalimar Bagh, Nishat Bagh.
- Shah Jahan: Red fort, Delhi, Taj Mahal.
- Aurangzeb: Bibi ka Maqbara at Aurangabad.

UNIT 5 Nawabi Architecture of the Post Mughal Period, Indo-Saracenic Architecture

- Nawabi - Awadh (Lucknow): Rumi Darwaja, Asafi Imambara Complex.
- Nawabi – Hyderabad: Falaknuma Palace, Chowmahalla Palace.
- Rajputana Architecture: Gwalior Fort, Chittorgarh Fort, Jaipur Palace, Udaipur Palace
- Influence of Colonial Architecture in India: Churches in Goa, French Settlement in Pondicherry, Art-deco in Bombay.
- Revival of Indian architecture under British patronage - Indo-Saracenic Architecture: Victoria Memorial, Rashtrapati Bhavan, Parliament House.

References:

1. Brown Percy, Indian Architecture (Islamic Period) VolII; Taraporevala and Sons, Bombay, 2021
2. Satish Grover, Islamic Architecture in India, South Asia Books, 1996
3. Asher Catherine, Architecture of Mughal India (The New Cambridge History of India) Cambridge University Press; Illustrated edition, 1992
4. Archana Pandey, Rajiv Misra; Lucknow Architecture: A fusion of Indo- Islamic and European Culture: Uniqueness and Grandeur of Nawabi Architecture; LAP LAMBERT Academic Publishing; 2014
5. G.H.R. Tillotson – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989
6. Pradip Kumar Das, Henry Irwin and the Indo Saracenic Movement Reconsidered; Partridge Publishing 2014
7. A.K.Jain, Lutyens Delhi, Bookwell India, 2010
8. G S Ghurye, Rajput Architecture, Popular Prakasan. 2005

Course Outcomes:

- The student will understand the overview rise of Indo Islamic Architecture in India
- The student will be able to learn different building typologies and building elements in Indo Islamic Architecture.
- Students will be able to understand the importance of landscaping, spatial design aspects, place making in Indo-Islamic architectural style.
- Students will be able to understand the influences and impressions of Indo-Islamic architecture in post Mughal building designs.
- Students will be able to understand the diversity in amalgamation of vatious existing styles in a given building with Indo-Islamic/saracenic style.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	-	-	-	2	1	1	-	2	-	2	1	3
CO2	3	2	-	-	-	2	1	1	-	2	-	2	1	3
CO3	3	2	-	-	-	2	1	1	-	2	-	2	1	3
CO4	3	2	-	-	-	2	1	1	-	2	-	2	1	3
CO5	3	2	-	-	-	2	1	1	-	2	-	2	1	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 11	
SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable	
SDG Justification:	
Eastern Architecture II is a topic which provides a deep insight to the historic buildings, their traditional construction methods and also the settlement of the bygone time. therefore, the knowledge on the topic facilitates a better understanding of the past and respecting them towards the future sustainable growth of cities.	

AAR307	Site Planning & Landscape Design	L	T	ST	J	C
SDG No. 11		3	0	0	0	3

Course Description:

This course introduces students to the fundamentals of site planning and landscape design, focusing on natural and artificial elements. Core topics include site analysis, the historical evolution of global garden styles, planting design, and techniques for microclimate modification and resource conservation. The course emphasizes landscape elements' environmental, aesthetic, and functional roles, including hardscape features and soft landscaping components. It aims to equip students to analyse a site holistically, select appropriate plant species, and integrate landscape strategies for sustainable design. Students will gain practical skills in designing outdoor and indoor spaces that enhance user experience and environmental performance.

Course Objectives:

- To acquaint the students with the site planning process and site analysis.
- To provide students with an overview of the evolution and principle of various gardens around the world.
- Environmental regulation with trees and methods of landscaping for microclimate modification and resource conservation.
- Principles of planting design and plant selection criteria.
- To acquaint students with Hard and Soft Landscaping elements street furniture and indoor landscaping methods.

UNIT 1

Site Planning Process: Need, Definition, scope and relationship in between site planning & landscape Architecture. Site Analysis, Analysis of all natural and man-made factors of site.

UNIT 2

Evolution of Garden Design: A brief study of different garden types: Principles of Persian gardens, Mughal gardens, Spanish Gardens, Italian Gardens, French Gardens, English Gardens, Japanese gardens.

UNIT 3

Visual and Function role of trees in Landscape design, Landscaping design for microclimate modification, Role of water in landscape design. Principles of Xeriscape, Landscaping for water conservation, Berms and landforms, Roadside plantation and planting for noise reduction.

UNIT 4

Plant selection criteria, Plant characteristics: Structure, form and foliage of various trees and shrubs, climbers and groundcovers. Study and identification of tropical plants and trees through field studies.

UNIT 5

Manmade Elements of Landscape: Hard and soft landscaping, street furniture, lighting fixtures, signage and sign boards, fences, paving materials, surface drainage, design of rock garden and terrace garden, Indoor landscaping

References:

1. L. J. Hopper, Landscape Architectural Graphic Standards, Hoboken: John Wiley & Sons, Inc., 2007.

2. P. C. Siciliano, Landscape Interpretations: History, Techniques, and Design Inspiration, Australia: Thomson, 2005.
3. T. Waterman, Fundamentals of Landscape Architecture, Switzerland: AVA Publishing, 2009.
4. V. Chatterjee, Community Landscape Design, Hong Kong: Design Media Publishing Limited, 2015.
5. M. Laurie, An Introduction to Landscape Architecture, 2nd ed., New York: Elsevier, 1986.
6. M. Jain, Landscape Architecture: History, Ecology and Patterns, Ghaziabad: Copal Publishing Group, 2017.
7. H. Venhaus, Designing the Sustainable Site: Integrated Design Strategies for Small-scale Sites and Residential Landscapes, Hoboken: John Wiley & Sons, Inc., 2012.
8. A. Zimmermann, Constructing Landscape: Materials, Techniques, Structural Components, 2nd ed., Basel: Birkhäuser, 2015.

Course Outcomes:

- Understand and apply the principles of site planning and site analysis by evaluating natural and built elements to inform architectural and landscape design decisions.
- Demonstrate knowledge of historical and cultural evolution of gardens by analyzing key characteristics and principles of major garden typologies across global traditions.
- Integrate environmental strategies in landscape design through appropriate use of trees, water elements, berms, and microclimate-responsive methods such as xeriscaping and noise-reducing plantations.
- Select and apply appropriate plant materials in design by understanding their structural, aesthetic, and functional characteristics, including field identification of tropical species.
- Incorporate hard and soft landscaping elements such as street furniture, lighting, signage, paving, and indoor landscape features into cohesive design solutions for varied architectural contexts.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	2	1	-	2	1	1	1	2	1	-	-	-
CO2	2	2	2	2	-	2	2	1	2	2	1	-	-	-
CO3	3	2	3	3	-	2	3	1	2	2	1	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 11 – Make cities and human settlements inclusive, safe, resilient and sustainable; SDG 13 – Take urgent action to combat climate change and its impacts.	

SDG Justification:
SDG 11: Promotes integrated site and landscape planning to enhance the livability, resilience, and sustainability of urban environments. SDG 13: Teaches climate-responsive design strategies like xeriscaping and microclimate modification to mitigate environmental impacts.

AAR319	Architectural Design - III	L	T	ST	J	C
SDG No. 11, 13		1	0	7	0	8

Course Description:

This course focuses on developing integrated design thinking through context-sensitive and inclusive architectural solutions. Core themes include spatial planning, climatic responsiveness, community-based design, structural integration, and the application of building services. Students are trained to approach complex design problems such as mixed-use complexes, pavilions, or healthcare facilities, ensuring alignment with building byelaws, the National Building Code, and sustainability principles. The course aims to foster creative and analytical skills while enhancing awareness of social, cultural, and environmental contexts. By the end, students can generate comprehensive design proposals supported by drawings and models, demonstrating proficiency in holistic architectural design and regulatory compliance.

Course Objectives:

- To enable students to develop integrated design thinking skills
- To cultivate in students the ability to design built forms in diverse climatic conditions to achieve thermal comfort and sustainability
- To foster in students the sensitivity towards social, cultural and community based aspects of design ensuring inclusivity
- Train students to integrate appropriate structural considerations and basic building services
- To make the students aware and equip them with the skills to design aligned with relevant building-byelaws, codes, and standards

The design issues to be addressed:

- Design theory and application in more complex problems covering functional relationship, climatic condition, social aspects along with structural considerations and basic building services.
- The Design Programme prepared by the students should take into account relevant building bye-laws and provision of National Building Code.

The list of suggested topics to be covered as design problems:

Major Design Problem:
Commercial cum Residential complex, Exhibition Pavilion, Nursing Home etc.
Design (Time) Problem (12):
Club house, Highway Restaurant, Tourist Information Centre etc.

Viva voce
Final Viva-voce on all the design assignments done in the semester
Note: At least one major design exercise and one minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the problems.

References:

1. Time savers standards, Neufert's Architects data, National Building Code.
2. B. Lawson, *How Designers Think: The Design Process Demystified*, London: Routledge, 2005.
3. S. F. Miller, *Design Process: A Primer for Architectural and Interior Design*, New York: Van

Nostrand Reinhold, 1995.
4. A. Tarwani, *Studio Proceedings: Recognition of Through Memory Mapping: Lateral Strategies for Architectural Design Studios*, New Delhi: Metro Books, 2019.
5. O. H. Koenigsberger, *Manual of Tropical Housing and Building Climate Design*, Hyderabad: University Press Pvt. Ltd., 2016.
6. J. J. Maisel, B. Megan, and E. Smith Korydon H. Steinfeld, *Inclusive Design: Implementation and Evaluation*, New York: Routledge, 2018.
7. M. Brawne, *Architectural Thought: The Design Process and the Expectant Eye*, Oxford: Architectural Press, 2005.
8. C. Day, *Consensus Design: Socially Inclusive Process*, Oxford: Architectural Press, 2003.

Course Outcomes:

- Students will create conceptual design solutions demonstrating functional relationships and spatial organization.
- Students will evaluate climatic data to determine suitable passive and active design strategies.
- Students will integrate inclusive and user-oriented spaces within their design proposals.
- Students will select appropriate structural systems and integrate basic building services
- Students will identify and interpret relevant building bye-laws and NBC provisions.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	1	-	-	1	-	-	-	-	-	-	-
CO2	3	3	3	1	-	-	1	-	-	-	-	-	-	-
CO3	2	1	2	1	-	-	2	-	-	-	-	-	-	-
CO4	3	3	3	1	-	-	1	-	-	-	-	-	-	-
CO5	1	1	2	1	-	-	1	-	-	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 11,13,	
SDG 3-Good Health and Well-being - Ensure healthy lives and promote well-being for all. SDG 11-Sustainable Cities and Communities - Make cities and human settlements inclusive, safe, resilient, and sustainable. SDG 13-Climate Action - Take urgent action to combat climate change and its impacts.	
SDG Justification:	
This course equips students to design built environments that are socially inclusive, climatically responsive, and compliant with safety regulations.	

AAR313	Building Construction IV	L	T	ST	J	C
SDG No. 4		1	0	4	0	5

Course Description:

This course provides comprehensive knowledge of advanced construction techniques and systems used in building structures. Core topics include formwork, shoring, scaffolding, domes, shells, suspended ceilings, wall cladding, large-span structures, and expansion and construction joints. The course aims to familiarize students with structural support systems, various structural forms, joint detailing, and material usage to achieve stability, durability, and performance in construction. Emphasis is placed on techniques to span large areas without intermediate supports and the integration of specialized finishes. By the end, students will have technical skills to detail and construct complex building elements while ensuring safety, functionality, and adherence to construction standards.

Course Objectives:

- To familiarize students about the various support systems for erection of a structure.
- To develop an understanding on the different forms of arches, domes, various geometrical forms of shell and plate structure.
- To familiarize students about the various types of suspended ceiling and wall cladding.
- To understand various structural systems and materials used to achieve long spans without intermediate supports
- To introduce various types of joints, their materials and provision of these joints at various locations of the buildings and their methods of construction.

UNIT 1

Formwork, Shoring, Underpinning, Scaffolding: Types of formwork, Formwork for various construction elements, Removal of formwork, Types of Shoring, Methods of underpinning, Types of Scaffolding.

UNIT 2

Domes and Shells: Various form of domes, various geometrical forms of shell and plate structures, construction detailing and methods of centering.

UNIT 3

Suspended Ceilings: Methods of suspended framing materials like – timber, pressed steel, aluminum, different covering materials – acoustical board, gypsum board, PVC tiles etc. special consideration of fire and acoustical insulation.

Building Cladding: Details of cladding of wall with stone, tiles, timber and steel framing.

UNIT 4

Large Span Structures: Types and forms of roofing in steel and RCC, their applications to factories sheds, halls, Hangers, canopies, North light roofing in steel and RCC, Patent Glazing, Coffered Slab.

UNIT 5

Expansion and Construction Joints: Provision of joints in buildings, types of joints: expansion joints, isolation joints, contraction joints, sliding joints, construction joints, and floor joints; materials and methods for provision of these joints at various locations of the buildings.

Text Books:

1. S.C.Rangwala, *Building Construction*, Charotar Publishing House Pvt. Ltd, India, 2010.
2. W.B. MacKay, '*Building Construction*', Vol. 1,2,3 Longmans, U.K. 1981.
3. B. C. Punmia; *Building Materials and Construction* .Laxmi Publications Pvt Ltd, New Delhi,1993.
4. S. P. Bindra and D. S. Arora, *Building Materials and Construction*, Dhanpat Rai Publications, New Delhi, India, latest ed.2019.

Course Outcomes:

- To acquire practical knowledge of the construction methods at various stages in construction
- To understand latest technology of construction of domes and shells
- To sensitize the students in choosing materials and construction techniques while designing, interior and detailing.
- To determine what kind of structure is suitable for the large span structures
- To gain technical knowledge of construction joints.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO2	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO3	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO4	3	2	3	1	1	3	2	1	2	2	1	1	2	1
CO5	3	2	3	1	1	3	2	1	2	2	1	1	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 4	
SDG 4-Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
The course provides insights of required understanding on construction procedures in the building industry, reinforces the required cognitive skills for innovation, and applications in the practical field of architectural professional practice.	

EOE302	German for Beginners	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Description :
This course introduces the German language, focusing on developing basic communication, grammar, and reading skills. Core themes include everyday vocabulary, sentence construction, pronunciation, and fundamental grammar such as noun cases, verb conjugations, and pronouns. Students will converse practically about greetings, directions, personal descriptions, and daily situations. The course is designed to build confidence in speaking and understanding German, while also developing a foundational grasp of its grammatical structure and pronunciation, including vowels, consonants, and umlauts. By the end, students can hold basic conversations, read simple texts, and express themselves clearly in routine contexts.

Course Objectives:

- To introduce basic knowledge about German Language.
- To encourage preliminary conversation in German.
- To educate basic grammar, speaking & reading skills in German.

UNIT 1

Introduction to the German language, grammar and pronunciation. Lan-guage: Greetings; Introducing oneself, asking the way, giving directions. Grammar: The nouns, gender distinctions, cases, definite and indefinite articles. Pronunciation: Vowels.

UNIT 2

Language: Asking for and giving information; Discussing home and the household. Grammar: Conjugation of verbs, verbs with separable and inseparable prefixes, modal verbs. Pronunciation: Vowels.

UNIT 3

Language: Describing people and their qualities, describing shape, size and colour of objects. Grammar: Personal pronouns, possessive pronouns, reflexive pronouns. Pronunciation: Consonants.

UNIT 4

Language: The Working World: Returning faulty goods to a shop, asking someone to repeat something; Refusing or declining politely. Grammar: Cases: nominative, accusative, dative. Pronunciation: Diphthongs.

UNIT 5

Language: Making Comments and Suggestions: Asking for and giving opinions. Grammar: Structure of sentence and categories of sentences; subordinate clause - causative and conditional sentences. Pronunciation: Umlaut.

References:

1. Deutsch als Fremdsprache IA Grundkurs

2. Ultimate German Beginner - Intermediate (Coursebook), Living Language, 2004.
3. Paulina Christensen, Anne Fox , Wendy Foster: German For Dummies

Web Reference

- https://www.deutschalsfremdsprache.ch/

Course Outcomes

- Students are equipped to listen, understand the German language.
- Sufficient skills to converse in German Language are established

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1														
CO2														
CO3														
CO4														
CO5														

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	ACADEMIC COUNCIL: 01-Apr-22
SDG No. & Statement:	
SDG Justification:	

EOE305	French for Beginner	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Description:

This course introduces students to the basics of French, focusing on essential grammar, vocabulary, and pronunciation to build foundational communication skills. Core themes include everyday conversations, personal information, directions, travel, shopping, and daily routines. Grammar topics cover present tense conjugations, possessive forms, reflexive verbs, and common irregular verbs such as *avoir*, *être*, *aller*, and *faire*. The course aims to help students engage in simple spoken and written interactions in French. By the end, students can comprehend and construct basic sentences, ask and respond to everyday questions, and communicate effectively in common real-life situations.

Course Objectives:

- To introduce basic knowledge about French Language.
- To encourage preliminary conversation in French.
- To educate basic grammar, speaking & reading skills in French.

UNIT 1

Asking for and giving personal information, asking for and giving direc-tions, gender and number. Grammar: Verbs "avoir" and "etre", present tense, questions, vocabulary: countries and nationalities, professions, family, food.

UNIT 2

Asking and giving the time, asking when something is open or someone is available, asking for prices and describing what one wants. Grammar: Alphabet and numbers, possessive adjectives, negative sentences. Vocabu-lary: Days of the week, months, money.

UNIT 3

Asking for information related to travel and accommodation, expressing one's wants/needs. Grammar: Present tense for verbs in -er, -ir and -re, present tense of irregular verbs. Verbs: to be able to, to want, to know. Vocabulary: Food, shops, packaging and measures.

UNIT 4

Talking about daily routine and the working day, describing things, ex-pressing oneself when buying things. Grammar: Possessive pronouns, reflexive verbs. Vocabulary: Clothes, colours and shapes, weather.

UNIT 5

Describing places; visiting the doctor, reading short advertisements, de-scribing places, feelings and symptoms. Grammar: Using avoir aller, etre faire, vouloir pouvoir. Vocabulary: Parts of the body, rooms and features of interior spaces.

References:

1. LE NOUVEAU SANS FRONTIÈRES - Textbook

2. LE NOUVEAU SANS FRONTIÈRES - Workbook CD and selected passages/ exercises

Web Reference

- https://www.deutschalsfremdsprache.ch/

Course Outcomes

- Students are equipped to listen, understand French language.
- Sufficient skills to converse in French Language are established.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1														
CO2														
CO3														
CO4														
CO5														

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG Justification:	

EOE317	Personality Development	L	T	ST	J	C
SDG No. 3, 4		3	0	0	0	3

Course Description:

This course enhances students' self-awareness, self-discipline, and confidence through structured activities and introspective learning. Core themes include understanding personal strengths and traits, developing self-motivation, managing emotions and time effectively, and cultivating interpersonal and leadership skills. The course emphasizes adapting to diverse environments and building meaningful relationships for personal and professional growth. Students will learn to set goals, make decisions, and work collaboratively through interactive discussions, case studies, and team-based exercises. By the end, learners will gain practical tools for self-management, emotional resilience, and improved interpersonal behaviour—essential for success in both career and life.

Course Objectives:

- Recognize the importance of self-awareness.
- Practice self-discipline techniques.
- Build confidence through self-motivation.
- Apply skills for self-management in diverse environments.
- Develop interpersonal skills for a successful career and fulfilling life.

UNIT 1

Self Awareness: Know yourself, have a snapshot of yourself, assess yourpersonal traits, discover natural potential. Activities and Tasks: Class discussion, questionnaires, Johari Window, SWOC analysis (strengths, weaknesses, opportunities and challenges).

UNIT 2

Self Discipline: Importance of self discipline, characteristics of a selfdisciplined achiever, self discipline in personal life and career. Activities and Tasks: Viewing short videos followed by discussion and analysis, brainstorming in small groups, creating an action plan to realize academic and career goals.

UNIT 3

Motivating Oneself: Self motivation, confidence building, goal setting,decision making. Activities and Tasks: Discussion and analysis of case studies, completing self-assessment questionnaires.

UNIT 4

Managing Oneself: Handling emotions, time management, stress management, change management. Activities and Tasks: Discussion and analysis of case studies, completing self-assessment questionnaires.

UNIT 5

Interpersonal Behaviour: Attitude towards persons and situations, teamwork, leadership skills, problem solving skills, interpersonal adaptability, cultural adaptability. Activities and Tasks: Team-building games and activities.

References:

1. Hurlock Elizabeth B., *Personality Development*, McGraw Hill Education, India, 1979.
2. Covey, Stephen R., *The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change*, Free Press, 2004.
3. Carnegie, Dale, Levine, Stuart. R., *The Leader In You: How to Win Friends, Influence People and Succeed in a Changing World*, Pocket Books, 1995.
4. Swami Vivekananda, *Personality Development*, Advaita Ashrama, 1993.
5. NHS, "Johari's Window," 1955. [Online]. Available: https://www.hee.nhs.uk/sites/default/files/documents/Johari%20window.pdf.

Course Outcomes

- Analyze their own self to face the challenges of life.
- Demonstrate self-discipline strategies to achieve set goals.
- Enhance self-confidence through dedicated efforts.
- Manage time and emotions effectively in various situations.
- Develop interpersonal and adaptability skills for a contented life.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	-	2	1	-	-	1	1	-	2	2	-	3	2	2
CO2	-	1	1	-	-	1	1	-	1	1	-	3	2	1
CO3	-	1	2	-	-	1	1	-	2	2	-	3	2	2
CO4	-	1	2	-	1	1	1	-	2	2	-	3	2	2
CO5	1	2	2	-	1	2	1	-	3	3	-	3	2	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 3 & 4	
SDG 3-Ensure healthy lives and promote well-being for all at all ages SDG 4-Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
SDG Justification:	
The course offers insights for the development of personal and interpersonal well being (3) by imparting self awareness and understanding others balancing with ethical values (4).	

PSYC1002	Introduction to Psychology	L	T	ST	J	C
SDG No. 3		3	0	0	0	3

Course Description :

This course offers a foundational understanding of psychology, its history, branches, and practical applications. Core themes include cognitive and affective processes such as attention, perception, memory, learning, thinking, motivation, and emotions. Students will explore key psychological theories, principles, and concepts that explain human behaviour and mental processes. The course also emphasizes individual differences in intelligence and thinking, fostering deeper insight into personal and social behaviour. Students will gain critical thinking skills and a scientific perspective on human behaviour through analytical discussions and real-world examples. By the end, learners will be equipped to understand psychological influences and apply concepts in academic, personal, and professional contexts.

Course Objectives:

- Understand the history and branches of psychology.
- Gain a comprehensive understanding of psychology and its applications
- Analyze the basic theories, principles, and concepts of psychology
- Understand well-established theories in cognitive and affective domains such as attention, perception, memory, learning,thinking, motivation and emotions
- Analyze and facilitate students' understanding about individual differences in behavior, intelligence, and thinking

UNIT 1 Introduction

Definition, Historical Antecedents, Divisions of Psychology – American Psychological Association and British Psychological Association; Scope, Branches, and Methods of Psychology

UNIT 2 Attention, Sensation and Perception

Sensation, Concept of threshold, Absolute and Differential; Signal detection and vigilance; Attention: Types; Factors Influencing Attention including set and characteristics of stimulus. Perception - Definition and concept; Principles of Perceptual Organization; factors in perception; Depth Perception; Perceptual Constancies; Distortions in perception; Extrasensory Perception, culture and perception.

UNIT 3 Motivation and Emotions

Psychological and Physiological basis of Motivation and Emotions; measurement; effects of Motivation and Emotions on behavior; types of motivation; Factors influencing motivation; Emotions - Nature; Theories of Emotion.

UNIT 4 Learning, Memory and Forgetting

Learning - Nature and factors in learning; Theories of Learning; Conditioning: Principles/processes, Types and schedules of reinforcement, Modeling and Social Learning; Applications; Learning processes; transfer of training, programmed learning and self-instructional learning.

Memory and Forgetting - Encoding and remembering; Nature and types of memory; Multi-store Model, Levels of Processing; Types of forgetting: Decay, interference and retrieval failure, Amnesia; Anterograde and Retrograde; Strategies to enhance memory.

UNIT 5 Thinking and Intelligence

Concept Formation Processes, Information Processing; Intelligence – Nature, factors influencing intelligence and theories of intelligence - Spearman, Thurstone, Gardner, Cattell.

Textbook(s):

1. Ciccarelli, S. K., Meyer, G. E. & Misra, G., *Psychology*, Pearson,New Delhi, 2010
2. Morgan, C.C., King, R.R., Weisz, J. & Schopler, J., *Introduction to Psychology*, Pearson,New Delhi, 2017

References:

3. Baron, R. & Misra. G., *Psychology*, Pearson,New Delhi , 2013
4. Passer, M.W. & Smith, R.E. , *Psychology: The Science of Mind and Behavior,* Tata McGraw-Hill,NewDelhi, 2010
5. Robinson-Riegler, B. & Robinson-Riegler, L., *Psychology: Applying the Science of the Mind*, Pearson,NewDelhi, 2008

Course Outcomes

- Understand the history and scope of psychology and different schools of psychology
- Understand the basic processes of sensation and perception
- Explore the factors influencing motivation, emotion and summarize the theories of personality
- Understand learning, memory and forgetting
- Understand the phenomenon of thinking and intelligence

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1														
CO2														
CO3														
CO4														
CO5														

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 28-Jun-23	**ACADEMIC COUNCIL: 06-Aug-23**
SDG No. & Statement: 3	
Good Health and Well-being : Ensure healthy lives and promote well-being for all at all ages.	
SDG Justification:	
Syllabus ensures well-being through the application of psychological principles and theories in everyday life.	

LANG1181	Introduction to Spanish	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Description:

This course provides a foundational introduction to the Spanish language, focusing on essential grammar, vocabulary, and basic conversational skills. Core themes include greetings, self-introduction, telling time, daily routines, describing people and places, and expressing likes, preferences, and weather conditions. The course emphasizes regular and irregular verbs, personal pronouns, articles, and sentence structures. It aims to build confidence in speaking, reading, and understanding simple Spanish in real-life contexts. By the end of the course, students will be able to hold basic conversations, express daily habits, describe their surroundings, and engage with Hispanic culture through everyday vocabulary and grammar.

UNIT 1

Alphabet, Numbers, Greetings and Farewells, Self-introduction, Asking questions.
Grammar: Verbs 'SER' and 'ESTAR', Definite and Indefinite articles, Personal Pronouns.
Vocabulary: Greetings and Farewells, Countries, and Nationalities, ABECEDARIO. Classroom-related vocabularies.

LEARNING OUTCOME: After the completion of this unit, the student shall be able to :
- Exchange personal information in both formal and informal contexts.
- Understand the Spanish personal pronouns and identify themselves and others.
- Greet people with basic courtesy and politeness.
- Understand the gender and number of nouns.
- Use the correct definite and indefinite articles.

UNIT 2

Asking or telling time and date.
Grammar: Conjugation of Regular verbs in Present tense, Professions, Possessive Adjectives, Interrogative Pronouns, and Negative sentences, "Cuándo and Cuánto"
Vocabulary: Expressions of time, Numbers (0-30), Days, and Months. Daily activities.

LEARNING OUTCOME: After the completion of this unit, the student shall be able to :
- Tell the time and indicate the date.
- Conjugate regular verbs in present tense.
- Understand how to state the number of objects.

- Understand the concept of time.
- Ask questions to acquire information about other people.

UNIT 3

Describing people and objects, and their location.
Grammar: Adjectives of quality, Demonstratives, Introduction Of Irregular Verbs.
Vocabulary: House, Parts of House, Park, Classroom. Prepositions of location, "Dónde", "Porque, Por qué, "Hay " and"Estar ". Colors, Hobbies, Famous places of

Spain and Latin American Countries.

LEARNING OUTCOME: After the completion of this unit, the student shall be able to :
- Identify things and places.
- Define Personal relationships.
- Express existence and location.
- Express the idea of the relationship between the subject and the object.
- Conjugate irregular verbs.

UNIT 4

Daily Routines and Hobbies.
Grammar : Conjugation of Reflexive Verbs, Querer, “Gustar” Verbs for Activities and Hobbies, Irregular Verbs.
Vocabulary : Sports, Musical instruments, Movies, Hobby related nouns.

LEARNING OUTCOME: After the completion of this unit, the student shall be able to :
- Express what he/she likes to do in the leisure hour.
- Discover a variety of leisure activities commonly pursued in the Hispanic world.
- Express habits and frequency.
- Tell daily routine.

UNIT 5

Describing the weather.
Grammar: Continuation of Irregular verbs. 'IR', The near Future (IR+A+Infinitive).
Vocabulary: Days of the week, Months of the year, Season, Name of Clothes, Holiday related vocabulary.

LEARNING OUTCOME: After the completion of this unit, the student shall be able to :
- Describe nature and environment.
- Enhance the possibilities for describing activities
- Describe the place of residence with details.
- Tell his/her plans in the immediate future.

Textbook:

1. Aula Internacional 1, Jaime Corpas, Eva Garcia, Agustin Garmendia, Difusión, Madrid, 2016.

Additional Readings:

2. Español sin fronteras -1, Jesus Sanchez Lobato, Concha MorenoGarcia, Isabell Santos Gargallo, SGEL, Madrid, 1998.
3. Nuevo Ven 1, F.Castro, F. Marin, R. Morales, S. Rosa, Edelsa, Marid, 2003.

Web Reference

- https://www.lawlessspanish.com/
- https://www.spanishdict.com/

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1														
CO2														
CO3														
CO4														
CO5														

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS:	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

VI Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	ACE302	**Steel Structures**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR302	**Estimating, Costing & Specifications**	2	1	0	0	3	50	50	100	A1 (03 Hrs)
03	AAR316	**Modern & Contemporary Architecture**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
04	AAR308	**Housing**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR312	**Architectural Design IV**	1	0	8	0	9	200	200	400	C2 (Jury)
06	AAR324	**Working Drawing**	1	0	5	0	6	50	50	100	B2 (Jury)
07		**Program Elective**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
	AAR304	Building Economics and Sociology									
	AAR342	Barrier Free Architecture									
	AAR344	Vernacular Architecture									
		Total	**15**	**2**	**13**	**0**	**30**	**500**	**500**	**1000**	
		Total Hrs/Week	**30**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

ACE302	Steel Structures	L	T	ST	J	C
SDG No.		2	1	0	0	3

Course Description:

This course offers a detailed study of the design of steel structures based on IS 800-2007. It covers the behavior and design of tension, compression, and flexural members using various rolled and built-up steel sections. The course includes the design of bolted and welded connections, with emphasis on joint failure modes and efficiency. Key topics include stress-strain behavior of steel, effective length and slenderness in compression members, net effective area in tension members, and the design of laterally supported beams. Field visits to industries are incorporated to provide practical exposure to steel fabrication and connection techniques.

Course Objectives:

- To analyze bolted joints for potential failure, and design lap and butt connections for strength and efficiency.
- To evaluate welded joints under axial loads and design appropriate weld types using stress analysis.
- To design tension members by applying allowable stress criteria and calculating net effective sections for different profiles.
- To calculate slenderness ratios and effective lengths for compression members, and design axially loaded columns.
- To assess bending, shear, and bearing stresses in beams and determine effective lengths for laterally supported flanges.

UNIT 1

General: Fundamental concepts of design of structures, different types of rolled steel sections available to be used in steel structures, stress strain relationship for steel.

Bolted connections: Failure of a joint, Strength and efficiency of a joint, Lap Joint, Butt joint.

UNIT 2

Welded Connections: Types of welds, stresses in welds, Design of welded joints subjected to axial load.

UNIT 3

Tension Members: Allowable stress in axial tension, net effective sectional area for angle and Tee sections, Design of tension members.

UNIT 4

Compression Members: Effective length, radius of gyration and slenderness of compression members, Allowable stresses in compression, Design of axially loaded compression members.

UNIT 5

Beams: Allowable stresses in bending, shear and bearing, Effective length of compression flange, laterally supported beams.

*All the designs conform to the latest revised code of IS-800 (2007).

References:

1. S.K. Duggal, *Limit state of steel structures*, 2/e, Tata McGraw Hill, 2014.
2. N. Subramanyam, *Design of Steel Structures*, 1/e, Oxford University Press,2014
3. V.L. Shah and Veena Gore, *Limit State Design of steel structures IS: 800-2007*, Structures Publications, 2012.
4. M.L. Gambhir, *Fundamentals of Structural Steel Design*, McGraw Hill Education, 2013.
5. R. Narayanan, *Teaching Resource on Structural Steel Design*, INSDAG, Ministry of Steel Publications, 2002.
6. Ramachandra and V.Gehlot, *Design of Steel Structures*, Scientific Publishers, 2009

Course Outcomes:

- Understand fundamentals concepts of steel structures and Design of bolted connection
- Design of welded connection.
- Design of tension members.
- Design of compression members.
- Design of beam members.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	3	3	2	-	1	3	-	-	1	1	-	2	-
CO2	2	3	3	2	-	1	3	-	-	1	1	-	2	-
CO3	2	3	3	2	-	1	3	-	-	1	1	-	2	-
CO4	2	3	3	2	-	1	3	-	-	1	1	-	2	-
CO5	2	3	3	2	-	1	3	-	-	1	1	-	2	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 9	
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	
SDG Justification:	
Empowers students to design efficient, durable steel structures aligned with sustainable infrastructure demands. Promotes innovation in connection techniques and member design for resilient built environments.	

AAR302	Estimating, Costing & Specifications	L	T	ST	J	C
SDG No. 9, 11, 12		2	1	0	0	3

Course Description:

This course focuses on the principles and practices of building estimation and costing. It introduces the purpose, types, and preparation of building estimates, along with the formats used such as measurement forms, abstract estimates, and Bills of Quantities (BOQs). The course covers standard methods of measurement and material quantity calculation across different construction stages, including reinforcement in RCC works. It also includes rate analysis based on current market and schedule rates, emphasizing the breakdown of cost components. General specifications for building works and various types of construction contracts are explored, with practical guidance on writing item descriptions aligned with contract requirements.

Updated Course Objectives:

- To explain the importance, types, and basic principles of building estimation and costing.
- To develop detailed estimates and interpret formats such as measurement forms and BOQs.
- To calculate material quantities at various construction stages using standard measurement methods.
- To analyze rate components and perform rate analysis based on current market and schedule rates.
- To formulate appropriate general specifications and prepare item descriptions aligned with contract types.

UNIT 1

Introduction to Estimation & Costing For Building

- Definition of “Building estimate”
- Purpose of Estimating.
- Different Types of Estimate.

Introduction to Estimation & Costing For Building

- Definition of “Building estimate”
- Purpose of Estimating.
- Different Types of Estimate.

UNIT 2

Detailed Estimate

- Preparation of Detailed estimate.
- Function of “Measurement form” & “Abstract of estimate form”.
- Description & significance of Item in BOQ.

UNIT 3

Methods of Measurement of Works

- Different methods estimating building works.
- Estimation of a simple building at different stages:
    - Foundation up to plinth
    - Superstructure
    - Finishing works

- Reinforcement Quantities for RCC Works.
- Calculation of quantity for Reinforced concrete(RC) for:
- Column, Lintel, Slab & Beam.

UNIT 4

Analysis of Rate & Quantity of Materials

- Purpose of Rate analysis.
- Quantity of Materials.
- Different components of rate

UNIT 5

General Specifications & Types of Contract

- General idea of specifications of composite works in a building.
- Specifications of various building work as per NBC and ECBC.
- Types of Tender / contract and their reflection in BOQ.
- Writing Items for BOQ for Item rate contract.

References:

1. B. N. Dutta, *Estimating and Costing in Civil Engineering: Theory and Practice including Specification and Valuation*, 28th ed., New Delhi: CBS Publishers & Distributors, 2023.
2. M. Chakraborti, *Estimating, Costing, Specification and Valuation in Civil Engineering: Principles and Applications*, 26th ed., Kolkata: M. Chakraborti, 2015.
3. G. S. Birdie, *Textbook of Estimating and Costing*, 6th ed., New Delhi: Dhanpat Rai & Co., 2009.
4. A. K. Upadhyay, *Civil Estimating and Costing: Including Quantity Surveying, Tendering and Valuation*, New Delhi: S.K. Kataria & Sons, 2012.
5. B. S. Patil, *Civil Engineering Contracts and Estimates*, 3rd ed., Hyderabad: Universities Press, 2006.
6. J. Peter Cox, *Writing Specifications for Construction*, England: McGraw Hill, 1994.
7. R. H. Namavati, *Professional Practice (with Elements of Estimating, Valuation, Contract & Arbitration)*, Mumbai: Lakhani Book Depot, 2013.
8. Leonard Toenjes, *Building Trades Estimating*, U.S.A.: American Technical Publishers, 2000.

Course Outcomes:

- Students will be able to describe the purpose and types of estimates in building construction.
- Students will be able to prepare detailed estimates and compile itemized BOQs for simple structures.
- Students will be able to compute quantities for foundation, superstructure, and reinforcement works.
- Students will be able to perform rate analysis and determine the material and labor cost for key building items.
- Students will be able to draft general specifications and item entries for BOQs based on contract type.

Course PO Mapping:

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	1	1	2	2	2	1	2	2	2	3	1	1	2
CO2	2	1	1	2	2	2	1	2	2	2	3	1	1	2
CO3	2	3	1	2	2	2	1	2	2	2	3	1	2	1
CO4	2	3	1	2	2	2	1	2	2	2	3	1	3	2
CO5	2	2	1	2	2	2	1	2	2	2	3	1	3	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 9,11,12	
SDG 9 – *Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation* **SDG 11** – *Make cities and human settlements inclusive, safe, resilient and sustainable* **SDG 12** – *Ensure sustainable consumption and production patterns*	
SDG Justification:	
SDG 9: The course builds foundational skills in estimating, analyzing rates, and evaluating material requirements, which are essential for efficient and innovative infrastructure planning and execution. **SDG 11**: Emphasis on local standards (NBC/ECBC) and tendering systems aligns with sustainable construction practices and resilient urban development. **SDG 12**: Teaches material quantity optimization, waste minimization, and cost-effective specification writing—encouraging responsible resource use in building construction.	

AAR316	Modern & Contemporary Architecture	L	T	ST	J	C
SDG No.4, 11, 12		3	0	0	0	3

Course Description:

This course examines the transformation of architecture from the Industrial Revolution to the contemporary period, emphasizing the influence of new materials and construction techniques. It traces the development of modern architectural movements such as Art Nouveau, Organic Architecture, Functionalism, and the International Style, highlighting the contributions of key architects including Frank Lloyd Wright, Le Corbusier, Mies van der Rohe, and others. The course further explores significant architectural developments in the 20th century and the evolution of post-independence Indian architecture through the works of prominent architects such as B. V. Doshi, Charles Correa, and Laurie Baker. Emphasis is placed on critical analysis of architectural philosophies, stylistic innovations, and cultural context.

Course Objectives:

- To introduce the effect of new material on contemporary architecture.
- To explain about new art and architecture developed after the industrial revolution.
- To introduce functionalism in architecture and development of international style.
- To explain about 20th century world architects and their philosophy.
- To introduce Indian architecture after independence

UNIT 1

Introduction, Advent of Steel , Glass and Ferro-concrete

- Advent of Steel: James Bogardus, Henry Labrouste
- Great Exhibitions and their contributions
- Gustave Eiffel
- Development of Ferro concrete: Auguste Perret, Tony Garnier

UNIT 2

Development of ‘New Art & Architecture’

- Art Nouveau movement: Victor Horta, Otto Wagner, Antonio Gaudi
- H.P. Berlage, H. H. Richardson and ‘True Construction’
- Balloon Frame Structure and Plane Surfaces in America

Chicago School & Organic Developments

- Chicago School: Louis Sullivan
- Organic Architecture: Frank Lloyd Wright

UNIT 3

Functionalism in Architecture

- Walter Gropius and Bauhaus
- Le Corbusier

Development of International Style

- Mies van der Rohe
- Philip Johnson
- Louis I Kahn

UNIT 4

20th Century World Architecture

- Works of some master architects like, Eero Saarinen,Alvar Aalto, Oscar Niemeyer, Richard Neutra, Norman Foster, Frank O. Gehry, I. M. Pei, KenzoTange, Zaha Hadid, Santiago Calatrava, Rem Koolhas, Shigeru Ban.

UNIT 5

Indian Architecture since Independence

- B. V. Doshi
- Charles Correa
- Raj Rewal
- A. P. Kanvinde
- Laurie Baker
- Hasmukh Patel
- Revathi Kamat
- Christopher Charles Benninger
- Iconic Buildings in India

References:

1. F. Samuel, *Le Corbusier: Architect and Feminist*, Chichester: Wiley Academy, 2004.
2. W. Blaser, *Mies van der Rohe: Crown Hall*, Basel: Birkhäuser Publishers of Architecture, 2001.
3. W. Blaser, *Mies van der Rohe: IIT Campus*, Basel: Birkhäuser Publishers of Architecture, 2002.
4. A. Ruegg (ed.), *Le Corbusier*, Basel: Birkhäuser Publishers of Architecture.
5. C. Jencks, *The Language of Post-Modern Architecture*, 4th ed., London: Academy Edition, 1977.
6. J. Tietz, *The Story of Modern Architecture of the 20th Century*, Köln: H.F. Ullmann, 2013.
7. N. Levine, *Modern Architecture: Representation & Reality*, New Haven: Yale University Press, 2009.
8. K. Frampton, *Modern Architecture: A Critical History*, 5th ed., London: Thames & Hudson, 2020.

Course Outcomes:

- To understand the effect of industrial revolution on world architecture.
- To understand the evolution of new art and architecture.
- Able to understand the functionalism in architecture and its use in modern architecture.
- Able to understand the philosophy of world contemporary architects and their work. .
- To understand the development of Indian architecture after independence

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	2	1	_	3	2	1	1	3	2	3	1	2
CO2	3	3	2	3	_	3	2	3	1	3	2	3	2	2
CO3	3	3	2	3	_	3	3	3	1	3	2	3	2	2

CO4	3	3	2	3	3	3	3	3	1	3	2	3	2	2
CO5	3	3	2	3	3	3	3	3	1	3	2	3	2	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:	
SDG 4 – Quality Education **SDG 11** – Sustainable Cities and Communities	
SDG Justification:	
SDG 4: The course enables critical analysis and understanding of global and Indian architectural practices across time, supporting education rooted in cultural and technical literacy. **SDG 11**: Understanding works of master architects and sustainable pioneers like Laurie Baker and Shigeru Ban aligns with goals for resilient and sustainable built environments.	

AAR308	Housing	L	T	ST	J	C
SDG No. 1, 9		3	0	0	0	3

Course Description:

This course explores the interrelationship between housing and social equity, with a focus on the economic, political, and cultural dimensions shaping housing policy and practice in India. It provides an analytical framework for understanding housing demand, affordability, typologies, and accessibility across various socio-economic groups. The course reviews national and international housing policies, institutional frameworks, and standards governing housing development. Emphasis is placed on the design process, incorporating spatial standards, environmental considerations, and community needs. Through case studies, policy review, and project-based assessments, the course encourages critical engagement with contemporary housing challenges and equips participants with the tools to develop sustainable and inclusive housing solutions.

Course Objectives:

- Develop orientation to understand the scenario of the housing sector and affordable housing in India.
- Inculcate the ability to understand contemporary issues regarding housing demand and supply in India acquainted with various socio economic groups.
- Introduction to various housing policies in India as well other countries.
- Introduction to relevant housing standards and methodology adopted in preparation of housing layouts.
- Introduction to Housing Design process with the considerations of qualitative and quantitative indicators derived from housing spatial standards and regulations.

UNIT 1 Housing need & Demand

Review of different forms of housing globally, Housing Density, Calculation of future need. Housing resources and options available in housing.

UNIT 2 Housing Agencies and Policies

Housing Agencies and their contributions to housing development - HUDCO, State Housing Boards, Housing Co-operatives and Banks. Housing Policies in India and other countries like UK & USA.

UNIT 3 Socio Economic Aspects

Social factors influencing Housing Design, affordability, economic factors and housing concepts - Slum upgradation, and sites and services schemes, Public Private Partnerships related to Housing.

UNIT 4 Housing standards

Different types of Housing standards - Methodology of formulating standards - Relevance of standards in Housing Development.

UNIT 5 Housing design process

Different stages in project development - Layout design including utilities and common facilities - Housing design as a result of environmental aspects, development of technology and

community interests.
Case studies of Public Sector housing, Government housing, Private and Co-operative housing - their advantages and disadvantages.
Project Report and Appraisal.

References:

1. B. Mumtaz and Patweikly, *Urban Housing Strategies*. London: Pitman Publishing, 1976.
2. G. K. Payne, *Low Income Housing in the Developing World*. Chichester: John Wiley and Sons, 1984.
3. J. F. C. Turner, *Housing by People*. London: Marion Boyars, 1976.
4. M. Evans, *Housing, Climate and Comfort*. London: Architectural Press, 1980.
5. F. Davidson and G. Payne, *Urban Projects Manual*. Liverpool: Liverpool University Press, 1983.

Course Outcomes:

- Differentiate the level of socio-cultural hierarchy.
- Analyze the economic affordability within the social hierarchy.
- Understanding the application of government schemes under different housing policies.
- Analyze the benefits which can be attributed from the government schemes.
- Integrate design concept within the economic affordability of the hierarchy.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	1	2	-	-	2	1	1	1	-	-	-	-	2
CO2	3	2	3	-	-	3	1	2	-	-	-	-	-	3
CO3	2	3	3	-	-	3	2	1	1	-	-	-	-	2
CO4	2	3	3	-	-	3	2	1	1	-	-	-	-	2
CO5	3	3	3	-	-	2	2	1	1	-	-	-	-	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS : 20-May-22 (15th BOS)	**ACADEMIC COUNCIL: 17-Jun-22**
SDG No. & Statement: SDG 1 and SDG 9	
SDG 1: No Poverty - End poverty in all its forms everywhere SDG 9: Industry, Innovation and Infrastructure - *Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation*	
SDG Justification:	
This Course introduces the students to the basic fundamentals of habitable space standards along with guidelines pertaining to affordability and housing policies laid by the Govt on socialistic grounds. Understanding the phenomenon of slums, squatter settlements, densification in the contextual settings of an urban premise and thereby the implications of supply demand curve of housing in Indian society derives the basic takeaways from the subject.	

AAR312	Architectural Design - IV	L	T	ST	J	C
SDG No.		1	0	8	0	9

Course Description:

This studio-based course focuses on architectural design as a synthesis of functional, climatic, social, structural, and regulatory considerations. It introduces the integration of spatial planning with building services and emphasizes barrier-free design in compliance with building bye-laws and the National Building Code. The course explores design applications in projects such as sports complexes, resorts, auditoriums, and transportation hubs, with attention to user needs, circulation patterns, and accessibility. Through major and minor design exercises, students address structural integration, service planning, and inclusive design, culminating in visual presentations and physical models. Critical evaluation and design communication are reinforced through structured juries and viva voce.

Course Objectives:

- To understand the importance of functional relationships of spaces and influence of social and climatic aspects on architectural design.
- To understand various building services required for modern buildings.
- Introduction to Barrier free aspects of building design.
- To develop the ability to handle complex architectural programs through the integration of structural systems, building services, and sustainability principles into architectural design.
- To enable students to design with sensitivity to climatic, socio-cultural, and urban contexts, especially in relation to site, users, and programmatic requirements.

The design issues to be addressed:

- Design theory and application in the problems covering functional relationship, climatic condition and social aspects. along with structural considerations.
- Design should include the aspects of barrier free.
- Design Programme prepared by the students should take into account relevant building bye-laws and provision of National Building Code.
- The project should also include all types of building services required for modern buildings.
- Incorporation of structural elements and their details in design.

The list of suggested topics to be covered as design problems:

Major Design Problem:
Sports Complex, Holiday resort, Auditorium(1000 Capacity), Three star Hotel, Bus Terminal.

Minor Design (Time) Problem (12 Hrs.**)**
Skill Development Center, Museum, SOS village

Viva voce
Final Viva-vice on all the design assignments done in the semester

Note: At least one major design exercise and one minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the problems.

References:

1. S. Unwin, *Analysing Architecture*, 5th ed. London: Routledge, 2020.
2. E. Neufert and P. Neufert, *Architects' Data*, 4th ed. Oxford: Wiley-Blackwell, 2012.
3. F. D. K. Ching and C. Binggeli, *Interior Design Illustrated*, 3rd ed. Hoboken, NJ: John Wiley & Sons, 2012.
4. M. Carmona, T. Heath, T. Oc, and S. Tiesdell, *Public Places, Urban Spaces: The Dimensions of Urban Design*, 2nd ed. London: Routledge, 2010.
5. C. Alexander, S. Ishikawa, and M. Silverstein, *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press, 1977.
6. K. Lynch, *The Image of the City*. Cambridge, MA: MIT Press, 1960.
7. K. Yeang, *EcoDesign: A Manual for Ecological Design*. London: Wiley-Academy, 2006.
8. E. Mazria, *The Passive Solar Energy Book*. Emmaus, PA: Rodale Press, 1979.

Course Outcomes:

- Analyze the functional relationship between the proposed activities and ancillary functions needed.
- Conceptualize the structural aspects.
- Design spaces fulfilling the services requirement.
- Visualize and understand the provisions given in building bye-laws and regulations.
- Integrate the special requirements like barrier free aspects.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	4	-	2	2	2	-	-	-	-	3	3
CO2	2	1	1	1	-	1	2	2	-	-	-	-	2	1
CO3	2	2	1	1	-	2	2	2	-	-	-	-	2	2
CO4	3	2	3	2	-	2	2	2	-	-	-	-	3	2
CO5	3	3	3	3	-	3	3	3	-	-	-	-	3	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 9 & 11	
SDG 9: *Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation* SDG 11: *Make cities and human settlements inclusive, safe, resilient and sustainable*	
SDG Justification:	
This course addresses the issues like urban housing, climate-responsive urban form, walkability, and inclusive design with projects emphasizing upon urban-scale thinking, livable cities, public spaces.	

AAR324	Working Drawings	L	T	ST	J	C
SDG No.		1	0	5	0	6

Course Description:

This course focuses on the preparation of comprehensive working drawings essential for construction execution and municipal approvals. It emphasizes precision in the representation of architectural intent through plans, sections, elevations, schedules, and detailing. The course trains in manual and mechanical drafting techniques and introduces technical documentation for various building components such as structure, services, furniture, and equipment. Integration of architectural detailing with structural and service elements is emphasized. The course culminates in a complete set of municipal submission and working drawings conforming to professional and regulatory standards.

Course Objectives:

- To enable students to understand the basics in working drawings, study of process and symbols, labelling and dimensioning of working drawings.
- To enable students to understand and appreciate the challenges in construction detailing and to train them in the aspects of detailing buildings with allied requirements namely structure, furniture, parking, fittings & equipment along with the installation methods.
- To equip students with the knowledge and skills required for preparing comprehensive construction documentation suitable for municipal approvals and on-site execution.
- To foster an appreciation for precision, clarity, and adherence to professional codes and regulatory frameworks in the preparation of working drawings.
- To enhance students' proficiency in detailing interior components such as furniture, fixtures, and equipment, building services like water supply, and sanitation along with their respective installation techniques.

Mode of Drawings: Manual and Mechanical.

- Layout plan of the whole building and excavation plan of one building
- Foundation plan
- Floor plans along with schedule of internal finishes
- Terrace / roof plan including roof drainage
- All 4 side elevation with labelling
- Minimum 2 sections including one through staircase.
- Door, window and hardware schedule.
- Municipal Submission Drawings.O. Wakita, The Professional Practice of Architectural Working Drawings, New Jersey: John Wiley & Sons Inc, 2017.
- Bureau of Indian Standards, National Building Code of India 2016, New Delhi: Bureau of Indian Standards, 2016.

References:

1. Bureau of Indian Standards, National Building Code of India 2016, New Delhi: Bureau of Indian Standards, 2016.

2. E. Allen, Architectural Detailing: function, constructibility, aesthetics, New Jersey,: Wiley, 2016.
3. S. Emmitt, Principles of Architectural Detailing, Oxford: Oxford Blackwell Publishing, 2004.
4. D. Plunkett, Construction and Detailing for Interior Design, London: Laurence King Publishing Ltd. , 2015.
5. T. Ryan, Detailing for Landscape Architects : aesthetics, function, constructibility, London : John Wiley & Sons, Inc. , 2011.
6. O. Wakita, The Professional Practice of Architectural Working Drawings, New Jersey: John Wiley & Sons Inc, 2017.

Course Outcomes:

- Draw the residential floor plans with column placement.
- Draw the centre line of the column layout with respect to floor plan
- Draw the excavation/foundation plan with respect to the column layout
- Draw the detailed elevations and sections of the given floor plan
- Prepare a Municipal submission drawing as per the prescribed format.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	2	3	1	1	1	1	1	1	3	1	2	2	3
CO2	3	2	3	1	1	3	3	1	3	3	2	2	3	3
CO3	3	2	3	1	1	3	3	1	3	3	2	2	3	3
CO4	3	2	3	1	1	3	3	1	3	3	2	2	3	3
CO5	2	3	3	1	1	2	2	1	3	3	2	2	2	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement:8	
SDG 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
SDG Justification:	
The built environment interacts with decent work and economic growth on both a planning level and on a building level	

AAR304	Building Economics and Sociology	L	T	ST	J	C
SDG No. 8, 10		3	0	0	0	3

Course Description:

This interdisciplinary course introduces the fundamental principles of micro and macroeconomics and their influence on national development, especially in the context of large-scale and socially impactful projects. It examines key economic factors such as demand, supply, market structures, public goods, national income, and fiscal policies relevant to the built environment. The course also explores core sociological concepts including social structures, institutions, urban and rural dynamics, and factors influencing social change. Emphasis is placed on understanding the relationship between economics, sociology, and architecture, particularly in shaping housing, neighborhoods, and community decision-making processes.

Course Objectives:

- Introducing fundamentals of micro and macro economics, their effect on national development.
- To sensitize various economic aspects and financing related to large-scale, social projects.
- To study sociological concepts, social structure, and character of life in urban and rural India.
- To understand decision-making processes in society and their impact on social change.
- To understand how biological, technological, and cultural changes influence housing, neighborhoods, and community decision-making processes

ECONOMICS:

UNIT 1

Micro Economics: The market, budget constraint, choice, demand and supply, concept of demand factors for building, uncertainties, equilibrium, technological constraints, profit maximization and cost minimization, monopoly and oligopoly, production welfare and public good.

Macro Economics: Gross Domestic Product (GDP),Gross National Product (GNP), Net National Product (NNP), demand and supply, inflation, interest rate, employment, saving and investment, monetary and fiscal systems and policies.

UNIT 2

General discussions on various economic issues such as public versus private participation, equity, labour intensive versus capital intensive projects.

General economics of the basic inputs into building construction- land, labour, capital and materials. Financing for projects, sources costs and utility in financing. Agencies and institutions directly and indirectly influencing economic aspects of project.

SOCIOLOGY:

UNIT 3

Definition, scope and use of sociology. Relation between sociology and architecture and its application.

Basic concepts of sociology: society, groups, community, association, institution, culture, civilization and personality in terms of their characteristics and types.

UNIT 4

Social structure of India: Caste and class, family and marriage, their characteristics.
Rural and Urban societies – their characteristics, features and problems like crime, slum and poverty.

UNIT 5

Social change: Biological, technological and cultural factors of social change.

Social aspects of housing and neighborhoods in the context of changing society and growing population.

Structure of decision making processes related to community projects.

References

1. A. Rapoport, *House Form and Culture*. Prentice-Hall, Englewood Cliffs, NJ, 1969
2. Wallis, Wilson D and Willey, M.M, *Textbook of Sociology*, 1st ed., KhelSahitaya Kendra, New Delhi, 2001.
3. Bilton, Tony and Oth. *Introductory Sociology*, 3rd ed. Palgrave, New York, 1997.
4. Stone, P.A. *Building Economy: Design Production and Organisation a synoptic view*, 2nd ed., Pergamon Press, Oxford, 1976.
5. Koutsoyiannis, A.*Modern Microeconomics,* 2nd ed., ELBS with MacMillan Press, 1994.
6. Nobbs, Jack and Hopkins, Ian. *Economics: a core text*, 4th ed. McGraw-Hill, London, 1995.
7. Teck, HoonHian and Oth.*Economics: theory and applications*, McGraw-Hill, Taiwan, 1998.
8. Dewett, K.K.*Modern Economic Theory*, ShyamLal Charitable trust, New Delhi, 2005.

Course Outcomes:

- Clarity about various aspects of society and their effect on the economic development of the nation.
- Deeper understanding about the sociological aspects of a society on architecture of that place.
- To develop adaptability to identify the changing needs of the society with time and context.
- Clarity about different types of economy of a country.
- Understanding of relation between sociology and economics.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	1	3	1	1	1	1	2	3	2	3
CO2	3	3	3	2	1	3	2	2	2	2	3	3	3	3
CO3	3	2	3	2	1	3	2	1	2	1	2	3	1	2
CO4	3	2	3	2	1	3	2	1	1	1	1	3	2	2
CO5	3	2	3	2	2	3	2	2	1	2	1	3	2	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 8 and 10	
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all *SDG 10: Reduce inequality within and among countries*	
SDG Justification: They highlight the importance of integrating economic viability, social equity, environmental responsibility, and innovative practice in both the economic and sociological aspects of project planning, building design, construction, housing, and community development	

ARR342	Barrier Free Architecture	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Description

This course introduces the principles of Universal Design with a focus on creating barrier-free environments that are accessible to all, including persons with disabilities. It explores various types of disabilities, mobility aids, and the physical and sensory barriers that impact accessibility. Emphasis is placed on understanding construction and maintenance standards, modern building bye-laws, and access provisions in different building typologies. The course covers the design of accessible elements both within and outside buildings, such as entrances, toilets, circulation spaces, kerbs, public facilities, and signage. Practical exposure is provided through accessibility audits at building, site, and neighborhood levels, promoting inclusive design strategies without economic burden.

Course Objectives:

- Develop orientation to understand types of disabilities, barriers, mobility devices and Principles of Universal design.
- Introduction to the fundamentals of construction and maintenance standards, classification of buildings and access controls for barrier free environment.
- Understanding of design elements within buildings, entrance, exit, approach to plinth, corridors, toilets, staircase, lifts, flooring materials, etc to create Universal accessibility.
- Understanding of design elements outside buildings, site, parking, entrance, kerb, road crossings, public toilets, signage's etc to create universal accessibility.
- An insight into modern building bye-laws in making Built environment Barrier Free and Accessible to all.

UNIT 1

Types of disability, mobility devices and controls.

UNIT 2

Construction and maintenance standards, classification of buildings and access provisions. Provisions in residential building, auditorium, parks, restaurants, railway station. Modern building bye-laws.

UNIT 3

Design elements within buildings, site planning, parking, approach to plinth levels, corridors, entrance and exit, windows, stairways, lifts, toilets, signage, guiding and warning systems, floor materials.

UNIT 4

Design elements outside the building – kerb at footpath, road crossing, public toilet, bus stop, toilet booth, and signage.

UNIT 5

Accessibility audit & its importance. Conducting accessibility audit at building, site and

neighborhood level.

References:

1. S. P. Harkness and J. N. Groom, *Building Without Barriers for the Disabled*. New York, NY, USA: Whitney Library of Design, 1976
2. R. M. Goldenson, Ed., *Disability and Rehabilitation Handbook*. New York, NY, USA: McGraw-Hill, 1978.

Course Outcomes:

- The general goal of the course is to overcome, as much as possible, the disability's effects and to enable the disabled to participate in all areas, so as to ensure the specific environment created are suitable for all categories of people.
- The course gives a direction to a well-designed environment which is safe, convenient, comfortable, and readily accessible which benefits everyone.
- It inculcates accessibility programs that include good facility design.
- The course inculcates broad-spectrum approaches that avoid stigmatizing or discriminating against persons with disabilities.
- The course also strengthens the fact that BARRIER FREE DESIGN or UNIVERSAL DESIGN or DESIGN FOR ALL, can be achieved without economic burden.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	3	1	3	3	3	-	2	-	3	2	2
CO2	3	3	3	3	1	3	3	3	-	2	-	3	2	2
CO3	3	3	3	3	1	3	3	3	-	2	-	3	2	2
CO4	3	3	3	3	1	3	3	3	-	2	-	3	2	2
CO5	3	3	3	3	1	3	3	3	-	2	-	3	2	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 3, 5	
SDG 3: Ensure healthy lives and promote well-being for all at all ages *SDG 5: Achieve gender equality and empower all women and girls*	
SDG Justification: The course equips students to implement and advocate for built environments that are accessible, equitable, and contribute to a more inclusive and sustainable society.	

AAR344	Vernacular Architecture	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Description

This course explores the evolution, diversity, and significance of vernacular architecture as a culturally and environmentally responsive design tradition. Emphasizing traditional building methods, spatial planning, and material use, the course introduces students to vernacular architecture as both a process and a product rooted in local context. Topics include climate-responsive design strategies, construction techniques, symbolism, and cultural expressions embedded in vernacular forms. Global case studies—ranging from igloos to Japanese ken systems—are studied alongside Indian examples, highlighting regional variations and the impact of Western and colonial influences on indigenous architecture and settlement patterns. The course promotes a holistic understanding of sustainability, identity, and community in architectural traditions.

Course Objectives:

- Introduction to vernacular Architecture, its evolution, process, methodology and overview to cultural and contextual responsiveness of vernacular architecture.
- An understanding into climate responsive vernacular architecture.
- An insight into planning and construction aspects in vernacular settlements.
- An overview of vernacular architecture in various regions of the world and India.
- To understand Western and colonial impacts on Indian vernacular architecture and regional settlement patterns.

UNIT 1

Introduction to Vernacular architecture: Evolution of traditional shelter forms, Vernacular architecture as a process – Survey and study of vernacular architecture: methodology- Cultural and contextual responsiveness of vernacular architecture: an overview

UNIT 2

Climate responsive Vernacular architecture: Traditional examples from hot and dry climates, cold climates, warm and humid climates and composite climates.Examples like the Igloo, Taos and Acoma Pueblo buildings. Sustainability in Vernacular Architecture.

UNIT 3

Planning and Construction Aspects: Influence of Spatial planning in vernacular settlements, cultural aspects, symbolism, colour, art, materials of construction and techniques of construction in vernacular buildings.

UNIT 4

Vernacular architecture in various regions of the world: underground dwellings in China and Troglodyte buildings and earth sheltered building. Proportioning systems such as Ken in Japanese Vernacular Architecture Significance of religion in the shaping of vernacular settlements and buildings.Role of Vastu shastra and FengShui.

UNIT 5

Vernacular architecture India: Western influence on vernacular architecture in India, Colonial influence on traditional houses Goa and the evolution of traditional bungalows. Vernacular settlement patterns of homogenous communities such as fishing settlements etc. Examples of vernacular architecture from different states in India.

Recommended books:

1. Paul Oliver, *Encyclopedia of Vernacular Architecture of the World*, Cambridge University Press,1997.
2. Amos Rapoport, *House, Form & Culture*, Prentice Hall Inc. 1969.
3. R W Brunskill, *Illustrated Handbook on Vernacular Architecture*, 1987.
4. V.S. Pramar, Haveli, *Wooden Houses and Mansions of Gujarat*, Mapin Publishing Pvt. Ltd.,Ahmedabad, 1989.
5. Kulbushanshan Jain and Minakshi Jain, *Mud Architecture of the Indian Desert*, AadiCentre,Ahmedabad 1992.63
6. G.H.R. Tillotsum, *The tradition of Indian Architecture Continuity, Controversy and Change since 1850*, Oxford University Press, Delhi, 1989.
7. S. Muthiah, Meenakshi Meyappan, and Visalakshi Ramaswamy, *The Chettiar Heritage*. Chettiar Heritage, Chennai, 2000
8. B. Rudofsky, *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*. University of New Mexico Press, 1987.

Course Outcomes:

- To understand the evolution of vernacular shelter forms through times
- To understand different vernacular built forms in response to different climatic conditions
- To understand the Influence of Spatial planning in vernacular settlements
- To understand the variety of vernacular architecture with respective to cultural differences around the world
- To understand the Western influence on vernacular architecture in India

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	1	-	-	3	1	-	-	-	-	3	1
CO2	3	3	3	2	-	-	3	1	-	-	-	-	3	2
CO3	3	3	3	1	-	-	3	2	-	-	-	-	3	1
CO4	3	3	3	3	-	-	2	1	-	-	-	-	3	2
CO5	3	3	3	3	-	-	2	1	-	-	-	-	3	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
SDG No. & Statement: 9	
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
SDG Justification: These goals underscore the course's central theme: using the wisdom of vernacular traditions to build resilient, resource-efficient, culturally vibrant, and environmentally sensitive environments, supporting sustainable development across environmental, social, and economic dimensions.	

VII Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR403	**Advanced Services**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR461	**Research Methodology and Seminar**	1	2	0	0	3	100	-	100	B1 (Viva)
03	AAR463	**Architectural Design - V**	1	0	7	0	8	200	200	400	C2 (Jury)
04	AAR419	**Introduction to Human Settlements & Town Planning**	3	0	0	0	3	50	50	100	A1 (03 Hrs)
05	AAR465	**Building Information Modelling**	0	0	3	0	3	100	-	100	B1 (Viva)
06		**Elective Basket I**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR471	Introduction to Architectural Conservation									
	AAR473	Innovative Approaches in Interior Design									
	AAR475	Elements of Landscape Architecture									
	AAR477	Fundamentals of Circular Economy in Architecture and Construction									
07		**Elective Basket II**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR481	Computational Design and Digital Fabrication									
	AAR483	Fundamentals of Net zero in Built environment									
	AAR485	Building Construction Planning and Scheduling									
	AAR487	Urban Design Theory									
		Total	**10**	**4**	**12**	**0**	**26**	**600**	**400**	**1000**	
		Total Hrs/Week	**26**								

L- Lecture; T- Tutorial; St - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

AAR403	Advanced Services	L	T	ST	J	C
SDG No. 7,9 and 11		3	0	0	0	3

Course Description:

This course introduces advance building services, including fire safety systems, electronic communication networks, and specialized hospitality services. It covers the design and operation of swimming pools, waste management practices, and sustainable energy solutions. Students will also explore advanced systems required in high-rise buildings, such as vertical transportation, electrical distribution, and gas supply networks. The course emphasizes practical integration of safety, efficiency, and environmental responsibility in building design.

Course Objectives:

- To introduce fire safety systems & its design in buildings.
- To familiarize about various electronic systems for safety & communication in Buildings.
- To introduce the parts,design and functioning of swimming pools in a built environment along with specialised hospitality services .
- To sensitize students with Environmental management issues in buildings.
- To orient students on Special Services necessary in High rise Buildings.

Unit 1

Fire Safety in buildings: portable fire fighting equipment, NBC standards, built in wet riser system, sprinkler system, fire hydrant, class of fire and occupancy, Fire safety design, planning for fire protection, Fire detection & fire fighting, Different firefighting methods to be adopted in buildings.

Unit 2

Electronic Systems in Buildings: Telephone and communication, networks in buildings EPABX, Security systems, Burglar alarms, video surveillance, access control, design of computer labs, access flooring, server rooms, DTH Internet and Television Network.

Unit 3

Swimming Pools: Pool tank design, patio, finishes, Water circulation, cascades, channels, filtration and water treatment, Water quality and disinfection, balancing tank.

Hotel services: Specialty services required for hospitality industry, Laundry services, Kitchen services, Channeled Music, Internet.

Unit 4

Environmental services: waste generation in buildings, various types of waste, solid, liquid, gas, treatment and disposal facilities, waste management in hospital buildings. Recommendations as per Eco-Niwas Samhita 2021.

Alternative energy sources for buildings: hot water solar energy system, applications of photo voltaic cells, biomass digesters, wind energy.

Unit 5

Special services in High rise buildings: vertical transportation, plumbing and sanitary systems, Lightning arresters, Electrical distribution, Garbage Chutes, Cooking gas distribution in High- rise buildings.

References:

1. P. Negi, V. Gupta, and S. C. Srivastava, “Integration of Industry 4.0 Technologies in Fire and Safety Management,” *Fire*, vol. 7, no. 10, Art. no. 335, 2024.
2. R. Djehaiche, M. Nait-Sidi-Moh, A. Lakas, and M. Benali, “Adaptive Control of IoT/M2M Devices in Smart Buildings using Heterogeneous Wireless Networks,” *arXiv preprint arXiv:2302.00000*, Feb. 2023.
3. S. Constantinou, K. Fokaides, and C. Christodoulides, “A review on technological and urban sustainability perspectives of advanced building-integrated photovoltaics,” *Energy Science & Engineering*, vol. 12, no. 3, pp. 1265–1293, Dec. 2023.
4. X. Wang, Y. Zhang, and H. Li, “A review on building-integrated photovoltaic/thermal systems for green buildings,” *Applied Thermal Engineering*, vol. 229, Art. no. 120607, Jul. 2023.
5. P. N. Nayan, R. Shah, and K. Patel, “Impact Analysis of Rooftop Solar Photovoltaic Systems in Academic Buildings,” in *Intelligent Computing and Optimization*, LNNS, vol. 852, Springer, Cham, Dec. 2023.
6. S. V. Ganesh, V. Suresh, and S. G. Barnabas, “Innovative solid waste management strategies for smart cities in Tamil Nadu: challenges, technological solutions, and sustainable prospects,” *Applied Sciences*, vol. 6, no. 660, 2024.
7. Bureau of Energy Efficiency, *Eco-Niwas Samhita 2021 – Code Compliance and Part-II: Electro-Mechanical and Renewable Energy Systems*, New Delhi, India: Ministry of Power, Govt. of India, 2021.
8. Y. Wang, C. H. Li, and X. L. Tian, “Review on Electrical Installations and Lightning Protection Measures for High-rise Building,” *World Construction*, vol. 6, no. 1, Art. 81, 2024.

Course Outcomes:

- Students would be able to understand about fire safety systems & its design in buildings.
- Students would be familiar about various electronic systems for safety & communication in buildings.
- Students would understand about various elements in the design of swimming pools in built environment and its allied services through site visit.
- Students would be familiar about the specialty services required in various category of hospitality industry.
- Students would be aware about environmental management issues in buildings and special Services necessary in High rise Buildings.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	1	1	1	-	-	-	-	-	-	-	2	2
CO2	3	2	1	1	1	-	-	-	-	-	-	-	2	2

CO3	3	2	1	1	1	-	-	-	-	-	-	-	2	2
CO4	3	2	1	1	1	-	-	-	-	-	-	-	2	2
CO5	3	2	1	1	1	-	-	-	-	-	-	-	2	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 20-May-22 (15th BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 7,9 and 11. The course supports the global goals of creating **safe, resilient and sustainable buildings and cities** by promoting **innovative infrastructure**, smart and efficient building systems and the **use of clean and reliable energy** solutions for the built environment.	
SDG Justification: The **Advanced Services** course supports sustainable development by integrating design and technological solutions that enhance the **safety, efficiency and sustainability** of buildings. It promotes: ● **Urban resilience and safety** through fire protection systems, high-rise building services, and environmental management (SDG 11). ● **Innovation and smart infrastructure** by introducing IoT-based systems, communication networks, and automation in building operations (SDG 9). ● **Clean and renewable energy adoption** via solar heating, photovoltaic systems, and Eco-Niwas Samhita 2021 compliance (SDG 7).	

AAR461	Research Methodology and Seminar	L	T	ST	J	C
SDG No. 4 and 9		1	2	0	0	3

Course Description:

This course introduces the fundamentals of research in architecture, covering research design, data collection, and analysis techniques. Students will learn to identify appropriate research methods, evaluate data sources, and apply tools for literature review, plagiarism checks, and manuscript formatting. Emphasis is placed on writing and structuring research papers to meet academic publication standards.

Course Objectives:

- Introduce the fundamental concepts and importance of research in architecture.
- To understand different types of research techniques and choose the appropriate method suitable for the research
- To acquire the skills of data collection from primary and secondary sources.
- To acquire skills of organizing research and using manuscript writing tools.
- To acquire manuscript writing according to the journal requirements.

Unit 1: Introduction to Research:

- Definition, Basic research issues and concepts,
- Orientation to the research process,
- Elements of Research (Research Question/Hypothesis,
- Aim, Objectives, Methods, (Scope/Limitations, Result & Findings, Future Scope).

Unit 2: Types of Research:

- Basic, Applied, Empirical and Theoretical research
- Classification of research on Methodology (Quantitative, Qualitative, Mixed)
- Classification of research on Nature (Descriptive, Exploratory, Experimental)
- Classification of research on Data Collection (Survey, Case study, Longitudinal, Cross-sectional)
- Classification of research on Environment (Field, Laboratory)

Unit 3: Data Collection in Research:

- Different methods of Primary (Quantitative & Qualitative)
- Secondary Data Collection (Databases, Journals, Academic studies, Reports, Feedback)
- Reliability and Validity of research
- Problems encountered in data collection from primary and secondary sources.

Unit 4: Tools and techniques for Research:

Tools and techniques for Research: Data analysis (Excel, SPSS), Literature review (Mendeley, EndNote), Plagiarism check (Turnitin, Grammarly), Writing & Formatting – LaTeX, Microsoft Word, Google Docs.

Unit 5: Report Writing:

Structuring the manuscript, Finding an appropriate journal for publication, Journal requirements

of manuscript, and Journal Referencing styles.

References:

1. M. U. Hensel and F. Nilsson, *The Changing Shape of Practice: Integrating Research and Design in Architecture*. London, UK: Routledge, 2016.
2. E. D. Niezabitowska, *Research Methods and Techniques in Architecture*. New York, NY: Routledge, 2018.
3. M. Fraser, *Design Research in Architecture: An Overview*. New York, NY: Routledge, 2016.
4. L. Groat and D. Wang, *Architectural Research Methods*, 2nd ed. Hoboken, NJ: Wiley, 2013.
5. J. Gehl, *Cities for People*. London, UK: Island Press, 1936.
6. L. Groat and D. Wang, *Architectural Research Methods*, 2nd ed. Hoboken, NJ, USA: Wiley, 2013.
7. R. Lucas, *Research Methods for Architecture*. London, UK: Laurence King Publishing, 2016.
8. "Peer Reviewed Journals in Architecture, Planning, Built Environment," GITAM University Library. [Online]. Available: https://library.gitam.edu/resources.php#Databases

NB: The above books are general that help; however, the student has to choose books based on the individual area of research

Course Outcomes:

- Understand research concepts, processes, and literature review to formulate research questions and objectives.
- Identify and apply suitable research methodologies based on purpose, methodology, nature, and data collection.
- Acquire data collection, validation, and analysis skills while addressing reliability challenges.
- Use digital tools for data analysis, literature management, plagiarism detection, and research writing.
- Master research writing, structuring reports, proper referencing, and formatting for manuscript publication.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	3	3	3	3	-	-	-	3	-	-	3	2	3
CO2	-	-	3	3	3	-	-	3	-	-	-	-	1	2
CO3	-	-	-	-	-	-	-	-	3	-	3	-	2	3
CO4	-	-	-	-	-	-	-	-	3	-	3	-	2	3
CO5	-	-	-	-	-	-	-	-	-	3	-	-	2	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 4 & 9	
The course introduces students to the fundamentals of architectural research design, data collection, analysis, and academic writing. The course equips students with theoretical ideas and practical skills needed to conduct a research study and publish a scholarly article.	
SDG Justification:	
The course supports **UN SDG 4 (Quality Education)** by fostering critical thinking, research literacy, and academic writing skills that enhance higher education outcomes in architecture. It also aligns with **UN SDG 9 (Industry, Innovation, and Infrastructure)** by promoting research-led innovation and evidence-based design, essential for developing sustainable and resilient architectural solutions.	

AAR463	Architectural Design V	L	T	ST	J	C
SDG No. 11& 13		1	0	7	0	8

Course Description:

Architectural Design V focuses on complex site planning involving multiple buildings, emphasizing spatial-functional relationships, climatic responsiveness, user behavior, and inclusive design. Through major and minor design problems such as group housing, campus planning, or mixed-use developments, students explore the integration of structural elements, advanced building services, and barrier-free measures. The course trains students to incorporate applicable building byelaws and National Building Code standards in their design proposals. Emphasis is placed on understanding site context, service integration at micro and macro scales, and preparing comprehensive design outputs including models. A final viva voce assesses overall design synthesis, technical understanding, and contextual responsiveness.

Course Objectives:

- To introduce and impart training in understanding the process of site planning having multiple buildings scenario.
- To sensitize about the importance of functional relationships of spaces and their influence on social and climatic aspects on macro level of the built environment.
- To introduce and create awareness about various building services required for modern & more complex services-oriented buildings at micro and macro level.
- To impart training about various structural elements, user-behavior aspects, and barrier-free measures in the design of built environment.
- To introduce about applicable building byelaws and their impact on architectural design.

The design issues to be addressed:

- Design theory and application in more complex problems covering functional relationship, climatic condition, behavioral aspects.
- The project should include basic structural elements, barrier free measures etc.
- The project should also include all types of building services required for modern buildings at micro and macro level.
- Design Program prepared by the students should take into account relevant building bye-laws and provision of National Building Code

The list of suggested topics to be covered as design problems:

Main Design Problem

Campus Planning, Group Housing, Mixed use occupancy buildings, Specialist Hospital, Convention Center, Shopping Mall cum Multiplex, etc.

Minor Design (Time) Problem (15 hrs.)

Any internal block of Major Design Exercise to be detailed out in Minor Design (Time Problem)

Viva voce.

Final Viva-vice on all the design assignments done in the semester. Note: At least one major design exercise and one minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the problems.

Note: At least one major design exercise and one minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the problems.

References:

1. F. D. K. Ching, *Architecture: Form, Space, and Order*, 4th ed. Hoboken, NJ: John Wiley & Sons, 2014.
2. J. De Chiara, J. Panero, and M. Zelnik, *Time-Saver Standards for Building Types*, 4th ed. New York: McGraw-Hill, 2011.
3. K. Lynch, *The Image of the City*. Cambridge, MA: MIT Press, 1960.
4. N. J. Habraken, *The Structure of the Ordinary: Form and Control in the Built Environment*. Cambridge, MA: MIT Press, 1998.
5. V. Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism*, Updated ed. Princeton, NJ: Princeton University Press, 2015.
6. S. V. Szokolay, *Introduction to Architectural Science: The Basis of Sustainable Design*, 3rd ed. London: Routledge, 2014.
7. W. Preiser and E. Ostroff, *Universal Design Handbook*, 2nd ed. New York: McGraw-Hill, 2001.
8. Bureau of Indian Standards, *National Building Code of India 2016*. New Delhi: BIS, 2016.

Course Outcomes:

- Students are trained in the process of site planning having multiple buildings scenario.
- Students can assess the importance of functional relationships of spaces and their influence on social and climatic aspects on macro level of the built environment.
- Students can explain about various structural and about various building services required elements, user-behavior aspects and barrier-free measures and their impact on the design of built environment.
- Students are familiar about applicability of relevant building byelaws and their impact on architectural design.
- Students will demonstrate through design their understanding of site context, site zoning, climate responsiveness, building services & applicable codes.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO2	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO3	3	3	3	2	2	2	3	1	3	2	1	2	2	2
CO4	3	2	3	2	2	2	3	1	3	2	1	2	2	2
CO5	3	3	3	2	2	2	3	2	3	2	1	2	2	1

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 11	
SDG 11 – Sustainable Cities and Communities Make cities and human settlements inclusive, safe, resilient, and sustainable. **SDG 13 – Climate Action** Take urgent action to combat climate change and its impacts.	
SDG Justification:	
SDG 11 – Sustainable Cities and Communities: The course fosters inclusive, safe, and community-oriented urban design through climate-responsive, byelaw-compliant, and socially sensitive multi-building planning. **SDG 13 – Climate Action:** The course emphasizes climate-responsive design and resource-efficient planning, reducing environmental impact in the built environment.	

AAR419	Introduction to Human Settlements & Town Planning	L	T	ST	J	C
SDG No. 11		3	0	0	0	3

Course Description:

This course provides a foundational understanding of the evolution, structure, and dynamics of human settlements, focusing on their growth and decay across time. It traces the development of town planning in India, from ancient civilizations like Harappa and Dholavira to modern planned cities such as Gandhinagar and Naya Raipur. Students will explore key planning concepts, terminologies, and the hierarchical levels of planning as per national guidelines. The course delves into historical and contemporary planning theories, including the Garden City, City Beautiful Movement, and Utopian models, alongside contributions from global pioneers like Le Corbusier. Emphasis is placed on zoning practices, development control regulations, and urban design strategies within the broader context of sustainable and inclusive urban development. Through this course, students gain a critical perspective on the principles, tools, and challenges that shape town planning in India and beyond.

Course Objectives:

- To introduce the process of human settlements growth & decay.
- To study the history of the Indian Town Planning system from ancient times to Post independence Era.
- To introduce the concept of town planning and its process of preparation.
- To study and understand the implications of various planning concepts and theories.
- To study the zoning & development control regulations at various levels of planning.

Unit 1: Introduction to Human Settlements:

Introduction to Evolution of human settlements- man, environment and built structure. Factors affecting the settlement. Characteristics of settlements. Growth patterns. Introduction to rural and urban settlements, Settlement patterns. Birth of early and medieval cities: Egyptian, Roman, Florence-Renaissance. Short introduction to factors leading to the decay of settlements and a brief theories related to settlement by- Luis Mumford, Patrick Geddes and Ekistics by Doxiadis.

Unit 2: History of settlement planning in Ancient, Medieval, and contemporary India:

A short introduction to the ancient systems of town planning in India with respect to Indus valley civilization – Harappa and Dholavira. Town planning principles as per Vastu-shashtra. A brief introduction to the Settlement patterns according to Manasara Shilpashastra. Morphology of pre-medieval to post- independence cities in India –Varanasi, Srirangam, Jaipur, Gandhinagar Lyuten’s Delhi, Naya Raipur.

Unit 3: Introduction to Planning & its Process:

Introduction to terminology of Town planning according to URDPFI guidelines, levels of planning in India, scope and components. Introduction to Urban Settlement and Characters of a town, census definition of urban area. Overview of the concept of master plan, its elements, preparation and implementation, Perspective plans, structure plans, advocacy plans, zonal

plans, Participatory and inclusive planning. Introduction to different types of Survey techniques.

Unit 4: Regional and Metropolitan Planning theories and concepts:

Zoning Theories, City beautiful movement, Garden cities, neighbourhood concept and Radburn city. Utopian Planning theories by FLWright, Soriya Y Mata. Contribution of Le Corbusier to town Planning. Selected examples to include concentric city, radiant city, CIAM, linear industrial city and Chandigarh.

Unit 5: Zoning & Development control:

Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines on land use zoning, land subdivision regulations. Development control, the comprehensive role of urban design in town planning process. Introduction contemporary issues and strategies in urban planning: Urban Sprawl, Urban decay, redevelopment strategies, urban renewal, Transit Oriented Development.

References:

1. J. Radcliffe, An Introduction to Town and Country Planning. London: Hutchinson, 1981.
2. A. B. Gallion and S. Eisner, The Urban Pattern – City Planning and Design. New York: Van Nostrand Reinhold Company.
3. Rangwala, Town Planning. Anand, India: Charotar Publishing House.
4. R. Gowda, Urban and Regional Planning.
5. C. L. Doxiadis, An Introduction to the Science of Human Settlements: Ekistics. London: Hutchinson, 1968.
6. A. Ray, Towns and Cities of Medieval India. New Delhi: Manohar Publishers and Distributors, 2015.
7. D. K. Bubbar, The Spirit of Indian Architecture. New Delhi: Rupa & Co., 2005.
8. A. D. Thomas, Housing and Urban Renewal. Sydney: George Allen and Unwin, 1986.
9. R. S. Sandhu, Sustainable Human Settlements: Asian Experience. Jaipur: Rawat Publications, 2001.
10. Ministry of Housing and Urban Affairs, Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vols. I, II-A, II-B, 2014. [Online]. Available: http://moud.gov.in/URDPFI

Course Outcomes:

- Understand the factors influencing the origin, growth and decay of human settlement.
- Ability to understand the factors influencing morphology of town forms from ancient to post independence times in India.
- Ability to understand and analyze the concept of preparation of master plan for a town and its comprehensive process in the formulation and implementation.
- Ability to understand and review various planning concepts and theories and respective implications in case examples across the globe.
- Ability to understand, analyze and review zoning and developmental control regulations in the process of town planning. Be able to identify and analyze contemporary planning issues and applicable strategies to deal with.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02

CO1	3	3	2	2	2	3	2	3	2	3	2	3	3	2
CO2	3	3	2	2	2	3	2	3	2	2	1	3	3	1
CO3	3	3	2	3	2	3	3	3	3	3	3	3	3	2
CO4	3	3	2	2	2	3	2	3	2	3	2	3	3	2
CO5	3	3	2	3	2	3	3	3	3	3	3	3	3	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. : 11	
SDG Statement : Make cities and human settlements inclusive, safe, resilient and sustainable.	
SDG Justification:	
This curriculum holistically supports **SDG 11** by: Promoting historical and theoretical understanding of human settlements. Encouraging inclusive, participatory, and culturally informed planning. Equipping learners with tools to manage urban growth, redevelopment, and sustainable infrastructure. Supporting urban resilience, heritage conservation, and environmental sustainability.	

AAR465	Building Information Modelling	L	T	ST	J	C
SDG No. 9		0	0	3	0	3

Course Description:

This course introduces Building Information Modelling (BIM) as a transformative digital approach to architectural design, documentation, and visualization. It covers the evolution of BIM, its distinction from conventional 3D CAD, and its applications in sustainable and efficient building practices. Students will gain hands-on experience with BIM software platforms, learning to model building components, manage design data, and create detailed drawings and presentations. Emphasis is placed on using BIM for material applications, lighting configurations, and realistic renderings to support innovative and sustainable design solutions.

Course Objectives:

- To introduce the concept of Building Information Modelling (BIM) and its application.
- To discuss about the role and impact of BIM in Design.
- To train on the BIM software tools for design of architectural projects.
- To explain building elements and modeling techniques in BIM.
- To enable students to create realistic renderings, material applications, lighting configurations, and visual presentations for architectural design using BIM.

Unit 1

Introduction to BIM: Definition of BIM, Evolution and development of BIM. BIM Vs. 3D CAD. BIM Modelling basics. Various applications of BIM. BIM Modelling basics.

Unit 2

Introduction to 2D and 3D drafting softwares. BIM platforms and BIM software and tools. Getting familiar to the User Interface and basic operations in BIM software.

Unit 3

Construction of a simple project. Mass and concept modelling. Creating Plans, elevations, sections, details, toposurface etc. Interiors, fixtures, fittings and furniture database. Managing views.

Unit 4

Creating, importing and modifying families of objects and elements. Documentation-Text, callout, dimension, annotation, schedules. Creating , tagging and modifying rooms and areas.

Unit 5

Working with materials and lights in BIM models. Generation of different Views and visualization. Development of various Layouts and preparation of presentations.

References:

1. Kymmel, W. (2007). Building Information Modelling: Planning and Managing construction projects with 4D.

2. Krygiel, E., & Niles, B. (2008). Green BIM: Successful sustainable design with building information modeling. John Wiley & Sons.
3. Issa, R.R., & Olbina, S. (Eds). (2015). Building Information Modelling: Applications and Practices, American Society of Civil Engineers.
4. Duell, R., Hathorn, T, and Hathorn, T.R. (2015). Autodesk Revit Architecture 2016 Essentials. Wiley Publications.
5. C. Eastman, P. Teicholz, R. Sacks, and K. Liston, *BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers*, 3rd ed., Wiley, 2018.
6. R. Garber, *BIM Design: Realising the Creative Potential of Building Information Modelling*, Wiley, 2014.
7. R. Bynum, Building Information Modeling: BIM in Current and Future Practice, Wiley, 2013.

Course Outcomes:

- Understand the concept of Building Information Modelling (BIM) and its application.
- Understand the impact of BIM in Design.
- Make use of BIM families and its application
- Develop the design of projects with BIM software tools.
- Apply material and lighting configurations in BIM to create detailed visualizations and professional presentation layouts for architectural projects.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	1	1	2	3	1	2	3	3	3	3	1	3
CO2	1	1	3	3	2	3	1	1	2	2	2	2	1	3
CO3	1	1	1	1	2	3	1	2	3	3	3	3	1	3
CO4	1	1	3	3	2	3	1	1	2	2	2	2	1	3
CO5	1	1	2	2	3	3	2	2	3	3	3	3	2	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 9 – Industry, Innovation, and Infrastructure **Statement:** The BIM course supports **Sustainable Development Goal 9** by promoting innovation in architectural design and construction practices through digital technologies.	
SDG Justification:	

By incorporating BIM tools and workflows, students are equipped to develop smarter, more efficient building designs that reduce resource waste, enhance coordination, and foster resilient infrastructure. BIM not only streamlines the design process but also supports lifecycle management, which is vital for sustainable and future-ready built environments.

AAR471	Introduction to Architectural Conservation	L	T	ST	J	C
SDG No. 11,15		1	1	1	0	3

Course Descpription:

This course introduces the fundamentals of architectural conservation, focusing on the history, purpose, and evolving practices of preserving built heritage. It explores traditional building materials and construction systems, emphasizing their role in conservation strategies. Students will examine the relationship between architecture, culture, and ecological heritage, understanding how socio-cultural values shape conservation efforts. The course also covers essential documentation and communication techniques used in heritage recording, including field surveys and data collection. Through a hands-on project, students will apply basic documentation methods to analyze and record a historic building, promoting practical learning and appreciation of architectural heritage.

Course Objectives:

- To introduce the history and origin of architectural conservation and its basics.
- To understand the historical building materials and construction practices.
- To emphasize the relevance of socio-cultural and ecological heritage as an integral part of architectural conservation.
- To introduce the basics of heritage documentation and communication techniques.
- To incorporate the idea of learning from the subject into a project through basic documentation techniques.

Unit 1: History of Architectural Conservation

- Introduction to architectural conservation,
- Heritage conservation- need, debate and purpose
- Understanding heritage and types of heritage resources,
- Values and significance

Unit 2: Historic Building Materials and Systems

- Historic building materials- types, physical and structural properties
- Study of historic constructions as found in archaeological sites, identification of building materials, their use and conservation process
- Strength of the materials in relation to the heritage structure
- Workability of building materials like stone, lime, and timber

Unit 3: Cultural and Ecological Heritage

- Definition of culture
- Architecture as a cultural element
- Understanding cultural landscape theories through examples
- Study of few examples explaining the relationship between culture and architecture

Unit 4: Heritage Documentation Techniques I

- Introduction to documentation – need for and importance of documentation
- Available methods of documentation and communication
- Various data collection techniques
- Survey tools selection – preparation for field documentation

Unit 5: Project Documentation

- Study the history of the building
- Collect data from various sources
- Physical and literary documentation of the identified building through preliminary techniques
- Final project presentations

References:

1. Biswas, S.S. Protecting the cultural heritage: National Legislation, 344.094BIS-P and International Conventions,1999
2. Blistene, Bernard, ISBN:9782080105646, History of 20th-centuryArt, Flammarion, 2001, 2. Heath, Kingston Wm, Vernacular Architecture and Regional Design: Cultural., 720.103 HEA Process and Environmental Response,2009 3.
3. Marie Louise Stig Sorensen, John Carman, ISBN:9780415431859, Heritage Studies: Methods and Approaches
4. Bernard Feilden, ISBN: 0750658630, Conservation of Historic Buildings
5. J. Stanley Rabun, ISBN: 978-0-471-31545-2, Structural Analysis of Historic Buildings: Restoration, Preservation, and Adaptive Reuse Applications for Architects and Engineers
6. Stig Sørensen and J. Carman, *Heritage Studies: Methods and Approaches*, London: Routledge, 2009.
7. Feilden, *Conservation of Historic Buildings*, 3rd ed., Oxford: Architectural Press, 2003.
8. Rabun, *Structural Analysis of Historic Buildings: Restoration, Preservation, and Adaptive Reuse Applications for Architects and Engineers*, Hoboken, NJ: Wiley, 2000.

Course Outcomes:

- Understand the need for conservation and its significance in contemporary conditions.
- Understand and assess the relevance of the building materials that were suitable for the historic construction practices.
- Relate the impact of the historic buildings on the socio-cultural and ecological heritage of the place and vice-versa.
- Understand and compile basic documentation for a heritage building.
- Compile a basic documentation of the heritage building, emphasising its history, building materials and techniques, and socio-cultural relevance through a simple documentation.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	-	-	2	-	-	-	-	3	-	-	-	2	1
CO2	2	-	2	-	-	-	-	-	3	-	-	-	2	-
CO3	-	-	-	3	-	-	-	-	3	-	-	-	2	1
CO4	2	3	2	-	-	-	-	-	-	-	-	-	2	-

CO5	-	-	-	-	-	-	2	2	3	-	-	-	-	-

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: **SDG 11 — Make cities and human settlements inclusive, safe, resilient, and sustainable**	
SDG 15 - Protect, restore and promote sustainable use of terrestrial ecosystems...	
SDG Justification:	
Preserving architectural heritage fosters resilient and sustainable urban development by retaining cultural identity and reducing the need for new construction. **Conservation of vernacular landscapes and heritage buildings** supports ecosystem-sensitive development and protects land-based cultural identities.	

AAR473	Innovative Approaches in Interior Design	L	T	ST	J	C
SDG No. 4,11,12		1	1	1	0	3

Course Description:

This course explores modern and forward-thinking practices in interior design, focusing on space planning, ergonomics, color psychology, sustainable materials, and smart technologies. Students will develop creative, user-centered design solutions while gaining exposure to tools like AR/VR and real-world business insights. A hands-on project encourages the integration of personal, cultural, and environmental values into innovative interior spaces.

Course Objectives:

- Develop orientation to understand the profession of interior design, role of interior designer, process, elements, and principles of interior design.
- Introduction to the fundamentals of interior design, interior space planning, and using ergonomics and human dimensions.
- An understanding of colours-symbolism and psychology, interior lighting, indoor landscaping, and accessories.
- Understanding design tools, software, and Virtual and Augmented Reality (AR, VR).
- An insight into the business perspective of interior design.

Unit 1: Introduction to Modern Interior Design

- Understanding transition from past to present trends in Interior design
- Elements of Interior Design and Key principles in modern interior design with case examples.

Unit 2: Sustainable Materials in Interior Design

- Study of sustainable materials used in Interior Design with respect to the functional requirements
- Applications of eco-friendly materials: a case study

Unit 3: Value Integration in Interior Design

- Individuality: Reflecting the personal tastes and preferences of the occupants, application of ergonomics, creating a unique and personalized space.
- Cultural Sensitivity: Incorporating cultural elements and traditions into the design.

Unit 4: Technology Integration in Interior Design

- Smart home technologies for an automated living Environment
- Innovative design tools, software, and Virtual and Augmented Reality (AR, VR).

Unit 5: Project Work

- Designing an innovative interior space using sustainable materials.

References:

1. Archi World Co., *Interior Best Collection: Residence, Commerce, Office, Restaurant Asia I–IV*. Korea: Archi World Co., 2003.
2. A. Friedmann *et al.*, *Interior Design: An Introduction to Architectural Interiors*. New York: Elsevier, 1979.
3. E. W. Miller, *Basic Drafting for Interior Designers*. New York: Van Nostrand Reinhold, 1981.
4. J. Kurtich and G. Eakin, *Interior Architecture*. New York: Van Nostrand Reinhold, 1993.
5. M. P. Rao, *Interior Design: Principles and Practice*, 3rd ed. Delhi: Standard Publishers, 2004.
6. L. Crespi, *Cultural, Theoretical, and Innovative Approaches to Contemporary Interior Design*. Hershey, PA: IGI Global, 2020. [Online]. Available: https://doi.org/10.4018/978-1-7998-2823-5
7. C. Grimley and M. Love, *The Interior Design Reference & Specification Book: Everything Interior Designers Need to Know Every Day*. Beverly, MA: Rockport Publishers, 2018.

Course Outcomes:

- The course teaches students to make thoughtful design choices by considering aesthetics, building technologies, human needs, and ensuring the health, safety, and welfare of the public.
- The course gives the ability for the students to design based on the interrelationship between time, space, user, and functionality.
- The course transforms conceptual design ideas into a detailed solution that considers existing building constraints, user needs, cost, building codes and standards, and a program of spaces.
- It inculcates strong professional communication skills and presents their design ideas and solutions with confidence.
- Students will be globally conscious interior designers.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	2	2	2	2	2	3	2	1	1	1
CO2	2	3	3	2	3	2	2	2	2	3	3	2	1	1
CO3	2	2	3	2	3	2	2	2	2	3	3	2	2	1
CO4	2	2	3	2	2	2	2	2	2	2	2	2	2	1
CO5	3	3	3	2	3	3	3	2	1	3	3	3	1	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 4: Quality Education **Goal:** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	
SDG 11:Sustainable Cities and Communities **Goal:** Make cities and human settlements inclusive, safe, resilient, and sustainable.	
SDG 12: Responsible Consumption and Production **Goal:** Ensure sustainable consumption and production patterns.	
SDG Justification:	
1. The course builds comprehensive professional skills in design, sustainability, and technology, aligned with SDG 4.4 – increasing the number of youth and adults with relevant skills for employment. 2. It incorporates interdisciplinary learning—combining creative, technical, cultural, and business aspects—supporting lifelong learning and professional development. 3. The course emphasizes sustainable materials, ergonomic solutions, and smart technology integration in interior spaces—directly contributing to **SDG 11.3 and 11.7**. 4. Promotes culturally sensitive and user-centered design to enhance well-being and inclusivity in built environments. 5. Students are trained to evaluate and implement eco-friendly materials, low-impact solutions, and sustainable sourcing—supporting SDG 12.2. 6. Encourages thoughtful material choices and waste reduction through design efficiency and reuse, aligned with SDG 12.5.	

AAR475	Elements of Landscape Architecture	L	T	ST	J	C
SDG No. 11		1	1	1	0	3

Course description:

Elements of Landscape Architecture introduces students to the foundational principles of landscape design, emphasizing the integration of natural, socio-cultural, and architectural systems. The course covers historical and contemporary landscape contexts, site analysis techniques, and sustainable practices including green infrastructure and stormwater management. Students gain proficiency in digital tools like GIS and AutoCAD for environmental mapping and design visualization. Through studio-based learning, they conceptualize and develop integrated landscape proposals informed by climate, ecology, and culture. Critical engagement with case studies and participatory methods fosters the ability to evaluate and present resilient, context-sensitive landscape solutions for contemporary urban and ecological challenges.

Course Objectives:

- **Design Fundamentals**: Identify and apply core design principles such as natural, socio-cultural and architectural factors.
- **Environmental Analysis:** Develop skills in site analysis, considering factors like climate, topography, soil, vegetation and hydrology.
- **Sustainable Practices**: Learn to incorporate sustainable and resilient design strategies, including green infrastructure and stormwater management.
- **Digital Proficiency:** Gain hands-on experience with digital tools (e.g., GIS, AutoCAD) for landscape planning and visualisation.
- **Project Development:** Enhance the ability to conceptualise, develop, and present integrated landscape design proposals.

Unit 1: Introduction & Historical Context

- Recollection from semester-V Landscape theory
- Comparative analysis of global and regional landscapes
- Fundamental Design Elements: Key components: topography, water, soil, vegetation and hardscape
- The interplay between built and natural environments

Unit 2: Site Analysis Techniques

- Climate, soil, hydrology, and vegetation assessments.
- Site inventory, mapping, and environmental impact tools.
- Ecological and Sustainable Design: Principles of ecological design and resilience.
- Sustainable practices, including green infrastructure and stormwater management.

Unit 3: Digital Tools in Landscape Architecture

- Introduction to GIS, AutoCAD, and digital visualisation software.
- Practical exercises in digital site mapping and design simulation.
- Conceptual design and iterative development.

Unit 4: Cultural and Social Dimensions

- Understanding cultural landscapes and heritage conservation.

- Community engagement and participatory design strategies.
- Case studies of culturally significant multidisciplinary projects.

Unit 5: Design Development & Contemporary Practice Critique

- Studio project work: initial sketches, design proposals, and peer critiques
- Analysis of current trends, innovative multidisciplinary projects in landscape architecture and developing a skill for appreciative criticism
- Final project presentations and comprehensive critiques

References:

1. I. Hough, *Cities and Natural Process: A Basis for Sustainability*, 2nd ed. London, UK: Routledge, 2004.
2. M. M. McHarg, *Design with Nature*, New York, NY: John Wiley & Sons, 1992.
3. P. Ozawa, *The Portland Edge: Challenges and Successes in Growing Communities*, Washington, D.C.: Island Press, 2004.
4. T. Steiner, *The Living Landscape: An Ecological Approach to Landscape Planning*, 2nd ed., Washington, D.C.: Island Press, 2008.
5. B. Bolstad, *GIS Fundamentals: A First Text on Geographic Information Systems*, 6th ed. White Bear Lake, MN: Eider Press, 2019.
6. D. Fairclough, G. S. Graham, and J. Harrison, *Cultural Landscape and Heritage Values: Stakeholders in the Heritage Process*, London, UK: Routledge, 2008.
7. H. Sanoff, *Community Participation Methods in Design and Planning*, New York, NY: John Wiley & Sons, 2000.
8. S. Swaffield, *Theory in Landscape Architecture: A Reader*, Philadelphia, PA: University of Pennsylvania Press, 2002.

Course Outcomes:

- Articulate the core elements and design principles that underpin landscape architecture.
- Perform comprehensive site analysis that addresses environmental, cultural, and ecological factors.
- Develop and communicate integrated design proposals through both hand-drawn and digital representations.
- Evaluate design solutions for sustainability and cultural sensitivity.
- Critically assess historical and/ or contemporary landscape projects and trends.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	-	-	3	-	-	-	-	3	-	-	-	2	3
CO2	2	3	-	3	-	-	-	3	-	-	-	-	3	2
CO3	2	-	3	-	-	-	-	3	3	-	-	3	3	2
CO4	-	-	-	2	-	-	3	-	-	2	-	-	2	3
CO5	3	3	3	3	2	3	2	2	2	3	3	2	3	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 11: Sustainable Cities and Communities; SDG 13: Climate Action; SDG 9: Industry, Innovation, and Infrastructure	
SDG Justification:	
● The course equips students with the understanding of the evolution of global and regional landscapes, and the balance of built-natural environments, encourages contextual design thinking critical to sustainable urbanism. ● It fosters focus on cultural landscapes and participatory design that embeds social equity and heritage conservation in landscape practice. ● By integrating studio-based learning, critical thinking, and exposure to innovative practice nurture professional skill development and reflective practice among students.	

AAR477	Fundamentals of Circular Economy in Architecture and Construction	L	T	ST	J	C
SDG No.		1	1	1	0	3

Course Description:

This course introduces the principles of the circular economy in the built environment, focusing on material life cycles, ESG (Environmental, Social, Governance) drivers, and sustainable design strategies. Students explore life cycle assessment, modularity, and resource flow management while analyzing global and national policies. Through case studies and practical applications, the course develops skills to design adaptable, durable, and resource-efficient buildings, preparing students to integrate circularity and sustainability into architectural and construction practices.

Course Objectives:

- Introduce and clarify the principles and concepts of circular economy as applied to architecture and construction.
- Develop an understanding of the environmental, social, and governance (ESG) imperatives driving circular practices.
- Equip students with analytical tools to assess material flows, life cycle impacts, and resource efficiency in building projects.
- Encourage innovative design thinking that embraces principles of durability, adaptability, and deconstruction.
- Prepare students to integrate sustainability and circularity into practical architectural and construction solutions.

Unit 1: Introduction to circular economy in architecture and construction

- Definition, core principles, and comparison with linear economy models.
- Global resource depletion, environmental impacts, and sustainability challenges.
- From traditional sustainable practices to modern circular approaches in construction.
- National and international policies that incentivize circular practices.
- Early adopters and landmark projects in circular construction.
- Life cycle thinking, material circularity, and performance indicators.

Unit 2: Principles and strategies for circular design

- Strategies to extend building lifespans and adapt to changing needs.
- Principles of modular design, disassembly methods, and reversible connections.
- Criteria for selecting renewable, recycled, and low-impact materials.
- Integrating resource-saving strategies into design.
- Fundamentals of Life Cycle Assessment (LCA) applied to buildings.
- Exploring biomimicry, regenerative design, and cradle-to-cradle concepts.

Unit 3: Material and resource flow in construction

- Techniques for tracking resource inputs and outputs across the construction process.
- Approaches to reduce, reuse, and recycle construction waste.
- Understanding and calculating the environmental impacts of materials.
- Methods to transform construction waste into valuable resources.
- Quantitative tools and indicators to measure performance.

- Overview of regulatory and financial drivers for efficient resource use.

Unit 4: Economic analysis and business models for circular construction

- Exploring product-service systems, leasing, and performance-based contracts in construction.
- Evaluating the financial viability of circular interventions.
- Mechanisms and instruments for funding sustainable construction projects.
- Identifying and mitigating financial and operational risks in circular projects.
- Role of collaborations in advancing circular economy projects.
- Detailed review of projects where circular business models have succeeded.

Unit 5: Future trends and global perspectives

- Role of digital tools and smart materials in advancing circular practices.
- Comparative analysis of international circular construction projects.
- Strategies for integrating circular economy principles into city planning and infrastructure.
- Identifying barriers to implementation and pathways for overcoming them.
- Forecasting changes in regulation, market forces, and technological innovation.
- Connecting architecture, engineering, and urban planning in the circular economy paradigm.

References:

1. McDonough, W. & Braungart, M.Cradle to Cradle: Remaking the Way We Make Things
2. Webster, K.The Circular Economy: A Wealth of Flows
3. Lacy, P. & Rutqvist, J.Waste to Wealth: The Circular Economy Advantage
4. Murray, A., Skene, K., & Haynes, K.The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context
5. Blomsma, F. & Tennant, R.Circular Economy in the Construction Industry: Exploring Sustainable Possibilities

Course Outcomes:

- Articulate the key tenets of circular economy and explain their significance in modern architectural practice.
- Critically assess construction systems from a circular perspective, including resource utilization and waste management.
- Apply design strategies that enhance building longevity, deconstruction, and material reuse.
- Conduct basic life cycle and embodied energy assessments relevant to circular construction.
- Evaluate the economic and environmental benefits of circular design interventions in case studies and design projects.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	1	1	-	-	3	2	-	-	1	3	2
CO2	3	3	2	2	1	-	-	3	2	-	2	1	3	3
CO3	3	2	2	3	1	-	-	3	2	-	2	-	3	3

CO4	2	3	3	2	1	-	2	3	2	-	2	1	3	3
CO5	3	3	3	2	1	-	2	3	2	-	2	1	3	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG Justification:	

AAR481	Computational Design and Digital Fabrication	L	T	ST	J	C
SDG No. 9		1	1	1	0	3

Course Description:

This course introduces students to the role of computation in architectural design through the use of advanced digital tools like Rhino and Grasshopper. It focuses on parametric and generative design techniques, enabling students to explore complex geometries, spatial logic, and adaptive systems. Students will learn to visualize and integrate data into design workflows, using simulation tools to inform environmental and structural decisions. The course also provides hands-on experience with digital fabrication methods such as 3D printing and laser cutting, guiding students through the process of translating digital models into physical prototypes. A final project challenges students to design and fabricate an architectural model using computational strategies.

Course Objectives:

- To understand the role of computation in architectural design, focusing on software like Rhino and Grasshopper.
- To develop proficiency in using digital tools to create and analyse architectural designs with a focus on form, geometry, and space.
- To acquaint students with the adaptive and responsive architectural design using parametric modelling techniques.
- To acquaint students with fabrication techniques such as, Laser cutting, and 3D printing for creating physical models and building components.
- To apply parametric and generative design principles in real-world architectural projects.

Unit 1: Introduction to Rhino, its user interface and advanced modelling

Overview of RHINO and its capabilities, Basic navigation and user interface (UI) of RHINO, Surface modelling including loft, sweep, blend, and network surface, solid modelling, Boolean operations, offset, fillet and chamfer.

Unit 2: Computational Design (Parametric Design and Generative Design

Basic parametric design principles and creating geometry in parametric inputs, Introduction to geometric patterns and grid-based systems, Basic transformations (translation, rotation, scaling) in GRASSHOPPER, Complex 3D geometries and their parametric relationships, Creating parametric grids, lattices, and arrays.

Unit 3: Generative Design

Data visualization for generative design: Mapping and analysing data for design insights, Integrating data analysis into design algorithms, Understanding simulation-based optimization: Environmental, structural, or material simulations to inform design choices.

Unit 4: Design fabrication- 3D PRINTING, LASER CUTTING

Preparing models for 3D printing: Slicing software and file formats, Advanced 3D printing techniques: Multi-material printing, infill patterns, and overhang structures, Design for laser cutting: 2D vector formats (e.g., DXF, SVG) and material thickness considerations, combining laser cutting with other fabrication techniques (e.g., 3D printed components, assembly.

Unit 5:Design of Small Architectural Model

Design of an architectural model using the computational approach and making a 3d model out of it using digital fabrication.

References:

1. N. Leach, A. Dufresne, and D. Petrescu, Eds., Digital Architecture: An Introduction to Digital Design and Fabrication. London, U.K.: Routledge, 2010.
2. R. Oxman, Digital Architecture and Fabrication: The Future of Design and Construction. London, U.K.: Routledge, 2010.
3. B. Kolarevic and A. M. Malkawi, Eds., Architecture in the Digital Age: Design and Manufacturing. New York, NY: Taylor & Francis, 2005.
4. A. Menges and S. Ahlquist, Computational Design Thinking: Computation Design and Theory. Hoboken, NJ: Wiley, 2011.
5. B. Gleason, Designing with Rhino and Grasshopper: An Introduction to Computational Design for Architects. London, U.K.: Routledge, 2018.
6. P. Beesley and R. Jäger, Generative Design: Visualize, Program, and Create with Processing. Cham, Switzerland: Springer, 2017.
7. N. Leach, D. Turnbull, and C. Williams, Digital Architecture: Design and Manufacturing. Hoboken, NJ: Wiley, 2018.
8. M. Carpo, The Digital Turn in Architecture 1992–2012: An AD Reader, Wiley, 2012.

Course Outcomes:

- The student will demonstrate proficiency in using Rhino and Grasshopper for architectural design, including creating, manipulating, and analysing complex geometric forms.
- Students will be able to apply parametric and generative design principles to create complex architectural forms based on defined parameters and constraints.
- The students will be able to design and prototype components for physical models, integrating CNC, Laser cutting and 3D printing to create architectural prototypes.
- Students will develop a comprehensive design from conceptualization to fabrication, applying the principles of computational design and fabrication techniques learned throughout the course.
- Students will be able to successfully complete a final design project that integrates computational design, generative design, and fabrication principles, demonstrating the ability to apply the course's learned skills in a real-world context.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	1	1	-	-	3	2	-	-	1	3	2
CO2	3	3	2	2	1	-	-	3	2	-	2	1	3	3
CO3	3	2	2	3	1	-	-	3	2	-	2	-	3	3
CO4	2	3	3	2	1	-	2	3	2	-	2	1	3	3
CO5	3	3	3	3	1	2	3	3	2	2	3	2	3	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: SDG 9 (Industry, Innovation, and Infrastructure).	
Statement: Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation.	

SDG Justification:
Unit 1: Introduction to Rhino – User Interface and Advanced Modelling
Justification:

- Introduces students to industry-standard digital tools (Rhino), enhancing technological capacity in architectural education.
- Builds foundational skills in digital modelling, which are essential for modern infrastructure design.
- Encourages innovation by enabling students to explore complex geometries and design possibilities beyond manual drafting.

Supports SDG 9 targets on upgrading infrastructure and fostering innovation through technology.

Unit 2: Computational Design – Parametric and Generative Principles
Justification:

- Equips students with computational thinking and parametric design skills, fostering digital innovation in architecture.
- Enables the creation of efficient, adaptable design systems that respond to real-world constraints.
- Promotes inclusive access to advanced design methodologies, preparing students for future-ready roles.

Aligns with SDG 9 targets on promoting inclusive industrialisation and enhancing scientific research and innovation.

Unit 3: Generative Design and Simulation-Based Optimization
Justification:

- Integrates data-driven design and simulation tools to optimise building performance (energy, structure, materials).
- Encourages resilient infrastructure development by teaching students to design with environmental and structural intelligence.
- Fosters research-orientated innovation, bridging design with analytical evaluation.

Directly supports SDG 9 targets on sustainable infrastructure and fostering innovation through research and development.

Unit 4: Design Fabrication – 3D Printing and Laser Cutting
Justification:

- Introduces sustainable fabrication technologies like 3D printing and laser cutting, reducing material waste.
- Builds capacity for digital manufacturing, a key component of modern industrialisation.
- Encourages hybrid fabrication approaches, promoting efficiency and adaptability in construction.

Supports SDG 9 targets on upgrading industries with sustainable technologies and promoting environmentally sound processes.

Unit 5: Design of Small Architectural Model
Justification:

- Synthesises all learnt skills into a real-world prototype, demonstrating innovation in design and fabrication.
- Encourages students to address infrastructure challenges through computational and sustainable approaches.
- Promotes inclusive and practical learning, preparing students to contribute meaningfully to industry and society.

Embodies SDG 9 principles by fostering innovation, sustainability, and inclusive skill development in infrastructure design.

AAR483	Fundamentals of Net Zero in Built Environment	L	T	ST	J	C
SDG No. 7,11,12,13		1	1	1	0	3

Course Description:

This course introduces the core principles of Net Zero in the built environment, focusing on reducing energy consumption and environmental impact through sustainable design. Students will explore passive design strategies, sustainable materials, and alternative construction techniques. The course covers methods to quantify energy use and waste generation in residential and commercial buildings, along with the integration of renewable energy and waste management technologies. Emphasis is placed on understanding life cycle assessment, energy policies, building codes, and global standards that support the development of Net Zero buildings.

Course Objectives:

- Introduce the fundamental concepts and importance of Net Zero in the context of the built environment.
- To understand various sustainable building materials and alternative construction techniques
- To quantify Energy consumption and waste generation in Residential and Commercial sectors.
- To quantify alternative energy generating technologies and integrate waste management practices.
- To understand policies, regulations and global standards shaping Net Zero built environments.

Unit 1

Overview of the Built Environment, The Role of the Built Environment in Achieving Climate Goals, Global Trends and Climate Change, Concepts of Net Zero and Life Cycle Assessment.

Unit 2

Passive Design Strategies, Sustainable Materials, Embodied Energy, Construction Waste Minimization, Innovative Building Technologies.

Unit 3

Energy Usage and waste generated in Residential and Commercial Buildings, Net Zero Energy Design, Energy Efficiency and Waste Management Technologies.

Unit 4

Types of Renewable Energy, Designing for Renewable Energy, Energy Management Systems

Unit 5

Building Codes and Standards, Government Policies and Incentives for Renewable Integration.

References:

1. N. N. Myint, “Net zero carbon buildings: A review on recent advances, challenges, and strategies,” *Building and Environment*, vol. 230, p. 110032, 2025.

2. O. Masniari and R. H. Koestoer, “Sustainable Building Materials for Green Construction: A Review,” *International Research Journal of Advanced Engineering and Science*, vol. 9, no. 2, pp. 68–72, 2024.
3. S. C. Ismaeel, N. F. Hussein, M. A. Fayad, and M. T. Chaichan, “Renewable energy potential towards attainment of net-zero energy buildings status: A critical review,” *Journal of Cleaner Production*, vol. 450, p. 135678, 2025.
4. X. Zhang, M. Liu, Y. Chen, and Q. Wang, “Renewable energy integration and energy efficiency in buildings for achieving net zero outcomes,” *Buildings*, vol. 15, no. 3, Art. no. 414, 2025.
5. J. H. Yoon, “Technology-enabled carbon emissions regulations for net-zero building policy frameworks,” *Carbon Management Journal*, vol. 16, no. 2, pp. 123–142, 2025.
6. L. Chen, Z. Wu, H. Zhang, and Y. Lin, “Green building practices to integrate renewable energy in construction sector,” *Environmental Chemistry Letters*, vol. 22, no. 6, pp. 1505–1520, 2024.

Course Outcomes:

- The ability to define Net Zero, explain its importance in the built environment and recognize the role of the built environment in global climate initiatives.
- The ability to assess net zero building materials and construction practices in order to reduce carbon emissions.
- To understand energy consumption and waste generation patterns to explore and apply energy efficiency strategies and technologies.
- To gain ability in evaluating and integrating renewable energy systems into Net Zero building designs.
- To understand key policies, regulations, and certifications required to meet Net Zero standards.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	2	1	1	1	2	2	3	3	2	1	2	2	2
CO2	3	3	2	3	2	1	2	3	2	1	1	2	3	3
CO3	2	3	3	3	2	2	2	3	3	2	2	2	2	3
CO4	2	3	3	3	2	2	3	3	2	2	2	2	2	3
CO5	2	2	2	2	3	2	1	3	3	2	2	2	2	2

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	

Unit 1 – Net Zero & Life Cycle Assessment SDG 13 “Take urgent action to combat climate change and its impacts.” Unit 2 – Passive Design & Sustainable Materials SDG 12 “Ensure sustainable consumption and production patterns.” Unit 3 – Energy Use & Waste Management SDG 7 “Ensure access to affordable, reliable, sustainable and modern energy for all.” Unit 4 – Renewable Energy & EMS SDG 7“Ensure access to affordable, reliable, sustainable and modern energy for all.” Unit 5 – Policies, Codes, Standards SDG 11 “Make cities and human settlements inclusive, safe, resilient and sustainable.”
SDG Justification: Unit 1 Focuses on climate-conscious design principles such as Net Zero concepts, Global Climate Goals, and Life Cycle Assessment, all essential to combatting climate change in the built environment. Unit 2 Promotes responsible construction practices by minimizing embodied energy, using sustainable materials, and adopting passive design strategies to reduce environmental impact. Unit 3 Encourages analysis and optimization of energy consumption and waste generation in buildings, while promoting energy efficiency and sustainable operational practices. Unit 4 Supports the integration of renewable energy systems such as solar, wind, and biomass in building design, along with smart energy management systems for long-term sustainability. Unit 5 Helps students understand national and global regulations, codes, and incentive frameworks that enable widespread adoption of Net Zero strategies in urban planning and architecture.

AAR485	Building Construction Planning and Scheduling	L	T	ST	J	C
SDG No.9		1	1	1	0	3

Course Description:

This course introduces the principles and practices of managing building construction projects with an emphasis on scientific and optimization methods. Students will learn project planning, scheduling, and controlling techniques, including Critical Path Method (CPM) and PERT analysis. The course covers cost-time optimization, resource allocation strategies, and project progress updating. Additionally, it familiarizes students with modern computer-based construction management tools like Primavera, supported by practical case studies to enhance real-world application skills.

Course Objectives:

- To introduce various processes of management of building construction.
- To familiarize about various scientific methods to manage construction projects.
- To sensitize about various existing optimization methods to manage project resources.
- To explain the process of updating during the construction progress.
- To introduce computer-based construction management tools

Unit 1

Introduction to Construction Industry, building construction practices, current management practices, Project planning and project scheduling and project controlling, Role of Decision in project management, Method of planning and programming, Human aspects of project management, work breakdown structure, Life cycle of a project, disadvantages of traditional management system.

Unit 2

Elements of Network & Critical Path Method and PERT analysis: Event, activity, dummy, network rules, graphical guidelines for network, numbering of events. CPM network analysis & PERT time estimates, time computation & network analysis.

Unit 3

Project time reduction and optimization: Project cost, Indirect project cost, direct project cost, slope of the direct cost curve, Total project cost and optimum duration, contracting the network for cost optimization, steps in cost-time optimization

Unit 4

Project updating: Frequency of updating of project schedules, Data required for updating, steps in the process of updating.
Resource allocation: Resource usage profile: Histogram, Resource smoothing and Resource leveling, Computer applications in project management.

Unit 5

Project Management Tools: Introduction to Project Management Tools like Primavera, Theory and their uses. Case-Study of a construction project using these software tools.

References:

1. B. C. Punmia and K. K. Khandelwal, *Project Planning and Control with PERT and CPM*, 5th ed. New Delhi, India: Laxmi Publications, 2013.
2. S. P. Mukhopadhyay, *Project Management for Architects and Civil Engineers*. Kharagpur, India: Indian Institute of Technology, 1974.
3. J. D. Wiest and F. K. Levy, *A Management Guide to PERT/CPM*. New Delhi, India: Prentice Hall of India, 1982.
4. R. A. Burgess and G. White, *Building Production and Project Management*. London, U.K.: The Construction Press, 1979.
5. H. N. Ahuja, S. P. Dozzi, and S. M. AbouRizk, *Project Management: Techniques in Planning and Controlling Construction Projects*, 2nd ed. New Delhi, India: Wiley India, 2010.
6. K. K. Chitkara, *Construction Project Management: Planning, Scheduling and Controlling*, 2nd ed. New Delhi, India: Tata McGraw-Hill Education, 2011.
7. S. Keoki and G. R. Oberlender, *Project Management for Engineering and Construction*, 3rd ed. New York, NY, USA: McGraw-Hill, 2014.
8. C. Hendrickson and T. Au, *Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects, and Builders*, 2nd ed. Pittsburgh, PA, USA: Prentice Hall, 2008. [Online]. Available: https://www.cmu.edu/cee/projects/PMbook/
9. F. Harris, R. McCaffer, and F. Edum-Fotwe, *Modern Construction Management*, 7th ed. Chichester, U.K.: Wiley-Blackwell, 2013.
10. J. L. Burcar and K. R. Weidman, *Primavera P6 Professional Project Management*, 1st ed. CreateSpace Independent Publishing, 2015.

Course Outcomes:

- Students would be aware of various processes of management of building construction.
- Students would be familiar about various scientific methods used in managing construction projects.
- Students would be aware about various existing optimization methods effective in managing project resources.
- Students would understand the need and process of updating during the construction progress.
- Students would be aware about existing computer-based construction management tools

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	2	3	3	1	1	1	3	3	3	3	2	3
CO2	1	1	2	3	3	1	1	1	3	3	3	3	2	3
CO3	1	1	2	3	3	1	1	1	3	3	3	3	2	3
CO4	1	1	2	3	3	1	1	1	3	3	3	3	2	3
CO5	1	1	2	3	3	1	1	1	3	3	3	3	2	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. : 09	
SDG Statement: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	
SDG Justification:	
The syllabus focused on construction project management, which is at the heart of building efficient infrastructure, modernizing construction practices, and optimizing project delivery using tools, techniques, and technology. These directly contribute to the intent of SDG 9, which emphasizes: **1. Modern and sustainable infrastructure systems** **2. Strengthening industry-related capabilities, including construction** **3. Enhancing the efficiency and innovation of industrial processes** **4. Promoting the use of modern technologies and project management tools**	

AAR487	Urban Design Theory	L	T	ST	J	C
SDG No. 3,9,11		1	1	1	0	3

Course Description:

This course introduces the fundamental principles and scope of urban design, highlighting its close relationship with planning and architecture. Students will analyze key urban design elements—such as urban structure, streetscapes, and public spaces—and explore foundational theories by pioneers like Kevin Lynch, Gordon Cullen, and Jane Jacobs. The course emphasizes the role of urban design in shaping policies, development regulations, and resilient planning strategies. Through Indian and global case studies, including transit-oriented development and inclusive public spaces, students will examine contemporary urban design challenges and innovative solutions that contribute to vibrant, sustainable cities.

Course Objectives:

- To introduce fundamental urban design principles, scope, and its relationship with planning and architecture.
- To analyze the key elements of urban design and their role in shaping the built environment.
- To explore foundational urban design theories and their relevance in contemporary urbanism.
- To understand the role of urban design in policy-making, development regulations, and resilient planning.
- To examine contemporary urban design challenges and solutions through Indian and global case studies

Unit 1: Introduction to Urban Design:

- Definition, scope, and importance of urban design.
- Historical evolution of urban design concepts from global west and east.
- Principles of urban design.
- Relationship between urban design, planning, and architecture.

Unit 2: Elements of Urban Design:

- Introduction to elements in Urban Design - Urban Structure, Urban Grain, Density, Height, Massing, Streetscape/ Landscape, Façade and interface, Materials and details.
- Relationship between open space systems and built forms.
- Public and private realms.

Unit 3: Fundamental Urban Design Theories:

- Kevin Lynch’s Image of the City
- Gordon Cullen’s Townscape approach
- Jane Jacobs and the concept of vibrant urbanism
- Overview on dimensions of urban design – Morphological, Social, Perceptual, Temporal, Visual, Functional

Unit 4: Role of Urban Design in framing guidelines and policy making:

- Role of urban design in planning policies
- Development regulations and design guidelines

- Role of urban design in environmentally sensitive areas (Resilient urban design)

Unit 5: Contemporary Aspects and Case Studies:

- Transit-oriented development (T.O.D.)
- Inclusive Public spaces and place-making strategies
- Case studies of successful urban design projects in India - Chandigarh, New Delhi, Pune, Chennai, Bangalore and Ahmedabad.

References:

1. K. Lynch, *The Image of the City*. Cambridge, MA, USA: MIT Press, 1960
2. G. Cullen, *The Concise Townscape*. London, U.K.: Architectural Press, 1961.
3. J. Jacobs, *The Death and Life of Great American Cities*. New York, NY, USA: Random House, 1961
4. J. Gehl, *Life Between Buildings: Using Public Space*, Washington, DC, USA: Island Press, 2011
5. C. Moughtin, *Urban Design: Street and Square*, Oxford, UK: Architectural Press, 2003
6. D. Thomas, *Placemaking: An Urban Design Methodology*. London, UK, Routledge, 2016
7. R. Parthasarathy, *Making Indian Cities Habitable*. Jaipur, India, Rawat Publications, 2009
8. S. T. A. Pickett, M. L. Cadenasso, and B. McGrath, *Resilience in Ecology and Urban Design: Linking Theory and Practice for Sustainable Cities*. Dordrecht, Netherlands: Springer, 2013

Course Outcomes:

- Demonstrate an understanding of urban design concepts, historical evolution, and principles.
- Analyze and apply urban design elements such as urban structure, streetscapes, and public-private realms.
- Critically evaluate urban design theories and their application in real-world scenarios.
- Assess the influence of urban design in policy-making, environmental resilience, and planning frameworks.
- Develop contextual urban design strategies by examining case studies and emerging urban trends.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	3	2	2	-	1	2	3	-	-	2	3	2
CO2	3	3	3	2	2	1	2	2	3	2	-	2	3	3
CO3	3	2	3	3	3	2	3	3	2	3	2	2	3	2
CO4	3	3	3	3	2	2	3	3	3	3	2	3	3	3
CO5	3	2	3	3	2	2	3	3	3	2	3	3	3	3

3- High Correlation, 2- Medium Correlation, 1- Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**

SDG No. & Statement:

1. SDG 11: Sustainable Cities and Communities- Take urgent action to combat climate change and its impacts.
2. SDG 9: Industry, Innovation and Infrastructure- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
3. SDG 3: Good Health and Well-being- Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

1. This course links climate resilience, policymaking, and urban design. Guidelines for urban design make sure that expansion is equitable, managed, and sensitive to environmental threats. Cities can better prepare for climate-related disasters including heat waves, floods, and air pollution by implementing resilient urban design concepts.
2. It aids students in examining the form, scale, density, and materials that make up a city's physical structure. Walkability, inclusivity, environmental responsiveness, and quality of life are all directly impacted by these factors. For instance, properly planned streetscapes enhance public life, while the right height and massing encourage density optimization and energy efficiency.
3. It aids students to understand Lynch, Cullen, and Jacobs' theories place a high value on public engagement, safe spaces, intelligibility, and people-centered cities. Their concepts serve as the foundation for urban planning that fosters social contact, mental wellness, and lively public areas—all of which support inclusive and healthful urban life.

VIII Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR462	**Internship****	0	0	0	**	24	300	300	600	D (Jury)
02	AAR464	**Professional Practice & Building Regulations**	1	1	0	0	2	50	50	100	A2 (Report
		Total	**1**	**1**	**0**	**	**26**	**350**	**350**	**700**	
		Total Hrs/Week	**26**								

*** Note: Students need to undergo an internship in an architectural firm for the total duration of the semester.*

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

AAR462	Internship	L	T	ST	J	C
SDG No.		0	0	0	**	24

** Note: Students need to undergo an internship in an architectural firm for the total duration of the semester.

Course Description:

This course is designed to bridge the gap between academic learning and professional practice by placing students in real-world architectural offices for hands-on exposure. It enables students to understand the dynamics of architectural execution, supervision, documentation, and post-occupancy performance by engaging with built projects, site conditions, and collaborative workflows. The course fosters the integration of theoretical concepts with practical knowledge across various phases of a project from design to construction and use.Students are expected to critically appraise building performance through post-occupancy evaluations, supervise construction activities, document working drawings, and prepare technical reports. Emphasis is placed on developing observational, analytical, and documentation skills through log sheets, site reports, and reflective practice.

Course Objectives:

- To bridge the transformation between theoretical and practical domains by providing scope to get trained and interact with an experienced professional.
- To equip the students with required/basic technical knowledge on various aspects being involved in architectural practice.
- To make student expose and understand the required set of drawings and documents to be produced for appropriate execution of project.
- To introduce how to critically analyze the project cycle inclusive of post occupancy.
- To expose student to practical issues in a project during construction phase by involving the student in site visits and supervision practices.

Each candidate shall have to prepare a detailed report along with necessary drawings, sketches, measurement records, readings, observations, survey analysis, log sheets about the following aspects.

1. Critical appraisal: Post Occupancy Analysis of any building that the office has designed and executed. The building should be in use and the students may record the reactions of the users to support his appraisal in addition to photographs, drawings etc.
2. Site Supervision and practices – A detail report on minimum number of two site supervisions for any part of a building that has been personally supervised by the student/ his supervisor. If the student does not get an opportunity to supervise their office work, he can give site report of any other work. It may include total site information, cross verification of as built drawings and statutory drawings, material palette and other necessary information.
3. Log Sheet and Training Certificate – A student shall fill the log sheets, as a record of his work on daily basis and shall submit the same, along with the performance certificate through confidential report from his employer. The student must maintain at least 90% of attendance.

4. A student shall submit all the working details prepared by him during his practical training along with estimates and specifications report of a small project or any special work done during his training such as any computer programme, lighting scheme, glazing details for energy efficiency and calculations, acoustical details, etc.

*The student is advised to adhere to the syllabus and keep constantly prepare and update the training report on monthly basis while working in the office where he/she is undergoing the training, and prepare themselves ready for the viva-voce to be conducted at the school at the end of the Practical Training programme.

Course Outcomes:

- The student will be able understand on how theory & practical are works together in design and construction of buildings and its services.
- The course recognizes buildings as a dynamic structure that supports the people and technologies working within its four walls.
- The course builds competence to understand that an intelligent building is one which provides a productive and cost-effective environment through optimization of its four basic elements structure, systems, services and management and the interrelationship between them.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	2	3	2	2	3	2	2	3	2	3
CO2	3	2	3	2	2	2	2	1	1	2	2	2	2	1
CO3	2	2	3	1	2	3	3	2	3	2	2	2	2	1
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG Justification:	

AAR464	Professional Practice & Building Regulations	L	T	ST	J	C
SDG No. II		1	1	0	0	2

Note: Course delivery in remote learning mode.

Course Description:

This course introduces students to the professional, legal, and ethical frameworks that govern architectural practice in India. It offers an in-depth understanding of the roles and responsibilities of key regulatory bodies such as the Indian Institute of Architects (IIA) and the Council of Architecture (CoA), including the Architects Act, 1972 and its latest amendments. Students will gain insight into the professional obligations of architects towards clients, collaborators, society, and the built environment. Through the study of building bye-laws, the National Building Code (NBC 2015), and contract formats prescribed by the CoA, the course prepares students to navigate regulatory frameworks and understand legal and procedural aspects of practice. It also introduces various career paths ranging from private practice to salaried employment, helping students make informed post-graduation decisions. The course further explores the structure and ethical conduct of architectural competitions.

Course Objectives:

- To provide students with in-depth understanding of the origin and importance of Indian Institute of Architects, and the Council of Architecture, and to make students familiar with the liabilities, and obligations of a professional architect towards client, peers, and the society at large.
- To make the students familiar with common elements of various building bye-laws, and the National Buildng Code 2015.
- To make the students aware of the various options available after graduating from architecture and familiarize them with the pros and cons of the common ones - private practice, and salaried appointment.
- To introduce the students to CoA prescribed format of building contract and familiarize them with important aspects of the contract.
- To familiarize the students with CoA prescribed guidelines for architectural competitions.

Unit 1

Role of Professional body - Indian Institute of Architects, its working, constitution and bye laws, categories of membership, election procedures. Code of conduct. Role of its conventions, Its publications etc. Architects Act'1972: Detailed study of the act and its provisions and recent amendments. Role and responsibilities of Council of Architecture. Role of its electorate, procedure of membership.

Unit 2

Professional Responsibilities and Liabilities of the architects, Responsibilities of Client and Contractor(s), copy rights, scale of charges, variation of charges, mode of payment, termination of services. Arbitration. Specialized building services. Professional Service Tax.

Architectural Competitions: Its purpose, Types of Architectural competitions, Its guidelines for

participation, prizes, assessment, etc.

Unit 3

Architects in practice:

- Private practice - Partnership office management, methods of organization, filing, documentation and working.
- Salaried appointment - Public sector, Private sector jobs, procedure of operation in government organization.

Unit 4

Contracts and Construction process

Types of building contracts, their merits and de-merits. Preparation of tender documents, method of writing tenders, opening of tenders. Preparation of contract documents, general conditions of contract, interim certificates, defect liability periods, retention amount, security deposits, mobilization money and virtual completion.

Unit 5

Review Contents of National Building Code.

Building bye laws, submission plans, Methods of municipal approval, Development Controls and Zoning regulations, and other regulatory aspects such as Master plan and Zonal plans.

References:

1. R. Namavati, Professional Practice. Mumbai, India: Lakshmi Book Store, 2011.
2. K. G. Krishnamurthy and S. V. Ravindra, Professional Practice. Bengaluru, India: Sapna Book House, 2014.
3. Council of Architecture (CoA), Handbook of Professional Documents. New Delhi, India: CoA, 2015. [Online]. Available: https://www.coa.gov.in
4. Indian Institute of Architects (IIA), Code of Professional Conduct and Bye-laws. Mumbai, India: IIA, 2020. [Online]. Available: https://indianinstituteofarchitects.com
5. Government of India, The Architects Act, 1972 with Rules and Regulations. New Delhi, India: Ministry of Law and Justice, 2021. [Online]. Available: https://legislative.gov.in
6. Bureau of Indian Standards, National Building Code of India 2016, 2nd ed. New Delhi, India: BIS, 2016.
7. Emmitt, S. Design management for architects: Definitions, history and roles. *Architectural Engineering and Design Management,* 11(2), 93–108, 2015.
8. Salama, A. M. Spatial design education: New directions for pedagogy in architecture and beyond. *Archnet-IJAR*, 9(2), 1–17, 2015.
9. Vischer, J. C. Ethics and the architect: Practice and purpose in the built environment. *Journal of Business Ethics*, 34(3-4), 193–209, 2001.
10. Bafna, S. Building codes and architectural identity: The case of Indian cities. *City, Culture and Society,* 4(2), 95–103, 2013.

Course Outcomes:

- Student shall understand the roles of Indian Institute of Architects, and the Council of Architecture and
- Students shall be prepared for professional practice by understanding the liabilities, obligations, and responsibilities of a professional architect, and also understanding building bye-laws and regulations, and learning to apply the same.

- Students shall have learned about various prospects after graduation including professional practice or salaried appointment and evaluating the pros and cons of each
- Students shall be able to understand, analyze and evaluate various types of contracts, and will be able to issue Notice Inviting Tenders.
- Students shall understand the importance and types of competitions

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	1	1	1	1	3	3	3	3	3	1	3	1	3
CO2	2	2	1	1	1	3	3	3	3	3	1	3	1	3
CO3	1	1	1	1	1	3	3	3	3	3	1	3	1	3
CO4	1	2	2	1	1	3	3	3	3	3	2	3	1	3
CO5	2	2	2	2	1	3	2	3	3	3	1	3	1	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 11 – Sustainable Cities and Communities, SDG 16 – Peace, Justice and Strong Institutions, SDG 4 – Quality Education	
SDG Justification:	
● The course equips students with regulatory knowledge and ethical practice frameworks essential for designing safe, inclusive, and sustainable urban environments. ● It fosters legal literacy, transparency, and professional accountability, enabling architects to uphold justice and integrity in the built environment sector. ● By integrating professional, legal, and regulatory dimensions into architectural training, the course ensures students gain relevant skills for responsible practice and lifelong learning.	

IX Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR551	**Community Design Theory**	1	2	0	0	3	50	50	100	A1 (03 Hrs)
02	AAR561	**Architectural Design - VI (Community Projects Studio)**	1	0	7	0	8	200	200	400	C2 (Jury)
03	AAR563	**Dissertation**	1	5	0	0	6	200	-	200	B1 (Viva)
04	AAR565	**Architectural Detailing**	1	0	2	0	3	100	-	100	B1 (Portfolio Assessment)
05		**Elective Basket I**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR571	Architectural Conservation Planning									
	AAR573	Fundamentals in Furniture Design									
	AAR575	Urban Landscapes									
	AAR577	Integrated Applications of Circular Economy in Architecture and Construction									
06		**Elective Basket II**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR581	Interactive Design									
	AAR583	Sustainable Materials and Construction Techniques									
	AAR585	Building Construction Materials and Equipment Management									
	AAR587	Urban Infrastructure and Housing									
		Total	**6**	**9**	**11**	**0**	**26**	**650**	**350**	**1000**	
		Total Hrs/Week	**26**								

L- Lecture; T- Tutorial; ST - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

AAR551	Community Design Theory	L	T	ST	J	C
SDG No.11		1	2	0	0	3

Course description:

This course familiarizes students with the concepts and techniques of community-focused design, highlighting the significance of socio-spatial interactions, cultural identity, and inclusivity. It investigates how communities engage with space and infrastructure via participatory methods and human-centered planning. Students will work with instruments for community evaluation, stakeholder participation, and gender-aware design. Case studies from both urban and rural settings offer insights into creating environments that cater to shared needs and community values.

Course Objectives:

- Understand socio-spatial dynamics and the importance of cultural and local identity in community-based design.
- Learn the foundational principles that drive inclusive and people-centric architecture and planning.
- Acquire tools and strategies for engaging with communities through participatory and inclusive design processes.
- Recognise the value of community infrastructure in everyday life and collective experiences.
- Analyse real-world examples of community design to derive relevant lessons for future applications.

Unit 1 - Introduction to Community Design

- Community and its context: Explore how communities function as interconnected systems shaped by social, cultural, spatial, and technological influences.
- Space and society: Examine the dynamic relationship between physical spaces and societal structures, where each continuously shapes and reflects the other.
- Typologies of communities: Identify various types of communities across urban, rural, and peri-urban settings, distinguished by geography, demography, and social organisation.
- Sense of place and local identity: Investigate how people form emotional and cultural connections with spaces, giving rise to a unique sense of place and local identity.

Unit 2 - Foundations of Community Design

- Principles of community design: Learn the core principles that guide the creation of socially inclusive, accessible, environmentally sensitive, and culturally resonant community spaces.
- Built and open space relationships: Understand how the balance and arrangement of buildings and open areas influence daily interactions, movement, and communal well-being.
- Stages of community design: Explore the step-by-step process of community design, from assessing local needs to developing and evaluating interventions.

Unit 3 - Processes & Assessments

- Reading a community: Practice methods for observing, documenting, and interpreting community patterns, behaviours, and spatial dynamics.

- Stakeholder mapping and participation: Learn how to identify and involve diverse stakeholders through participatory frameworks that promote inclusive decision-making.
- Gender-sensitive and child-friendly design: Understand how to design inclusive spaces by addressing the unique needs and experiences of women, children, and vulnerable groups.
- Designing with local skills: Embrace local knowledge and craftsmanship as valuable assets in co-creating spaces that strengthen social bonds and empower residents.

Unit 4 - Approaches & Interventions in Community Design

- Designing for everyday life and collective needs: Study architectural responses to collective daily needs through built examples like Anganwadis, schools, and public spaces across various regions.
- Key approaches in infrastructure design: Analyse strategies for planning and designing essential community infrastructure that supports health, education, mobility, and resilience.
- Role of infrastructure in well-being: Examine how well-designed infrastructure contributes to physical, emotional, and social well-being within communities.

Unit 5 - Case Studies in Community Design

- Urban case studies (national and international): Critically review successful urban community design projects from India and abroad to derive best practices and lessons learned.
- Rural case studies (national and international): Explore rural case studies that highlight context-sensitive and community-driven design strategies in low-resource settings.

References:

1. J. Gehl, *Cities for People*. Washington, DC: Island Press, 2010.
2. H. Sanoff, *Community Participation Methods in Design and Planning*. New York: Wiley, 2000.
3. N. Hamdi, *The Placemaker's Guide to Building Community*. London: Earthscan, 2010.
4. K. Lynch, *The Image of the City*. Cambridge, MA: MIT Press, 1960.
5. M. Francis, *Urban Open Space: Designing for User Needs*. Washington, DC: Island Press, 2003.
6. N. Awan, T. Schneider, and J. Till, *Spatial Agency: Other Ways of Doing Architecture*. London: Routledge, 2011.
7. V. Mehta, *Public Space: An Introduction*. London: Routledge, 2022.
8. UN-Habitat, *Streets as Public Spaces and Drivers of Urban Prosperity*. Nairobi: UN-Habitat, 2013.

Course Outcomes:

- Analyse and interpret community structures through cultural, spatial, and technological lenses.
- Apply inclusive design principles to address community needs effectively.
- Use participatory design tools like stakeholder mapping and community engagement methods.
- Evaluate the role of infrastructure and typologies in enhancing community well-being.
- Critically assess urban and rural case studies to inform context-sensitive design approaches.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	2	2	–	–	3	3	2	–	2	3	2
CO2	3	2	2	3	3	2	2	3	3	2	–	2	3	3
CO3	2	3	3	2	3	3	2	2	3	3	2	2	3	3
CO4	3	2	2	3	2	2	2	3	3	2	2	2	3	2
CO5	2	3	3	2	2	2	–	2	3	2	2	3	3	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
11 & Make cities and human settlements inclusive, safe, resilient and sustainable.	
SDG Justification: This course aligns directly with SDG 11 by promoting inclusive, people-centric design and participatory planning that recognizes cultural identity and social diversity. It equips students with tools to assess and design community spaces that enhance everyday life, foster social equity, and support sustainable infrastructure. By addressing rural and urban needs through real-world case studies, the course empowers future architects and planners to create built environments that are safe, resilient, and rooted in local context—essential principles of sustainable urban development.	

AAR561	Architectural Design – VI (Community Projects Studio)	L	T	ST	J	C
SDG No.11		1	0	7	0	8

Course description:

This design studio equips students with the tools and empathy required to engage in socially embedded and community-centric architectural practice. Through participatory methods, students learn to analyse urban socio-spatial systems, identify stakeholder needs, and co-design inclusive, context-responsive interventions. Emphasis is placed on real-use detailing, climate sensitivity, and communication of design intent to both professionals and community users. The final outcome is a buildable design proposal shaped by stakeholder feedback and real-life conditions.

Course Objectives:

- Equip students with methods to analyse and interpret urban socio-spatial systems with depth and empathy.
- Introduce participatory tools and techniques to engage with users and stakeholders during design development.
- Develop student capacity to translate real-world problems into architectural opportunities.
- Foster sensitivity toward socially and environmentally responsive detailing.
- Strengthen the ability to communicate architectural intent effectively to both professionals and non-professionals.

Module 1: Reading the City and Understanding Context

- Historical evolution, spatio-temporal timelines, and transformations of the study area through macro, meso and micro level observations.
- City-reading exercises include figure-ground mapping, street network analysis, and built and open space ratios.
- User mapping and identification: gender, age, occupation, mobility, and informal/formal use.
- Primary fieldwork: photo surveys, observational studies, community walk, and spatial diaries.
- Stakeholder identification: residents, local workers, vendors, civic officials, and NGOs.
- Urban design reading sessions and discussions on typologies and place-making in dense, layered environments.

Module 2: Situational Analysis, Inference & Program Development

- Detailed situation mapping: infrastructure, accessibility, social behaviour, climate, sanitation, and safety.
- Conduct structured stakeholder engagement and community surveys to gather qualitative input.
- Synthesising findings into key challenges and latent potentials.
- Comparative learning: case readings of best practices in participatory and inclusive design (India & Global South).
- Formation of evidence-based inferences for design direction.
- Drafting of basic program and typological strategies.
- Site finalisation (within the 1 sq. km zone) for architectural intervention (max 5 acres).
- Focus Themes: community resilience, gendered spaces, public amenities, vending zones, micro-infrastructure.

Module 3: Design Argument, Guidelines & Frameworks

- Formulate a clear design argument rooted in community needs and spatial logic.
- Draft area-specific spatial and architectural guidelines based on analysis and local DCRs.
- Develop framework drawings reflecting modularity, growth, shared use, and incrementalism.
- Engage stakeholders again to validate the argument and co-create with sketch responses.
- Review the feasibility and scope of the design through stakeholder and peer critique.
- Outputs: Program booklet, design frameworks, user scenarios, and site strategies..

Module 4: Design Development and Iteration

- Detailed spatial articulation of architecture with layering of structure, material, and usability.
- Emphasis on climate response, local materials, and construction systems with durability and adaptability.
- Integrating landscape, utilities, and public thresholds into the design.
- Mid and final stage design reviews with external experts and users.
- Emphasise co-ownership in design narrative—show how users shape the design.
- Optional Exercises: physical models, immersive walkthroughs, implementation plans.

Module 5: Final Integration and Communication

- Compilation of detailed study report: city context, user studies, stakeholder engagements, program, and design evolution.
- Architectural drawings set: site plan, sections, elevations, detailed plans, and construction logic.
- Participatory documentation of process and reflection on learnings.
- Stakeholder feedback presentation and peer evaluation.
- Viva voce with internal and external jurors.
- Final Outcome: A buildable, stakeholder-endorsed design intervention situated in a real, lived context.

Other Important Details:

- Studio Type: Live Project Oriented, Collaborative and Community Engaged.
- Teaching Methodology: Lectures, Field Work, Role Plays, Reviews, Model Making, etc.
- Assessment Components:
    - Context Study and Mapping – 20%
    - Program and Framework Formulation – 20%
    - Design Iteration and Detailing – 30%
    - Community Engagement and Feedback Integration – 15%
    - Final Submission & Communication – 15%
- Group Work: Initial stages may be in groups; final intervention must be individual.
- Documentation: All students must submit a bound ‘Design with Community’ Portfolio + Study Report.

References:

1. H. Sanoff, *Community Participation Methods in Design and Planning*. New York: John Wiley & Sons, 2000.
2. N. Hamdi, *Small Change: About the Art of Practice and the Limits of Planning in Cities*. London: Earthscan, 2004.
3. IDEO.org, *The Field Guide to Human-Centered Design*. IDEO.org, 2015. [Online]. Available: https://www.designkit.org/resources/1

4. CURE India, *Participatory Planning and Urban Poor Toolkit*. [Online]. Available: http://www.cureindia.org
5. G. Bhan, S. Srinivas, and V. Watson, Eds., *The Routledge Companion to Planning in the Global South*. London: Routledge, 2018.
6. V. Papanek, *Design for the Real World: Human Ecology and Social Change*. New York: Pantheon Books, 1971.
7. J. Gehl, *Cities for People*. Washington, DC: Island Press, 2010.
8. R. Janmohamed, *Inclusive Urban Sanitation: A Handbook for Participatory Design*. New Delhi: WaterAid India, 2017.

Course Outcomes:

- Critically map and analyse socio-spatial contexts using empathic and evidence-based tools.
- Engage meaningfully with diverse users and stakeholders, integrating their inputs into architectural programs.
- Formulate a compelling design argument rooted in real community needs and urban dynamics.
- Develop buildable, sustainable architectural interventions within a real urban setting, responding to contextual realities.
- Communicate ideas effectively to both academic and community audiences, and reflect on architecture's role in transformation.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	2	–	–	–	3	3	–	–	2	3	2
CO2	2	2	2	2	2	3	–	2	3	2	–	3	3	2
CO3	3	3	3	3	–	2	–	2	3	–	2	2	3	3
CO4	3	2	2	3	–	1	2	3	3	–	2	1	3	3
CO5	2	1	–	2	2	3	1	2	3	3	1	2	2	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 11	
Make cities and human settlements inclusive, safe, resilient and sustainable.	
SDG Justification: This course directly contributes to SDG 11 by fostering design thinking that is inclusive, participatory, and rooted in lived realities. Students actively engage with diverse communities to co-create architectural interventions that enhance public amenities, social infrastructure, and resilience, particularly in dense urban contexts. Through hands-on fieldwork, stakeholder consultations, and real-site problem-solving, the course prepares students to design sustainable, context-aware, and equitable urban environments.	

AAR563	Dissertation	L	T	ST	J	C
SDG No.4		1	5	0	0	6

Course description:

This course enables students to explore an architectural topic of interest through structured research and analytical methods. It introduces tools for literature review, field-based data collection, case study analysis, and manuscript preparation. Emphasis is placed on understanding research frameworks, interpreting data, and presenting findings in the form of a journal-ready paper. Students also gain familiarity with academic writing conventions, citation standards, and publication strategies in architectural research.

Course Objectives:

- To develop an in-depth understanding of a chosen architectural topic through structured research.
- To use various methodology for data collection, analysis and research writing.
- To acquire skills of organizing research and using manuscript writing tools.
- To select appropriate journal for publication with respect to the topic
- To prepare final manuscript according to the requirements of journal.

Unit 1: Introduction & Topic Development:

- Introduction and scope of architectural dissertation,
- Differences between design thesis and studio work
- Topic selection, formulation of objectives,
- Synopsis preparation grounded in personal interest, current research trends.

Unit 2: Literature Review & Case Study Analysis:

- Methods for reviewing relevant literature
- Analyzing case studies to build theoretical and contextual understanding.
- Engagement with papers, archival texts, codes, regulations, and case precedents
- Establishing logic to formulate comparative research frameworks.

Unit 3: Research Methods & Data Collection:

- Qualitative and quantitative tools for primary and secondary data collection
- Field observation, interviews, surveys, visual documentation, and participatory techniques.
- Significance of selecting context-appropriate tools for collecting data, particularly in relation to spatial and social variables.

Unit 4: Data Analysis & Synthesis:

- Interpreting collected data,
- Validating research objectives, and synthesizing insights.
- Establishing a connection between their research findings
- Theoretical propositions and design possibilities
- Architectural arguments or design implications.

Unit 5: Introduction & Topic Development:

- Structuring and writing the final dissertation
- Layout formatting
- Appropriate referencing (APA/ MLA/ Harvard),
- Citation of drawings/ images, visual content, and presentation for viva voce.

The inputs to the students on various topics would be in the form of internal and external Expert /Guest Lectures. Each student should select a topic related to any architectural design/research area, and collect necessary data, review literature on the chosen topic and present their dissertation as a journal ready manuscript at the end of the semester.

References:

1. L. Groat and D. Wang, *Architectural Research Methods*, 2nd ed. Hoboken, NJ: Wiley, 2013.
2. E. D. Niezabitowska, *Research Methods and Techniques in Architecture*, New York, NY: Routledge, 2018.
3. P. Farrell, *Writing Built Environment Dissertations and Projects: Practical Guidance and Examples*. Chichester, UK: Wiley-Blackwell, 2011.
4. M. U. Hensel and F. Nilsson, *The Changing Shape of Practice: Integrating Research and Design in Architecture*. London, UK: Routledge, 2016.
5. L. T. M. Blessing and A. Chakrabarti, *DRM, a Design Research Methodology*. London, UK: Springer, 2009.
6. W. L. Neuman, *Social Research Methods: Qualitative and Quantitative Approaches*, 7th ed. Boston, MA: Pearson, 2014.
7. L. N. Groat, *Theories of Architecture: Concepts, Approaches, and Practices*. New York, NY: Routledge, 2022.
8. M. Fraser, *Design Research in Architecture: An Overview*. New York, NY: Routledge, 2016.

Online Sources:

9. Centre for Advanced Urbanism, "MIT CAU Research Projects," *Massachusetts Institute of Technology*. [Online]. Available: https://cau.mit.edu. [Accessed: Jul. 27, 2025]
10. RIBA, "RIBA Architecture Resources," *Royal Institute of British Architects*. [Online]. Available: https://www.architecture.com. [Accessed: Jul. 27, 2025].

NB: The above books are general that help; however, the student has to choose books based on the individual's area of research.

Course Outcomes:

- Identify and apply suitable research methodologies based on purpose, methodology, nature, and data collection.
- Derive meaningful conclusions that contribute to academic or practice-based architectural knowledge.
- Structure and present research findings effectively through academic writing, supported by visuals, diagrams, and references.
- Demonstrate critical thinking and originality in addressing architectural challenges through theoretical, contextual, or technical lenses.
- Defend and communicate the dissertation work confidently during oral presentations and viva-voce, engaging with critique constructively.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	3	3	3	3	-	-	-	3	-	-	3	2	3
CO2	-	-	3	3	3	-	-	3	-	-	-	-	1	2
CO3	-	-	-	-	-	-	-	-	3	-	3	-	2	3
CO4	-	-	-	-	-	-	-	-	3	-	3	-	2	3
CO5	-	-	-	-	-	-	-	-	-	3	-	-	2	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 4: Quality Education; SDG 11: Sustainable Cities and Communities; SDG 17: Partnerships for the Goals	
SDG Justification:	
● The course encourages independent, critical thinking and research grounded in personal interest and real-world relevance—enhancing academic inquiry and lifelong learning. ● It builds foundational understanding of socio-spatial, regulatory, and cultural contexts—critical for urban and architectural sustainability. ● It teaches responsible referencing, knowledge sharing, and academic integrity—building strong scholarly contributions that support collective knowledge building.	

AAR565	Architectural Detailing	L	T	ST	J	C
SDG No.4		1	0	2	0	3

Course description:

This course focuses on developing technical competence in drafting comprehensive vertical building sections and detailing key architectural elements. Students will explore the structural and material composition from foundation to roof, including façades, wet areas, staircases, ramps, and basements. Emphasis is placed on functional zoning, environmental performance, and the integration of multiple building systems. The course culminates in the creation of a fully detailed, technically coherent building section that demonstrates an understanding of real-world construction complexities.

Course Objectives:

- Understand and draft comprehensive vertical building sections from foundation to roof.
- Analyze function-specific zones and detail them using appropriate materials.
- Design and detail building skins/facades for environmental performance.
- Understand the structural and spatial requirements of ramps, stairs, and basements.
- Integrate multiple systems into a complete, technically coherent architectural detail.

Unit 1: Vertical Building Sections

Understanding foundational construction from plinth to roof. Layering of materials, insulation, parapet, floor buildup. (complete vertical cross-section including wall buildup, slab, foundation, parapet, roof)

Unit 2:Functional Detailing:

Kitchens, washrooms, wet areas (domestic/ industrial/ institutional). Focus on plumbing, waterproofing, hygiene, finishes.

Unit 3: Building Skin Systems:

Detailing of façades, insulation, external finishes, shading devices, glazing. (façade section and detail drawings, including joinery, cladding, thermal insulation. Interface detailing between dissimilar materials—e.g., concrete-to-glass, wood-to-steel, cladding-to-wall transitions. Technical understanding of expansion joints, sealants, thermal bridging, and tolerances.)

Unit 4: Circulation Elements – Staircases, Ramps, and Basements:

Stairs, ramps, and basement parking layouts. RCC detailing, slope logic, clearances.

Unit 5: Integrated Detailing Studio:

Combine all zones into one coordinated building section with multiple callouts and material detailing. (final integrated vertical section and plan, showing connections of multiple building elements.)

References:

1. F. D. K. Ching, *Building Construction Illustrated*, 6th ed., Hoboken, NJ: Wiley, 2020.
2. E. Allen and J. Iano, *Fundamentals of Building Construction: Materials and Methods*, 7th ed., Hoboken, NJ: Wiley, 2022.
3. W. B. McKay, *McKay's Building Construction*, Vols. 1–4, New Delhi: Pearson, 2015.
4. S. C. Rangwala, *Building Construction*, 33rd ed., Anand, India: Charotar Publishing House, 2022.
5. J. Fernandez, *Material Architecture: Emergent Materials for Innovative Buildings and Ecological Construction*, London: Routledge, 2006.
6. J. H. Callender, Ed., *Time-Saver Standards for Architectural Design Data*, New York: McGraw-Hill, 2007.
7. A. Newton and S. Melville, *Detailing for Architecture*, 2nd ed., London: Laurence King Publishing, 2023.
8. K. Baden-Powell, *Architectural Detailing: Function, Constructibility, Aesthetics*, 2nd ed., Oxford: Wiley-Blackwell, 2010.

Course Outcomes:

- Produce accurate vertical cross-sections of a building with structural and material clarity.
- Draft detailed working drawings for kitchens, washrooms, and utility areas with appropriate material specifications.
- Develop detailed façade/skin sections that respond to aesthetics, climate, and construction logic.
- Create detailed drawings of staircases, ramps, and basement parking aligned with building codes and structural logic.
- Synthesize all learned components into a final integrated detail demonstrating holistic architectural comprehension.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	3	2	1	-	2	2	2	3	2	1	1	1
CO2	2	3	3	2	3	2	2	2	2	3	3	2	1	1
CO3	2	2	3	2	3	2	2	2	2	3	3	2	2	1
CO4	2	2	3	2	2	2	2	2	2	2	2	2	2	1
CO5	3	3	3	2	3	3	3	2	1	3	3	3	1	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 4 – Quality Education	
SDG Justification:	
This course supports SDG 4 (Quality Education) by providing students with hands-on, skill-based learning in architectural detailing and construction practices. It promotes technical competence, critical thinking, and real-world problem-solving, preparing learners for professional challenges in the built environment. The inclusive, studio-based approach ensures equitable access to quality education tailored to diverse learning needs.	

AAR571	Architectural Conservation Planning	L	T	St	J	C
SDG No.11		1	1	1	0	3

Course Description:

This course offers a comprehensive introduction to architectural conservation with a special focus on Indian heritage and philosophical traditions. Students progress from foundational awareness of conservation principles to practical application through documentation, policy understanding, and ethical planning. The course integrates traditional knowledge systems with modern tools—including digital and AI-based methods—to address contemporary conservation challenges. Emphasizing cultural continuity, community engagement, and sustainable practices, students will develop critical thinking skills and the ability to formulate context-sensitive conservation strategies for diverse heritage typologies.

Course Objectives:

- Examine the historical evolution of architectural conservation philosophies while developing a critical understanding of diverse conservation approaches and heritage typologies.
- Investigate the distinctive characteristics of Indian conservation philosophy and traditional knowledge systems in contrast to Western approaches, with emphasis on cultural continuity, sacred-secular dynamics, and indigenous authenticity concepts.
- Evaluate the regulatory frameworks governing architectural conservation at international and national levels, including their practical implementation through various institutional structures.
- Develop proficiency in traditional and emerging documentation methodologies, condition assessment protocols, and investigative techniques including digital tools and AI applications for heritage conservation.
- Synthesize conservation theory, indigenous knowledge, regulatory frameworks, and technical skills into comprehensive planning approaches for diverse heritage contexts, with emphasis on stakeholder engagement and sustainability principles.

Unit 1: Foundations of Conservation

Awareness (Bodha)-Knowing (Mati Jnana)

This module establishes initial awareness of conservation philosophies and approaches, moving toward basic knowing of foundational concepts. Students develop initial consciousness (bodha) of conservation principles and acquire ordinary cognition (mati Jnana) through sensory engagement with heritage typologies and conservation approaches.

- Evolution of Architectural Conservation Planning and practices
- Concepts and approaches to conservation: preservation, restoration, rehabilitation, adaptive reuse
- Theories of heritage: Typologies and approach

Unit 2: Conservation Concepts in Indian context

Knowing (Mati Jnana)-Knowledge(Sruta Jnana)

This module transitions from basic knowing to deeper knowledge by contextualizing conservation within Indian philosophical frameworks. Students move from ordinary cognition (mati jnana) to knowledge derived from traditional texts and teachings (sruta jnana), understanding how Indian perspectives on time, continuity, and authenticity shape conservation approaches.

- The new paradigm: Indian vrs western philosophies
- Indian Perspectives on Time, Continuity, and Change
- Sacred and Secular in Indian Built Heritage
- Cultural significance and values (tangible and intangible)
- Authenticity: NARA document and beyond, new paradigm of ways of seeing
- Indian traditional knowledge system of conservation planning

Unit 3: Frameworks and Policies

Knowledge (Vidya)-Understanding (Anumana-Viveka)

This module builds upon established knowledge to develop understanding of regulatory frameworks and their practical applications. Students progress from structured knowledge (vidya) to inferential understanding (anumana) of how conservation policies operate across different contexts and institutional structures.

- International and Indian charters
- National policies and acts
- Heritage bye-laws and zonal regulations
- Existing bodies involving in conservation

Unit 4: Tools and Techniques

Understanding (Anumana-Viveka)-Insight (Pratibha Jnana)

This module advances from understanding of documentation principles to insightful application of advanced techniques. Students develop discernment (viveka) between appropriate methodologies and contexts, potentially achieving intuitive flashes of understanding (pratibha jnana) when applying emerging technologies like AI to conservation challenges.

- Documentation methods
- Advance documentation techniques
- Condition assessment and mapping
- Cultural mapping
- Investigation
- Artificial Intelligence and conservation planning

Unit 5: Planning and Practice

Insight (Pratibha Jnana)-Wisdom (Prajna)

This culminating module synthesizes previous learning into wise, contextually appropriate conservation planning approaches. Students integrate intuitive understanding (pratibha jnana) with ethical wisdom (prajna) to balance stakeholder needs, sustainability principles, and heritage values in comprehensive conservation planning.

- Introduction to

    - Urban conservations
    - Indian Cultural Landscapes
    - Built vs precincts
- Architectural conservation plans
- Stakeholders: the community, who is a heritage expert?
- Best practices of Integrated and Sustainable Conservation

References:

1. D. Theodossopoulos, *Structural Design in Building Conservation*, London, U.K.: CRC Press, 2012.
2. J. H. Stubbs and R. G. Thomson, *Architectural Conservation in Asia: National Experiences and Practice*, London, U.K.: Taylor & Francis, 2016.
3. H. Kalman, *Heritage Planning: Principles and Process*, New York, U.S.: Taylor & Francis, 2014.
4. S. Brusaporci, *Digital Innovations in Architectural Heritage Conservation: Emerging Research and Opportunities*, Hershey, U.S.: IGI Global, 2017.
5. U. Carughi and M. Visone, *Time Frames: Conservation Policies for Twentieth-Century Architectural Heritage*, London, U.K.: Taylor & Francis, 2017.
6. R. Pickard, *Funding the Architectural Heritage: A Guide to Policies and Examples*, Strasbourg, France: Council of Europe Publishing, 2009.
7. B. Weiler and N. Gutschow, *Authenticity in Architectural Heritage Conservation: Discourses, Opinions, Experiences in Europe, South and East Asia*, Cham, Germany: Springer, 2016.
8. K. F. Hmood, Ed., *Urban and Architectural Heritage Conservation Within Sustainability*, London, U.K.: IntechOpen, 2019.

Course Outcomes:

- Be able to understand and articulate the fundamental conservation concepts, differentiate between preservation, restoration, rehabilitation and adaptive reuse approaches, and apply appropriate theoretical frameworks to heritage contexts. (Awareness and knowing)
- Be able to analyze the unique dimensions of Indian heritage contexts, interpret tangible and intangible cultural values, and integrate traditional knowledge systems into contemporary conservation planning frameworks.(Knowing and knowledge)
- Be able to navigate the complex policy landscape of heritage conservation, interpret applicable legal provisions, and develop conservation strategies that comply with regulatory requirements while addressing heritage preservation goals.(Knowledge and understanding)
- Develop proficiency in traditional and emerging documentation methodologies, condition assessment protocols, and investigative techniques including digital tools and AI applications for heritage conservation.(Understanding and insight)
- Be able to formulate/evaluate contextually appropriate conservation plans for buildings, precincts and cultural landscapes that balance interventions by experts with community values, integrate sustainable practices, and respond to the unique challenges of Indian urban and rural heritage environments.(Insight and wisdom)

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	1	3	3	2	1	1	1	2	1	1	2	1	2	3

CO2	1	1	3	1	3	2	2	2	1	1	3	1	2	2
CO3	3	2	1	3	2	1	1	3	1	1	2	1	1	1
CO4	1	2	3	3	3	3	1	2	1	2	3	2	2	2
CO5	1	3	2	2	1	2	1	2	1	1	3	1	2	1

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG - 11 Make cities and human settlements inclusive, safe, resilient, and sustainable	
SDG Justification: ● Architectural conservation strengthens the cultural and historical fabric of urban settlements, promoting **identity, continuity, and community resilience.** ● Planning for conservation encourages **adaptive reuse,** sustainable material practices, and inclusive strategies that integrate **vernacular wisdom** into future-ready development.	

AAR573	Fundamentals in Furniture Design	L	T	ST	J	C
SDG No. 4,12		1	1	1	0	3

Course Description:

This course provides a comprehensive understanding of furniture design through the exploration of conceptual, functional, ergonomic, material, and manufacturing aspects. Emphasis is placed on design thinking, human-centered design, and the application of technical skills to create functional and aesthetic furniture. Students will explore historical precedents, develop conceptual ideas, and translate them into detailed designs ready for presentation and critique. The course also covers mass production principles and sustainable design approaches.

Course Objectives:

1. To develop conceptual and technical foundations of furniture design.
2. To understand ergonomics, human factors, materials, and their applications.
3. To understand functional and aesthetic furniture design principles and the design process.
4. To understand mass production techniques and manufacturing processes.
5. To explore sustainable practices and innovative technologies in furniture design.

Unit 1: Introduction to Furniture Design

- History and Evolution of Furniture
- Furniture Typologies and Functions
- Basic Principles of Furniture Design

Unit 2: Ergonomics and Human Factors

- Anthropometry and Human Dimensions
- Comfort and Posture in Design
- User-Centric and Inclusive Design

Unit 3: Materials and Joinery Understanding

- Introduction to Furniture Materials
- Properties and Selection of Materials
- Basic Joinery and Furniture Detailing

Unit 4: Furniture Design Process

- Concept Generation Techniques
- Design Development and Refinement
- Technical Drawings and Representation

Unit 5: Final Presentation and Review

- Design Documentation
- Visual Presentation Techniques

- Final Jury and Peer Review

Submission Details:

Portfolio Format: A3 sheets (Physical or PDF)

Minimum Submission Requirements:

- 1 mood board or concept sheet
- 2–3 concept development sheets
- 2 technical drawing sheets (plans, elevations, views)
- 1 ergonomic/user study sheet
- 1 material and joinery detail sheet
- 1 final design presentation sheet
- 1 sheet on design reflections/learning outcomes

References:

1. C. Grimley and M. Love, *The Interior Design Reference & Specification Book: Everything Interior Designers Need to Know Every Day*, Rockport Publishers, 2018.
2. M. Pratap Rao, *Interior Design: Principles and Practice*, 3rd ed., Standard Publishers, 2004.
3. L. Crespi, *Cultural, Theoretical, and Innovative Approaches to Contemporary Interior Design*, IGI Global, 2020. [Online]. Available: https://doi.org/10.4018/978-1-7998-2823-5
4. J. Kurtich and G. Eakin, *Interior Architecture*, New York: Van Nostrand Reinhold, 1993.
5. A. Friedmann *et al.*, *Interior Design: An Introduction to Architectural Interiors*, Elsevier, 1979.
6. M. A. Clark, *Sustainable Furniture Design: Materials, Manufacturing, and Applications*, Laurence King Publishing, 2022.
7. R. S. Sandhu, *Sustainable Human Settlements: Asian Experience*, Rawat Publications, 2001.
8. R. A. Kolodziej and C. J. DiNenna, *Residential Interior Design: A Guide to Planning Spaces*, 3rd ed., Wiley, 2016.

Course Outcomes:

- Understand the evolution and typologies of furniture design across historical and cultural contexts.
- Apply ergonomic and anthropometric principles to furniture suited for various users and activities.
- Evaluate and select materials based on function, form, and sustainability.
- Develop and communicate conceptual furniture design through sketches, drawings, and detail studies.
- Create a coherent portfolio that demonstrates critical thinking, design development, and presentation skills.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	1	-	-	-	2	-	-	-	-	-	-	-
CO2	2	3	2	-	2	-	-	-	-	-	-	-	-	-
CO3	2	2	3	-	2	2	3	-	-	-	-	-	-	-
CO4	3	3	3	2	2	-	-	-	2	2	-	2	-	-
CO5	2	2	2	-	2	2	2	-	3	3	-	2	-	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 4: Quality Education The course fosters design thinking, technical skills, and sustainability awareness, supporting SDG 4.4 by preparing students for creative industries. It also promotes lifelong learning through interdisciplinary exploration and hands-on projects.	
SDG 12: Responsible Consumption and Production Students learn to select sustainable materials, reduce waste, and design for durability and reuse—directly contributing to SDG 12.2 and 12.5. The course encourages circular design thinking and responsible production in the furniture industry.	
SDG Justification: 1. The course develops industry-relevant design, technical, and sustainability skills, preparing students for responsible and innovative roles in architecture and design. 2. Emphasizes material efficiency, sustainable sourcing, and circular design principles, encouraging environmentally responsible furniture production.	

AAR575	Urban Landscapes	L	T	ST	J	C
SDG No.		1	1	1	0	3

Course Description:

This course introduces students to sustainable urban landscape design through the lens of ecology and climate resilience. It covers environmental systems, nature-based solutions, and digital analysis tools like GIS. Through iterative design studios and case studies, students will explore strategies for urban regeneration, green infrastructure, and community-based climate action. Emphasis is placed on integrating ecological processes with design, aligned with global sustainability goals.

Course Objectives:

- Interdisciplinary Understanding: Develop a comprehensive understanding of urban ecology and environmental systems within the context of urban design.
- Sustainable Strategies: Learn to create urban landscapes that integrate ecological processes, promote sustainability, and address climate challenges.
- Analytical Skills: Enhance skills in environmental analysis using digital tools and GIS for informed urban planning.
- Design Integration: Foster the ability to translate theoretical concepts into practical design solutions through iterative design studio projects.
- Community & Resilience: Emphasise the role of community engagement and participatory design in creating resilient urban environments.

Unit 1: Introduction to landscape and ecological urbanism

- Introduction to urban landscapes and environmental systems
- Overview of urban ecology and interdisciplinary frameworks
- Environmental analysis in urban settings (land profile, water, air, soil, vegetation and illumination)

Unit 2: Urban green strategies through NbS

- Sustainable urban design and Nature-based solutions, blue-green infrastructure (BGI)
- Case studies of successful urban regeneration and ecological integration
- Digital tools and GIS for environmental mapping.

Unit 3: Reflection of sustainable design techniques

- Design studio project: conceptualising sustainable urban landscapes
- Iterative design development and peer critiques
- Understanding the actors of climate change and their influence on urban landscape planning

Unit 4: Strategies for sustainable Urban landscape

- Adaptive reuse and urban regeneration strategies
- Integrated sustainable landscape strategies in relation to UN-SDGs
- Climate Adaptation and Mitigation Strategies

Unit 5: Urban landscape management

- Urban Heat Island Effect and Mitigation Techniques
- Watershed based urban planning and management (Understanding stormwater slow runoff, Rain Gardens, Bioswales, Permeable Surfaces)
- Urban Biodiversity and habitat conservation
- Climate action and resilience planning through community, stakeholder engagement

References:

1. M. M. McHarg, *Design with Nature*, New York, NY: John Wiley & Sons, 1992.
2. F. Steiner, *The Living Landscape: An Ecological Approach to Landscape Planning*, 2nd ed., Washington, D.C.: Island Press, 2008.
3. United Nations Environment Programme, "Nature-Based Solutions for Climate Change," *UNEP*, 2022. [Online]. Available: https://www.unep.org/resources/report/nature-based-solutions-climate-change. [Accessed: Jul. 27, 2025].
4. C. Benedict and N. McMahon, *Green Infrastructure: Linking Landscapes and Communities*, Washington, D.C.: Island Press, 2006.
5. T. Beatley, *Biophilic Cities: Integrating Nature into Urban Design and Planning*, Washington, D.C.: Island Press, 2011.
6. T. G. Sanders and K. J. Emery, "Stormwater Management Using Low Impact Development and Green Infrastructure," *Journal of Green Building*, vol. 11, no. 3, pp. 157–170, 2016. doi: 10.3992/jgb.11.3.157.
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Web References:

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10. P. Walker, “Green roofs deliver for biodiversity – how Basel put nature on top,” *The Guardian*, Feb. 28, 2025. [Online]. Available: https://www.theguardian.com/environment/2025/feb/28/green-roofs-deliver-for-biodiversity-how-basel-put-nature-on-top. [Accessed: Jul. 27, 2025].

Course Outcomes:

- Articulate key principles of urban ecology and their impact on landscape architecture.
- Critically evaluate environmental challenges associated with urbanisation.
- Develop and present integrated urban landscape designs that reflect sustainable and resilient practices.
- Utilise digital mapping and modelling tools to assess environmental data and simulate urban scenarios.

- Engage with contemporary case studies to draw lessons for practical applications in urban design.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	2	-	3	-	3	2	1	-	2	2	3
CO2	3	2	2	3	2	-	2	3	3	1	-	2	3	2
CO3	2	3	2	2	-	-	3	2	1	2	1	2	2	3
CO4	3	2	3	3	1	2	2	2	2	2	2	2	2	3
CO5	3	2	2	2	2	3	1	3	3	2	2	3	3	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 15: Life on Land; SDG 11: Sustainable Cities and Communities; SDG 13: Climate Action	
SDG Justification:	
● It introduces environmental systems (soil, vegetation, air, water), reinforcing ecological awareness in urban contexts. ● It emphasizes urban ecology and systems thinking critical to sustainable urban development. ● The course demonstrates how Nature-based Solutions (NbS) and Blue-Green Infrastructure (BGI) mitigate climate impacts in cities.	

AAR577	Integrated Applications of Circular Economy in Architecture and Construction	L	T	ST	J	C
SDG No. 7, 9, 11, 12, & 13		1	1	1	0	3

Course Description:
This course translates circular economy concepts into practice, focusing on design-for- disassembly, material reuse, and adaptive building systems. Students engage with BIM- based material passports, digital twins, parametric tools, and circular business models. Onsite techniques, policy frameworks, and collaborative studio projects integrate theory with implementation. Combining technology, design, and governance perspectives, the course equips students to develop viable, policy-aligned circular solutions for architectural and construction projects, emphasising interdisciplinary teamwork and real-world application.

Course Objectives:

- Translate theoretical knowledge of circular economy into advanced, practice-based architectural and construction applications.
- Apply systemic design strategies to achieve circularity across building life cycles.
- Integrate circular economy metrics into architectural workflows, including material passports and digital twins.
- Explore multi-stakeholder collaboration models for circular project delivery.
- Critically engage with global best practices, technology, and policy mechanisms promoting circular construction.

Unit 1: Applied Circular Design in Architecture

- Integrating design-for-disassembly (DfD) and modular coordination into real projects.
- Case-based design analysis: Circular building typologies (residential, commercial, retrofit).
- Functional adaptability: mixed-use design, reconfigurable interiors, and long-life loose-fit structures.
- Circular façade systems and cladding strategies.
- Incorporating biobased materials: hempcrete, timber, mycelium, algae facades.
- Comparative studies of circular design codes and certifications (e.g., WELL, Cradle-to-Cradle Certified®, LEED).

Unit 2: Digital Tools for Circular Construction

- Material Passports and BIM-enabled circular workflows.
- Integration of Digital Twin technology for resource tracking and performance simulation.
- Circular economy modelling using parametric tools (Grasshopper, Ladybug, One Click LCA).
- AI and data-driven decision-making for waste minimization and design optimisation.
- Blockchain for traceability and supply chain transparency.
- Real-time material inventory systems and feedback loops for adaptive reuse.

Unit 3: Circular Construction Techniques and Onsite Practices

- Onsite material sorting, reclamation, and reprocessing techniques.
- Strategies for zero-waste construction sites and circular site management.
- Urban mining and sourcing reclaimed components from existing structures.

- Assembly and deconstruction protocols and documentation practices.
- Reverse logistics and lifecycle tracking in material procurement.
- Industrial symbiosis and co-location of circular industries.

Unit 4: Policy, Regulation, and Governance in Circular Built Environment

- Interpretation of evolving building codes and government circular economy mandates.
- Public procurement for circular construction – strategies and case laws.
- Municipal frameworks for circular infrastructure and urban regeneration.
- Embedding ESG (Environmental, Social, Governance) criteria in project compliance.
- Circularity KPIs and policy performance indicators.
- Urban-scale policy analysis and the role of architecture in policy co-creation.

Unit 5: Circular Economy Studio and Capstone Projects

- Interdisciplinary team projects addressing a real-world site or issue.
- Students to develop a proposal integrating circular design, materials, business model, and policy compliance.
- Critique sessions with external experts from industry and academia.
- Development of visual and analytical presentations including drawings, LCA analysis, and cost-benefit breakdown.
- Digital submission of material passports and disassembly plans.
- Reflection journals capturing learning, team dynamics, and application strategies.

References:

1. Cheshire, D. (2016), Building Revolutions: Applying the Circular Economy to the Built Environment
2. Naboni, E., & Havinga, L. (2023), Circular Design for Zero Emission Architecture and Building Practice
3. Hes, D., & du Plessis, C. (2014), Designing for Hope: Pathways to Regenerative Sustainability
4. Greenfield, D., Brass, C., & Osagie, D. (2021), Circular Economy and the Built Environment: A Toolkit for Architects and Designers
5. Baker-Brown, D. (2017), The Re-Use Atlas: A Designer’s Guide Towards a Circular Economy
6. Kibert, C. J. (2016), Sustainable Construction: Green Building Design and Delivery
7. CSE India Reports on Resource Efficiency in Construction (Centre for Science and Environment).
8. BMTPC Handbook on Sustainable Building Materials and Technologies.

Course Outcomes:

- Demonstrate applied knowledge of circular design, materials, and technologies in diverse architectural contexts.
- Develop BIM-integrated workflows that support circular material documentation and lifecycle planning.
- Design and evaluate building components for disassembly, reuse, and long-term adaptability.
- Collaborate across disciplines and with stakeholders to execute circular economy strategies in real-life scenarios.
- Formulate policy-aligned circular construction proposals with environmental and economic viability.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	1	1	–	3	–	2	–	–	1	3	2
CO2	3	3	2	2	3	–	2	–	2	2	2	1	3	3
CO3	3	2	3	3	2	–	3	–	2	1	2	–	3	3
CO4	2	3	3	2	2	2	3	1	3	2	2	1	3	3
CO5	3	3	3	2	2	2	3	1	2	2	2	1	3	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
This course aligns with several United Nations Sustainable Development Goals (SDGs), including SDG 11 – Sustainable Cities and Communities, SDG 12 – Responsible Consumption and Production, SDG 13 – Climate Action, SDG 9 – Industry, Innovation and Infrastructure, SDG 7 – Affordable and Clean Energy, and SDG 17 – Partnerships for the Goals.	
SDG Justification:	
The course directly supports SDG 12 by equipping students with skills to minimize waste, design for disassembly, and promote circular material flows in construction. It contributes to SDG 11 by integrating adaptive reuse and regenerative urban strategies that foster sustainable communities. Through lifecycle assessments and energy-efficient solutions, it addresses SDG 13 on climate action. The use of digital tools like BIM, digital twins, and material passports advances SDG 9, while passive design and smart energy systems contribute to SDG 7. Finally, interdisciplinary team projects and collaborative frameworks reinforce SDG 17, promoting partnerships across industry, government, and academia.	

AAR581	Interactive Design	L	T	ST	J	C
SDG No. 9		1	1	1	0	3

Course description:

This course introduces students to immersive technologies and interactive design in architecture through the use of AR, VR, and MR platforms. It focuses on integrating real-time feedback and environmental data to create adaptive, user-driven spatial experiences. Students will prototype responsive environments using tools like Unity, Grasshopper, and environmental sensors, blending digital and physical design methods. The course culminates in an interactive architectural output that demonstrates spatial intelligence and immersive storytelling.

Course Objectives:

- To introduce students to the concepts and interfaces of interactive design in architecture using AR, VR, and MR platforms.
- To explore how real-time feedback systems enhance architectural experiences through user interaction.
- To apply environmental inputs such as light, motion, and temperature to drive adaptive spatial behaviour.
- To develop skillsets in prototyping responsive immersive environments using digital and physical tools.
- To produce an interactive architectural output that demonstrates immersive communication and spatial intelligence.

Pre-Requisite: Basic 3D modelling skills (SketchUp, Rhino, or Revit) and understanding of spatial design.

Unit 1: Introduction to Digital Interfaces

Definition and evolution of interactive design. Understanding Augmented, Virtual, and Mixed Reality. Components of digital interfaces in immersive environments. Introduction to various platforms. UI/UX basics: navigation, interaction zones, user flow in immersive space

Unit 2: Real-Time Feedback Systems

Role of sensors and input devices in real-time interactions. Types of feedback: visual (colour, movement), auditory (sound), and tactile. Connecting hardware with design environments. Integrating real-time response in immersive platforms. Simple event-driven interactions in Unity/Grasshopper using sensor data.

Unit 3: Environmental Inputs in Interactive Design

Introduction to climate-responsive interactivity. Data-driven interaction using light, temperature, wind, and humidity. Environmental sensors and input mechanisms. Concept of adaptive façades, kinetic structures, and context-based feedback. Use of tools like Ladybug, Firefly, and Climate Consultant.

Unit 4: Prototyping Interactive Experiences

Ideation, user journey mapping, and interaction flow. Types of prototypes: screen-based, physical-digital hybrids, immersive VR. Low-fidelity vs. high-fidelity prototyping methods. Digital fabrication for immersive spaces (laser cutting, 3D printing for headset accessories or physical models). Testing and iteration cycles based on user input.

Unit 5 – Output and Final Presentation

Final output formats: AR demonstration, VR walkthrough, and MR responsive scene. Preparing a comprehensive interaction design document. Evaluating user interaction quality and immersion depth. Technical setup for showcasing: mobile AR, desktop VR, or HMD. Presentation and peer critique session.

References:

1. H. Papagiannis, *Augmented Human: How Technology Is Shaping the New Reality*. Sebastopol, CA: O'Reilly Media, 2017.
2. T. Parisi, *Learning Virtual Reality*. Sebastopol, CA: O'Reilly Media, 2015.
3. A. Craig and W. Sherman, *Understanding Virtual Reality: Interface, Application, and Design*. Burlington, MA: Morgan Kaufmann, 2018.
4. C. Hillmann, *The UX of XR: User Experience Design and Strategies for Immersive Technologies*. New York, NY: Apress, 2021.
5. J. Whyte, *Virtual Reality and the Built Environment*. London, U.K.: Routledge, 2002.
6. M. Billinghurst, A. Clark, and G. Lee, “A Survey of Augmented Reality,” *Foundations and Trends® in Human–Computer Interaction*, vol. 8, no. 2–3, pp. 73–272, 2015.
7. M. McCullough, Ambient Commons: Attention in the Age of Embodied Information, Cambridge, MA: MIT Press, 2013.
8. S. Greenberg, N. Sheelagh, and B. Buxton, *Sketching User Experiences: The Workbook*, Burlington, MA: Morgan Kaufmann, 2011.
9. P. Dourish, *Where the Action Is: The Foundations of Embodied Interaction*, Cambridge, MA: MIT Press, 2001.

Course Outcomes:

- Understand the structure and role of digital interfaces in immersive spatial environments.
- Apply real-time feedback systems for user-driven spatial experiences.
- Integrate environmental data and sensor inputs into responsive architectural elements.
- Prototype immersive interactive environments using industry-relevant tools.
- Present an interactive output that demonstrates communication through immersive technology.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	-	2	-	3	2	2	-	-	1	-	2	2	2
CO2	3	2	3	2	3	-	-	-	2	-	-	3	3	3
CO3	2	3	3	2	2	2	2	-	3	3	-	2	2	3

CO4	3	3	3	3	3		1	-	3	3	2	2	3	3
CO5	2	-	2	1	2	2	-	3	3	3	2	2	2	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: SDG 9	
SDG Statement: Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation.	
SDG Justification: This course aligns with **SDG 9 (Industry, Innovation, and Infrastructure)** by fostering innovation through the integration of immersive technologies like AR, VR, and MR in architectural design. It equips students with advanced digital competencies and tools that drive **technological advancement and smart infrastructure solutions**. By enabling prototyping of responsive, sensor-driven environments, the course encourages **cutting-edge innovation in the built environment** aligned with emerging industry trends.	

AAR583	Sustainable materials and Construction Techniques	L	T	ST	J	C
SDG No. 9,11,12		1	1	1	0	3

Course description:

This course offers a comprehensive understanding of sustainability principles in relation to the built environment, focusing on eco-friendly materials and climate-responsive construction methods. Students will explore traditional and emerging materials, assess their environmental impacts, and study innovative technologies such as 3D printing and modular systems. Through case studies and hands-on documentation, the course empowers students to evaluate and apply sustainable solutions in real-world architectural contexts, aligned with global SDGs and green building standards.

Course Objectives:

- To develop an in-depth understanding of the principles of sustainability with respect to the built environment and materials.
- To explore a wide range of eco-friendly materials, including emerging, bio-based, and recycled materials with low environmental impact.
- To analyse traditional and contemporary construction techniques in the context of climate responsiveness, and cultural relevance.
- To understand methods of evaluating environmental footprint for building materials and construction techniques.
- To conduct case studies and document sustainable buildings focussing upon materials and construction techniques.

Unit 1: Introduction to Sustainable Construction

- Introduction to sustainability and sustainable development goals (SDGs) in built environment
- Role of materials in sustainable building design
- Environmental, economic, and social dimensions of sustainability
- Introduction to green building rating systems (LEED, IGBC, GRIHA,BREEAM) and ECBC.

Unit 2: Sustainable Building Materials

- IUnderstanding the properties and performance of Eco-friendly materials i.e, natural, bio-based, recycled and hybrid materials.
- Analysis of Low embodied energy materials i.e, bamboo, mud, lime, fly ash, recycled aggregates.
- Innovations in sustainable materials (hempcrete, mycelium, geopolymers, etc.)
- Barriers and enablers for sustainable material adoption.

Unit 3: Emerging Construction Technologies

- Modular and prefabricated systems
- 3D printing in architecture and robotic construction
- Adaptive reuse and material upcycling strategies
- Socio-cultural and regional influences on construction choices

Unit 4: Assessment of Building Materials and Techniques

- Energy use in buildings
- Tools and labels to assess environmental impact
- Cost-benefit and lifecycle cost analysis
- Quantifying impact of construction waste and circular economy concepts

Unit 5: Case Studies and Documentation

- Methodology for case study analysis and documentation
- Study and documentation of selected green-certified buildings
- On-site evaluation of sustainable materials and construction techniques
- Student-led group project: developing a prototype to improve the building performance.

References:

1. B. D. Talpur, S. Liuzzi, C. Rubino, A. Cannavale, and F. Martellotta, “Life Cycle Assessment and Circular Building Design in South Asian Countries: A Review of the Current State of the Art and Research Potentials,” *Buildings*, vol. 13, no. 12, Art. no. 3045, Dec. 2023.
2. F. Asdrubali, A. F. Colladon, L. Segneri, and D. M. Gandola, “LCA and energy efficiency in buildings: Mapping more than twenty years of research,” *arXiv preprint arXiv:2409.00065*, Aug. 2024.
3. J. Jayawardana, M. Sandanayake, A. K. Kulatunga, J. A. S. C. Jayasinghe, G. Zhang, and S. A. U. Osadith, “Evaluating the Circular Economy Potential of Modular Construction in Developing Economies—A Life Cycle Assessment,” *Sustainability*, vol. 15, no. 23, Art. no. 16336, 2023.
4. R. Ganesan, A. Maheswari, and R. Venkatesan, “State of the Art Review on Hempcrete as a Sustainable Substitute for Traditional Construction Materials for Home Building,” *Buildings*, vol. 15, no. 12, Art. no. 1988, 2025.
5. F. Lima, A. P. Silva, J. M. Sousa, and R. Martins, “Modular Construction in the Digital Age: A Systematic Review on Smart and Sustainable Innovations,” *Buildings*, vol. 15, no. 5, Art. no. 765, Feb. 2025.
6. Y. Meng, S. Cavalaro, and F. D. M. Osmani, “Probabilistic Multi-Criteria Decision-Making for Circularity Performance of Modern Methods of Construction Products,” *arXiv preprint arXiv:2504.07850*, Apr. 2025.
7. K. Adu-Duodu, S. Wilson, Y. Li, A. Oladimeji, T. Huraysi, M. Barati, C. Perera, E. Solaiman, O. Rana, R. Ranjan, and T. Shah, “A Circular Construction Product Ontology for End-of-Life Decision-Making,” *arXiv preprint arXiv:2503.13708*, Mar. 2025.

Course Outcomes:

- Understand and choose building materials in terms of sustainability.
- Identify and analyze eco-friendly materials of low environmental impact and performance characteristics.
- Compare traditional and contemporary construction techniques in terms of climate adaptability, material efficiency and socio-cultural relevance.
- Analyse environmental impacts and lifecycle costs of different building materials and construction techniques.
- Document and critically analyse case studies of sustainable buildings with a focus on material use and construction techniques, demonstrating the integration of theory into practice.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	2	-	2	3	-	-	2	-	2	3	2
CO2	3	2	3	-	2	3	3	-	-	2	-	1	3	2
CO3	3	2	3	-	3	3	3	-	-	-	-	1	3	2
CO4	2	2	3	2	3	2	2	-	2	2	2	2	2	2
CO5	2	3	2	3	2	3	3	-	2	3	-	2	2	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 9,11, and 12	
This course fosters understanding of sustainable materials and construction techniques, eco-friendly innovations, advanced modular systems, lifecycle assessment, and case-based documentation—enabling students to contribute to environmentally responsible, socially relevant, and technologically innovative built environments.	
SDG Justification: This course supports **SDG 9 (Industry, Innovation, and Infrastructure)** by introducing innovative construction technologies and sustainable material alternatives that drive eco-conscious development in the building sector. It aligns with **SDG 11 (Sustainable Cities and Communities)** by promoting climate-responsive and culturally relevant construction practices that enhance urban resilience and reduce environmental impact. Through the study of lifecycle assessment and circular economy principles, the course advances **SDG 12 (Responsible Consumption and Production)** by encouraging efficient material use, waste reduction, and sustainable decision-making in architectural design and construction.	

AAR585	Building Construction Materials and Equipment Management	L	T	ST	J	C
SDG No.12		1	1	1	0	3

Course description:

This course introduces students to the planning, selection, and management of construction materials and equipment within the context of site operations. Emphasizing cost-efficiency, lifecycle analysis, digital inventory tools, and sustainability, the course equips students with practical strategies for procurement, subcontractor coordination, and equipment logistics. Through case-based learning and digital tools such as BIM and RFID, students will understand how to integrate performance, sustainability, and risk management into site-level resource planning, preparing them for responsive and informed decision-making in construction environments.

Course Objectives:

- Understand characteristics and performance criteria for materials and equipment.
- Plan site logistics and manage material flows with subcontractor interfaces.
- Apply cost-awareness and lifecycle analysis in equipment decisions.
- Implement inventory and procurement strategies using digital tools.
- Integrate sustainability and risk responsiveness in resource management.

Unit 1: Introduction to Materials and Construction Equipment

Classification and performance of major building materials, Construction equipment: types, uses, suitability, roles on site. Criteria for material and machinery selection (cost, availability, sustainability). Equipment roles across project phases

Unit 2: Procurement, Inventory and Subcontractor Coordination

Procurement methods (centralised vs decentralised), inventory systems (Just-In-Time, buffer stock), vendor management, documentation, and tracking. Integration with design timelines and procurement schedules. Documentation, approvals, and lead time control

Unit 3: Equipment Planning, Cost Effectiveness and Site Logistics

Site layout planning for equipment access and storage; decision-making on equipment selection (capacity, compatibility); cost of owning and operating equipment (fuel, maintenance, productivity); lifecycle costing and replacement strategy; case study comparison of hire vs buying decisions. Crisis/security concerns in resource handling

Unit 4: Digital Tools for Inventory and Equipment Tracking

Use of BIM for materials/equipment tracking, QR/barcode/RFID usage in site inventory management, introduction to digital logistics software platforms, reporting and analytics- Material tracking dashboards, Reporting and alerts using mobile or desktop platforms

Unit 5: Site Management, Sustainability and Reflection

Low-impact materials, use of recycled/reused materials, energy-efficient equipment, lean construction techniques for minimising waste, carbon footprint analysis. Role of field architect in site-level resource planning; Execution coordination across materials, equipment, and subcontractors

References:

1. R. L. Peurifoy, **Construction Planning, Equipment and Methods**, 7th ed. New York, NY, USA: McGraw-Hill, 2005.
2. E. R. K. Loraine, **Construction Management in Developing Countries**, Abingdon, U.K.: Routledge, 2001.
3. J. E. Schaufelberger and L. C. Holtzhausen, **Management of Construction Projects: A Constructor's Perspective**, New York, NY, USA: Routledge, 2017.
4. L.-P. Rusch, **Basic Site Management**, Berlin, Germany: Springer Vieweg, 2020.
5. K. Krishnamurthy and S. Ravindra, **Construction and Project Management**, Chennai, India: Charotar Publishing House, 2014.
6. K. N. Jha, *Construction Project Management*, 2nd ed. New Delhi, India: Pearson Education, 2015.
7. Central Public Works Department (CPWD), *Handbook on Construction Equipment Management*. New Delhi, India: Govt. of India, Ministry of Housing and Urban Affairs, 2007.

Course Outcomes:

- Identify suitable materials and equipment based on cost and performance.
- Plan logistics and procurement, integrating subcontractor and equipment strategies.
- Analyse cost implications for equipment operation and lifecycle planning.
- Apply digital tools for real-time tracking and inventory management.
- Recommend sustainable, site-appropriate strategies for resource use.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	1	1	3	1	1	2	1	1	1	1	3	3	2
CO2	1	3	2	2	3	1	3	2	2	2	2	2	3	3
CO3	1	2	3	1	3	1	2	2	2	2	3	2	2	2
CO4	1	1	2	1	3	2	3	1	2	2	3	3	1	3
CO5	1	1	2	1	3	1	2	3	3	2	3	2	3	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 12 and "Ensure sustainable consumption and production patterns."	
SDG Justification: The course emphasizes efficient material usage, lifecycle cost analysis, equipment sustainability, and waste minimization—core principles of SDG 12. By integrating digital tools for procurement and inventory, promoting low-impact and recycled materials, and applying lean construction techniques, students are trained to reduce environmental footprint in construction. The course also encourages resource efficiency across the supply chain,	

which supports sustainable infrastructure development and responsible management of natural resources.

AAR587	Urban Infrastructure and Housing	L	T	ST	J	C
SDG No.3,8,10		1	1	1	0	3

Course description:

This course provides an integrated understanding of how urban infrastructure and housing systems influence architectural site planning and design. It explores the interdependence of physical, social, and mobility infrastructures in shaping equitable, resilient, and sustainable urban environments. Students will examine water, waste, energy, and mobility networks as vital systems that inform layout planning and design interventions. Emphasis is placed on Indian case studies, planning norms, and housing typologies relevant to urban development. The course also delves into government policies, financing mechanisms, and inclusive design practices that support affordable housing delivery. Through real-world examples and critical analysis, students will gain the ability to integrate infrastructure intelligence and housing strategies into architectural solutions responsive to urban realities.

Course Objectives:

- To understand how physical infrastructure systems support urban life and influence architectural site planning.
- To introduce transportation and mobility systems that improve connectivity and sustainability.
- To emphasise the value of social infrastructure in creating equitable and livable neighbourhoods.
- To explore housing policies and typologies specific to India’s urban context.
- To integrate housing finance tools and delivery mechanisms in architectural design.

Unit 1: Physical Infrastructure:

- Water supply systems - sourcing, treatment, and distribution in urban contexts.
- Drainage and sewerage networks for stormwater and wastewater management.
- Solid waste management processes - collection, segregation, and disposal.
- Electricity distribution planning and processes.
- Infrastructure networks within housing layouts - spatial and zoning efficiency.
- Urban flooding, design for climate resilience using blue-green infrastructure.
- Decentralised systems, such as on-site treatment and solar energy, for sustainability.
- Indian case studies like Chennai’s RWH, Pune’s waste segregation, and Delhi’s STPS for real-world insights.

Unit 2: Traffic and Transportation

- Transport modes include non-motorised, shared, and public systems.
- Street hierarchies ensure efficient vehicular and pedestrian circulation.
- Pedestrian-friendly environments with safe crossings, walkways, and shading.
- Last-mile connectivity and its role in urban mobility.
- TOD principles and their application in Indian cities.

- Study Indian examples like Pune BRT, Chennai Smart Streets, and Delhi Metro interchanges.

Unit 3: Social Infrastructure

- Public amenities include education, health, recreation, and cultural needs.
- URDPFI Guidelines and planning norms for effective layout zoning.
- Accessibility and barrier-free design for inclusive infrastructure.
- Gender safety and universal design through spatial strategies and detailing.
- Social infrastructure using FSI, zoning, and land-use integration.

Unit 4: Housing Policies and Planning

- Diverse housing needs across income groups in Indian cities.
- Schemes like PMAY, RAY, and JNNURM are addressing affordable housing.
- Housing typologies include EWS, LIG, slum redevelopment, and rental housing.
- Planning tools like land pooling, TDR, and mixed-use development for efficient housing layouts.

Unit 5: Housing Financing Tools and Schemes

- Basics of loans, subsidies, and microfinance for low-cost housing.
- Roles of HUDCO, NHB, SHGS, and private banks in housing finance.
- CLSS, rent-to-own models, and PPP frameworks in the Indian context.
- Design for cost-efficiency by using modular construction, passive design, and local materials.

References:

1. UN-Habitat, *Planning Sustainable Cities: Global Report on Human Settlements 2009*. London: Earthscan, 2009.
2. ITDP India, *Better Streets, Better Cities: A Guide to Street Design in Urban India*, Institute for Transportation and Development Policy, 2011.
3. UN-Habitat, *Planning Sustainable Cities: Global Report on Human Settlements 2009*. London: Earthscan, 2009.
4. Affordable Housing in India: Challenges and Opportunities – NIUA
5. S. Sharma, *Urban Infrastructure: A Textbook for Planning Students*. New Delhi, India: Copal Publishing.
6. National Housing Bank (NHB) and Housing and Urban Development Corporation (HUDCO), *Housing Finance: A Guide for Urban Practitioners*. New Delhi, India: NHB/HUDCO, 2010
7. V. Mukhija and D. Madden, *Housing for All: Reimagining the Public Role in Housing*. Princeton, NJ: Princeton University Press, 2022.
8. S. Phillips, *The Affordable City: Strategies for Putting Housing Within Reach (and Keeping it There)*. Washington, DC: Island Press, 2020.

Course Outcomes:

- Design and integrate water, waste, and energy infrastructure into housing layouts.
- Propose sustainable mobility strategies for pedestrian and transit-oriented environments.
- Plan social infrastructure using national guidelines and inclusive design principles.
- Apply housing policy frameworks to inform context-sensitive housing design.
- Develop financially viable housing solutions using funding schemes and cost-effective models.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	3	–	–	2	3	2	1	2	1	3	2
CO2	2	2	2	2	–	–	1	3	3	1	2	1	3	2
CO3	2	2	2	3	–	–	2	3	3	–	2	–	3	2
CO4	3	3	3	2	–	–	–	2	3	–	3	1	3	3
CO5	2	2	2	2	–	–	–	2	2	–	3	–	2	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**

SDG No. & Statement:

1. SDG 3: Good Health and Well-being- Ensure healthy lives and promote well-being for all.
2. SDG 10: Reduced Inequalities- Reduce inequality within and among countries.
3. SDG 8: Decent Work and Economic Growth- Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all.

SDG Justification:

1. This course is linked with Social infrastructure like schools, health centers, and cultural spaces is essential for equity, education, and well-being. Concepts of barrier-free design, gender safety, and universal access directly respond to SDGs 3, 4, 5, and 10. Planning norms and zoning ensure that services are accessible to all socio-economic groups.
2. This course is linked with creating inclusive, safe, and efficient urban mobility systems. Encouraging non-motorized and public transport reduces emissions, promotes health, and supports inclusive access. Concepts like TOD (Transit-Oriented Development) and last-mile connectivity also reduce dependency on private vehicles, aligning with sustainable urban mobility targets.
3. It is also linked with social infrastructure like schools, health centers, and cultural spaces that are essential for equity, education, and well-being. Concepts of barrier-free design, gender safety, and universal access directly respond to SDGs 3, 4, 5, and 10. Planning norms and zoning ensure that services are accessible to all socio-economic groups.

X Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			Assessment Category (Hours/Type)
			L	T	ST	J		I	E	T	
01	AAR562	**Design Thesis**	0	0	16	0	16	300	300	600	E (Jury)
02	AAR564	**Thesis Document**	0	1	3	0	4	100	-	100	B1 (Viva)
03		**Elective Basket I**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR573	Architectural Conservation Management									
	AAR574	Lighting Design in Architecture									
	AAR576	Landscape Design Communication									
	AAR578	Circular Cities: Indian and Global Perspectives									
04		**Elective Basket II**	1	1	1	0	3	50	50	100	A2 (Portfolio Assessment)
	AAR582	Data Driven Architecture									
	AAR584	Net Zero Assessment and Analysis									
	AAR586	Building Construction Safety, Quality Assurance and Control									
	AAR588	Participatory Planning and Design									
		Total	**2**	**3**	**21**	**0**	**26**	**500**	**400**	**900**	
		Total Hrs/Week	**26**								

L- Lecture; T- Tutorial; St - Practicals/Studio; J - Internship
I- Continuous Evaluation Marks; E- End Term Exam Marks; T- Total Marks

AAR562	Design Thesis	L	T	ST	J	C
SDG No. 4, 9,11, 12		0	0	16	0	16

Course Description:
This culminating studio course enables final-year architecture students to undertake an independent, research-driven design project that demonstrates professional-level competence, contextual sensitivity, and user responsiveness. Emphasising critical inquiry, technical integration, and advanced communication, the course guides students through the entire design process from framing a topic and conducting precedent and site studies to conceptual development and technical resolution. Students are expected to synthesise structural, environmental, and regulatory systems within their design and articulate their vision through comprehensive drawings, models, and a final presentation. The course fosters a culture of reflection, ethical practice, and design maturity, preparing students to confidently defend their thesis before academic and professional juries and contribute meaningfully to architectural practice.

Course Objectives:

- To enable students to develop an architectural design solution that is comprehensive, contextually relevant, and user responsive.
- To promote a culture of inquiry and reflection through an investigative approach to design problems and arguments.
- To integrate appropriate structural, environmental, technological, and regulatory systems within the design solution.
- To cultivate professional-level design thinking and presentation competencies for a variety of stakeholders.
- To prepare students for independent, critical, and ethical practice through a self-directed thesis journey.

Course Content

- Topic Proposal and Research Framing
- Literature Review and Case Study Analysis
- Site Selection and Contextual Appraisal
- User Profiling and Area Programming
- Design Conceptualisation and Development
- Technical Resolution (Structure, Services, Sustainability)
- Graphic Representation (Drawings, 3D Models, Visual Narratives)
- Final Jury Presentation and Viva Voce

Deliverables

- Individual Design Sheets and Models
- Individual Thesis Report (paired with AAR564)
- Final Jury Presentation
- Consolidated Studio Report (Institutional submission for archive and future reference; recommended as best practice)

References:

Books

1. Designing Buildings
2. Ching, F. D. K. (2015). Architecture: Form, space, and order (4th ed.). Wiley.
3. Unwin, S. (2014). Analysing architecture (4th ed.). Routledge.
4. Clark, R. H., & Pause, M. (2012). Precedents in architecture: Analytic diagrams, formative ideas, and parts (4th ed.). Wiley.

Architectural Methods and Design Approaches

5. Lawson, B. (2006). How designers think: The design process demystified (4th ed.). Routledge.
6. Mari, A. (2021). Catalogue of spatial verbs. Architectura & Natura Press.
7. Groat, L., & Wang, D. (2013). Architectural research methods (2nd ed.). Wiley.
8. Salama, A. M. (2007). Design studio pedagogy: Horizons for the future. ARTI-ARCH.
9. Alexander, C. (1977). A pattern language: Towns, buildings, construction. Oxford University Press.

Space and Contextual Analysis

10. LaGro, J. A. (2013). Site analysis: A contextual approach to sustainable land planning and site design (3rd ed.). Wiley.
11. White, Edward T. Site Analysis: Diagramming Information for Architectural Design. Florida Architectural Media Ltd. 2004
12. LaGro, James A. Site Analysis: informing context-sensitive and sustainable site planning and design (3rd ed.). Wiley.
13. Lynch, K. (1960). The image of the city. MIT Press.
14. Zumthor, P. (2006). Thinking architecture (3rd ed.). Birkhäuser.
15. McDonough, W., & Braungart, M. (2002). Cradle to cradle: Remaking the way we make things. North Point Press.
16. Smith, P. F. (2010). Sustainability at the cutting edge: Emerging technologies for low energy buildings. Routledge.
17. Yeang, K. (1999). The green skyscraper: The basis for designing sustainable intensive buildings. Prestel Publishing.
18. Bahga, S., & Raheja, G. (2014). Modern architecture in India: Concepts, designs, and technology. HarperCollins.
19. Venhaus, Heather. Designing the sustainable site : integrated design strategies for small-scale sites and residential landscapes. Wiley.
20. Friedman, Avi. Designing Innovative Sustainable Neighborhoods/ Avi Friedman. New York Routledge 2022.

Case Studies and Design Process

21. Eggermont, M. (2015). Case study strategies for architects and designers: Integrative data research methods. Routledge.
22. Lawson, B. (2006). What designers know. Routledge.
23. Cuff, D. (1992). Architecture: The story of practice. MIT Press.

Journals and Articles

24. Journal of Architectural Education (JAE).
25. Architectural Review.

26. Habitat International.
27. Energy and Buildings.

Online Sources:

28. ArchDaily. (n.d.). World's most visited architecture website. Retrieved from https://www.archdaily.com
29. Dezeen. (n.d.). Design magazine. Retrieved from https://www.dezeen.com
30. World Architecture Community. (n.d.). Architectural projects and trends. Retrieved from https://www.worldarchitecture.org
31. MIT OpenCourseWare. (n.d.). Free architecture courses. Retrieved from https://ocw.mit.edu

Course Outcomes:

- Develop and present a complete architectural design solution that reflects understanding of context, function, and user needs.
- Conduct independent design research and critical evaluation of case studies, precedents, and user data.
- Integrate building systems, sustainability strategies, and structural logic into the final design.
- Demonstrate design maturity and graphic excellence through advanced drawings, models, and visual tools.
- Defend their design thesis through articulate communication and reasoning in professional juries.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	3	3	2	3	3	2	1	2	3	2	3	3	2
CO2	3	3	3	3	3	3	3	2	2	3	2	3	3	2
CO3	3	2	3	2	3	2	3	2	1	3	2	3	3	2
CO4	3	2	3	3	3	2	3	2	2	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 4 – Quality Education **SDG 9 – Industry, Innovation, and Infrastructure** **SDG 11 – Sustainable Cities and Communities** **SDG 12 – Responsible Consumption and Production**	

SDG Justification:
This course supports **SDG 4 (Quality Education)** by fostering independent, research-driven learning that equips students with critical thinking, design maturity, and professional communication skills essential for lifelong architectural practice. It aligns with **SDG 9 (Industry, Innovation, and Infrastructure)** by integrating innovative design approaches with technical systems, encouraging students to propose resilient and intelligent architectural solutions. Through context-sensitive and user-responsive design, the course advances **SDG 11 (Sustainable Cities and Communities)** by promoting inclusive, sustainable, and adaptable built environments. Additionally, it contributes to **SDG 12 (Responsible Consumption and Production)** by encouraging thoughtful material use, lifecycle analysis, and sustainability strategies in the design process.

AAR564	Thesis Document	L	T	ST	J	C
SDG No. 4, 9, 11		0	1	3	0	4

Course Description:
This course focuses on developing students' academic writing and documentation skills specific to the architectural Design Thesis. It emphasises clarity, coherence, and critical reflection in articulating the design process through structured text and visuals. Through guided writing tasks and iterative reviews, students learn to communicate their design rationale, theoretical grounding, methodology, and technical resolutions in a professionally formatted report. The course supports students in systematically documenting their thesis journey from framing the research to final concept development, culminating in a submission-ready document that meets academic and archival standards. It also prepares students to present and defend their work during viva voce through the lens of well-structured documentation.

Course Objectives:

- To develop students' academic writing and documentation skills in architectural contexts, specifically the Design Thesis.
- To support systematic thinking and communication of the design process through text and visuals.
- To inculcate the essence of clarity, coherence, and referencing in professional thesis documentation.
- To document the evolution of design ideas, decisions, and theoretical positions.
- To prepare a well-curated report suitable for submission, publication, or archival of the Design Thesis course specifically.

Course Content

- Writing a Synopsis: Introducing the topic's background and significance, with clearly defined aims, objectives, methodology, and expected outcomes.
- Review of Literature and Theoretical Framing: Design argument substantiating with ample literature study with clear aim, objectives, and anticipated outcomes.
- Methodology (A detailed strategy/approach in achieving the aim, objectives and anticipated outcomes)
- Case Study and Situation Analysis Documentation
- Site Analysis Documentation
- Area Programming and Statement Development
- Concept and Design Process Writing
- Technical Integration and Design Justification
- Layout Design, Referencing, Editing and Formatting Final Report
- Final Submission of the Thesis Document
- Compilation of Executive Summaries for Institutional Archive

Deliverables

- Individual Thesis Document (Hard + Digital Copy)
- Viva Voce based on quality of report content, clarity, and its integration with the design thesis

- Institutional Copy of Executive Summary/Abstract
- Optional: Studio-Wide Compendium of All Abstracts

References:

1. Michael U. Hensel, Fredrik Nilsson (2016). The Changing Shape of Practice: Integrating Research and Design in Architecture. London: Routledge
2. Elzbieta Danuta Niezabitowska (2018). Research Methods and Techniques in Architecture, New York: Routledge
3. Murray Fraser (2016) Design Research in Architecture: An Overview, New York: Routledge
4. Linda Groat, David Wang (2013). Architectural Research Methods, Hoboken NJ: Wiley https://doarchforensics2018.wordpress.com/wp-content/uploads/2018/01/groatwang-architectural-research-methods.pdf
5. Jan Gehl (1936). Cities for People, London: IslandPress
6. https://archive.org/details/cities-for-people-jan-gehl/mode/2up?view=theater
7. Peer Reviewed Journals in Architecture, Planning, Built environment from any databases like Scopus, Web of Science
8. https://library.gitam.edu/resources.php#Databases
9. “Turabian, K. L. A Manual for Writers of Research Papers, Theses, and Dissertations (University of Chicago Press)” for report structure and formatting.

NB: The above books are general that help; however, the student has to choose books based on the individual area of research

Course Outcomes:

- Structure and draft a comprehensive report that reflects their design process and thinking.
- Use correct referencing systems, captions, and layout conventions across all report sections.
- Articulate research, analysis, and design development clearly through text and diagrams.
- Reflect critically on design choices and justify them in writing. (Evaluate)
- Prepare a professional-quality report suitable for academic or professional audiences.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	2	3	2	1	1	2	3	2	3	2	2
CO2	2	2	2	2	3	1	1	1	2	3	1	3	2	2
CO3	3	3	2	2	3	2	2	1	2	3	1	3	2	2
CO4	3	3	3	3	2	2	2	2	2	3	2	3	2	2
CO5	3	3	2	3	3	2	2	2	2	3	2	3	2	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 4 – Quality Education **SDG 11 – Sustainable Cities and Communities** **SDG 9 – Industry, Innovation, and Infrastructure**	
SDG Justification:	
This course supports **SDG 4 (Quality Education)** by equipping students with critical academic writing and documentation skills essential for communicating complex architectural ideas with clarity and precision. It fosters structured thinking, research integration, and reflective practice, all aligned with the goals of higher education and professional readiness. While primarily focused on the thesis report, it indirectly contributes to **SDG 11 (Sustainable Cities and Communities) and SDG 9 (Industry, Innovation, and Infrastructure)** by enabling the clear dissemination of sustainable and innovative design solutions developed in the parallel design studio. The course ensures that students leave with a professionally curated document ready for archival, publication, or industry engagement.	

AAR572	Architectural Conservation Management	L	T	ST	J	C
SDG No. 4,11,12, & 17		1	1	1	0	3

Course Description:

This elective course offers a foundational introduction to architectural conservation management with a focus on Indian contexts. It moves from basic awareness of conservation philosophies to practical tools, ethical frameworks, and integrative strategies for sustainable heritage management. Emphasizing heritage as a living process, the course highlights traditional Indian systems that support cultural continuity. Students will explore key concepts, operational methods, and stakeholder engagement through case studies and management frameworks. Structured around progressive levels of understanding—from awareness to applied wisdom—it fosters critical thinking and a holistic perspective on conserving both tangible and intangible heritage within contemporary architectural practice.

Course Objectives:

- Examine the philosophical nuances and evolving frameworks of heritage management with special emphasis on Indian traditional systems and cultural continuity approaches.
- Develop proficiency in operational tools and frameworks necessary for effective conservation management, including project planning, legal considerations, financial strategies, and adaptive management techniques.
- Analyze diverse conservation management practices across Indian cultural landscapes, focusing on adaptive reuse strategies, maintenance protocols, risk assessment, and documentation methodologies.
- Evaluate ethical dimensions, governance structures, and technological innovations (Artificial Intelligence) in conservation management while exploring the dynamics between subject experts and community participation.
- Investigate/be able to evaluate the relationship between tangible and intangible heritage, tourism development, and sustainable management practices to ensure holistic conservation outcomes.

Unit 1: Concepts and Philosophies of Management

Unit 1 establishes fundamental awareness (Bodha) of conservation management philosophies and Indian traditional systems that view heritage as process rather than product.

- Planning vs. management and Gaps
- Heritage as process, not product
- Indian traditional heritage management systems: Cultural continuity
- Philosophical foundations and evolution
- Principles and Practice of Conservation Management

Unit 2: Operational Tools and Frameworks

Unit 2 develops operational knowing (Mati Jnana through practical tools for project management, legal frameworks, and economic considerations.

- Project phasing, scheduling, and budgeting
- Law and Jurisprudence
- Financial and organizational framework: Heritage economics
- Knowledge management
- Adaptive management: Living heritage management

Unit 3: Introduction to Conservation Management in Practice

Unit 3 builds structured knowledge (Sruta Jnana) through examination of conservation management practices across Indian landscapes, maintenance systems, and documentation approaches.

- Indian Cultural Landscapes: Urban Landscapes, Rural Landscapes ad Sacred Landscapes
- Adaptive reuse strategies in Indian heritage contexts
- Maintenance schedules and conservation manuals (cases and contexts)
- Periodic inspections, risk analysis, and emergency preparedness
- Role of documentation during and after execution
- Role of artificial intelligence

Unit 4: Governance, Ethics, and Technology

Unit 4 fosters deeper understanding (Anumana) of ethical dimensions, stakeholder dynamics, and technological innovations in governance.

- Ethics and decision-making in conservation
- Stakeholders: community, who is a heritage expert?
- Post-conservation monitoring and evaluation
- Artificial Intelligence and Architectural Conservation Management
- Multi-level governance: Best practices

Unit 5: Public Interface and Intangible Heritage

The journey culminates in Unit 5 with integrative wisdom (Prajna) as students address the delicate relationship between heritage tourism, intangible values, and sustainable management practices, demonstrating the ability to balance preservation with public engagement in diverse heritage contexts.

- Heritage tourism and public interface
- Architectural heritage management of the intangibles
- Best practices for Sustainable Heritage Management

References:

1. Chandler and M. Pace, *The Production of Heritage: The Politicisation of Architectural Conservation*, London, U.K.: Taylor & Francis, 2019.
2. Stubbs and R. G. Thomson, *Architectural Conservation in Asia: National Experiences and Practice*, London, U.K.: Taylor & Francis, 2016.
3. Chalana and A. Krishna, *Heritage Conservation in Postcolonial India: Approaches and Challenges*, London, U.K.: Taylor & Francis, 2020.
4. Avrami, S. Macdonald, R. Mason, and D. Myers, *Values in Heritage Management: Emerging Approaches and Research Directions*, Los Angeles, U.S.: Getty Conservation Institute, 2019.
5. *Conservation of Architectural Heritage*, Switzerland: Springer International Publishing, 2022.

6. *Built Heritage: Monitoring Conservation Management*, Cham, Germany: Springer International Publishing, 2014.
7. *Time Frames: Conservation Policies for Twentieth-Century Architectural Heritage*, London, U.K.: Taylor & Francis, 2017.
8. *Cultural Heritage Ethics: Between Theory and Practice*, Cambridge, U.K.: Open Book Publishers, 2014.

Course Outcomes:

- Be able to distinguish between conservation planning and management approaches, articulate the process-oriented nature of heritage, and apply traditional Indian management principles to contemporary conservation challenges. (Awareness)
- Be able to develop comprehensive conservation management plans incorporating appropriate legal frameworks, financial models, knowledge management systems, and adaptive strategies for heritage projects. (Knowing)
- Be able to formulate contextually appropriate maintenance schedules, risk management protocols, and documentation systems for diverse heritage contexts including cultural landscapes and adaptive reuse projects. (Knowledge)
- Be able to navigate complex ethical dilemmas in conservation decision-making, facilitate multi-stakeholder engagement, implement monitoring systems, and integrate technological innovations in heritage management. (Understanding)
- Be able to design sustainable heritage tourism initiatives that balance visitor experience with conservation needs while safeguarding the intangible dimensions of architectural heritage.(Wisdom)

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	3	1	2	1	3	3	3	3	2	3	3	2	1
CO2	2	3	3	3	2	2	2	3	2	2	2	3	3	2
CO3	2	2	3	3	3	2	2	2	2	2	2	3	3	3
CO4	1	2	2	3	3	3	2	3	3	3	2	2	2	2
CO5	1	2	3	2	2	3	3	3	2	2	2	2	2	1

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 11 – Sustainable Cities and Communities	

SDG 4 – Quality Education **SDG 12 – Responsible Consumption and Production** **SDG 17 – Partnerships for the Goals**
SDG Justification:
This course aligns strongly with **SDG 11 (Sustainable Cities and Communities)** by promoting sustainable heritage management practices that preserve cultural identity and ensure continuity of built heritage in urban and rural contexts. It supports **SDG 4 (Quality Education)** by fostering critical thinking, cultural literacy, and awareness of ethical conservation practices through a structured, reflective learning approach. The emphasis on traditional knowledge systems and sustainable practices in heritage conservation also resonates with **SDG 12 (Responsible Consumption and Production)** by encouraging minimal intervention, reuse, and adaptive management of existing resources. The inclusion of stakeholder engagement and governance introduces students to collaborative conservation models aligned with **SDG 17 (Partnerships for the Goals)**.

AAR574	Lighting Design in Architecture	L	T	ST	J	C
SDG No.4,7,11, and 12		1	1	1	0	3

Course Description:

This course introduces students to the principles and practices of lighting design in architecture, emphasising the aesthetic, functional, and psychological impact of light in built environments. Students will explore both natural and artificial lighting strategies and learn how to integrate lighting into architectural concepts to enhance spatial quality. The course also introduces lighting simulation tools and software, enabling data-driven design decisions and energy-conscious solutions. Through case studies and project work, students will gain the ability to conceptualise, simulate, and present innovative lighting solutions tailored to specific architectural contexts.

Course Objectives:

- To understand the role of lighting design in architecture.
- To understand natural and artificial lighting techniques.
- To use lighting as a tool to enhance the aesthetics and functionality of architectural spaces.
- To introduce lighting software and analysis tools to support professional design.
- To evaluate the environmental, economic, and human impacts of lighting choices in architectural design.

Unit 1: Introduction to Lighting Design

- Basics of lighting and its physical properties
- Psychological and spatial impacts of lighting
- Importance of lighting in architectural design

Unit 2: Natural Lighting Techniques

- Daylighting principles and strategies
- Shading devices and climate-based design
- Skylights, atriums and light shelves

Unit 3: Artificial Lighting Techniques

- Types of artificial light sources (incandescent, LED, etc.)
- Ambient, task, accent, and decorative lighting
- Lighting calculations and energy efficiency

Unit 4: Tools and Software for Lighting Design

- Overview of lighting tools
- Understanding photometric data and IES files
- Introduction to basic lighting layout simulations

Unit 5: Case Studies and Final Project

- Analysis of exemplary lighting design in architecture
- Site-specific lighting problem and conceptual approach

- Final portfolio review and presentation

References:

1. M. J. Kroelinger, *Lighting Design Basics*, 4th ed., Hoboken, NJ: Wiley, 2021.
2. G. Zissis and D. Guarnieri, *Lighting: Fundamentals, Technology and Application*, Springer, 2020.
3. D. DiLaura, K. Houser, R. Mistrick, and G. Steffy, *The Lighting Handbook*, 10th ed., New York: Illuminating Engineering Society, 2011.
4. M. Boubekri, *Daylighting, Architecture and Health: Building Design Strategies*, Routledge, 2014.
5. D. Loe, *Lighting for Interior Design*, London: Laurence King Publishing, 2011.
6. C. Cuttle, *Lighting Design: A Perception-Based Approach*, 2nd ed., New York: Routledge, 2021.
7. A. Dubois and E. Blomsterberg, “Energy efficiency and lighting design,” *Energy and Buildings*, vol. 155, pp. 113-125, 2017.
8. J. Bean, *Lighting Simulation for Architects*, Springer, 2022.

Course Outcomes:

- Understand the role of lighting in enhancing spatial experience and architectural form.
- Differentiate between natural and artificial lighting systems and their appropriate applications.
- Application of effective lighting strategies to maximize both energy efficiency and user comfort.
- Use of lighting design software to simulate and analyze lighting performance.
- Document and present a comprehensive lighting design portfolio including concept, strategy, and visual representation.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	-	-	-	2	-	-	2	-	-	-	-
CO2	2	3	2	-	2	2	3	-	-	2	-	-	-	-
CO3	3	3	3	-	2	3	3	-	-	2	-	-	-	-
CO4	2	2	3	3	3	2	2	-	2	3	2	3	-	-
CO5	2	2	2	-	2	2	3	-	3	3	2	3	-	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: **SDG 7 – Affordable and Clean Energy** **SDG 11 – Sustainable Cities and Communities** **SDG 12 – Responsible Consumption and Production** **SDG 4 – Quality Education**	
SDG Justification:	
This course supports **SDG 7 (Affordable and Clean Energy)** by introducing energy-efficient lighting strategies and simulation tools that enable students to design low-energy, sustainable lighting systems. It contributes to **SDG 11 (Sustainable Cities and Communities)** by promoting well-lit, safe, and visually enriching environments that enhance the quality of urban and architectural spaces. Through an emphasis on efficient use of natural and artificial light, the course aligns with **SDG 12 (Responsible Consumption and Production)** by encouraging responsible resource use and energy-conscious design. Additionally, it fosters design literacy and professional competency in lighting design, supporting **SDG 4 (Quality Education).**	

AAR576	Landscape Design Communication	L	T	ST	J	C
SDG No. 11,12, and 15		1	1	1	0	3

Course Description:

This course equips students with the skills necessary for the professional representation, detailing, and documentation of landscape design projects. Emphasising a balance between creative expression and technical accuracy, the course guides students through the complete process of site analysis, conceptual development, graphic communication, and construction documentation. Students will develop competence in site inventory and analysis, utilise both manual and digital tools for graphical representation, and produce construction-ready landscape plans that integrate environmental and material considerations. The course also focuses on developing communication skills, both visual and verbal to effectively present landscape narratives to diverse stakeholders. Through studio-based project work, students learn to synthesize site-specific data with design and technical principles, culminating in a comprehensive, buildable landscape proposal.

Course Objectives:

- Comprehendible Representation: Develop comprehensive skills in analyzing sites and formulating effective landscape plans with global graphic standards and symbols.
- Graphical Communication: Enhance the ability to convey design ideas through high-quality, detailed graphics using conventional and digital methods.
- Construction Detailing: Master techniques for creating detailed construction documents that communicate materiality, scale, and technical specifications.
- Integration of Disciplines: Combine design theory, environmental context, and technical detailing to produce cohesive and sustainable landscape proposals.
- Professional Communication: Use concise language to explain design ideas. A well-prepared verbal presentation that helps convey the spatial narrative and design intent effectively.

Unit 1: Introduction to site inventory

Overview of landscape site planning representation fundamentals, Techniques for site inventory, environmental analysis, and context assessment, Understanding of criteria of landscape design for green buildings

Unit 2: Graphic Representation Techniques

Principles of effective graphic communication in landscape architecture, Illustration methods: sketches, diagrams, renderings, Implication of digital tools (e.g., AutoCAD, SketchUp, Adobe Illustrator, Adobe InDesign).

Unit 3: Fundamentals of Construction Detailing

Overview of materials, methods, and standards in landscape construction, Techniques for detailing hardscape, softscape, water, and Illumination features, and Integration of design aesthetics with technical requirements.

Unit 4: Advanced Construction Documentation

Producing comprehensive tender and construction documents, including bills of quantities, Annotations, specifications, and detailing practices, best practices for preparing construction-ready plans.

Unit 5: Studio Project & Final Review

Integrated project work from site analysis to final documentation, Peer critiques, iterative feedback sessions, and project revisions, Final presentation of complete landscape site planning and construction details.

Reading Lists:

1. K. Booth, *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design*, Hoboken, NJ: Wiley, 2011.
2. N. Hacker, N. Sparrow, and P. Johnston, *Site Planning and Design Handbook*, 2nd ed., New York, NY: McGraw-Hill Education, 2012.
3. R. S. Nelson, "Landscape Construction Techniques: Sustainable Site Development Practices," *Journal of Green Building*, vol. 9, no. 4, pp. 102–118, 2014. doi: 10.3992/jgb.9.4.102.
4. G. S. Thompson and F. Steiner, *Ecological Design and Planning*, New York, NY: Wiley, 1997.
5. L. E. Harris and J. Dines, *Time-Saver Standards for Landscape Architecture*, 2nd ed., New York, NY: McGraw-Hill, 1997.
6. S. Simonds and B. Starke, *Landscape Architecture: A Manual of Site Planning and Design*, 4th ed., New York, NY: McGraw-Hill, 2013.
7. U.S. Green Building Council, "LEED v4 for Building Design and Construction," *USGBC*, 2023. [Online]. Available: https://www.usgbc.org/leed/v4. [Accessed: Jul. 27, 2025].
8. Autodesk, "Landscape Design Tools in AutoCAD and Civil 3D," *Autodesk Knowledge Network*, 2023. [Online]. Available: https://knowledge.autodesk.com. [Accessed: Jul. 27, 2025].

Web References:

9. Software tutorials for AutoCAD, SketchUp, and Adobe Illustrator
10. https://edis.ifas.ufl.edu/publication/EP426
11. https://libguides.nybg.org/siteinventory

Course Outcomes:

- Conduct in-depth site analysis to inform design decisions.
- Develop and present coherent landscape site plans that integrate spatial organization with environmental and cultural contexts.
- Produce detailed construction drawings and documentation using manual sketching and digital software.
- Apply construction detailing principles to ensure design feasibility and clarity.
- Critically evaluate design details for constructability and sustainability.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	3	-	-	2	2	-	-	-	-	2	3

CO2	2	-	-	2	-	-	3	-	-	3	-	-	-	3
CO3	3	2	2	3	-	-	3	1	-	2	2	-	2	3
CO4	3	3	3	3	1	3	3	3	3	2	2	2	3	3
CO5	2	-	-	-	-	3	2	-	-	3	-	-	-	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
SDG 11 – Sustainable Cities and Communities; SDG 12 – Responsible Consumption and Production; SDG 15 – Life on Land	
SDG Justification:	
● It emphasizes environmentally responsible planning, landscape design for green buildings, and sustainable site assessment practices. ● It advances use of environmentally responsible materials and detailing methods that reduce resource waste. ● It teaches integration of green features like softscape and water systems that support biodiversity and ecosystem function.	

AAR578	Circular Cities: Indian and Global Perspectives	L	T	ST	J	C
SDG No. 9, 11, 12, & 13		1	1	1	0	3

Course Description:

This course explores circular economy principles at an urban scale, analysing sectoral applications in energy, waste, mobility, housing, and water systems. Students study Indian and international case studies, urban metabolism, governance models, and policy frameworks enabling circular transitions. A studio-based capstone applies circular strategies to Indian urban contexts, linking design, policy, and community engagement. The course prepares students to create climate-resilient, resource efficient cities by integrating systemic thinking with practical, culturally relevant interventions for sustainable urban futures.

Course Objectives:

- Understand the concept of circular cities and their relevance in climate-resilient urban futures.
- Examine global and Indian case studies to identify key strategies, success factors, and implementation models.
- Analyse infrastructure, policy, and governance mechanisms essential for enabling circular transitions in urban environments.
- Evaluate the socio-economic and environmental impacts of circular city interventions.
- Equip students to design context-specific urban interventions applying circular principles across sectors

Unit 1: Introduction to Circular Cities

- Defining circular cities and comparison with sustainable city models.
- Key drivers: climate change, resource scarcity, and urban resilience.
- Global frameworks: Ellen MacArthur Foundation, UN-Habitat, EU Circular Cities Declaration.
- Indicators and metrics for circular urban systems.
- Overview of urban metabolism and system mapping tools.

Unit 2: Sectoral Applications of Circularity in Cities

- Circular water and sanitation systems.
- Waste management: zero-waste cities, decentralised recycling, urban mining.
- Mobility and logistics: shared transport, EV integration, last-mile connectivity.
- Circular housing and public infrastructure: retrofitting, modular urban structures, co-housing.
- Energy systems: microgrids, district cooling/heating, energy-positive buildings.

Unit 3: Governance, Policy, and Financing for Circular Cities

- Circular urban governance models and stakeholder engagement.
- Local and national policies in India: Swachh Bharat Mission, Smart Cities Mission, AMRUT.
- International policy perspectives: Amsterdam, Singapore, Copenhagen.
- Financing mechanisms and Public-Private Partnerships (PPP) for circular infrastructure.
- Urban data governance and digital platforms.

Unit 4: Circular Cities in the Indian Context

- Review of circular urban initiatives in Indian cities (e.g., Panaji, Indore, Surat, Pune).
- Local innovation, vernacular materials, and traditional practices.
- Challenges in adoption: urban informality, infrastructure deficits, regulatory gaps.
- Role of ULBs (Urban Local Bodies), NGOs, and community-led circular transitions.
- Integration with India's Net Zero and SDG targets.

Unit 5: Capstone Studio – Designing a Circular Neighborhood

- Site-based studio project applying circular city principles to an Indian urban context.
- Analysis of existing systems (waste, water, mobility, housing, energy).
- Propose interventions for local loop closures.
- Stakeholder engagement strategies and implementation roadmaps.
- Development of presentation package: urban systems mapping, policy linkages, and visualisation.

References:

1. Prasad, S. (2023), Circular Economy and Urban Development in India
2. Williams, J. (2021), Circular Cities: A Revolution in Urban Sustainability
3. Ellen MacArthur Foundation & ARUP (2019), The Circular Economy in Cities
4. Lehmann, S. (2020), Designing for Zero Waste Cities: Principles, Practices and Examples
5. C40 Cities & UN-Habitat (2022), Urban Circular Economy Guidebook
6. NIUA (National Institute of Urban Affairs) reports on Smart Cities and Circular Economy.
7. Government of India – AMRUT and Swachh Bharat Mission guidelines.

Course Outcomes:

- CO1: Explain the concept of circular cities and critically compare Indian and global practices.
- Analyse sectoral interventions across urban systems through a circular economy lens.
- Evaluate governance, policy, and finance frameworks for implementing circular cities.
- Propose design-based and policy-linked circular strategies for Indian urban contexts.
- Collaboratively develop and communicate a circular neighbourhood plan using integrated systems thinking.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	1	1	3	3	1	2	2	–	1	3	2
CO2	3	3	2	2	2	3	3	–	2	2	1	1	3	2
CO3	3	2	3	3	2	3	3	1	2	2	2	1	3	3
CO4	2	3	3	2	2	3	3	1	2	2	2	1	3	3
CO5	3	3	3	2	3	3	3	1	3	3	2	2	3	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement:	
This course aligns with SDG 11 – Sustainable Cities and Communities, SDG 12 – Responsible Consumption and Production, SDG 13 – Climate Action, SDG 9 – Industry, Innovation and Infrastructure, and SDG 17 – Partnerships for the Goals.	
SDG Justification:	
The course directly contributes to **SDG 11** by enabling students to propose context-specific strategies for sustainable urban development and regeneration. Through systems thinking and sectoral circularity, **SDG 12** advances focusing on waste reduction, resource recovery, and closed-loop urban systems. The emphasis on climate-resilient infrastructure, mobility, and energy transitions supports **SDG 13**. Integration of digital tools, policy innovations, and resilient urban infrastructure links to **SDG 9**, while the interdisciplinary and multi-stakeholder engagement in studio work aligns with **SDG 17**, fostering collaborative governance models for circular cities.	

AAR582	Data Driven Architecture	L	T	ST	J	C
SDG No. 9		1	1	1	0	3

Course Description:

This course introduces students to data-driven design approaches using custom tools, simulations, and AI. Through visual scripting and coding, students will learn to build intelligent workflows that enhance architectural performance and responsiveness. Key topics include environmental analysis, geospatial data integration, performance simulation, and machine learning for design optimisation. The course also explores generative AI for rapid design ideation and adaptive systems. Students will develop a final project that applies data-informed methods to their own architectural work. Prior experience with 3D modelling, visual scripting, or digital simulations is recommended.

Course Objectives:

- To introduce students to the concept of custom tool creation for architectural workflows using visual and code-based interfaces.
- To enable the application of data-driven methods for environmental, spatial, and performance analysis in design.
- To explore how advanced simulations inform design decisions and optimise architectural systems.
- To integrate AI-driven techniques for both analysis and rapid design ideation.
- To develop customised tools or intelligent systems supporting architectural project workflows.

Pre-Requisite: Basic knowledge of interactive design concepts, 3D modelling, visual scripting, and familiarity with digital simulation or immersive tools is recommended.

Unit 1: Custom Tool Development for Design Workflows

Fundamentals of visual programming and custom script generation. Introduction to creating custom tools or add-ons for design platforms. Data handling: importing, structuring, and using datasets for parametric control. Workflow automation to enhance architectural processes and decision-making.

Unit 2: Environmental and Geospatial Data Analysis

Use of simulation tools to analyse environmental, geographic, and infrastructural data. Climate analysis, solar studies, and terrain response as design drivers. Integration of geospatial data into design parameters. Developing responsive systems based on environmental performance.

Unit 3: Performance Simulation in Design

Setting up data-driven performance simulations: lighting, energy use, airflow, thermal comfort. Interpreting simulation output to inform architectural decision-making. Optimising design strategies based on real-time feedback loops. Scenario-based modelling for sustainable performance enhancement.

Unit 4: AI-Based Data Analysis in Architecture

Training and applying data models for recognising patterns in spatial or performance data. Using large datasets to inform adaptive architectural strategies. Ethical use of data in design decision-making.

Unit 5 - Generative AI for Design Ideation

Exploring AI tools for generating spatial ideas, material systems, or design schemes. Techniques for using AI outputs as conceptual springboards. Balancing machine-generated content with architectural intent. Final individual project: development of a design tool or simulation-driven output based on the student's primary design project.

References:

1. Y. Li, H. Chen, P. Yu, and L. Yang, "A Review of Artificial Intelligence in Enhancing Architectural Design Efficiency," *Applied Sciences*, vol. 15, no. 3, p. 1476, Jan. 2025. [Online]. Available: https://doi.org/10.3390/app15031476
2. N. D. Cortiços, X. Zheng, and C. C. Duarte, "The Impact of Artificial Intelligence on Architecture: A Comprehensive Analysis of AI Software Tools and Their Global Adoption," in *Proc. 10th Int. Conf. on Building Materials and Construction*, Springer, pp. 152–169, Jul. 2025. [Online]. Available: https://link.springer.com/chapter/10.1007/978-981-96-7687-3_15
3. M.-M. Fernandez-Antolin, J. M. del Río, and R.-A. Gonzalez-Lezcano, "Building Performance Simulation Tools as Part of Architectural Design: Breaking the Gap Through Software Simulation," *Int. J. Technol. and Design Educ.*, vol. 32, pp. 1227–1245, Jan. 2022. [Online]. Available: https://link.springer.com/article/10.1007/s10798-020-09641-7
4. M. Donn, "Trusting Building Performance Simulation: Avoiding the Gap Between Designed and Measured Performance," *Buildings and Cities*, Special Issue CFP, Sep. 2025. [Online]. Available: https://www.buildingsandcities.org/media/pdf/CFPTrusting_Building_Perf_Simulation.pdf
5. B. Calka and M. Szostak, "GIS-Based Environmental Monitoring and Analysis," *Applied Sciences*, vol. 15, no. 6, p. 3155, Mar. 2025. [Online]. Available: https://doi.org/10.3390/app15063155
6. C. Su et al., "Geospatial Information Technology: Analysis of Architectural Characteristics and Intelligent-Driven Application Modes," *Int. J. Digital Earth*, vol. 18, no. 1, p. 2528634, Jun. 2025. [Online]. Available: https://www.tandfonline.com/doi/pdf/10.1080/17538947.2025.2528634
7. D. Rosebrook, "Custom Design Tooling: Crafting the Future of Design Workflows," *Darian Rosebrook Blog*, Nov. 2024. [Online]. Available: https://darianrosebrook.com/articles/design-tooling
8. A. Ramzy and M. Nour, "Streamlining Design-to-Development with Custom Tools," *Klivvr Blog*, Oct. 2024. [Online]. Available: https://blog.klivvr.com/streamlining-design-to-development-with-custom-tools
9. "Best Automation Tools in 2025: Power Automate vs. Custom Workflow Engines," *200OK Solutions Blog*, Apr. 2025. [Online]. Available: https://200oksolutions.com/blog/best-automation-tools-in-2025-power-automate-vs-custom-workflow-engines/

Course Outcomes:

- Students will develop custom tools and design workflows tailored to specific architectural needs.
- Students will apply environmental and geospatial data in driving design performance.
- Students will simulate and optimize architectural strategies using performance-based metrics.
- Students will understand and apply AI models for analyzing design data.
- Students will integrate AI-based content generation into their design ideation process and produce a functional, data-driven output.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	-	2	1	3	-	-	-	-	-	-	1	1	3
CO2	2	-	2	1	3	-	2	-	-	-	-	1	1	3
CO3	2	-	2	1	3	-	-	-	-	-	-	1	1	3
CO4	1	2	3	2	3	-	1	-	-	1	-	2	1	3
CO5	1	2	3	2	3	-	1	-	-	1	-	2	1	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: SDG 9	
Statement: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.	
SDG Justification: UNIT -1 - Custom Tool Development for Design Workflows - Promotes technological innovation by teaching students to create custom tools and automate workflows, enhancing efficiency and adaptability in architectural practice. UNIT - 2 - Environmental and Geospatial Data Analysis - Enables resilient and sustainable infrastructure by integrating climate and geospatial data into design decisions, fostering data-informed environmental responsiveness. UNIT - 3 - Performance Simulation in Design - Supports optimisation of infrastructure through simulation-based analysis of energy, lighting, and airflow, contributing to sustainable and high-performance built environments. UNIT - 4 - AI-Based Data Analysis in Architecture - Advances industrial innovation by applying AI to recognise patterns and inform adaptive design strategies, aligning with smart and future-ready infrastructure goals.	

UNIT - 5 - Generative AI for Design Ideation – Encourages creative innovation through AI-driven ideation and tool development, empowering students to produce intelligent, data-responsive architectural outputs.

AAR584	Net Zero Assessment and Analysis	L	T	ST	J	C
SDG No. 7,9,11		1	1	1	0	3

Course Description:

Course Objectives:

- To introduce the principles and strategies of energy efficiency in building systems and design.
- To develop the ability to conduct energy audits and apply them to analyze and evaluate building energy performance using simulation tools.
- To understand the building envelope, comfort systems and controls, lighting and controls, electrical and renewable energy systems aspects.
- To develop competence in using building performance simulation tools i.e, Envimet and Design Builder, for analysing and optimizing energy consumption.
- To conduct energy audits, retrofitting analyses for existing buildings and documentation.

Unit 1: Fundamentals of Energy Efficiency in Buildings

- Introduction to energy use in the built environment, Principles of energy-efficient design
- Thermal comfort indices and energy balance
- Heat gain/loss, internal loads, natural vs mechanical systems
- Energy concepts: Net-zero, net-positive, passive house

Unit 2: Energy Auditing and Conservation Strategies

- Types of energy audits,Energy auditing procedures and tools
- Data collection techniques and instrumentation
- Identifying Energy Conservation Measures (ECMs)
- Economic analysis: payback, life-cycle costing

Unit 3: Building Envelope and Environmental Systems

- Thermal performance of building materials
- Passive design strategies for heating, cooling, and lighting
- Building envelope components: walls, roofs, windows
- Indoor environmental quality,HVAC systems and controls,Lighting and daylighting strategies.
- Integration of renewable energy systems (Solar, Wind, Geothermal and Hybrid technologies)

Unit 4: Simulation Tools for Energy Performance

- Overview of building energy modeling

- Introduction to simulation software: DesignBuilder and ENVI-met
- Model inputs: geometry, construction, schedules, systems, weather data
- Calibration and validation of simulation models
- Interpretation of simulation outputs (energy use, comfort, carbon emissions)

Unit 5: Retrofitting and Documentation

- Energy assessment and analysis of existing buildings
- Retrofitting strategies and optimization techniques for energy efficiency
- Simulation-based evaluation of retrofits,
- Final project:Preparation of energy audit reports and retrofit documentation.

References:

1. H. Khosravi, H. Sahebi, R. Khanizad, and I. Ahmed, “Building Energy Efficiency through Advanced Regression Models and Metaheuristic Techniques for Sustainable Management,” arXiv preprint arXiv:2305.08886, May 2023.
2. V. Michalakopoulos, S. Pelekis, G. Kormpakis, V. Karakolis, S. Mouzakitis, and D. Askounis, “Data-driven building energy efficiency prediction using physics-informed neural networks,” arXiv preprint arXiv:2311.08035, Nov. 2023.
3. IEA, Energy Efficiency 2024 – Analysis, International Energy Agency, Nov. 2024.
4. Moncef Krarti, Energy Audit of Building Systems: An Engineering Approach, 3rd ed., CRC Press, 2020 (updated edition widely circulated as of 2021).
5. Proceedings of Sustainability in Energy and Buildings 2023, Smart Innovation, Systems and Technologies, vol. 378, Springer, 2024.

Course Outcomes:

- CO1: Ability to understand key principles and strategies for enhancing energy efficiency in building design and systems.
- CO2: Conduct energy audits and apply findings to assess and improve the energy performance of buildings using relevant simulation tools.
- CO3: Analyze the performance of building envelope, HVAC systems, lighting, electrical systems, and renewable energy components in the context of energy efficiency.
- CO4: Demonstrate skills in using building performance simulation tools, to evaluate and optimize energy consumption.
- CO5: Execute retrofitting analyses for existing buildings and prepare energy audit documentation and reports.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	-	-	-	3	-	-	2		2	-	-
CO2	3	3	3	2	3	2	3	-	-	2		2	-	-
CO3	3	2	3	2	2	2	3	-	-	2		1	-	
CO4	2	2	3	2	3		2	-	-	1		1	-	-
CO5	2	3	3	3	3	2	3	-	2	3	2	3	-	-

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: This course aligns with three key Sustainable Development Goals (SDGs)—SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), and SDG 11 (Sustainable Cities and Communities)—by integrating sustainable design principles, simulation tools, and retrofitting strategies to improve energy efficiency in buildings.	
SDG Justification: ● Encourages passive and active energy strategies and renewable energy system integration. ● Trains learners in conducting energy audits and identifying Energy Conservation Measures (ECMs). ● Introduces modern simulation tools (DesignBuilder, ENVI-met) for modeling, analysis, and optimization. ● Promotes retrofitting and performance enhancement of existing buildings, contributing to sustainable cities. ● Supports data-driven innovation in the construction and building management sectors.	

AAR586	Building Construction Safety, Quality Assurance and Control	L	T	ST	J	C
SDG No. 8		1	1	1	0	3

Course Description:

This course provides architecture students with essential knowledge and skills to ensure safety and quality in construction site practices. Students are introduced to legal frameworks, standard protocols, and ethical responsibilities that govern safe and quality-conscious construction. The course emphasises a proactive and structured approach to hazard identification, risk assessment, and quality assurance (QA) using both conventional and digital tools. Through case studies, simulations, and field-based practices, students learn to integrate safety standards (such as OSHA, BIS, and IS codes) with quality benchmarks, while exploring the use of mobile applications and BIM-integrated platforms to monitor and document site performance. The course also fosters leadership, ethical decision-making, and a collaborative culture of safety within construction teams.

Course Objectives:

- Familiarise with legal frameworks, hazard types, and architect's duties in site safety.
- Conduct structured risk assessments and identify control measures.
- Implement QA/QC protocols using standard checklists and codes.
- Apply digital tools to track safety performance and quality benchmarks.
- Build an ethical mindset and collaborative culture around construction safety.

Unit 1: Safety Regulations and Hazard Identification

Introduction to safety standards and codes (OSHA, BIS, IS 14489), types of construction hazards (mechanical, electrical, environmental), personal protective equipment (PPE), accident causation theories, hierarchy of controls.

Unit 2: Risk Assessment and Crisis Planning

Hazard identification techniques, risk matrix and rating, construction safety planning, accident prevention. Crisis management strategies (evacuation, fire, structural failure).Local and global case studies on site incidents

Unit 3: Quality Assurance and Inspection Frameworks

BIS/ISO quality benchmarks in construction; QA documentation (method statements, ITPs, NCRs); Field inspection protocols for civil, services and finishes; Responsibilities of QA officers and architects on site; Quality culture and its relationship to cost-effectiveness

Unit 4: Digital QA/QC and Safety Tools

Mobile applications and software used for site inspection; BIM-integrated QA tools and snag tracking; Use of checklists, defect logs, photo documentation; Real-time dashboards for safety and quality monitoring; CDM-based documentation

Unit 5: Ethics, Responsibility and Culture of Safety

Building a safety-first culture in design and construction; Ethical case studies in construction safety lapses; Leadership and communication in safety training; Creating a quality and safety training manual; Final safety+quality audit project + reflection report

References:

1. J. L. Ashford, The Management of Quality in Construction. London, U.K.: E & FN Spon, 1989.
2. Institution of Civil Engineers, RAMP: Risk Analysis and Management for Projects, 2nd ed. London, U.K.: Thomas Telford Publishing, 2005.
3. M. van Staveren, Uncertainty and Ground Conditions: A Risk Management Approach. Oxford, U.K.: Butterworth-Heinemann, 2006.
4. P. W. G. Morris, The Management of Projects, 2nd ed. New York, NY, USA: Thomas Telford, 2004.
5. P. S. Gahlot and M. Dhir, Building Repair and Maintenance Management. New Delhi, India: CBS Publishers & Distributors, 1999.
6. E. M. Bennett, Adding Value Through Project Management of CDM. London, U.K.: Thomas Telford Publishing, 2003.
7. J. Hinze, Construction Safety, 2nd ed. Upper Saddle River, NJ, USA: Prentice Hall, 2006.
8. Bureau of Indian Standards, IS 14489: Code of Practice on Occupational Safety and Health Audit. New Delhi, India: BIS, 1998.
9. Bureau of Indian Standards, IS 4925: Concrete Batching and Mixing Plant – Specification. New Delhi, India: BIS, Reaffirmed 2017.
10. T. E. Glavinich, Contractor's Guide to Green Building Construction: Management, Project Delivery, Documentation, and Risk Reduction. Hoboken, NJ, USA: John Wiley & Sons, 2008.

Course Outcomes:

- Interpret and apply safety codes and classify construction site hazards.
- Conduct risk assessments and prepare crisis control strategies.
- Implement QA protocols and inspection practices aligned to site standards.
- Use digital tools for monitoring safety and quality benchmarks.
- Demonstrate ethical responsibility and leadership in safety/QA decision-making.

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	2	1	1	1	1	1	1	3	1	1	1	1	2	1
CO2	1	3	2	1	3	1	1	1	1	1	2	2	1	2
CO3	1	2	3	1	2	1	2	1	1	1	3	2	2	3
CO4	1	1	2	1	3	1	3	1	1	1	3	3	1	3
CO5	1	1	2	1	3	2	1	2	2	3	3	2	1	2

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. : 08	

SDG Statement: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
SDG Justification:
The syllabus emphasizes occupational safety, risk reduction, quality assurance, and ethical practices in the construction industry — all of which are foundational to ensuring safe, productive, and dignified work environments, especially in high-risk sectors like construction.

AAR588	Participatory Planning and Design	L	T	ST	J	C
SDG No. 11,17, and 13		1	1	1	0	3

Course Description:

This course explores participatory planning as a democratic and transformative approach to urban development. Focusing on both theory and practice, it equips students with the skills to engage communities meaningfully in the planning and design process. Students will learn to apply participatory tools such as mapping, focus group discussions (FGDs), and e-governance platforms, while understanding the complex social, cultural, and political dimensions that influence participation in India's urban fabric. The course redefines the architect's role as a collaborator, negotiator, and listener, emphasising ethics, empathy, and equity in design. Through critical reflection on constitutional mandates (such as the 73rd and 74th Amendments), rights-based urbanism, and global-local case studies, students will learn how participatory processes shape more inclusive and resilient built environments.

Course Objectives:

- To explore participatory planning as an essential tool in democratic urban development.
- To develop technical and interpersonal skills for community engagement in the design process.
- To critically understand urban participation's social, cultural, and political dynamics.
- To redefine the architect's role as a collaborator, negotiator, and listener.
- To learn from global and local participatory case studies that demonstrate transformative impact.

Unit 1: Understanding Participation in Planning and Design:

- Significance of participation in India's diverse and layered urban fabric.
- Global participatory theories and their evolution over time.
- The 73rd and 74th Constitutional Amendments mandate local governance.
- Rights-based urbanism as a foundation for inclusive design practices.
- Citizen engagement tools used in national planning and smart cities.

Unit 2: Tools and Techniques in Participatory Design

- Stakeholder analysis to identify and prioritise community actors.
- Participatory methods like mapping, surveys, FGDs to generate user insights.
- Platforms like MyGov, PGIS, and dashboards are used to promote e-participation.
- Participatory designs using matrices, visual tools, and community feedback.

Unit 3: Social and Cultural Dimensions of Participation

- How caste, gender, and religion affect engagement and design priorities.
- Embed equity and spatial justice in the creation of inclusive public spaces.
- Local customs and social behaviours into architectural design.
- Devise inclusive design strategies for housing and public infrastructure.

Unit 4: Role of the Architect in Participatory Planning

- Architect as a co-creator who empowers community voices.
- Ethical dilemmas and power imbalances in participatory processes.
- Co-production of design knowledge through continuous community engagement.
- Participatory design of infrastructure like toilets, schools, and housing.
- Impactful works of Laurie Baker, SPARC, and Hunnarshala Foundation.

Unit 5: Case Studies and Emerging Trends

- Indian initiatives like Pune are participatory budgeting and Bhuj's post-earthquake planning.
- Global projects include Medellín's escalators, Porto Alegre's budget model, and Kibera upgrades.
- Tactical urbanism as a tool for temporary community-led interventions.
- Emerging participatory methods using VR, gamification, and AI.

References:

1. L. Teli, M. Balestrini, and A. Seravalli, *Co-Designing Publics: How Digital Design Shapes Participatory Democracy*, Cambridge, MA: MIT Press, 2022.
2. S. Tiwari, *The Inclusive City: Approaches to Urban Design and Planning*, New Delhi: Tulika Books, 2021
3. Designing for Diversity: Gender, Race, and Ethnicity in the Architectural Profession (2021)
4. N. Hamdi, *The Placemaker's Guide to Building Community*. London: Earthscan, 2010.
5. H. Sanoff, *Community Participation Methods in Design and Planning*. New York: John Wiley & Sons, 2000
6. A. Appadurai, "Deep democracy and urban governmentality," *Environment and Urbanization*, vol. 13, no. 2, pp. 23–43, Oct. 2001
7. A. Joshi and M. Moore, "Institutionalised co-production: Unorthodox public service delivery in challenging environments," *The Journal of Development Studies*, vol. 40, no. 4, pp. 31–49, Apr. 2004
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Course Outcomes:

- Apply participatory theories and decentralisation policies to design frameworks.
- Conduct community engagement using mapping, FGDs, surveys, and digital tools.
- Translate cultural and gender dynamics into inclusive spatial design.
- Adopt ethical and facilitative roles in participatory planning.
- Evaluate participatory projects and propose innovative community-led design approaches

Course PO Mapping

#	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12	PSO 01	PSO 02
CO1	3	2	2	3	2	2	–	3	3	2	–	2	3	2
CO2	2	3	3	2	2	3	2	3	3	3	–	2	3	3
CO3	3	2	2	2	2	2	–	3	3	2	–	2	3	2

CO4	2	2	2	2	3	3	–	2	3	2	–	3	2	3
CO5	2	3	3	2	2	2	2	3	3	2	–	3	3	3

3 - High Correlation, 2 - Medium Correlation, 1 - Low Correlation

APPROVED IN:	
BOS: 04 JUNE 2025 (21st BOS)	**ACADEMIC COUNCIL: 15 JULY 2025**
SDG No. & Statement: 1. SDG 11: Sustainable Cities and Communities- Make cities and human settlements inclusive, safe, resilient, and sustainable. 2. SDG 17: Partnerships for the Goals- Enhance inclusive partnerships for sustainable development. 3. SDG 13: Climate Action- Promote resilience and adaptive capacity to climate-related disasters.	
SDG Justification: 1. This course builds foundational knowledge of participatory governance in India's complex social fabric. It supports inclusive urban governance through rights-based urbanism and decentralized decision-making under the 73rd and 74th Amendments. Citizen engagement tools in smart cities promote transparent, accountable institutions aligned with SDG 16. 2. This course emphasizes community engagement techniques like stakeholder analysis, PGIS, and dashboards. These tools create a data-informed and participatory ecosystem for planning. Platforms such as MyGov exemplify how technology and multi-stakeholder partnerships (SDG 17) enhance civic involvement and transparency. 3. This course teaches practical insights into participatory resilience planning (Bhuj post-earthquake), budget justice (Porto Alegre, Pune), and tactical urbanism. New tools like VR and gamification demonstrate innovation in engagement, supporting adaptive planning and cross-sector partnerships (SDG 17).	