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 2024-25)

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 2024-25 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 011	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 2019-20 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 will be based on two components: Continuous Evaluation (I) (50 marks) and Semester-end Examination (E) (50 marks).

9.2. The assessment of the student's performance in studio courses will be based on two components: Continuous Evaluation (I) (50 %) and End Exam component in the form of jury /external viva (E) (50 %).

9.3. 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.

9.4. Courses like Fundamentals of Entrepreneurship, Sketching Workshop, Model Making Workshop, Computer Applications in Architecture –I & II, Research Seminar, and Building Information Modelling are completely assessed under Continuous Evaluation. A student must secure a minimum of 45% marks in each course to be declared to have passed the 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

Sl.No.	*Components of Assessment*	*Marks Total*	*Type of Assessment*	*Marks Allotted*	*Scheme of Examination*
1	**Theory Course with Semester–End Examination** (All Semesters)	**100**	Continuous Evaluation	50 (I)	i. One mid-semester examination shall be conducted for twenty-five (25) Marks. ii. Twenty-five (25) Marks are allotted for Assignments.
			Semester-end Examination	50 (E)	Fifty (50) marks are allotted for the semester-end examination.
2	**Theory Course with End Semester Viva-Voce** (All Semesters)	**100**	Continuous Evaluation	50 (I)	i. Mid-semester Portfolio comprising sheets/ assignments shall be evaluated for twenty-five (25) Marks. ii. End semester Portfolio comprising of sheets /assignments shall be evaluated for twenty-five (25) Marks.
			End Semester Viva-Voce	50 (E)	Fifty (50) marks are allotted for the End Semester Portfolio Assessment Viva-Voce#.
					# Portfolio Assessment shall be conducted through a viva-voce by internal or external examiners.
3	**Architectural Drawing & Graphics** (I & II Semesters) (or) **Building Construction** (II to V Semesters)	**100**	Continuous Evaluation	50 (I)	i. One mid-semester examination shall be conducted for ten (10) marks. ii. Mid-semester Portfolio comprising sheets and assignments shall be evaluated for fifteen (15) marks. iii. End semester Portfolio comprising of sheets and assignments shall be evaluated for twenty-five (25) Marks.
			Semester-end Examination	50 (E)	Fifty (50) marks are allotted for the semester-end examination.
4	**Basic Design & Visual Arts** (I & II Semesters)	**400**	Continuous Evaluation	200 (I)	i. Mid-semester Portfolio comprising sheets shall be evaluated for Fifty(50) marks. ii. End semester Portfolio comprising sheets shall be evaluated for Fifty (50) marks.
			External Jury	200 (E)	External Jury on the design work done in the Semester by a practising Architect.
					I - Continuous Evaluation, E - End Semester Assessment

Table 01. Details of the assessment procedure (contd.)

Sl.No.	*Components of Assessment*	*Marks Total*	*Type of Assessment*	*Marks Allotted*	*Scheme of Examination*
5	**Architectural Design** (III to VII & IX Semesters)	**400**	Continuous Evaluation	200 (I)	i. Mid-semester Portfolio comprising sheets shall be evaluated for One Hundred (100) marks. ii. End semester Portfolio comprising sheets shall be evaluated for One Hundred (100) marks.
			External Jury	200 (E)	External Jury on the end semester portfolio by a practising Architect.
6	**Working Drawing** (VI Semester)	**100**	Continuous Evaluation	50 (I)	i. Mid-semester Portfolio comprising sheets shall be evaluated for twenty-five (25) marks. ii. End semester Portfolio comprising sheets shall be evaluated for twenty-five (25) marks.
			External Jury	50 (E)	External Jury on the end semester portfolio by a practising Architect.
7	**Courses with Complete Internal Evaluation** Sketching Workshop; Model Making Workshop, Fundamentals of Entrepreneurship, Computer Applications in Architecture -I & II, Research methodology and Seminar, Building Information Modelling, etc.	**100**	Continuous Evaluation	100 (I)	i. Mid-semester Portfolio comprising sheets shall be evaluated for Fifty(50) marks. ii. End semester Portfolio comprising sheets shall be evaluated for Fifty (50) marks.

I - Continuous Evaluation, E - End Semester Assessment

Table 01. Details of the assessment procedure (contd.)

Sl.No.	*Components of Assessment*	*Marks Total*	*Type of Assessment*	*Marks Allotted*	*Scheme of Examination*
8	**Internship** (VIII Semester)	**600**	Continuous Evaluation	300 (I)	i. One Hundred Fifty (150) marks are allotted for mid-semester evaluation, such as portfolio / internal faculty inspection assessment/log record, etc. ii. One Hundred Fifty (150) marks are allotted for end semester evaluation, such as portfolio /internal faculty inspection assessment/log record, etc.
			Performance Evaluation by principal architect (150)	300 (E)	i. 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)		ii. External Jury on the work done in the Semester by a practising architect.
9	**Design Thesis** (X Semester)	**600**	Continuous Evaluation	300 (I)	i. One Hundred Fifty (150) marks allotted for mid-semester evaluation of the project by panel reviews and the internal guide. ii. One Hundred Fifty (150) marks allotted for end semester evaluation of the project by panel reviews and the internal guide.
			External Jury	300 (E)	Three hundred (300) marks are allotted for the external jury.

I - Continuous Evaluation, E - End Semester Assessment

10. Retotalling, 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’ Grade in any course (which has a semester-end examination component) shall have to reappear at the subsequent semester-end examination held for that course.

10.4. Candidates having less than 45% of the maximum marks in the Continuous Evaluation component of a Theory/studio course of any Semester are eligible to appear for Repeat Continuous Evaluation (RCE), by paying the prescribed fee.

10.5. A candidate can register for a maximum of 25 credit courses, with not more than two Basic Design/Architectural Design courses.

10.6. STudents who have completed the program duration of 5 years may appear with more than the stipulated credits, if recommended by the internal committee on compassionate grounds, based on individual circumstances.

10.7. Candidates are required to attend RCE classes of 80 hours/60 hours/40 hours for Basic Design/Architectural Design courses and 40 hours/20 hours for courses with no end examination component, based on the status of work progress during the semester. He/she needs to take 20 hours for theory subjects.

10.8. Candidates can only register for the Design thesis course if he/she has no backlog in Basic Design/Architectural Design courses. Candidates need to appear for the Design Thesis course along with the regular batch, with an option to carry forward any previously completed work to fulfil the requirements of the Design Thesis.

10.9. Candidates are expected to maintain 100% attendance, but no less than 90% attendance in case of a valid reason for absence during RCE Classes. Biometric attendance and signing of attendance sheets for each course, during RCE classes, are mandatory.

10.10. STudents can score a maximum of 50% in B.Arch. of the total internal assessment marks.

10.11. Candidates need to attend RCE classes as per Table 02.

Table 02. Details of the assessment pattern.

Sl. No.	*Course*	*Duration*	*Assessment*
01	Studio Course (Basic Design/ Architectural Design)	80 hours/ 60 hours/ 40 hours #	Portfolio Evaluation
02	Studio Courses (Building Construction/ Architectural Drawing and Graphics)	40 hours/ 20 hours #	Portfolio Evaluation with Mid-Examination
03	Courses without an End examination Component	40 hours/ 20 hours #	Portfolio Evaluation
04	Theory Course	20 hours	Mid-examination

 # Duration of the class based on the status of the work progress of the student in the previous semester.

10.12. A student who has secured an 'F' Grade in Design Thesis (AAR562) and Internship (AAR462) shall have to improve his/her portfolio and reappear for a viva-voce at the time of special examination to be conducted in the summer vacation.

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 period of study 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 completion of 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 at the end of the semester in each course. 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.

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

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

15.4. The CGPA required for classification of the class after the successful completion of the programme 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 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 above regulations may be relaxed by the Vice Chancellor 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 workshop, etc.

18.3. Studio (ST)

STudents work on creative incubation for design synthesis/application of theory inputs on respective workstations. The teacher interacts on an individual basis 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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR111	**Introduction to Art and Architecture**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR113	**Basic Design & Visual Arts I**	1	0	5	0	6	100	100	200	Jury
03	AAR115	**Architectural Drawing and Graphics I**	1	0	5	0	6	50	50	100	05 Hrs
04	AAR121	**Sketching Workshop**	0	0	3	0	3	100	-	100	Viva
05	ACE101	**Engineering Mechanics**	2	1	0	0	3	50	50	100	03 Hrs
06	AMT111	**Mathematics for Architects**	3	0	0	0	3	50	50	100	03 Hrs
07	AEG111	**Technical Communication**	2	0	0	0	2	50	50	100	03 Hrs
08	IENT1051	**Fundamentals of Entrepreneurship**	2	0	0	0	2	100	-	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR112	**Theory of Architecture**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR114	**Basic Design & Visual Arts II**	1	0	5	0	6	100	100	200	Jury
03	AAR116	**Architectural Drawing and Graphics II**	1	0	5	0	6	50	50	100	05 Hrs
04	AAR118	**Building Construction & Materials I**	3	0	3	0	6	50	50	100	05 Hrs
05	ACE102	**STrength of Materials**	2	1	0	0	3	50	50	100	03 Hrs
06	AAR126	**Model Making Workshop**	0	1	2	0	3	100	-	100	Viva
07	AES201	**Environmental STudies**	3	0	0	0	3	50	50	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	ACE201	**Theory of STructures I**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR201	**Climatology in Architecture**	3	0	1	0	4	50	50	100	03 Hrs
03	AAR203	**History of Western Architecture**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR104	**Building Materials II**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR217	**Architectural Design I**	1	0	7	0	8	200	200	400	Jury
06	AAR219	**Building Construction II**	1	0	4	0	5	50	50	100	05 Hrs
07	AAR221	**Computer Applications in Architecture I**	0	0	3	0	3	100	-	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	ACE202	**Surveying for Architects**	1	0	2	0	3	50	50	100	03 Hrs
02	ACE204	**Theory of STructures II**	2	1	0	0	3	50	50	100	03 Hrs
03	AAR212	**History of Eastern Architecture I**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR204	**Water Supply & Sanitation**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR205	**Building Materials III**	3	0	0	0	3	50	50	100	03 Hrs
06	AAR216	**Architectural Design II**	1	0	7	0	8	200	200	400	Jury
07	AAR218	**Building Construction III**	1	0	4	0	5	50	50	100	05 Hrs
08	AAR222	**Computer Applications in Architecture II**	0	0	3	0	3	100	-	100	Viva
		Total	**15**	**2**	**14**	**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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	ACE301	**Concrete STructures**	2	1	0	0	3	50	50	100	03 Hrs
02	AAR301	**Architectural Acoustics**	3	0	0	0	3	50	50	100	03 Hrs
03	AAR303	**Mechanical and Electrical Services**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR315	**History of Eastern Architecture II**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR307	**Site Planning & Landscape Design**	3	0	0	0	3	50	50	100	03 Hrs
06	AAR319	**Architectural Design III**	1	0	7	0	8	200	200	400	Jury
07	AAR313	**Building Construction IV**	1	0	4	0	5	50	50	100	05 Hrs
08		**Open Elective**	3	0	0	0	3	50	50	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	ACE302	**STeel STructures**	2	1	0	0	3	50	50	100	03 Hrs
02	AAR302	**Estimating, Costing & Specifications**	2	1	0	0	3	50	50	100	03 Hrs
03	AAR316	**Modern & Contemporary Architecture**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR308	**Housing**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR312	**Architectural Design IV**	1	0	8	0	9	200	200	400	Jury
06	AAR324	**Working Drawing**	1	0	5	0	6	50	50	100	Jury
07		**Program Elective**	3	0	0	0	3	50	50	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR403	**Advanced Services**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR461	**Research Methodology and Seminar**	1	2	0	0	3	100	-	100	Viva
03	AAR463	**Architectural Design - V**	1	0	7	0	8	200	200	400	Jury
04	AAR419	**Introduction to Human Settlements & Town Planning**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR465	**Building Information Modelling**	0	0	3	0	3	100	-	100	Viva
06		**Elective Basket I**	1	1	1	0	3	50	50	100	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	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR462	**Internship****	0	0	0	**	24	300	300	600	Jury
02	AAR464	**Professional Practice & Building Regulations**	1	1	0	0	2	50	50	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR551	**Community Design Theory**	1	2	0	0	3	50	50	100	03 Hrs
02	AAR561	**Architectural Design - VI (Community Projects Studio)**	1	0	7	0	8	200	200	400	Jury
03	AAR563	**Dissertation**	1	5	0	0	6	200	-	200	Viva
04	AAR565	**Architectural Detailing**	1	0	2	0	3	100	-	100	Portfolio Assessment
05		**Elective Basket I**	1	1	1	0	3	50	50	100	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	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR562	**Design Thesis**	0	0	16	0	16	300	300	600	Jury
02	AAR564	**Thesis Document**	0	1	3	0	4	100	-	100	Viva
03		**Elective Basket I**	1	1	1	0	3	50	50	100	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	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR111	**Introduction to Art and Architecture**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR113	**Basic Design & Visual Arts I**	1	0	5	0	6	100	100	200	Jury
03	AAR115	**Architectural Drawing and Graphics I**	1	0	5	0	6	50	50	100	05 Hrs
04	AAR121	**Sketching Workshop**	0	0	3	0	3	100	-	100	Viva
05	ACE101	**Engineering Mechanics**	2	1	0	0	3	50	50	100	03 Hrs
06	AMT111	**Mathematics for Architects**	3	0	0	0	3	50	50	100	03 Hrs
07	AEG111	**Technical Communication**	2	0	0	0	2	50	50	100	03 Hrs
08	IENT1051	**Fundamentals of Entrepreneurship**	2	0	0	0	2	100	-	100	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.		3	0	0	0	3

Course Objectives:

- To provide students with an understanding of various art forms and the history of art
- To introduce to 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, and types of drawings required, and their importance.
- To give a brief idea about how architecture is influenced by various factors and the study of time-tested vernacular architecture of various 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. Use of water as an art form, 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 to be studied by an architect and their relevance to practice; Types of architectural drawings to be prepared by an architect; 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. Evolution of shelter forms as a response to climate, materials, and construction methods. Examples of vernacular architecture in different regions of the world and India.

References:

1. Craven, C.Roy. Indian Art, a Concise History.
2. Kumar, Raj (Ed.) Essays on Indian Art and Architecture. Discovery Pub., New Delhi, 2003
3. Fisher, E.Robert. Buddhist Art and Architecture. Thames and Hudson, London, 1993.
4. Ghosh, A (Ed) Jain Art and Architecture, Vol 1-3, BharatiyaJnanpith, New Delhi.
5. James C.Snyder and Anthony Y. Catanese, Introduction to Architecture, New York: McGraw Hill.
6. Rappoport, Amos, House, Form and Culture.
7. Khare , Ajay, Temple Architecture of Eastern India , Shubhi Publications, New Delhi , 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	-	-	-	-	-	-	-

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

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

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

Course Objectives:

- To give an introduction about the design.
- To provide students with an understanding of elements and principles of design.
- Understanding colour theory and various colour compositions.
- Preliminary introduction of architectural elements such as doors, grills, and openings.
- Understanding the role of Visual graphics and their importance in the design representation.
- Understanding principles of visual design through Gestalt laws/theory.
- Understanding the effects of light, shade, and shadow on objects.
- Understanding the significance of the textural quality of different.

Course Content

- Introduction to design; Importance of design; STudy and appreciation of design examples from natural and man-made environments. Exercises in elements of design, principles of design, 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. Form Space & Order by Francis, D.K.Ching
2. Principles of two-dimensional designs by Wong Wucius
3. Designer's Guide to Colour by Ikuyoshi Shibikawa and Yumi Takahashi
4. Elements of Architecture by Von Mises
5. Architectural Composition by Robkrier
6. Design & Form by Johannes Itten
7. Architecture Drafting & Design by Donald E. Helper, Paul I. Wallach
8. The Decorative Designs of Frank Lloyd Wright by David A. Hanks
9. Principles of Design in Architecture by K.W.S. Mithies
10. Drawing for 3-dimensional design by Alan Pipes

Course Outcomes:

- Understand the application of design principles and the usage of architectural elements at a fundamental level of design thinking.
- Understand the importance of graphics in building design
- Understand the representation, integrated with aspects of colour and Gestalt principles.

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	
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 into consideration. 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 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 constructions and scaled drawings.
- 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. Sir Banister Fletcher, A History of Architecture, University of London, the Antholone Press, 1986.
2. S. Lloyd and H.W. Muller, History of World Architecture – Series, Faber and Faber Ltd., London, 1986.
3. Hiraskar ; The Great Ages of World Architecture
4. Kenneth Frampton, Modern Architecture: A Critical History; Thames and Hudson, London, 1994.

5. Sigfried Gideon, Space Time and Architecture: The Growth of a New Tradition, Hazard University Press, 1978.

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 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 Objectives:

- To introduce the skill and necessity of freehand drawing in design.
- To provide students with an understanding of various techniques involved in freehand sketching.
- To provide an understanding of the application of sketching in the architectural presentation.

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. Francis D.K. Ching Architectural Graphics
2. Rendering With Ink and Pen, Thames and Hudson

Course Outcomes:

- The student will be trained in using freehand sketching in design.
- The student will be able to use sketching as an effective tool in communicating ideas.
- The student will gain technical knowledge of architectural sketching of various elements like furniture, landscapes, buildings, 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	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 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. 10		2	1	0	0	3

Course Objectives:

- To give students practice applying their knowledge of mathematics, science, and engineering.
- To develop an ability to identify, formulate, and solve engineering problems.
- To prepare the students for higher-level courses such as courses in Mechanics of Solids, STructural Analysis, and Design of STeel STructures.

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 – on 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: Centre of gravity of parallel forces in a plane. Centroids and center of gravity of composite areas and composite 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 composite areas –– 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. Timoshenko and D.H. Young, Engineering Mechanics, McGraw Hill, Fourth edition
2. Engineering Mechanics by Singer, Prentice Hall India.
3. J.L. Meriam John Wiley & Sons, Engineering Mechanics

4. F.B. Beer and E.R. Johnston, Jr., Vector, Mechanics for Engineers STatics and Dynamics, Tata McGraw Hill, Fourth edition, 2002
5. I.B. Prasad, Applied Mechanics, Khanna Publishers, Delhi, Tenth edition 1984
6. A.K.Tayal, Engineering Mechanics
7. Engineering Mechanics by S.S.Bhavakatti, New age International

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	1	3	3	3	1	1	1	1	2	1	1	1	3	1
CO2	1	3	3	3	1	1	1	1	2	1	1	1	3	1
CO3	1	3	3	3	1	1	1	1	2	1	1	1	3	1
CO4	1	3	3	3	1	1	1	1	2	1	1	1	3	1
CO5	1	3	3	3	1	1	1	1	2	1	1	1	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:10	
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.		3	0	0	0	3

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, practical application of calculating areas and building elements like floors, 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 Mid ordinate 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 its 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.

Recommended Books:

1. Arumugam, S.Thangapandi - Engineering Mathematics - John Wiley and Sons Ltd - Singapore – 2001(8th Edition)
2. Construction Mathematics - Surinder Singh Virdi and Roy T Baker - Elsevier - 2008.
3. Higher Engineering Mathematics- B.S.Grewal- Khanna publishers- 43rd edition

References:

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. Colarado.
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 analyze 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 Justification:	

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

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, applying for a job, 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:	

IENT1051	Fundamentals of Entrepreneurship	L	T	ST	J	C
SDG No. 8		2	0	0	0	2

Course Objectives:

- Understand the fundamental concepts and processes of entrepreneurship.
- Identify and evaluate business ideas and opportunities.
- Know the techniques for effective problem-solving.
- Understand the customer and the customer discovery process and how to develop market insights.
- Effectively pitch your Venture Idea

Unit 1: Entrepreneurial Process and Mindset

Introduction to Entrepreneurship, Pilot Your Purpose, Innovation, Risk-Taking and Value Creation, Myths around Entrepreneurship, Distinct Types of Entrepreneurship, Entrepreneurial vs. Managerial Mindset.

Unit 2: Problem Identification and Ideation

Entrepreneurship Opportunity identification, Market and Need Analysis, Problem Discovery, Problem Statement Identification and definition, Evaluating and Selecting Ideas

Unit 3: Customer Discovery & Market Insights

Users and Buyers, Target Group and Persona, Customer Research Methods (People Shadowing, laddering etc.), Use Cases, Market Sizing & Segmentation, Customer Value Proposition.

Unit 4: Solution Design

Principles of Effective Solution Design, Prototyping Methods and Tools, Building and Testing Prototypes, Gathering Feedback on Prototypes, Iterating and Refining Solutions, Building a Minimum Viable Solution.

Unit 5: Crafting Your Venture Narrative

How you can launch a successful venture. Tell your venture story

References:

1. "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses by Eric Ries
2. Blank, S. and Dorf, B. (2012) The Startup Owner’s Manual: The Step-by-Step Guide for Building a Great Company. BookBaby, Pennsauken.
3. Neck, Heidi & Greene, Patricia & Brush, Candida. (2014). Teaching entrepreneurship: A practice-based approach. 10.4337/9781782540564.
4. Bloomberg Game Changers (e.g. Zuckerberg, Brin& Page; Jobs, Musk, etc.) – YouTube
5. Elon Musk: The future we're building and boring | TED – YouTube
6. Inspirational series about the entrepreneurial path of 5 of the most admired business entrepreneurs: Cornelius Vanderbilt (Railroads), John D. Rockefeller (Oil), Andrew Carnegie (Steel), J.P. Morgan (Banking) and H. Ford (Automobile)

7. Tips on Being a Successful Entrepreneur | John Mullins | TED – YouTube
8. Social Entrepreneurship - The Journey of Lakshmi Menon: https://open.spotify.com/episode/3frmNkjUNCZgXCbLsPpfve?si=fd13d7efa85741eb
9. Keep the spirit of customer centricity alive with Zoho I YouTube
10. Blinkit's Genius Strategy that stunned Amazon and Flipkart | Business Case Study – YouTube
11. How is Zerodha's GENIUS Business strategy CRUSHING its competition? Zerodha vs Upstox Case Study.

Course Outcomes:

- To discover skills and competencies needed for an entrepreneurial career
- Effectively utilize frameworks for business planning and development.
- Implement customer research methods such as shadowing, laddering, etc, to gather insightful data.
- Build and refine a minimum viable product (MVP) based on real customer feedback.
- Present a process pitch that integrates learnings across all units to propose a viable entrepreneurial venture.

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: 04-July-23**
SDG No. & Statement: 8	
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
SDG Justification:	
To achieve sustained per capita income growth and ensure higher economic productivity, focus should be on youth by grooming them to be creative and innovative, have productive employment and quality of life through Skill development and Entrepreneurship	

II Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR112	**Theory of Architecture**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR114	**Basic Design & Visual Arts II**	1	0	5	0	6	100	100	200	Jury
03	AAR116	**Architectural Drawing and Graphics II**	1	0	5	0	6	50	50	100	05 Hrs
04	AAR118	**Building Construction & Materials I**	3	0	3	0	6	50	50	100	05 Hrs
05	ACE102	**STrength of Materials**	2	1	0	0	3	50	50	100	03 Hrs
06	AAR126	**Model Making Workshop**	0	1	2	0	3	100	-	100	Viva
07	AES201	**Environmental STudies**	3	0	0	0	3	50	50	100	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 Objectives:

- To introduce various proportioning systems, organizing principles of architectural compositions.
- 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. Francis D.K. Ching; Architecture: Form, Space and Order.
2. Pramar V.S.; Design Fundamentals in Architecture.
3. Sharma, B.K. An Introduction to Environmental Pollution, Goel Publication House, Meerut
4. Trivedi, P.R. Encyclopedia of Ecology and Environment, IIEE, New Delhi
5. Crosbie, Michael J., Green Architecture, Rockport Publisher, Massachusetts.
6. Kevin Lynch; Site planning; MIT Press, Cambridge, MA – 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 on 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	-	-	-	-	-	-	-	-	-	-	-

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: 4 & 9	
SDG Justification:	
This Course introduces the students to the materials, innovations and techniques and how they are creatively adopted to the 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 in designing spaces more efficiently.	

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

Course Objectives:

- Understanding Massing in building design.
- To understand the application of various principles involved in design basics such as product design, furniture design, and small spaces. Design of small objects with respect to function, structure, and aesthetics.

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. All books and journals on architecture.

Course Outcomes:

- The student will be able to design smaller spaces of architecture.
- The student will gain knowledge of integrating functional and aesthetic requirements while designing an architectural project.
- The student will be able to understand the structure in a three-dimensional form. He/she will also understand the perception of the general shape and form, and size of a building and the functionality of the structure.

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	
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 Objectives:

- To enhance skills to represent architectural drawing with various drawing techniques.To introduce the study of various types of 3D views, shade and shadows on geometrical forms and buildings.
- To sensitize the rules of composition and perspectives for architectural rendering.

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 & Raja Roy; Engineering Drawing, I.K. International Publishing House Pvt. Ltd, New Delhi
2. N.D. Bhatt; Engineering Drawing.
3. Sherley W, MORGAN; Architectural Drawing, McGraw Hill
4. Arthur L. Guptill, Watson; Rendering in Pen and Ink, – Guptill Publications, New York.
5. Ching, Francis D.K., Architectural Graphics-4th Edition, Jon Wiley and Sons, Inc., New

Course Outcomes:

- An enhanced skill to represent 2D architectural drawings with various presentation techniques used in the architectural field.
- An enhanced skill in creating 3D views.
- Skill in the concept of light, shades, and shadows in 2-D and 3-D.
- Improved skills in working with various rendering media and their application.
- Ability to draw measured and scaled drawings.

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:	
SDG Justification:	
AD&G teaches fundamentals of drawing & design communication that instil a strong foundation for "quality education" in Architecture.	

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

Course Objectives:

- Understanding socio-cultural, architectural, and town planning aspects Indus Valley Civilization
- Understanding on construction techniques in rock cut architecture; designing of built environment reflecting Buddhist lifestyle and philosophy.
- Understanding the design development and evolution of Hindu temple from rock-cut to structural typologies; knowledge on temple prototypes with various construction techniques and materials like stone, brick, etc.
- Understanding on 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. 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. Arthur Lyons; Materials for Architects and Builders- An Introduction; Arnold, London 1997.

Course Outcomes:

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

ACE112	STrength of Materials	L	T	ST	J	C
SDG No. 10		2	1	0	0	3

Course Objectives:

- To establish an understanding of the fundamental concepts of mechanics of deformable solids, including static equilibrium, the geometry of deformation, and material constitutive behavior.
- To understand the concept of shear force and bending moment diagrams, to construct.
- S.F.D and B.M.D for simply supported beams, cantilever beams, and overhanging beams and to know the relationship between the load, shear force and bending moment.
- To understand the concept of transformation of stresses on the inclined planes, determination of principal planes and principal stresses.
- To determine flexural and shear stresses in beams.
- To analyze the shaft subjected to torsion and determination of stresses in the shaft.

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.

Text Books:

1. R. Subramanian, STrength of Materials, 2/e, Oxford,2010
2. E.Popov, Engineering Mechanics of Solids, 2/e, Pearson,2009

References:

3. S.S. Rattan, STrength of Materials, 2/e, Tata McGraw Hill Education,2011

4. Geriand Timoshenko, Mechanics of Materials, 4/e, CBS Publishers,2006
5. STephen Timoshenko, STrength of Materials, 3/e, CBS Publisher,2002
6. R.K. Rajput, STrength of Materials, S.Chand Publications,2007

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 diameter of the shaft, 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	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

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:	

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

Course Objectives:

- Understanding Geometry in model making through paper and other media.
- Understanding the importance of model making by means of 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 of different scales, templates, measuring aids; conventions followed.

Techniques for preparing presentation models, 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.

Course Outcomes:

- Understand the need and necesisity 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:	
SDG Justification:	
This course provides fundamentals of model making to visualise in a 3-dimensional perspective that influences their thought process in Architecture	

AES201	Environmental STudies	L	T	ST	J	C
SDG No.		3	0	0	0	3

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 following ecosystem: 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. Text book of environmental studies for undergraduates courses by ErachBharucha, Published by – University Grants Commission, Universities Press, India.
2. Text book of environmental studies for undergraduates courses by Benny Joseph Published by Tata McGraw Hill Publishing company limited.
3. Text book of environmental studies by Kaushik&Kaushik.
4. Agarwal,K.C.2001 Environmental Biology,NidiPubl.Ltd.Bikaner.
5. Brunner R.C., 1989,Hazardous Waste Incineration,McGraw Hill Inc.480p

Course Outcomes:

- Overexploitation of different resources.
- Identification of alternate resources.
- The concept of ecosystem and its structure.
- Create awareness about pollution prevention through individual participation.
- Values of biodiversity and adapting sustainable lifestyle.
- Various environmental legislations.

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:	

III Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			End Exam Hours/ Type
			L	T	St	J		I	E	T	
01	ACE201	**Theory of Structures I**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR201	**Climatology in Architecture**	3	0	1	0	4	50	50	100	03 Hrs
03	AAR203	**History of Western Architecture**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR104	**Building Materials II**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR217	**Architectural Design I**	1	0	7	0	8	200	200	400	Jury
06	AAR219	**Building Construction II**	1	0	4	0	5	50	50	100	05 Hrs
07	AAR221	**Computer Applications in Architecture I**	0	0	3	0	3	100	-	100	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

ACE201	Theory of Structures I	L	T	St	J	C
SDG No. 10		3	0	0	0	3

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 various techniques. (Theorem of three moments, and slope deflection method).
- To analyze continuous beams using various techniques. (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 using Macaulay's method and moment – area method.

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 theorem of three moments and Slope deflection method.

UNIT 4

Analysis of three span continuous beams using Moment distribution method.

UNIT 5

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

Text Books:

1. R. Subramanian, Strength of Materials, 2/e, Oxford University Press, 2010.
2. T.S. Thandavamoorthy, Structural Analysis, 2/e, Oxford University press, 2011.

References:

3. C.K. Wang, Statically Indeterminate Structures, Tata McGraw-Hill, 2010.
4. R.C. Hibbeler, Structural Analysis, 6/e, Pearson, 2011.

Course Outcomes:

- Analyze the deformations in statically determinate beams.
- Analyze the statically indeterminate fixed beams.
- Analyze the statically indeterminate continuous beams using theorem of three moments and Slope deflection method.
- Analyze the statically indeterminate continuous beams and will gain the knowledge of distribution of moments.

- Compute the critical load in a column subjected to axial and eccentric load.

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: 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL:01-Apr-22**
SDG No. & Statement: 10	
SDG Justification:	

AAR201	Climatology in Architecture	L	T	St	J	C
SDG No.		3	0	1	0	4

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 principles of Heat Transfer through building materials.
- Principles of Ventilation and Day lighting.
- 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 Day lighting

VENTILATION

- Air movement in and around buildings
- Basic objectives of ventilation
- Ventilation due to stack effect
- Ventilation due to pressure effect
- Combined ventilation due to pressure and stack effect
- Operable Window-to-floor Area Ratio (WFR).

DAYLIGHTING

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

UNIT 5: Design Principles for Different Climates

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

Assignments: Students to be shown various instruments used for Climatic data recording & Analysis. Practical Exercises using these instruments.

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. Sun Wind and Light – Architectural Design Strategies by Mark DeKay and G Z Brown, Wiley, 2014
7. Energy Conservation Building Code 2017
8. Eco-Niwas Samhita 2018

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.
- Student will be able to and select appropriate building materials to reduce heat flow through buildings.
- Student 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:	
SDG Justification:	

AAR203	History of Western Architecture	L	T	St	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To understand the relation of belief systems and built environment during the Egyptian era with 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 process of design approach with prime focus in evolution of construction techniques with the then engineering applications, interior designing during the Roman era.
- To understand the evolution of the church form; importance of application of suitable scale and proportion, use of art in architecture in buildings during Renaissance period.

UNIT 1: Development of prehistoric and historic architecture Egyptian Architecture

- Characteristic features
- Secular Architecture
- Mastabas.Example: Mastabaof Thi, Sakkâra
- Pyramids.Example: Step pyramid of Djoser (Zoser), Sakkâra; Bent pyramid of Dahshur, Great pyramid of Cheops, 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:HagiaSophia
- RomanesquePeriod
    - Characteristic Feature
    - Example:Pisa Cathedral complex
- GothicPeriod
    - Early Gothic style and Late Gothicstyle, Example:NotreDame,Paris
- RenaissanceArchitecture
    - Introduction to Renaissance,BaroqueArchitecture,etc.

References:

1. Sir Banister Fletcher, A History of Architecture, University of London, the Antholone Press, 1986.
2. S. Lloyd and H.W. Muller, History of World Architecture – Series, Faber and Faber Ltd. London, 1986.
3. Hiraskar ;The Great Ages of World Architecture
4. Kenneth Frampton, Modern Architecture: A Critical History; Thames and Hudson, London, 1994.
5. Sigfried Gideon, Space Time and Architecture: The growth of a New Tradition, Hazard University Press, 1978.

Course Outcomes:

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

AAR104	Building Materials II	L	T	St	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To gain knowledge of basic building materials, their properties, and applications
- Understand different types of masonries 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, 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 Additive and Mixtures in Concrete: Water repellent, Waterproofing compounds, Accelerators, Air entraining agents. Hardeners, Workability increasing agent/plasticizer, 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 stabilization and uses.

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

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. Arthur Lyons; Materials for Architects and Builders- An Introduction; Arnold, London 1997

Course Outcomes:

- Familiar with ferrous and non-ferrous metals and their properties, defects and methods of preventing them from damages
- Able to understand the characteristics, use and applications of concrete.

- Able to understand the use of additive 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 construction industry as well as 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 Justification:	

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

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

The design issues to be addressed:

- Formulations of concept.
- Analysis of space proximity studies with the help of Proximity charts
- Design methodology through bubble diagram.
- 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 problems should be given. The final submission shall necessarily include a model for at least one of the design problems.

References:

1. Time savers standards, Neufert's Architects data.
2. All books and journals on architecture.

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 for determining the 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 Justification:	

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

Course Objectives:

- To understand in general and detail about various types of lintels and arches, respective applications.
- Orientation about wooden carpentry and joinery. To sensitize the ability to choose context applicable joinery type in various applications.
- To develop an understanding both in general and detail about the available typologies of doors, windows, shutters, 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, louvered window, corner, bay window, Glazed windows, Ventilators.

UNIT 4

Carpentry and joinery: Terms defined, mitering, ploughing, grooving, rebating, veneering. Various forms of joints in wood work, such as 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.

Course Outcomes:

- Understand the types of arches, use of lintels used 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.

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:	
SDG Justification:	

AAR221	Computer Application in Architecture I	L	T	St	J	C
SDG No.		0	0	3	0	3

Course Objectives:

- Understanding of the power and precision of computer-aided modeling and drafting
- The course assists students in getting a complete understanding of the fundamentals and software tools to gain expertise in Architectural design.
- The course gives participants an unmatched overview of the 2D concepts
- Hands-on 2D CAD exercises throughout the course and explore how to implement these methods to increase productivity.

Creating two-dimensional architectural drawing with special emphasis on presentation and visualization 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 preparation of 2D documentations based on class projects in the previous semester in Architectural Designs.

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

References:

Course Outcomes:

- Use the CAD software program to create drawings from scratch and to modify, manipulate, copy, delete, save, and plot drawings.
- Ability to construct accurate 2D geometry
- Use the full range of CAD commands and options and employ shortcuts and time-saving strategies.
- Ability to assemble these drawings in industry-standard plan form and produce plotted hardcopies ready for distribution.

- Awareness of architectural drafting with a focus on industry 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	-	-	-	-	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 Justification:	

IV Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			End Exam Hours/ Type
			L	T	St	J		I	E	T	
01	ACE202	**Surveying for Architects**	1	0	2	0	3	50	50	100	03 Hrs
02	ACE204	**Theory of Structures II**	2	1	0	0	3	50	50	100	03 Hrs
03	AAR212	**History of Eastern Architecture I**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR204	**Water Supply & Sanitation**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR205	**Building Materials III**	3	0	0	0	3	50	50	100	03 Hrs
06	AAR216	**Architectural Design II**	1	0	7	0	8	200	200	400	Jury
07	AAR218	**Building Construction III**	1	0	4	0	5	50	50	100	05 Hrs
08	AAR222	**Computer Applications in Architecture II**	0	0	3	0	3	100	-	100	Viva
		Total	**15**	**2**	**14**	**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	Basics of Surveying Practices	L	T	St	J	C
SDG No. 10		1	0	2	0	3

Course Objectives:

- Obtain knowledge on basics of surveying and exposure to different techniques of surveying and associated equipment
- Understand working principles of survey instruments and types of errors encountered in field and calculations.
- Develop an understanding on advanced surveying equipment involved such as total station.

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 its temporary adjustments, measuring of 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, characteristics of contour lines, direct and indirect methods of contouring, interpolation of contours, 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 angels 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. Surveying (Vol – 1, 2 & 3)", B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi, 2016
2. Surveying and Levelling" R. Subramanian, Oxford University Press, New Delhi, 2014
3. Surveying (Vol – 1 & 2)", Duggal S K, Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.
4. Textbook of Surveying Vol. I", P. B. Shahani – Oxford and IBH Publishing Co – 1980
5. Surveying Vol 1, 2 & 3", Arora K R Standard Book House, Delhi, 2004

Course Outcomes:

- Learn about basics involved in different types of surveying like tape, compass, levelling, and theodolite
- demonstrate skills in measuring distances, angles, and levelling
- develop skills to apply error adjustment to the recorded reading to get an accurate surveying 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	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 Justification:	

ACE204	Theory of Structures II	L	T	St	J	C
SDG No. 10		2	1	0	0	3

Course Objectives:

- To understand the concepts and structural behavior of indeterminate structures.
- To understand the concepts of elastic and plastic analysis.
- Attain knowledge about stresses in thin and thick cylinders.

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

Moment Distribution Method: Analysis of single-story, single-bay portal frames under gravity loads.

Text Books:

1. G.S. Pandit, S.P. Gupta, R. Gupta, Theory of Structures-Vol I and II, 2/e, Tata McGraw-Hill,2003.
2. T.S. Thandavamurthy, Structural Analysis, 2/e, Oxford University Press, 2011.

References:

3. Vazirani and Ratwani, Analysis of Structures, Vol-II, 16/e, Khanna Publishers, 2015.
4. J.S. Kinney, Indeterminate Structural Analysis, 1/e, Naroja Publishing, 1987.
5. C.K. Wang, Statically Indeterminate Structures, Tata McGraw Hill, 2010.
6. Weaver and Gere, Matrix Methods of Framed Structures,2/e, cbs publisher, 1990.

Course Outcomes:

- Analyze the two and three hinge arches
- Analyze the Cables in Suspension Bridges
- Analyze 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 Justification:	

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

Course Objectives:

- Understanding socio-cultural, architectural, and town planning aspects Indus Valley Civilization
- Understanding on construction techniques in rock cut architecture; designing of built environment reflecting Buddhist lifestyle and philosophy.
- Understanding the design development and evolution of Hindu temple from rock-cut to structural typologies; knowledge on temple prototypes with various construction techniques and materials like stone, brick, etc.
- Understanding on 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 civilization

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 from 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.

References:

1. Brown, P. Indian Architecture (Buddhist Hindu) Vol. 1 Bombay 1942 & subsequent publications
2. Fergusson, J.A. A history of Indian and Eastern architecture, London 1876, revised 1891
3. Grover, S. The Architecture of India, Buddhist & Hindu, Sahibabad, 1980.
4. Michell,G, The Hindu Temple , London
5. Khare, Ajay, Temple Architecture of Eastern India, Shubhi Publications, New Delhi, 2005
6. Sterlin Henry, Architecture of World, India, Germany, ISBN-38228-9658-6

Course Outcomes:

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

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

Course Objectives:

- To study about sourcing, treatment of water, its distribution in low, medium, high-rise buildings.
- To study the methods and materials for sewerage and sanitation systems, suitable appliances.
- To equip the fundamentals to design plumbing systems for different sizes of buildings.

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-(self-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 building. 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, different 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 scheme. Preparation of plan, Planning of bathrooms, lavatory blocks and kitchen in domestic and multistoried buildings.

Indian standards for sanitary conveyance. Model bye laws 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 pla

References:

1. B. C. Punmia; Water Supply and Sanitation.
2. S.C. Rangwala, Water Supply and Sanitary Engineering, Charoter Publishing House.
3. C.S, Shah; Water supply and Sanitation Engineering.Galgotia Publications.
4. B.S.Birdie, Water supply and Sanitary Engineering, DhanpatRai and Sons.
5. National Building Code of India.
6. Eco-Niwas Samhita 2021 (Code Compliance and Part-II: Electro-Mechanical and Renewable Energy Systems)

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:	
SDG Justification:	

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

Course Objectives:

- Study of properties and uses of building materials such as Plastics, Laminates and Veneers, Glass, Paints, and Distempers.

UNIT 1

Plastics: Polymer types, thermo setting and thermo plastics, resins, common types of mouldings, fabrication of plastics, 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 above listed building materials and a detailed report of the study 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.

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 some 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:	
SDG Justification:	

AAR216	Architectural Design - II	L	T	St	J	C
SDG No.		1	0	7	0	8

Course Objectives:

- pplication on architectural design.
- To understand the integration of structural elements into architectural design.
- To gain an understanding of regional building by-laws and the National Building Code of India.

The design issues to be addressed:

- Organization of functional activities in relation to user requirements and the site.
- Relating the system of horizontal and vertical circulation, open spaces, parking, etc.
- Responding to socio-economic factors such as income levels, privacy, territoriality, interaction etc.
- Considering materials, structure and services in relation 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. All books and journals on architecture.

Course Outcomes:

- Conceptualize designs by integrating basic functional elements.
- Conceptualize designs by integrating structural elements
- Conceptualize design according to behaviour and circulation of various user groups.
- Formulate the design according to regional building bye-laws.
- Verify the regional bye-laws in light of national building regulations.

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 Justification:	

AAR218	Building Construction III	L	T	St	J	C
SDG No.		1	0	4	0	5

Course Objectives:

- To understand the various parts of building elements from substructure to superstructure and their construction details.
- To expose the student to various types of foundation, flooring, Damp proofing, roofing, and their construction 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 & Arora; Building Materials and Construction.

Course Outcomes:

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

AAR222	Computer Application in Architecture II	L	T	St	J	C
SDG No.		0	0	3	0	3

Course Objectives:

- To introduce concepts of 3d to the students who are already proficient in 2D
- To learn advance concepts and commands in CAD
- Make them understand how to draw views in term of objects and building 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 preparation of 2D documentations based on class projects in the previous semester in Architectural Designs.

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

References:

Course Outcomes:

- Understand the use of Xref and attributes command.
- 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 Justification:	

V Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			End Exam Hours/ Type
			L	T	St	J		I	E	T	
01	ACE301	**Concrete Structures**	2	1	0	0	3	50	50	100	03 Hrs
02	AAR301	**Architectural Acoustics**	3	0	0	0	3	50	50	100	03 Hrs
03	AAR303	**Mechanical and Electrical Services**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR315	**History of Eastern Architecture II**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR307	**Site Planning & Landscape Design**	3	0	0	0	3	50	50	100	03 Hrs
06	AAR319	**Architectural Design III**	1	0	7	0	8	200	200	400	Jury
07	AAR313	**Building Construction IV**	1	0	4	0	5	50	50	100	05 Hrs
08		**Open Elective**	3	0	0	0	3	50	50	100	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.		2	1	0	0	3

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 foundation.

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

Textbooks:

1. Pillai and Menon, Reinforced Concrete Design, 3/e, Tata McGraw Hill, 2009.
2. N. Subramanian, Design of Reinforced Concrete Structures, Oxford University, 2014.

References:

3. P.C. Varghese, Limit State Design of Reinforced Concrete, 2/e, Prentice Hall of India,2013
4. A.K. Jain, Reinforced Concrete – Limit State Design, 7/e Standard book house, 2012.

List of IS Codes:

5. IS 456:2000: Plain and Reinforced concrete code of practice
6. 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:	
SDG Justification:	

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

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:

1. A. B. Wood; A Text book of sound.
2. T. M. Yarwood; Acoustics.
3. Duncan Templeton; Acoustics in The Built Environment.
4. J E Moore; Design for good Acoustics and noise control.
5. K.A. Siraskar; Acoustics in Building Design.

Course Outcomes:

- To understand the 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 fundamental 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 Justification:	

AAR303	Mechanical and Electrical Services	L	T	St	J	C
SDG No.		3	0	0	0	3

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.

Exercise:

- Preparation of electrical layout of a simple residential building.
- Space requirements for Various Electrical and mechanical Services
    - Substation & DG Sets
    - Air Conditioning
    - Fire fighting and water Supply Pump
    - Telephone & Internet
    - Shafts & Various Ducts

References:

1. Derek Philips; Lighting in Architectural Design.
2. G.K.Lal, Elements of Lighting, 3-D Publishers.
3. R.G. Hopkinson and J.D.Kay, The lighting of buildings, Faber and Faber, London, 1969.
4. Philips Lighting in Architectural Design, McGraw Hill, New York, 1964.
5. I.E.S. Handbook.
6. International Lighting Review – Quarterly Journal.
7. E.R. Ambrose, Heat Pumps and Electric Heating, John Wiley and Sons Inc, New York, 1968.
8. Handbook for Building Engineers in Metric Systems, NBC, New Delhi, 196
9. Eco-Niwas Samhita 2021 (Code Compliance and Part-II: Electro-Mechanical and Renewable Energy Systems)

Course Outcomes:

- The students understand the basics of Electricity and 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 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 Justification:	

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

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. Asher Catherine, Architecture of Mughal India
2. Sterlin Henry, Architecture of World, India (Islamic), Germany ISBN– 38228-9658-6
3. Tadgell Christopher, The History of Architecture in India, London 1990
4. George Michell; Architecture of the Islamic World — (its history and social meaning), Thames and Hudson, London, 1978.
5. Robert Hillenbrand; Islamic Architecture, Form, Function and Meaning, Edinburgh University Press, 1994.
6. Brown Percy, Indian Architecture (Islamic Period) VolII; Taraporevala and Sons, Bombay, 198; and subsequent publications
7. G.H.R. Tillotson – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.George Michell ;Architecture of the Islamic World — (its history and social meaning), Thames and Hudson, London, 1978.
8. Robert Hillenbrand,;Islamic Architecture, Form, Function and Meaning, Edinburgh University Press, 1994.
9. Brown Percy, Indian Architecture (Islamic Period) VolII ;Taraporevala and Sons, Bombay, 198; and subsequent publications
10. G.H.R. Tillotson – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.

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.
- Student will be able to understand the importance of landscaping, spatial design aspects, place making in Indo-Islamic architectural style.
- Student 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:	
SDG Justification:	

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

Course Objectives:

- To acquaint the students with 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

Exercise: Landscape Design for any one of the Architectural Design problems.

References:

1. Kevin Lynch ;Site planning ;MIT Press, Cambridge, MA – 1967
2. J. O. Simonds; Landscape Architecture; McGraw Hill.
3. J. E. Ingels; Landscaping – Principles and Practice.

Course Outcomes:

- Students will get an understanding of the design principles of gardens in history.
- Students will be able to select appropriate plants for landscaping
- Apply various landscaping techniques for modifying the micro climate and conserve water and other natural resources.

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 Justification:	

AAR319	Architectural Design - III	L	T	St	J	C
SDG No.		1	0	7	0	8

Course Objectives:

- To understand the importance of social and climatic aspects application on architectural design.
- To understand integration of basic building services.
- To gain an understanding of regional building by-laws and National Building Code of India

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.
- 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. All books and journals on architecture.

Course Outcomes:

- To conceptualize specific requirements with regards commercial and residential use in terms of circulation of spaces.
- To coordinate designs, addressing socio-cultural behavioural aspects.
- To coordinate designs addressing environmental and technological aspects
- To conceptualize and coordinate designs addressing structure and services aspects.
- To formulate the design according to regional bye laws and National Building Code.

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:	
SDG Justification:	

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

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, wall cladding & large span structures.
- 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.

References:

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

Text Books:

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 & Arora; Building Materials and Construction.

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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
- The sensitize the students in choosing materials and construction techniques while designing, detailing and monitoring in the process of execution.
- To determine what kind of structure is suitable for the design
- 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:	
SDG Justification:	

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

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 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	0	0	0	3

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:

3. LE NOUVEAU SANS FRONTIÈRES - Textbook
4. 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:	

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

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 will introduce the general knowledge of the Spanish language, and the countries where it is spoken. It will focus on the 4 skills of language acquisition-listening, speaking, reading and writing. It will enable the students to understand basic grammar and equip them with the critical vocabulary needed to converse in Spanish.

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			End Exam Hours/ Type
			L	T	St	J		I	E	T	
01	ACE302	**Steel Structures**	2	1	0	0	3	50	50	100	03 Hrs
02	AAR302	**Estimating, Costing & Specifications**	2	1	0	0	3	50	50	100	03 Hrs
03	AAR316	**Modern & Contemporary Architecture**	3	0	0	0	3	50	50	100	03 Hrs
04	AAR308	**Housing**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR312	**Architectural Design IV**	1	0	8	0	9	200	200	400	Jury
06	AAR324	**Working Drawing**	1	0	5	0	6	50	50	100	Jury
07		**Program Elective**	3	0	0	0	3	50	50	100	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 Objectives:

- To learn IS 800-2007 code of practice for the design of Compression, Tension and Flexural members using various cross-sections
- To study the design of bolted and welded connections and arranging field visit to industries
- To study the behaviour and design of compression and tension members using simple and built-up sections
- To understand behaviour of flexural members and the design laterally restrained beams

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 confirming to latest revised code of IS-800 (2007).

Recommended books:

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

References:

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	2	2	2	1	1	2	1
CO2	2	3	3	2	1	3	1	2	2	2	1	1	2	1
CO3	2	3	3	2	1	3	1	2	2	2	1	1	2	1
CO4	2	3	3	2	1	3	1	2	2	2	1	1	2	1
CO5	2	3	3	2	1	3	1	2	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 Justification:	

AAR302	Estimating, Costing & Specifications	L	T	St	J	C
SDG No.		2	1	0	0	3

Course Objectives:

- Importance of estimation, type of estimates, mode of measurements, etc.
- To prepare different methods of approximate estimation.
- To prepare different methods of detailed estimation and write the bill of quantities.
- To calculate the exact quantities of items of civil works in different methods.
- Study of local SR rates, market rates.
- Rate analysis of building items as per current schedule of rate (CRS) of local PWD.
- To have thorough idea of specifications for different items. Different types of tenders.

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. M. Chakraborty; Estimating, Costing, Specification & Valuation.
2. B.N. Dutta; Estimating & Costing.
3. P. N. Khanna. Handbook of Civil Engineering.

Course Outcomes:

- To understand preparation of different abstract estimate
- To understand preparation of detailed estimation of building -
- Get ability to calculate the quantities of various items in the building
- Students can prepare the rate of every items of building through materials and labour rates
- Getting knowledge of contracts and tenders & writing specifications

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:	
SDG Justification:	

AAR316	Modern & Contemporary Architecture	L	T	St	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce effect of new material on contemporary architecture.
- To explain about new art and architecture developed after 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. SigfriedGiedion ;Space, time and Architecture.
2. Vincent Scully Jr; Modern Architecture.
3. Vikram Bhatt and Peter Sciver; After the masters (Contemporary Architecture of India).
4. Kenneth Frampton; Modern Architecture.
5. Library of Contemporary Architects.

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 Justification:	

AAR308	Housing	L	T	St	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- Develop orientation to understand scenario of 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.

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. Babur Mumtaz and Patweikly, Urban Housing Strategies, Pitman Publishing, London, 1976
2. Geofrey K.Payne, Low Income Housing in the Development World, John Wiley and Sons, Chichester, 1984
3. John F.C.Turner, Housing by people, Marison Boyars, London, 1976
4. Martin Evans, Housing, Climate and comfort, Architectural Press, London, 1980

5. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983.
6. Beaureu of Public Enterprises.

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 Justification:	

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

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.

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. All books and journals on architecture.

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:	
SDG Justification:	

AAR324	Working Drawings - I	L	T	St	J	C
SDG No.		1	0	5	0	6

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, building services, Furniture, Fittings & Equipment along with the installation methods.

Prerequisites: Sessionals, Architectural Detailing
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.

References:

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:	
SDG Justification:	

AAR304	Building Economics and Sociology	L	T	St	J	C
SDG No.		3	0	0	0	3

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 the society and their impact on social change.

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, monitory 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 neighbourhood in the context of changing society and growing population.

Structure of decision making processes related to community projects.

Recommended books:

1. Amos Rappoport, House Form and Culture
2. Wallis, Wilson D and Willey, M.M, Textbook of Sociology, 1st ed., KhelSahitaya Kendra, New Delhi, 2001.
3. Charon, Joel M.The Meaning of Sociology, 6th ed., Prentice Hall, New Jersey, 1999.
4. Thio, Alex.Sociology: a brief introduction, 4th ed. Allyn and Bacon, Boston, 2000.
5. Schaefer, Richard T.Sociology: a brief introduction, 4th ed. McGraw Hill, Boston, 2002.
6. Bilton, Tony and Oth. Introductory Sociology, 3rd ed. Palgrave, New York, 1997.
7. Stone, P.A. Building Economy: Design Production and Organisation a synoptic view, 2nd ed., Pergamon Press, Oxford, 1976.
8. Koutsoyiannis, A.Modern Microeconomics, 2nd ed., ELBS with MacMillan Press, 1994.
9. Nobbs, Jack and Hopkins, Ian. Economics: a core text, 4th ed. McGraw-Hill, London, 1995.
10. Teck, HoonHian and Oth.Economics: theory and applications, McGraw-Hill, Taiwan, 1998.
11. Dewett, K.K.Modern Economic Theory, ShyamLal Charitable trust, New Delhi, 2005.

Course Outcomes:

- Clarity about various aspects of society and their effect on 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 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:	
SDG Justification:	

ARR342	Barrier Free Architecture	L	T	St	J	C
SDG No.		3	0	0	0	3

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 accessiblity.
- 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. Building without barriers for the disabled, Harkness, Sarh P/690.554 HAR/B
2. Disability and rehabilitation Handbook/ Goldenson, RM/362.2002 DIS/M

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:	
SDG Justification:	

AAR344	Vernacular Architecture	L	T	St	J	C
SDG No.		3	0	0	0	3

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.

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 – Change since 1850, oxford University Press, Delhi, 1989.
7. Carmen Kagal, VISTARA – The Architecture of India, Pub: The Festival of India, 1986.
8. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000
9. Architecture without Architects: A Short Introduction to Non-Pedigreed Architecture by Bernard Rudofsky,University of New Mexico Press; Reprint edition (15 July 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:	
SDG Justification:	

VII Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR403	**Advanced Services**	3	0	0	0	3	50	50	100	03 Hrs
02	AAR461	**Research Methodology and Seminar**	1	2	0	0	3	100	-	100	Viva
03	AAR463	**Architectural Design - V**	1	0	7	0	8	200	200	400	Jury
04	AAR419	**Introduction to Human Settlements & Town Planning**	3	0	0	0	3	50	50	100	03 Hrs
05	AAR465	**Building Information Modelling**	0	0	3	0	3	100	-	100	Viva
06		**Elective Basket I**	1	1	1	0	3	50	50	100	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	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.		3	0	0	0	3

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 design of swimming pools in built environment and its allied services.
- To familiarize about the specialty services required in various category of hospitality industry.
- 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. Faber, Oscar and Kell, J.R. Heating and Air-Conditioning of Building. Architectural Press, Surrey, 1945.
2. Prasad, Manohar. Refrigeration and air-conditioning, 5th ed. New Age Intl. Pub., New Delhi, 1996.
3. Tiwari, Satish.Water and Energy resources.
4. Eco-Niwas Samhita 2021 (Code Compliance and Part-II: Electro-Mechanical and Renewable Energy Systems)

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: 04 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR461	Research Methodology and Seminar	L	T	ST	J	C
SDG No.		1	2	0	0	3

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. 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

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR463	Architectural Design V	L	T	ST	J	C
SDG No.		1	0	7	0	8

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. Time savers standards, Neufert's Architects data, National Building Code, URDPFI,
2. Urban design Guidelines,
3. Development Control Regulations- as per requirements.
4. Relevant case examples of Designed or executed projects.

5. All books and journals on architecture and urban design.

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR419	Introduction to Human Settlements & Town Planning	L	T	ST	J	C
SDG No.		3	0	0	0	3

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. John Radcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
2. Arthur B Gallion and Simon Eisner, The urban Pattern – City Planning and Design, Van Nostrand Reinhold Company
3. Rangwala, Town Planning, Charotar Publishing House
4. Rame Gowda, Urban and Regional Planning
5. C.L.Doxiadis, An Introduction to the Science of Human Settlements; Ekistics Hutchinson, London, 1968.
6. Aniruddha Ray, Towns and Cities of Medieval India, Manohar Publishers and Distributers, 2015
7. DK Bubbar, The Spirit of Indian Architecture, Rupa & Co, 2005
8. Andrew D.Thomas, Housing and Urban Renewal, George Allen and Unwin; Sydney, 1986.
9. Sustainable Human Settlements by R. S. Sandhu; Asian Experience, Rawat publications, 2001.
10. URDPFI Guidelines Vol I, II A, II B-2014. (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

AAR465	Building Information Modelling	L	T	ST	J	C
SDG No.		0	0	3	0	3

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.

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 Publicaitons.

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.

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

APPROVED IN:	
BOS: 04 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR471	Introduction to Architectural Conservation	L	T	ST	J	C
SDG No.		1	1	1	0	3

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

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR473	Innovative Approaches in Interior Design	L	T	ST	J	C
SDG No.		1	1	1	0	3

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. Interior Best Collection: Residence, Commerce, Office, Restaurant Asia I-IV. Archi World Co., Korea, 2003.
2. Friedmann, Arnold and Others. Interior Design: An Int. to Architectural Interiors. Elsevier, New York, 1979.
3. Miller, E. William. Basic Drafting for Interior Designers. Van Nostrand Reinhold, New York, 1981.
4. Kurtich, John and Eakin, Garret. Interior Architecture, VanNostrand Reinhold, New York, 1993.
5. Rao, M. Pratap. Interior Design: Principles and Practice, 3rd ed. STandard Pub., 2004.

6. Luciano Crespi (Politecnico di Milano, Italy) Cultural, Theoretical, and Innovative Approaches to Contemporary Interior Design, DOI: 10.4018/978-1-7998-2823-5, February 2020.

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR475	Elements of Landscape Architecture	L	T	ST	J	C
SDG No.		1	1	1	0	3

Course Description:

This course examines the fundamental elements of landscape architecture, blending design theory, environmental analysis, and cultural context. Students will explore how natural elements, built structures, and human interactions converge to shape sustainable and aesthetically engaging landscapes. Emphasis is placed on integrating ecological principles, digital design tools, and cultural heritage considerations into the planning and execution of landscape projects.

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. Landscape Architecture: A Manual of Environmental Planning and Design by John Ormsbee Simonds
2. Design with Nature by Ian McHarg
3. Selected journal articles, case studies, and supplemental readings (provided throughout the course)

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR477	Fundamentals of Circular Economy in Architecture and Construction	L	T	ST	J	C
SDG No.		1	1	1	0	3

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

AAR481	Computational Design and Digital Fabrication	L	T	ST	J	C
SDG No.		1	1	1	0	3

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. Leach, N., Dufresne, A., & Petrescu, D. (Eds.). (2010). Digital architecture: An introduction to digital design and fabrication. Routledge.
2. Oxman, R. (2010). Digital architecture and fabrication: The future of design and construction. Routledge.

3. Kolarevic, B., & Malkawi, A. M. (Eds.). (2005). Architecture in the digital age: Design and manufacturing. Taylor & Francis.
4. Menges, A., & Ahlquist, S. (2011). Computational design thinking: Computation design and theory. Wiley.
5. Gleason, B. (2018). Designing with Rhino and Grasshopper: An Introduction to Computational Design for Architects. Routledge.
6. Beesley, P., & Jäger, R. (2017). Generative Design: Visualize, Program, and Create with Processing. Springer.
7. Leach, N., Turnbull, D., & Williams, C. (2018). Digital Architecture: Design and Manufacturing. Wiley.

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

AAR483	Fundamentals of Net Zero in Built Environment	L	T	ST	J	C
SDG No.		1	1	1	0	3

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:

8. Heijden, J. v. (2014). Governance for Urban Sustainability and Resilience: Responding to Climate Change and the Relevance of the Built Environment. USE: Edward Elgar.
9. Krishnan, A. (2010). Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings. New Delhi: Tata McGraw-Hill.
10. Majumdar, M. (2002). Energy Efficient Buildings in India. New Delhi: TERI Press.
11. Rohinton, E. (2012). Carbon Management in the Built Environment. London: Routledge.
12. Skates, H. (2011). Building Your Own Sustainable and Energy Efficient House. Wiltshire: The Crowood Press.
13. Leach, N., Turnbull, D., & Williams, C. (2018). Digital Architecture: Design and Manufacturing. Wiley.

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR485	Building Construction Planning and Scheduling	L	T	ST	J	C
SDG No.		1	1	1	0	3

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. Dr. B.C.Punmia et al. Project planning and control with PERT and CPM, Laxmi Publications, New Delhi
2. S.P.Mukhopadyay, Project management for Architect's and civil Engineers, IIT, Kharagpur, 1974
3. Jerome D.Wiest and Ferdinand K.Levy, A Management Guide to PERT, CPM, prentice Hall of India Pub, Ltd., New Delhi, 1982
4. R.A. Burgess and G.White, Building production and project Management, The construction press, London, 1979.

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

AAR487	Urban Design Theory	L	T	ST	J	C
SDG No.		1	1	1	0	3

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. Lynch, Kevin – The Image of the City (MIT Press, 1960)

2. Cullen, Gordon – The Concise Townscape (Architectural Press, 1961)
3. Jacobs, Jane – The Death and Life of Great American Cities (Random House, 1961)
4. Gehl, Jan – Life Between Buildings: Using Public Space (Island Press, 2011)
5. Moughtin, Cliff – Urban Design: Street and Square (Architectural Press, 2003)
6. Bacon, Edmund N. – Design of Cities (Penguin Books, 1976)
7. Krier, Rob – Urban Space (Academy Editions, 1979)
8. Alexander, Christopher – A Pattern Language: Towns, Buildings, Construction (Oxford University Press, 1977)
9. Barnett, Jonathan – An Introduction to Urban Design (Harper & Row, 1982)
10. Gosling, David & Maitland, Barry – Concepts of Urban Design (Academy Editions, 1984)

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 JUN 2025 (21st BOS)	**ACADEMIC COUNCIL:**
SDG No. & Statement:	
SDG Justification:	

VIII Semester

Sl. No	Course Code	Course Name	No. of Hrs/Wk				Credits	Marks			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR462	**Internship****	0	0	0	**	24	300	300	600	Jury
02	AAR464	**Professional Practice & Building Regulations**	1	1	0	0	2	50	50	100	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR551	**Community Design Theory**	1	2	0	0	3	50	50	100	03 Hrs
02	AAR561	**Architectural Design - VI (Community Projects Studio)**	1	0	7	0	8	200	200	400	Jury
03	AAR563	**Dissertation**	1	5	0	0	6	200	-	200	Viva
04	AAR565	**Architectural Detailing**	1	0	2	0	3	100	-	100	Portfolio Assessment
05		**Elective Basket I**	1	1	1	0	3	50	50	100	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	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			End Exam Hours/ Type
			L	T	ST	J		I	E	T	
01	AAR562	**Design Thesis**	0	0	16	0	16	300	300	600	Jury
02	AAR564	**Thesis Document**	0	1	3	0	4	100	-	100	Viva
03		**Elective Basket I**	1	1	1	0	3	50	50	100	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	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