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 2021-22)

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.

PE0 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.

PE0 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

	PE0 011	PEO 02	PEO 03	PE0 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.

P0 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.

P0 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.

P0 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.

P0 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.

P0 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.
PS0 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 are 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 the B.Arch programme is designed to have a total of 296 credits for the award of the B.Arch degree from the admitted batch of 2021-22 onwards.

5. Medium of Instruction

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

6. Registration

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

7. Attendance Requirements

7.1. 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.

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

8. Evaluation

8.1. 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).

8.2. 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 %).

8.3. 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.

8.4. 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.

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

8.6. 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**	**100**	Continuous Evaluation	50 (I)	One Mid-Semester Examination shall be conducted for Twenty-Five (25) Marks. Twenty-Five (25) marks are allotted for Assignments.
	(All Semesters)		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)	iMid semester Portfolio comprising of sheets/ assignments shall be evaluated for Twenty-Five (25) Marks. 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)	shall be conducted for Ten (10) Marks. Mid Semester Portfolio comprising of sheets and assignments shall be evaluated for Fifteen (15) Marks. 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.

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*
4	**Basic Design & Visual Arts** (I & II Semesters)	**200**	Continuous Evaluation	100 (I)	Mid-Semester Portfolio comprising of sheets shall be evaluated for Fifty (50) marks. End semester Portfolio comprising of sheets shall be evaluated for Fifty (50) marks.
			Semester-end Examination	100 (E)	One Hundred (100) marks are allotted for the semester-end examination.
5	**Architectural Design** (III to VIII Semesters)	**400**	Continuous Evaluation	200 (I)	Mid-Semester Portfolio comprising of sheets shall be evaluated for One Hundred (100) marks. End semester Portfolio comprising of sheets shall be evaluated for One Hundred (100) marks.
			External Jury	200 (E)	External Jury on the design work done in the Semester by a practising architect.
6	**Studio Course** (without jury)	**100**	Continuous Evaluation	100 (I)	Mid semester Evaluation comprising of sheets/ model/assignments shall be evaluated for Fifty (50) marks. End semester Evaluation comprising of sheets/ model/assignments shall be evaluated for Fifty (50) marks.
7	**Studio Course** (with jury)	**100**	Continuous Evaluation	100 (I)	Mid semester Review Thirty (30) marks. End semester evaluation for assignments / tasks / deliverables (20) marks End semester Evaluation through external jury for Fifty (50) marks.

- 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	**Practical Training** (IX Semester)	**600**	Continuous Evaluation	600 (I)	One Hundred Fifty (150) marks are allotted for mid semester evaluation such as portfolio / internal faculty inspection assessment / log record etc. One Hundred Fifty (150) marks are allotted for end semester evaluation such as portfolio /internal faculty inspection assessment / log record etc. One Hundred Fifty (150) Marks - Consolidation of Marks received in a sealed envelope / official mail from principal architect / training officer towards performance evaluation and feedback on the trainee One Hundred Fifty (150) Marks - External jury on the work done in the Semester by a Practicing Architect.
9	**Design Thesis** (X Semester)	**600**	Continuous Evaluation	600 (I)	Two Hundred (200) marks allotted for mid semester evaluation of the project by panel reviews and the internal guide. Two Hundred (200) marks allotted for end semester evaluation of the project by panel reviews and the internal guide. Two Hundred (200) marks are allotted for the external jury.

I - Continuous Evaluation, E - End Semester Assessment

9. Retotalling, Revaluation & Reappearance

9.1. 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.

9.2. 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.

9.3. 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.

9.4. 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.

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

9.6. 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.

9.7. 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.

9.8. 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.

9.9. 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.

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

9.11. 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

9.12. 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.

10. Prerequisites For Architectural Design Thesis

10.1. 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.

11. Special Examination

11.1. 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.

12. Betterment of Grades

12.1. 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.

13. Grading System

13.1. 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**	-

13.2. 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.

14. Grade Point Average

14.1. 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.

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

14.3. 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.

14.4. 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.*

15. Eligibility For Award of The B.Arch. Degree

15.1. 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.

15.2. However, the above regulations may be relaxed by the Vice Chancellor in individual cases for cogent and sufficient reasons.

15.3. 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.

16. Discretionary Power

16.1. 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.

17. Categories of Courses

17.1. 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.

17.2. 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.

17.3. Practicals/ 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.

17.4. Internship (J)

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

I– SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR111	Introduction to Art and Architecture	3	0	0	0	3	50	50	100	3
2	AAR113	Basic Design & Visual Arts - I	1	0	5	0	6	100	100	200	JURY
3	AAR115	Architectural Drawing and Graphics-I	1	0	5	0	6	50	50	100	5
4	AAR121	Sketching Workshop	0	1	2	0	3	100	-	100	-
5	ACE101	Engineering Mechanics	2	1	0	0	3	50	50	100	3
6	AMT111	Mathematics for Architects	3	0	0	0	3	50	50	100	3
7	AEG111	Technical Communication	2	0	0	0	2	50	50	100	3
8	VDC111	Venture Discovery	2	0	0	0	2	100	-	100	-
Total			**14**	**1**	**13**	**0**	**28**	**550**	**350**	**900**	
Total Hrs. per week			**28**								

II– SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR 112	Theory of Architecture	3	0	0	0	3	50	50	100	3
2	AAR 114	Basic Design & Visual Arts - II	1	0	5	0	6	100	100	200	JURY
3	AAR 116	Architectural Drawing and Graphics-II	1	0	5	0	6	50	50	100	5
4	AAR 118	Building Construction & Materials-I	3	0	3	0	6	50	50	100	5
5	ACE 102	Strength of Materials	2	1	0	0	3	50	50	100	3
6	AAR 126	Model Making Workshop	0	1	2	0	3	100	-	100	-
7	AES 201	Environmental Studies	3	0	0	0	3	50	50	100	3
Total			**13**	**2**	**15**	**0**	**30**	**450**	**350**	**800**	
Total Hrs. per week			**30**								

III– SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE201	Theory of Structures - I	3	0	0	0	3	50	50	100	3
2	AAR201	Climatology in Architecture	3	0	1	0	4	50	50	100	3
3	AAR203	History of Western Architecture	3	0	0	0	3	50	50	100	3
4	AAR104	Building Materials-II	3	0	0	0	3	50	50	100	3
5	AAR217	Architectural Design-I	1	0	7	0	8	200	200	400	JURY
6	AAR219	Building Construction-II	1	0	4	0	5	50	50	100	5
7	AAR221	Computer Applications in Architecture-I	0	1	2	0	3	100	-	100	-
Total			**14**	**11**	**4**	**0**	**29**	**550**	**450**	**1000**	
Total Hrs. per week			**29**								

IV – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE202	Surveying for Architects	1	0	2	0	3	50	50	100	3
2	ACE204	Theory of Structures- II	2	1	0	0	3	50	50	100	3
3	AAR212	History of Eastern Architecture-I	3	0	0	0	3	50	50	100	3
4	AAR204	Water Supply & Sanitation	3	0	0	0	3	50	50	100	3
5	AAR 205	Building Materials-III	3	0	0	0	3	50	50	100	3
6	AAR216	Architectural Design-II	1	0	7	0	8	200	200	400	JURY
7	AAR218	Building Construction-III	1	0	4	0	5	50	50	100	5
8	AAR222	Computer Applications in Architecture-II	0	1	2	0	3	100	-	100	-
Total			**14**	**1**	**16**	**0**	**31**	**600**	**500**	**1100**	
Total Hrs. per week			**31**								

V – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE301	Concrete Structures	2	1	0	0	3	50	50	100	3
2	AAR301	Architectural Acoustics	3	0	0	0	3	50	50	100	3
3	AAR303	Mechanical & Electrical Services	3	0	0	0	3	50	50	100	3
4	AAR315	History of Eastern Architecture - II	3	0	0	0	3	50	50	100	3
5	AAR307	Site Planning & Landscape Design	3	0	0	0	3	50	50	100	3
6	AAR319	Architectural Design – III	1	0	7	0	8	200	200	400	JURY
7	AAR313	Building Construction - IV	1	0	4	0	5	50	50	100	5
8	EOExxx	**Open Elective-I**	3	0	0	0	3	50	50	100	3
	EOE202	German for Beginners									
	EOE305	French for Beginners									
	EOE317	Personality Development									
Total			**19**	**1**	**11**	**0**	**31**	**550**	**550**	**1100**	
Total Hrs. per week			**31**								

VI – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE302	Steel Structures	2	1	0	0	3	50	50	100	3
2	AAR302	Estimating, Costing & Specifications	2	1	0	0	3	50	50	100	3
3	AAR316	Modern & Contemporary Architecture	3	0	0	0	3	50	50	100	3
4	AAR308	Housing	3	0	0	0	3	50	50	100	3
5	AAR312	Architectural Design – IV	1	0	8	0	9	200	200	400	JURY

6	AAR324	Working Drawings - I	1	0	5	0	6	50	50	100	VIVA
7	AARxxx	**Program Elective-I**									
	AAR304	Building Economics and Sociology	3	0	0	0	3	50	50	100	3
	AAR342	Barrier Free Architecture									
	AAR 344	Vernacular Architecture									
Total			**15**	**2**	**13**	**0**	**30**	**550**	**450**	**1000**	
Total Hrs. per week			**30**								

VII – SEMESTER

Sl. No.	**Course Code**	**Course Name**	**No. of Hrs. per week**				**Credits**	**Marks**			**End Exam Duration Hours**
			L	**T**	**ST**	**J**		**I**	**E**	**T**	
1	AAR401	Advanced Structural Systems	3	0	0	0	3	50	50	100	3
2	AAR403	Advanced Services	3	0	0	0	3	50	50	100	3
3	AAR405	Building Construction Management	3	0	0	0	3	50	50	100	3
4	AAR417	Architectural Design – V	1	0	8	0	9	200	200	400	JURY
5	AAR419	Introduction to Human Settlements & Town Planning	3	0	0	0	3	50	50	100	3
6	AAR423	Working Drawings - II	1	0	5	0	6	50	50	100	VIVA
7	AARxxx	**Program Elective-II**									
	AAR 441	Introduction to Architectural Conservation	3	0	0	0	3	50	50	100	3
	AAR 443	Interior Design									
	AAR 445	Sustainable Architecture									
Total			**17**	**0**	**13**	**0**	**30**	**550**	**450**	**1000**	
Total Hrs. per week			**30**								

VIII – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR402	Urban Design	3	0	0	0	3	50	50	100	3
2	AAR404	Disaster Resistant Buildings & Management	3	0	0	0	3	50	50	100	3
3	AAR 416	Advanced Construction and Materials	3	0	0	0	3	50	50	100	3
4	AAR418	Architectural Design – VI	1	0	8	0	9	200	200	400	JURY
5	AAR422	Research Seminar	1	0	2	0	3	100	-	100	-
6	AAR 426	Building Information Modelling	0	1	2	0	3	100	-	100	-
7	**AARxxx**	**Program Elective-III**	3	0	0	0	3	50	50	100	3
	AAR 442	Energy Efficient Green Architecture									
	AAR 444	Appropriate Technology									
	AAR 448	Graphic & Product Design									
8	**AIExxx**	**Interdisciplinary Elective-I**	2	0	1	0	3	50	50	100	3
	AIE 402	Basics of Geographic Information System									
	AIE 406	Maintenance & Repair of Buildings									
	AIE 414	Road Safety and Civic Sense									
Total			**18**	**0**	**12**		**30**	**650**	**450**	**1100**	
Total Hrs. per week			**30**								

IX– SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR521	**Practical Training**	0	0	0	**	30	600	-	600	VIVA
Total			**600**								

Note:** students have to undergo internship in anarchitectural firm for the total duration of the semester.

X– SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR502	Professional Practice & Building Regulations	3	0	0	0	3	50	50	100	3
2	AAR 504	Entrepreneurship Skills for Architects	3	0	0	0	3	50	50	100	3
3	AAR522	Design Thesis	0	0	18	0	18	600	-	600	VIVA
4	AARxxx	**Program Elective-IV**	3	0	0	0	3	50	50	100	3
	AAR542	Intelligent Buildings									
	AAR544	Research Methods in Architecture									
	AAR546	Professional Ethics and Human Values									
Total			**9**	**0**	**18**	**0**	**27**	**750**	**150**	**900**	
Total Hrs. per week			**27**								

Course PO Mapping

S. NO	COURSE CODE	COURSE NAME	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
1	AAR 111	Introduction to Art and Architecture	H		H	-	-	-	M	-	-	-	-	-	-	-
2	AAR 113	Basic Design & Visual Arts - I	H	M	H	H	L	L	M	L	H	H	L	H	L	M
3	AAR 115	Architectural Drawing and Graphics-I	H	M	H	L	L	M	L	M	L	H	L	M	L	H
4	AAR 121	Sketching Workshop	H	-	-	-	-	-	-	-	-	-	-	-	-	H
5	ACE 101	Engineering Mechanics	L	H	M	L	L	L	L	L	M	L	L	H	M	L
6	AMT 111	Mathematics for Architects														
7	AEG 111	Technical Communication														
8	VDC 111	Venture Discovery														
SEM-II																
9	AAR 112	Theory of Architecture	H	M	L	M	-	-	-	-	-	-	-	-	-	-
10	AAR 114	Basic Design & Visual Arts - II	H	M	-	-	-	-	-	-	-	-	-	-	-	-
11	AAR 116	Architectural Drawing and Graphics-II	1	2	1	1	1	1	1	1	1	3	1	3	1	2
12	AAR 118	Building Construction & Materials-I	H	H	H	L	M	H	H	H	M	H	H	H	H	H
13	ACE 102	Strength of Materials	L	H	H	L	L	L	L	L	M	M	L	H	M	L
14	AAR 126	Model Making Workshop	H	L	M		M		L		M	L			1	1
15	AES 201	Environmental Studies														
SEM-III																
16	ACE201	Theory of Structures - I	H	M	H	L	M	H	M	L	M	M	L	L	M	L
17	AAR201	Climatology in Architecture	-	-	H	H	H	M	M	M	H	L	L	M	L	M
18	AAR203	History of Western Architecture	H	H	M	L	L	H	M	M	L	M	L	H	H	M
19	AAR104	Building Materials-II	H	M	M	M	L	M	M	L	L	M	M	H	M	L
20	AAR217	Architectural Design-I	-	H	H	-	-	L	-	-	L	-	-	M	-	-
21	AAR219	Building Construction-II	H	M	H	L	L	H	M	L	M	M	L	L	M	L
22	AAR221	Computer Applications in Architecture-I	M	-	M	M	H	-	-	-	-	-	-	-	-	H
SEM-IV																
23	ACE202	Surveying for Architects	M	L	L	M	M	L	L	L	M	M	L	H	M	H
24	ACE204	Theory of Structures- II	L	H	M	L	L	L	L	L	M	L	L	H	M	L
25	AAR212	History of Eastern Architecture-I	H	L	H	M	L	H	L	M	H	H	L	H	H	L

26	AAR204	Water Supply & Sanitation	H	M	M	L	M	H	M	M	M	H	L	L	H	L
27	AAR 205	Building Materials-III	H	H	M	M	L	M	M	L	L	M	M	H	M	L
28	AAR216	Architectural Design-II	H	H	H	L	-	H	M	-	H	-	-	M	M	L
29	AAR218	Building Construction-III	H	H	M	M	L	H	H	M	M	H	M	H	M	H
30	AAR222	Computer Applications in Architecture-II	H	L	L	L	H	M	H	H	H	H	M	H	L	H
SEM-V																
31	ACE301	Concrete Structures	L	H	M	L	M	L	M	L	M	L	L	H	M	L
32	AAR301	Architectural Acoustics	H	M	M	-	-	L	L	-	M	M	-	L	M	L
33	AAR303	Mechanical & Electrical Services	H	M	M	L	M	H	M	M	M	H	L	L	H	L
34	AAR315	History of Eastern Architecture - II	-	-	-	M	L	M	L	L	-	M	-	M	-	M
35	AAR307	Site Planning & Landscape Design	H	H	H	-	-	-	-	-	-	-	-	-	H	-
36	AAR319	Architectural Design – III	H	M	M	L	L	M	L	L	H	M	L	M	L	L
37	AAR313	Building Construction - IV	H	M	H	L	M	H	M	L	M	M	L	L	M	L
SEM-VI																
38	ACE302	Steel Structures	L	H	M	L	L	L	L	L	M	L	L	H	M	L
39	AAR302	Estimating, Costing & Specifications	M	M	L	L	M	M	L	L	M	L	H	L	L	M
40	AAR316	Modern & Contemporary Architecture	H	H	M	H	L	H	H	H	L	H	M	H	M	M
41	AAR308	Housing	M	H	H	M	L	H	H	M	L	L	M	M	H	L
42	AAR312	Architectural Design – IV	H	H	H	H	H	H	M	-	H	M	-	M	H	H
43	AAR324	Working Drawings - I	H	M	H	H	M	H	H	M	H	M	H	M	H	M
	AARxxx	**Program Elective-I**														
44	AAR304	Building Economics and Sociology	H	M	M	H	L	H	H	H	L	M	H	H	H	M
45	AAR342	Barrier Free Architecture	H	H	H	H	L	H	H	H	L	M	M	H	M	M
46	AAR 344	Vernacular Architecture	H	M	H	L		H	H	L		M		L	H	
SEM-VII																
47	AAR401	Advanced Structural Systems	H	L	L	L	L	H	M	L	H	H	L	M	M	L
48	AAR403	Advanced Services	M	L	L	L	H	M	M	H	H	H	M	H	M	H
49	AAR405	Building Construction Management	L	L	M	H	H	L	L	L	H	H	H	H	M	H
50	AAR417	Architectural Design – V	H	H	H	M	M	H	M	M	H	M	L	M	M	M
51	AAR419	Introduction to Human Settlements & Town Planning	H	H	M	M	M	H	H	H	M	H	M	H	H	M
52	AAR423	Working Drawings - II	M	M	H	H	M	H	H	M	H	H	M	M	H	M
		Program Elective-II														

53	AAR 441	Introduction to Architectural Conservation	H	M	-	H	-	M	-	L	-	-	-	-	-	-
54	AAR 443	Interior Design	M	L	M	L	M	L	L	M	M	M	M	L	L	L
55	AAR 445	Sustainable Architecture	H	M	H	-	-	H	H	-	-	M	-	H	H	-
SEM-VIII																
56	AAR402	Urban Design	M	H	M	M	M	L	M	L	M	L	L	M	H	L
57	AAR404	Disaster Resistant Buildings & Management	H	M	-	-	L	-	-	-	-	-	-	-	L	-
58	AAR 416	Advanced Construction and Materials	L	L	L	L	H	M	M	H	H	H	M	H	M	H
59	AAR418	Architectural Design – VI	H	H	H	-	-	M	H	-	H	-	-	-	-	-
60	AAR422	Research Seminar	L	L	M	H	L	-	L	-	H	H	-	H	L	L
61	AAR 426	Building Information Modelling	L	M	M	H	H	M	M	L	H	H	H	H	M	H
		Program Elective-III														
62	AAR 442	Energy Efficient Green Architecture	H	H	H	L	L	H	H	M	M	M	L	H	M	L
63	AAR 444	Appropriate Technology	H	-	-	-	-	H	H		-	-	-	M	H	-
64	AAR 448	Graphic & Product Design	H	M	H	M	H	-	-	-	H	M	L	H	M	H
		Interdisciplinary Elective-I														
65	AIE 402	Basics of Geographic Information System														
66	AIE 406	Maintenance & Repair of Buildings														
67	AIE 414	Road Safety and Civic Sense	H	H	H	M	M	M	M	M	H	M	M	L	M	-
SEM-IX																
68	AAR521	Practical Training	H	M	H	M	M	M	L	L	M	M	M	H	L	M
SEM-X																
69	AAR502	Professional Practice & Building Regulations	1	2	1	1	1	3	3	3	3	3	1	3	1	3
70	AAR 504	Entrepreneurship Skills for Architects	-	-	-	-	-	-	-	H	H	H	H	H	-	H
71	AAR522	Design Thesis	H	H	H	H	H	H	H	L	H	H	L	M	H	H
		Program Elective-IV														
72	AAR542	Intelligent Buildings	H	L	M	L	H	M	H	L	L	L	L	L	L	M
73	AAR544	Research Methods in Architecture	L	H	H	H	H			H	H	H	H	H	M	H
74	AAR546	Professional Ethics and Human Values	-	-	-	-	-	M	L	H	M	-	-	-	-	-

I – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR111	Introduction to Art and Architecture	3	0	0	0	3	50	50	100	3
2	AAR113	Basic Design & Visual Arts - I	1	0	5	0	6	100	100	200	JURY
3	AAR115	Architectural Drawing and Graphics-I	1	0	5	0	6	50	50	100	5
4	AAR121	Sketching Workshop	0	1	2	0	3	100	-	100	-
5	ACE101	Engineering Mechanics	2	1	0	0	3	50	50	100	3
6	AMT111	Mathematics for Architects	3	0	0	0	3	50	50	100	3
7	AEG111	Technical Communication	2	0	0	0	2	50	50	100	3
8	VDC111	Venture Discovery	2	0	0	0	2	100	-	100	-
Total			**14**	**1**	**13**	**0**	**28**	**550**	**350**	**900**	
Total Hrs. per week			**28**								

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, 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, presentations 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 Color Theory and various color 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 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 textural quality of different materials

Course Outcomes:

On completion of the course, the student will be able to:

- 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.

Recommended Books:

- Form Space & Order by Francis, D.K.Ching
- Principles of two-dimensional designs by Wong Wucius
- Designer s Guide to Colour by Ikuyoshi Shibikawa and Yumi Takahashi
- Elements of architecture by Von Mesis
- Architectural Composition by Robkrier
- Design & Form by Johannes Itten
- Architecture Drafting & Design by Donald E. Helper, Paul I. Wallach
- The Decorative Designs of Frank Lloyd Wright by David A. Hanks
- Principles of Design in Architecture by K.W.S mithies
- Drawing for 3 – dimensional design by Alan pipes

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR115	ARCHITECTURAL DRAWING & GRAPHICS – I	L	T	ST	J	C
SDG No.4		1	0	5	0	6

Course Objectives:

- Familiarization with drawing equipment and drafting techniques.
- To introduce fundamentals of technical drawing and its practice, typography, 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 familiarization, use and handling.

Title panels and legends.

Simple exercises in drafting – horizontal, vertical, and angular lines and circles/arcs.

Line types, line weights, dimensioning.

Typography- anatomy of type, styles. Free hand 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 lateral surfaces of solid

Projection of points, lines, planes, and solids

Course Outcomes:

After completion of this course, students will be able to:

- 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.

Recommended Books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 in improving 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	1	2	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)

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.

Recommended Books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 necessary skills of freehand drawing which plays an important role in creative expression of thought and design thinking. This improvises communication skill 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.

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.

Recommended Books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	3	1	1	1	1	2	1	1	1	3	1	-	-
CO2	1	3	3	3	1	1	1	1	3	1	1	3	3	1	-	-
CO3	1	3	3	3	1	1	1	1	3	1	1	3	3	1	-	-
CO4	1	3	3	3	1	1	1	1	3	1	1	3	3	1	-	-
CO5	1	3	3	3	1	1	1	1	3	1	1	3	3	1	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS : 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement:10	
SDG Justification:	
The course provides insights of required understanding on construction industry, reinforces	

the required cognitive skills for innovation, applications in 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 Mid ordinate rule, Trapezoidal rule, Simpson's rule, Volume of irregular solids, 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

Probability and Statistics

- 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.

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

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:

1. Mario Livio - The Golden Ratio: The Story of Phi, the Extraordinary Number of Nature, Art and Beauty - Headline Review – 2003
2. Architecture and Mathematics in Ancient Egypt - Corinna Rossi - Cambridge University Press – 2003.
3. Geometry in architecture and building by Hans Sterk, Faculteit Wiskunde en Informatica, Technische Universiteit Eindhoven. Lecture notes.
4. 2nd Quarter Project, Leilehua High School Architects (Using Linear Equations). Assignment.
5. Geometry and the visual arts, Dan Pedoe, Dover publications, New York.
6. Geometry of Design, Studies in proportions and composition, Kimberly Elam, Princeton Architectural Press, New York.
7. Geometry in Ancient and Medieval India, Dr.T.A.sarasvati Amma, Motilal Banarsidass Publishers Private limited, New Delhi.
8. Vedic Mathematics Easy methods in maths, Dr.C.Nagalakshmi, EMESCO books, Hyderabad.
9. The power of limits, Proportional harmonies in nature, art and architecture, Gyorgy Doczi, Shambhala Publications, Inc. Colarado.
10. The thirteen books of Euclid's Elements, T.L.Heath, Cambridge University Press.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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		

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 & In formal 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

Course Outcomes:

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

- 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.

Recommended Books:

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

VDC111	VENTURE DISCOVERY	L	T	ST	J	C
SDG No.		2	0	0	0	2

Course Description and Learning Outcomes:

As part of its Make in India initiative, India has been focusing on creating incubation centers within educational institutions with an aim to generate successful start-ups. These start-ups will become employment creators than employment seekers, which is the need of the hour for our country.

This common course for all the disciplines is a foundation for venture development. It is an experiential course that lets students venture and find out what a business's financial and operating models are - Designing and prototyping a solution that meets their customers' needs and generates revenue for the business.

Course Objectives:

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

UNIT 1

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

UNIT 2

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

UNIT 3

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

UNIT 4

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

UNIT 5

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

Course Outcomes:

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

Reference textbooks and journal papers:

Personal Discovery Through Entrepreneurship, Marc H. Meyer and Chaewon Lee, The Institute of Enterprise Growth, LLC Boston, MA.

Suggested journals: Vikalpa, Indian Institute of Management, Ahmedabad, Journal of General Management, Mercury House Business Publications, Limited Harvard Business Review, Harvard Business School Publishing Co. USA

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

II– SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR 112	Theory of Architecture	3	0	0	0	3	50	50	100	3
2	AAR 114	Basic Design & Visual Arts - II	1	0	5	0	6	100	100	200	JURY
3	AAR 116	Architectural Drawing and Graphics-II	1	0	5	0	6	50	50	100	5
4	AAR 118	Building Construction & Materials-I	3	0	3	0	6	50	50	100	5
5	ACE 102	Strength of Materials	2	1	0	0	3	50	50	100	3
6	AAR 126	Model Making Workshop	0	1	2	0	3	100	-	100	-
7	AES 201	Environmental Studies	3	0	0	0	3	50	50	100	3
Total			**13**	**2**	**15**	**0**	**30**	**450**	**350**	**800**	
Total Hrs. per week			**30**								

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.

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.

Recommended Books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS : 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement: 4 & 9	
SDG Justification:	
This Course introduces the students to the materilas ,innovations and techniques and how they creatively adopted to the specific projects. Understanding the varipous philosophies of famous architects inspires students to come with innovative thoughts and novel ideas in design. The knowledge of various proportioning systems helps the students in designing spaces more efficeincently.	

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 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.

Course Outcomes:

- The student will be able to design smaller spaces of architecture.
- The student will gain knowledge of integrating functional and aesthetical 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.

Reference:

- All books and journals on architecture.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR116	**ARCHITECTURAL DRAWING**	L	T	ST	J	C
SDG No.4	**& GRAPHICS – II**	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:

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.

Course Outcomes:

At the end of the course, the students will have:

- 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.

Reference:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS : 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement:4	
AD&G teaches fundamentals of drawing & design communication that instills strong foundation for "quality education" in Architecture.	
SDG Justification:	

AAR118	**BUILDING CONSTRUCTION &**	L	T	P	J	C
SDG No.9	**MATERIALS – I**	3	0	3	0	6

Course Objectives:

- To understand fundamentals of building materials like brick, stone, cement, lime, sand, mortar, etc., their properties, applications, components, and use in construction.
- To understand basic structural systems and components of building and step by step construction procedure for a load bearing structure
- To understand principles of masonry, brick masonry and applications
- To understand principles of stone masonry, stone masonry and applications
- To understand importance of sub structure, types of simple foundation for a load bearing structure, importance of plinth for a building.

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, aesthetic qualities. Introduction to building materials as described in 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 section of 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.

Recommended Books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	2	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

ACE102	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.

Textbook(s)

- R. Subramanian, Strength of Materials, 2/e, Oxford,2010

- E.Popov, Engineering Mechanics of Solids, 2/e, Pearson,2009

References

1. S.S. Rattan, Strength of Materials, 2/e, Tata McGraw Hill Education,2011
2. Geriand Timoshenko, Mechanics of Materials, 4/e, CBS Publishers,2006
3. Stephen Timoshenko, Strength of Materials, 3/e, CBS Publisher,2002
4. R.K. Rajput, Strength of Materials, S.Chand Publications,2007

Course Outcomes:

By the completion of this course, the student will be able to:

- Learn the concept of the mechanical behavior 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	3	1	1	1	1	1	1	1	2	3	1	-	-
CO2	1	3	3	3	1	1	1	1	1	1	1	2	3	1	-	-
CO3	1	3	3	3	1	1	1	1	1	1	1	2	3	1	-	-
CO4	1	3	3	3	1	1	1	1	1	1	1	2	3	1	-	-
CO5	1	3	3	3	1	1	1	1	1	1	1	2	3	1	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS : 05-Aug-21 (13th BOS)	**ACADEMIC COUNCIL: 17-Sep-21**
SDG No. & Statement:10	
SDG Justification:	
The course provides insights of required understanding on construction industry, reinforces the required cognitive skills for innovation, applications in practical field of architectural professional practice	

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 mediums.
- 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-modeling: 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 model making to visualise in 3dimensional perspective that influence 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.
- Fundaments of disaster management.
- Environmental ethics, climate changes, 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 forest and tribal people. Water resources: Use and over-utilization 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, fertilizer-pesticide problems, waterlogging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, and alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion, and desertification. Role of an individual in 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 as a mega-diversity nation. Hot-sports of biodiversity .Threats to biodiversity : habitat loss, poaching of wildlife, 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

Recommended Books:

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:
Knowledge will be gained on

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE201	Theory of Structures - I	3	0	0	0	3	50	50	100	3
2	AAR201	Climatology in Architecture	3	0	1	0	4	50	50	100	3
3	AAR203	History of Western Architecture	3	0	0	0	3	50	50	100	3
4	AAR104	Building Materials-II	3	0	0	0	3	50	50	100	3
5	AAR217	Architectural Design-I	1	0	7	0	8	200	200	400	JURY
6	AAR219	Building Construction-II	1	0	4	0	5	50	50	100	5
7	AAR221	Computer Applications in Architecture-I	0	1	2	0	3	100	-	100	-
Total			**14**	**11**	**4**	**0**	**29**	**550**	**450**	**1000**	
Total Hrs. per week			**29**								

ACE201	THEORY OF STRUCTURES - I	L	T	ST	J	C
SDG No.		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.

Course outcomes:

The student will be able to

- 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.

Text Book(s)

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

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

Course Outcomes:

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

Recommended Books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 enviroenment during Egyptian era with focus on formative development stage of construction techniques.
- To understand the evouluton of various building typologies and settlements based on socio-cultural & socio-economical zoning strategies depending upon admisnistartive purposes during Mesopotamian times.
- To understand the process of designeing buildings and built enviroenment with specific design principles and impoartance for aesthetic appeal during Greek era.
- To understand the process of design approach with prime focus in evolution of construction techniques with the than engineering applications, intrior designing during Roman era.
- To understand the evolution of the church form; impoatance of application of suiatabke scale and proportaion, use of art in architecture in buildings during Rennaissance period.

UNIT 1

Development of prehistoric and historic architecture

Egyptian Architecture

a. Characteristic features
b. Secular Architecture
c. Mastabas.Example: Mastabaof Thi, Sakkâra
d. Pyramids.Example: Step pyramid of Djoser (Zoser), Sakkâra; Bent pyramid of Dahshur, Great pyramid of Cheops, Gizeh.
e. Temples. Example: Temples of Khons, Karnak, and The temple of Abu Simbel

UNIT 2

Ancient West Asiatic Architecture

a. Characteristic features
b. Sumerian Architecture, Ziggurats.Example: White Temple Warka
c. Babylonian Architecture.Example: City of Babylon
d. Assyrian Architecture.Example: City of Khorsabad
e. Persian Architecture.Example: City of Susa

UNIT 3

Classical Greek Period

a. Characteristic feature of Aegean Architecture
b. Hellenic period and Hellenistic period
c. Greek orders.Example: Doric, Ionic, and Corinthian
d. The Acropolis at Athens. Example: Parthenon, Propylaea.
e. Theatre, Stadium, and Agora

UNIT 4

Classical Roman Period

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

UNIT 5

Early Christian period

Characteristic feature
Basilican Churches.Example: St. Peter, Rome

Byzantine Period

Characteristic feature,
Example: Hagia Sophia

Romanesque Period

Characteristic feature
Example: Pisa Cathedral complex

Gothic Period

Early Gothic style and Late Gothic style
Example: Notre Dame, Paris

Renaissance Architecture

Introduction to Renaissance, Baroque Architecture, etc.

Recommended books:

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 enviroenment during Egyptian era.
- The course provides an understanding on reflection of socio-cultural & socio-economical factors on settlement zoning and building design in Mesopotamian times.
- The course provides an understanding on impoartance in application of aesthetics and design principles in buildings during Greek era.
- The course provides an understanding on the evolution of construction techniques reinforced with the than engineering applications during Roman era.
- The course provides an understanding the evolution of the church form; and impoartance of balancing scale and aesthetics in building.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	1	1	3	2	1	1	1	1	3	3	1	-	-
CO2	3	2	2	1	1	3	2	1	1	1	1	3	3	1	-	-
CO3	3	2	2	1	1	3	2	1	1	1	1	3	3	1	-	-
CO4	3	2	2	1	1	3	2	1	1	1	1	3	3	1	-	-
CO5	3	2	2	1	1	3	2	1	1	1	1	3	3	1	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Recommended Books:

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:

At the end of the course, a student will be:

1. Familiar with ferrous and non-ferrous metals and their properties, defects and methods of preventing them from damages
2. Able to understand the characteristics, use and applications of concrete.
3. Able to understand the use of additive and mixtures in concrete.
4. Familiar with properties and characteristics of timber and their uses in building construction.
5. Familiar with properties and uses of clay-product, mud and lime in construction industry as well as traditional building.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Course Outcomes:

After the end of semester the students will be able to:

- 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.

Reference:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	3	3	-	-	1	-	-	1	-	-	2	-	-	-	-
CO2	-	3	3	-	-	1	-	-	1	-	-	2	-	-	-	-
CO3	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	1	3	3	-	-	1	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Recommended Books:

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. VoI.1-Vol-IV, The English Language book society, Crospy Lockwood staples, London.

Course Outcomes:

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

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR221	**COMPUTER APPLICATIONS IN ARCHITECTURE – I**	L	T	ST	J	C
SDG No.		0	1	2	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 task to be determined each semester by the individual instructor.

Course Outcomes:

1. Use the CAD software program to create drawings from scratch and to modify, manipulate, copy, delete, save, and plot drawings.
2. Ability to construct accurate 2D geometry

3. Use the full range of CAD commands and options and employ shortcuts and time-saving strategies.
4. Ability to assemble these drawings in industry-standard plan form and produce plotted hardcopies ready for distribution.
5. Awareness of architectural drafting with a focus on industry standards.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
CO2	-	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE202	Surveying for Architects	1	0	2	0	3	50	50	100	3
2	ACE204	Theory of Structures- II	2	1	0	0	3	50	50	100	3
3	AAR212	History of Eastern Architecture-I	3	0	0	0	3	50	50	100	3
4	AAR204	Water Supply & Sanitation	3	0	0	0	3	50	50	100	3
5	AAR 205	Building Materials-III	3	0	0	0	3	50	50	100	3
6	AAR216	Architectural Design-II	1	0	7	0	8	200	200	400	JURY
7	AAR218	Building Construction-III	1	0	4	0	5	50	50	100	5
8	AAR222	Computer Applications in Architecture-II	0	1	2	0	3	100	-	100	-
Total			**14**	**1**	**16**	**0**	**31**	**600**	**500**	**1100**	
Total Hrs. per week			**31**								

ACE202	SURVEYING FOR ARCHITECTS	L	T	ST	J	C
SDG No.		1	0	2	0	3

Course Objectives:

The purpose of this course is to

- 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.

Recommended Books:

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:

The student will be able to

- 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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.		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

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

Text Book(s)

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

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

Course Outcomes:

The student will be able to

- 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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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		

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 Architecture:

- 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.

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.

Recommended books:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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 plan.

Recommended Books:

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Recommended Books:

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:

At the end of course, student should have learnt:

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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:

- To understand the importance of social and climatic aspects application 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.

Course Outcomes:
After the end of semester the students will be able to:

- 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.

Reference:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Text Books:

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

Recommended Books:

1. W.B. MacKay, 'Building Construction', Vol. 1,2,3 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.

Course Outcomes:

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

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR222	**COMPUTER APPLICATIONS IN ARCHITECTURE - II**	L	T	ST	J	C
SDG No.		0	1	2	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.

Course Outcomes:

At the end of the course the students will be able to:

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE301	Concrete Structures	2	1	0	0	3	50	50	100	3
2	AAR301	Architectural Acoustics	3	0	0	0	3	50	50	100	3
3	AAR303	Mechanical & Electrical Services	3	0	0	0	3	50	50	100	3
4	AAR315	History of Eastern Architecture - II	3	0	0	0	3	50	50	100	3
5	AAR307	Site Planning & Landscape Design	3	0	0	0	3	50	50	100	3
6	AAR319	Architectural Design – III	1	0	7	0	8	200	200	400	JURY
7	AAR313	Building Construction - IV	1	0	4	0	5	50	50	100	5
8	EOExxx	**Open Elective-I**	3	0	0	0	3	50	50	100	3
	EOE202	German for Beginners									
	EOE305	French for Beginners									
	EOE317	Personality Development									
Total			**19**	**1**	**11**	**0**	**31**	**550**	**550**	**1100**	
Total Hrs. per week			**31**								

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

Text Book(s)

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

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

List of IS Codes

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

Course Outcomes:
Student will be able to

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

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.

Recommended Books

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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:

Electrical systems-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 2021recommendations.

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

Recommended books:

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Recommended Books:

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	-	-	2	1	1	-	2	-	2	1	-	-	-
CO2	3	2	-	-	-	2	1	1	-	2	-	2	1	-	-	-
CO3	3	2	-	-	-	2	1	1	-	2	-	2	1	-	-	-
CO4	3	2	-	-	-	2	1	1	-	2	-	2	1	-	-	-
CO5	3	2	-	-	-	2	1	1	-	2	-	2	1	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR307	SITE PLANNING AND 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.

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.

Recommended books:

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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:

Main Design Problem
Commercial cum Residential complex, Exhibition Pavilion, Nursing Home etc.

Design (Time) Problem (12 hrs.)
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.

Reference:

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

Course Outcomes:

After the end of the semester the students will be able:

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

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

Text Books:

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

Recommended Books:

1. W.B. MacKay, 'Building Construction', Vol. 1,2,3longmans, 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Recommended Books:

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:

17.1.a https://www.deutschalsfremdsprache.ch/

Course Outcomes:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

EOE 305	**FRENCH FOR BEGINNERS**	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.

Recommended Books:

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

Course Outcomes:

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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

EOE 317	PERSONALITY DEVELOPMENT	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

The objectives of this course are:

- to sensitize a student on the importance of self awareness.
- to train the students in self discipline.
- to help build confidence among them through self motivation.
- to impart the skills of managing one's own self in diverse environments.
- to aid them in developing interpersonal skills for a better career and life.

UNIT 1

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

UNIT 2

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

UNIT 3

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

UNIT 4

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

UNIT 5

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

Recommended Books:

1. Hurlock Elizabeth B., Personality Development, McGraw Hill Education, India, 1979.
2. Covey, Stephen R., The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change, Free Press, 2004.
3. Carnegie, Dale, Levine, Stuart. R., The Leader In You: How to Win Friends, Influence People and Succeed in a Changing World, Pocket Books, 1995.
4. Swami Vivekananda, Personality Development, Advaita Ashrama, 1993.

Course Outcomes:

At the end of the course, the student will be able to

- understand one's own self to face challenges of life.
- practice self discipline in order to realize the set goals.
- develop self confidence through concerted efforts.
- realise and value the importance of managing time; and handling emotions in different situations.
- build interpersonal and adaptability skills for a contented life.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

VI - SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	ACE302	Steel Structures	2	1	0	0	3	50	50	100	3
2	AAR302	Estimating, Costing & Specifications	2	1	0	0	3	50	50	100	3
3	AAR316	Modern & Contemporary Architecture	3	0	0	0	3	50	50	100	3
4	AAR308	Housing	3	0	0	0	3	50	50	100	3
5	AAR312	Architectural Design – IV	1	0	8	0	9	200	200	400	JURY
6	AAR324	Working Drawings - I	1	0	5	0	6	50	50	100	VIVA
7	AARxxx	**Program Elective-I**	3	0	0	0	3	50	50	100	3
	AAR304	Building Economics and Sociology									
	AAR342	Barrier Free Architecture									
	AAR 344	Vernacular Architecture									
Total			**15**	**2**	**13**	**0**	**30**	**550**	**450**	**1000**	
Total Hrs. per week			**30**								

ACE 302	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:

1. V.L. Shah and Veena Gore, Limit State Design of steel structures IS: 800-2007, Structures Publications, 2012.
2. M.L. Gambhir, Fundamentals of Structural Steel Design, McGraw Hill Education, 2013.
3. R. Narayanan, Teaching Resource on Structural Steel Design, INSDAG, Ministry of Steel Publications, 2002.
4. Ramachandra and V.Gehlot, Design of Steel Structures, Scientific Publishers, 2009

Course Outcomes:

At the end of the course, the student will be able to

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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		

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR302	ESTIMATING, COSTING AND 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

1. Definition of "Building estimate"
2. Purpose of Estimating.
3. Different Types of Estimate.

Approximate Estimate

1. Importance & purpose of Approximate / Rough estimation
2. Different methods of approximate estimate

UNIT 2

Detailed Estimate

1. Preparation of Detailed estimate.
2. Function of "Measurement form" & "Abstract of estimate form".
3. Description & significance of Item in BOQ.

UNIT 3

Methods of Measurement of Works

1. Different methods estimating building works.
2. Estimation of a simple building at different stages:
    - Foundation up to plinth
    - Superstructure
    - Finishing works
3. 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

1. Purpose of Rate analysis.
2. Quantity of Materials.
3. Different components of rate

UNIT 5

General Specifications& Types of Contract

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

Recommended Books:

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 estimats
- 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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR 316	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

Recommended books:

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:

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

- 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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR 308	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.

Recommended books:

1. Babur Mumtaz and Patweikly, Urban Housing Strategies, Pitman Publishing, London, 1976
2. GeofreyK.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:

After the end of the semester the students will be able to:

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	-	-	2	1	1	1	-	-	-	-	-	-	-
CO2	3	2	3	-	-	3	1	2	-	-	-	-	-	-	-	-
CO3	2	3	3	-	-	3	2	1	1	-	-	-	-	-	-	-
CO4	2	3	3	-	-	3	2	1	1	-	-	-	-	-	-	-
CO5	3	3	3	-	-	2	2	1	1	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR 312	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:

Main 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.

Reference:
All books and journals on architecture.

Course Outcomes:

After the end of the semester the students will be able to:

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	4	-	2	2	2	-	-	-	-	-	-	-	-
CO2	2	1	1	1	-	1	2	2	-	-	-	-	-	-	-	-
CO3	2	2	1	1	-	2	2	2	-	-	-	-	-	-	-	-
CO4	3	2	3	2	-	2	2	2	-	-	-	-	-	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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.

Course Outcomes:

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

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR 304	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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR342	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.

UNIT5

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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	ST	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

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High 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. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR401	Advanced Structural Systems	3	0	0	0	3	50	50	100	3
2	AAR403	Advanced Services	3	0	0	0	3	50	50	100	3
3	AAR405	Building Construction Management	3	0	0	0	3	50	50	100	3
4	AAR417	Architectural Design – V	1	0	8	0	9	200	200	400	JURY
5	AAR419	Introduction to Human Settlements & Town Planning	3	0	0	0	3	50	50	100	3
6	AAR423	Working Drawings - II	1	0	5	0	6	50	50	100	VIVA
7	AARxxx	**Program Elective-II**	3	0	0	0	3	50	50	100	3
	AAR 441	Introduction to Architectural Conservation									
	AAR 443	Interior Design									
	AAR 445	Sustainable Architecture									
Total			**17**	**0**	**13**	**0**	**30**	**550**	**450**	**1000**	
Total Hrs. per week			**30**								

AAR 401	ADVANCED STRUCTURAL SYSTEMS	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce various structural forms suitable for architectural expression.
- To impart knowledge on the simple structural systems used in regular construction of buildings and their structural behavior.
- To explain the action of structural elements with singly and doubly curved structures.
- To introduce recent structural developments suitable for architectural built environment.
- To create awareness on combination of different types of structural elements as forms of architectural built environment.

UNIT 1

Structure and Form, Classification of structural forms, Equilibrium under simple tension or compression. Relation between structure and architecture, Geometry of form and structural function, Aesthetic theories of the expression of structural function in architectural form.

UNIT 2

Beams and Slabs, Portal Frames-Plane, Space Frames/Trusses (only structural action of the element, BMD and SFD calculations not included), single- and double-layer grids, Braced and folded grid structures.

UNT 3

Arches and catenaries; vaults, domes - braced domes, ribbed domes, Network domes, Lamella domes, Geodesic domes (only structural action of the element, BMD and SFD calculations not included).

UNIT 4

Folded plates, shells, cycloidal shells, the domical shell, Hyperbolic paraboloids, free forms – balloon structures.

UNIT 5

Curved membrane Structures, Singly curved suspended roofs, Combination of cables and struts, Fabric structures. One model submission.

Recommended Books:

1. Candela, Felix. Architecture and Structuralism. 1963.
2. Lane, Allen. Developments in Structural Form. Penguin Books ltd, London, 1975.
3. Macdonald, J. Angus. Structure and Architecture, 2nd ed. Architectural Press, Oxford, 2003.
4. Michaels, Leonard. Contemporary Structures in Architecture. 1950.
5. Schall, Rolf. Curtain Walls: Design Manual. Reinhold Pub., New York, 1962.
6. Siegel, Curt. Structure and Form in Modern Architecture. Crosby Lockwood and son Ltd., London, 7. 1962.
8. Subramanian, N. Principles of Space structures. Wheeler and Co., Allahabad, 1983.
9. Zannos, Alexander. Form and Structure in Architecture: The role of statical function. Van Nostrand
10. Reinhold Co., New York, 1987.

Course Outcomes:

- Students will be able to identify various structural forms suitable for architectural expression.
- Students will be able to understand about simple structural systems used in regular construction of buildings and their structural behavior.
- Student will be able to understand the action of structural elements with singly and doubly curved structures.
- Students will be familiar with recent structural developments suitable for architectural built environment.
- Students will be able to understand the combination of different types of structural elements as forms of architectural built environment.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	1	1	2	2	1	3	2	2	3	2	2	-	-
CO2	3	1	1	1	1	2	2	1	3	2	2	3	2	2	-	-
CO3	3	1	1	1	1	2	2	1	3	2	2	3	2	2	-	-
CO4	3	1	1	1	1	2	2	1	3	2	2	3	2	2	-	-
CO5	3	1	1	1	1	2	2	1	3	2	2	3	2	2	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR403	ADVANCED SERVICES	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce about fire safety systems & its design in buildings.
- To familiarize about various electronic systems for safety & communication in Buildings.
- To introduce 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 firefighting 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.

Recommended Books

1. Faber, Oscar and Kell, J.R. Heating and Air-Conditioning of Building. Architectural Press, Surrey, 1945.
2. Prasad, Manohar. Refrigeration and air-conditioning, 5thed. 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS : 20-May-22 (15th BOS)	**ACADEMIC COUNCIL: 17-Jun-22**
SDG No. & Statement:	
SDG Justification:	

AAR405	BUILDING CONSTRUCTION MANAGEMENT	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce about 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 about 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.

Recommended books:

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:

At the end of course, student should have learnt:

- 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 updation during the construction progress.
- Students would be aware about existing computer-based construction management tools

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR417	ARCHITECTURAL DESIGN-V	L	T	ST	J	C
SDG No.		1	0	8	0	9

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.

Reference:

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS : 18-Nov-21 (14th BOS)	**ACADEMIC COUNCIL: 01-Apr-22**
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 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.

Recommended Books

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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR423	WORKING DRAWINGS - II	L	T	ST	J	C
SDG No.		1	0	5	0	6

Course Objectives:

- To introduce about the basics in working drawings, study of process and symbols, labeling and dimensioning of working drawings.
- To impart detailed knowledge about various external finishes applicable in buildings and their representations in architectural drawings.
- To introduce about the details of sanitary and plumbing systems for buildings and their representation in architectural drawings.
- To introduce about the details of electrical layouts and their preparation.
- To sensitize about integration of above aspects and furniture layout.

Prerequisites: Sessional, Architectural Detailing

Mode of Drawings: Manual and Mechanical.

- External finishes of all types including all details required. Development of 'skin sections'.
- Details of toilets including plan, elevation, sections.
- Details of kitchen including plan, elevation, sections.
- Layout of sanitary and plumbing lines on site and connection with the main sewer/ septic tank.
- Electrical layout of a typical floor including specification of fixtures.

Course Outcomes:

- Students can explain about the basics in working drawings and can prepare them.
- Students are well-versed about various external finishes applicable in buildings and their representations in architectural drawings.
- Students can prepare detailed architectural drawings of sanitary and plumbing systems for buildings.
- Students would be able to prepare simple electrical layouts for regular buildings.
- Students can integrate the spatial aspects and necessary building services and prepare the detailed working drawings good for construction.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	1	1	1	1	1	1	3	1	2	2	3	-	
CO2	1	2	3	1	1	3	3	1	3	3	2	3	2	3	-	
CO3	1	2	3	1	1	3	3	1	3	3	2	3	2	3	-	
CO4	1	2	3	1	1	3	3	1	3	3	2	3	2	3	-	
CO5	1	2	2	1	1	2	2	1	3	3	2	2	2	3	-	

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR441	INTRODUCTION TO ARCHITECTURAL CONSERVATION	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce need and purpose of Architectural conservation, types of Architectural conservation practices and ethics of Architectural conservation.
- Introduce the philosophy and science of Architectural conservation by study of charters & legislations.
- To make understand the importance of appropriate methodologies of Research & Documentation in Architectural Conservation.
- To make understand various traditional and modern techniques and methods in Architectural conservation practice.
- To introduce urban conservation, its need, planning, legislative &management practices adopted.

UNIT 1

Introduction to conservation:

Understanding Heritage. Types of Heritage. Heritage conservation- Need, Debate, and purpose. Defining Conservation, Preservation, restoration, and Adaptive reuse. Concepts and approach's to conservation in India and other countries. Distinction between Architectural and Urban Conservation. Ethics of conservation, Significance and Value Assessment and Authenticity of Buildings.

UNIT 2

Development of Theory of Conservation:

History & development of Theory of Architectural Conservation, International agencies like ICCROM, ICOMOS, UNESCO, International conservation charters (Venice & Burra) and their role in Conservation, Selection Criteria of World Heritage Sites, Conservation Acts & Legislation in India (Center and State acts), Archaeological Acts (ASI) etc.

UNIT 3

Documentation:

Part A: Importance of Research in conservation, Sources of information like books, archival photographs and maps, folklores, mythology, oral tradition and memories, Structuring and interpretation of collected information.

PART B: Introduction to Heritage Database and Surveys for conservation [Building survey (Architectural & Authenticity), Condition Survey(Material & Structural), Intervention Survey, Site Survey (Context & Precinct) etc.], Listing & Grading of buildings, Measured Drawing(Techniques of Measurement, Drawing and Presentation), Photographic Documentation

. Overview of latest scanning technologies like LIDAR.

UNIT 4

Building Analysis & Design Intervention:

Part A: Introduction to Decay in Historical buildings, Materials and Structural failures, Internal and External environment of historic buildings, Climatic causes of decay, Botanical, biological and microbiological causes of decay, Man-made causes of decay.
Part B: Prevention of deterioration, Preservation of the existing state, Consolidation of the fabric, Restoration, Rehabilitation, Reproduction, Reconstruction.
Study of case examples: Hampi, Qutub Shahi tombs, Mahabalipuram etc.

UNIT 5
Urban Conservation:
Introduction to historic settlements; historic layering of the city and its values and meaning for the community; the role of urban systems and their inter-relational dynamics which give historic cities a distinctive and legible form; the agents and patterns of transformation.
Study of Case examples of Bologna, Cairo etc.
Approaches to integrated conservation in India with select examples explaining urban conservation tools and methods: Inner city regeneration, Adaptive reuse, Infill development etc., Institutional framework for urban conservation and renewal strategies in India (HRIDAY, Heritage component in SMART Cities and Master Plans) Study of Case examples: walled city of Ahmadabad, Mumbai, Hyderabad, Varanasi etc.

Recommended books:

1. Conservation of Historic Buildings by Fielden, Bernard, 2003, Architectural Press.
2. Guidelines for Conservation by Fielden, Bernard,1989, INTACH, New Delhi.
3. Historic England, Practical Building Conservation: Conservation Basics, 2013, Routledge.
4. B.K. Singh, "State and Culture", Oxford, New Delhi
5. A.G.K. Menon ed. "Conservation of Immovable Sites", INTACH Publication, N.Delhi., 1988
6. Croci, G. (1998). The Conservation and Structural Restoration of Architectural Heritage. Southampton, UK: WIT Press.
7. Fitch, J.M. (Reprint edition 1990). Historic Preservation: Curatorial Management of the Built World. Virginia: University Press of Virginia.
8. Cullinane, J. J. (2012). Maintaining and Repairing Old and Historic Buildings. Wiley-Blackwell.
9. Basu, S., Mukerji A (Eds.) (2017). Integrated Urban Conservation: An Approach towards Development, IIT, Kharagpur.
10. Donald Appleyard, "The Conservation of European Cities", M.I.T. Press, Massachusetts, 1979.
11. Urban Heritage in Indian Cities –Pearl – NIUA
12. INTACH Publications on Case Studies mentioned in Syllabus.

Course Outcomes:

- To **understand** the philosophy and science of Architectural conservation.
- Ability to **classify** and **analyze** various conservation ethics and charters specific to architectural and heritage conservation. Ability to **understand** the role of various national and international agencies.
- To **learn** the appropriate methodologies and tools for recording, documentation and inventorying of heritage structures, to **acquire** skills for documentation photography, surveys, research etc
- To **critically evaluate** and make assessment of heritage components and **apply** suitable methodology with reference to given context.
- To **understand** the approach to **effectively implement** Urban Conservation in Proposals of Master Plans, HRIDAY schemes and SMART city schemes.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-				-		-		-	-	-	-	-	-
CO2	3	-	-			2	-	1	-		-	-	-	-	-	-
CO3		-	-	3	3		-		-	1	-	-	-	-	-	-
CO4		-	-	2			-		-		-	-	-	-	-	-
CO5		-	-			2	-		-		-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR443	INTERIOR DESIGN	L	T	ST	J	C
SDG No.		3	0	0	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 human dimensions.
- An understanding of colours-symbolism and psychology, interior lighting, indoor landscaping and accessories.
- An overview of historic perspective of furniture and styles.
- An insight into business perspective of interior design

UNIT 1

The profession of Interior Design; Role of an Interior Designer- past and present; Scope of services; Interior Design Process. Interior Design and Concepts: Elements and Principles of design- an overview and their applications in interior designing. Business perspectives of Interior design – an overview of practice of interior design in India.

UNIT 2

Interior Space planning and human dimensions. Focuses on physical, psychological behavioural and human factors, study of proxemics, behavioural settings.

Introduction to the fundamentals of Interior Design such as Lighting, Furniture, Space, Materials, Furnishings, Art etc.

UNIT 3

Colours in interiors – Colour Theory, Effect of light on colour, various colour schemes like analogues, complementary, triadic etc. Colour symbolism. Psychology of colour, Industrial colour codes. International standards.

UNIT 4

Introduction to Furniture and Accessories: An overview of historical perspective of furniture and styles, accent pieces and accessories from Egyptian period to the present. Basic Furniture vocabulary.

UNIT 5

Interior lighting – direct and indirect lighting, location and light grid systems, types of luminaries, quality of lighting. Ambient, task and accent lighting. Exposure to eminent interior designers' works- Indian and international. Indoor plants and interior landscaping.

Recommended books:

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.

Course Outcomes:

- The course makes informed design decisions based on aesthetics, building technologies, human needs and the health, safety, and the welfare of the public.
- The course gives the ability for the students to design based on the inter relationship 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 present their design ideas and solutions with confidence.
- Students will be globally conscious interior designers.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	1	1	1	1	1	1	2	1	1	1	1	-	-
CO2	1	2	2	1	2	1	1	1	1	2	2	1	1	1	-	-
CO3	1	1	2	1	1	1	1	2	2	2	1	1	1	1	-	-
CO4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	-	-
CO5	3	3	3	2	2	3	2	1	1	2	2	2	1	2	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR445	SUSTAINABLE ARCHITECTURE	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce the concept of sustainability in Architecture and its impact on global environment.
- To explain about various aspects of sustainable practices related to built environment.
- To sensitize students about the need for conservation of natural resources and their impact.
- To familiarize about existing renewable energy systems suitable for built environment.
- To enhance understanding about application of sustainable practices in built-environment by studying of efficient projects through case-studies.

UNIT 1

Introduction to the ideas, issues and concepts of sustainable architecture, global environment and the built environment, principles of environmentally and ecologically supportive architecture.

UNIT 2

Study of sustainable architecture, use of energy, materials, health, and global environment as related to the construction and operation of buildings.

UNIT 3

Sustainable and conservation practices- water conservation, solid waste treatment, economics, and management.

UNIT 4

Integration of PV and wind systems in buildings, wind, solar and other non-conventional energy systems, solar and thermal applications for heating and cooling, electricity generation.

UNIT5

Case studies of contemporary sustainable architecture.

Reference books:

1. Books and manuals from TERI and other organizations.
2. Givoni .B, “Passive and Low Energy Cooling of Buildings”, Van Nostrand Reinhold, New York, 1994
3. Patrick Waterfield, “The Energy Efficient Home: A Complete Guide”, Crowood press ltd, 2011.
4. Dean Hawkes, “Energy Efficient Buildings: Architecture, Engineering and Environment”, W.W. Norton & Company, 2002

5. Majumdar M, "Energy-efficient Building in India", TERI Press, 2000.

Course Outcomes:

- Students are familiar about the concept of sustainability in Architecture and its impact on global environment.
- Students can explain about various aspects of sustainable practices related to built environment.
- Students are sensitive to the need for conservation of natural resources and their impact.
- Students are familiar about existing renewable energy systems suitable for built-environment.
- Students can assess the application of sustainable practices in built-environment by studying of efficient projects through case-studies

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	-	-	3	3	-	-	2	-	3	3	-	-	-
CO2	3	2	3	-	-	3	3	-	-	2	-	3	3	-	-	-
CO3	3	2	3	-	-	1	1	-	-	1	-	2	3	-	-	-
CO4	3	2	3	-	-	3	3	-	-	1	-	3	3	-	-	-
CO5	3	2	3	-	-	3	3	-	-	2	-	3	3	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

VIII – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR402	Urban Design	3	0	0	0	3	50	50	100	3
2	AAR404	Disaster Resistant Buildings & Management	3	0	0	0	3	50	50	100	3
3	AAR 416	Advanced Construction and Materials	3	0	0	0	3	50	50	100	3
4	AAR418	Architectural Design – VI	1	0	8	0	9	200	200	400	JURY
5	AAR422	Research Seminar	1	0	2	0	3	100	-	100	-
6	AAR 426	Building Information Modelling	0	1	2	0	3	100	-	100	-
7	**AARxxx**	**Program Elective-III**	3	0	0	0	3	50	50	100	3
	AAR 442	Energy Efficient Green Architecture									
	AAR 444	Appropriate Technology									
	AAR 448	Graphic & Product Design									
8	**AIExxx**	**Interdisciplinary Elective-I**	2	0	1	0	3	50	50	100	3
	AIE 402	Basics of Geographic Information System									
	AIE 406	Maintenance & Repair of Buildings									
	AIE 414	Road Safety and Civic Sense									
Total			**18**	**0**	**12**		**30**	**650**	**450**	**1100**	
Total Hrs. per week			**30**								

AAR402	URBAN DESIGN	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce urban design's importance in understanding the city as a context to architecture.
- To introduce various theories, elements, principles and dimensions of urban design and understanding respective roles.
- To create awareness that any building impacts the street and public space and is, in turn, constrained by the framework of urban building regulations.
- To introduce various methods and techniques used in interpretation of city in different ways and layers.
- The subject will be taught in congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

UNIT 1

Introduction to Urban Design

- Importance and emergence of Urban Design as a discipline.
- A brief Analysis of urban spaces in history.
- The West (Greek, Roman, Medieval and Renaissance towns) and The East (Vedic, temple towns, medieval and Islamic towns)
- Relevance of the historical concepts in the present context; Concepts of urban design- Urban design theories of Gordon Cullen and Kevin Lynch.
- Elements and dimensions of Urban Design.

UNIT 2

The Morphological and Perceptual Dimensions

- Key Concepts – Land use, Building Structures, Plot Pattern, and The Street Pattern;
- The Public Space Network; Buildings in Space and Buildings Defining Space; Traditional Urban Space;
- Urban block Patterns and Road Networks; Pod Development; The return to streets;
- Human sensory perception of environment; Meaning and symbolism in urban form; Sense of Place and Placeless-nests; Territoriality and personalization;

- Place Identity; Key Attributes of Successful places; Invented places and Superficiality.

UNIT 3

The Social Dimension

- Relationship between people (Society) and (Urban) space; Necessary, Optional and Social activities.
- The function of the Public Realm and its Decline.
- The Physical and Socio-Cultural Public Realm.
- Neighborhood Unit- Size, Boundaries, Social relevance and Meaning, Social mixed and Balanced Communities.
- Safety and Security; Accessibility and Exclusion; Equitable Environments.

UNIT 4

The Visual and Functional Dimension:

- Aesthetics Preferences; Patterns and Aesthetic Order; the Kinesthetic Experience; Positive and Negative Space;
- Streets and Squares; Townscape and Urban Architecture; Criteria for Harmonious Integration;
- Hard and soft Landscaping; Street Furniture; Public Private Interface – Comfort, Relaxation, Passive & Active Engagement, Discovery Social use of Space Movement; Privacy- Visual and Oral; Land use, Density and Urban Form;
- Environmental Design- Microclimate, Wind shading, designing for Sun and Shade, Natural Lighting, Parking, Servicing, and Infrastructure; Growth of Car free Streets and Squares.

UNIT 5

Renewal, Redevelopment and Formulating Urban Design Policies:

- Methodology for conducting an Urban Design Survey.
- Understanding urban renewal and the need for it; Scope, challenge and Implementation methods; Public participation;
- Townscape policies and urban design guidelines for new developments- Case studies.[C5].

Recommended books:

1. Public Places-Urban Spaces: The Dimensions of Urban Design by Carmona, Matthew; Heath, Tim; Oc, Taner; Tiesdell, Steven; 2003
2. The Concise townscape- Gordon Cullen, The Architecturalpress
3. Image of the city - KevinLynch

4. Architecture of town and cities - Paul D. Speriregon, The MITpress
5. Urban design - Ornament and decoration, Cliff Moughtin, BathPress
6. Urban design - street and square, Cliff Moughtin, BathPress
7. Town and square - PaulZucker
8. The urban pattern - Arthur B Gallion, CBSpublishers
9. Architecture and the urban experience - Raymond J Curran. Van Nostrand Reinhold Company
10. Indian city in the arid West - Kulbashan Jain, AadiCentre.

Course Outcomes:

- The course gives a clear understanding of role of urban design as a discipline bridging functional, aesthetical supplements in between micro, meso and macro-built environments.
- The course helps in knowing the process of critical appraisal for any given urban precinct as well for any new development so that issues shall be effectively dealt.
- The course gives a clear understanding of the need of effective tools and techniques to analysis the existing conditions of any precinct.
- The course gives a clear exposure and understanding of the best urban design practices in both national and international levels.
- The course gives a clear understanding about the co relation between architecture, urban design and urban planning and their inter dependency.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	3	3	3	2	3	3	2	3	3	-	3	2	3	-	-
CO2	1	3	2	2	2	-	2	2	2	3	2	2	2	2	-	-
CO3	2	3	3	2	3	2	3	3	1	2	2	3	3	2	-	-
CO4	3	3	3	3	3	1	2	3	2	3	2	3	3	3	-	-
CO5	2	3	3	2	2	1	2	3	2	3	2	3	3	3	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR404	DISASTER RESISTANT BUILDINGS AND MANAGEMENT	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To provide students with an overview of natural eco-systems and natural disasters and their mitigation and management.
- To familiarize students about the causes and impacts of natural calamities like earthquakes, cyclones, floods, droughts etc.
- To sensitize students about the impact of climate change, sea level rise and adverse impacts of illumination.
- To help students gain an understanding of Retrofitting of earthquake affected buildings.
- To encourage students to study about various aspects of past natural disasters in India.

UNIT 1

Basic understanding of fragile Eco-systems and factors that cause global climatic changes. Overview of major natural disasters, design and planning solutions for disaster mitigation, organizational and management aspects.

UNIT 2

Introduction to Natural Disasters: Understanding the effects of natural calamities such as floods, tropical cyclones, earthquakes, landslides, forest fires, draughts, and Tsunami.

UNIT 3

Factors Causing Disasters: Climate changes, global sea rise, coastal erosion, environmental degradation, large dams & earth tremors, roads buildings & landslides, urbanization & desertification, cyclone effects on coastal towns.

UNIT 4

Design and Retrofitting of Buildings for Earthquake resistance: Design, construction and detailing of buildings, materials and methods to be adopted for earthquake resistant buildings and retrofitting of earthquake affected buildings.

UNIT 5

Case studies of natural disasters in India: Earthquakes at Bhuj, Lattur, etc., Cyclones in coastal Andhra Pradesh& Orissa, Landslides in Uttarakhand, Nilgiris, Himachal etc, Floods in Bangladesh, and Droughts in Rajasthan & Tsunami in Tamil Nadu.

Recommended Books

1. S.Rajagopal - Problems of housing in cyclone prone areas - SERC, Vol.2, Chennai, 1980
2. Office of the UN Disaster Relief Coordinator - Disaster prevention and mitigation, Vol 12, Social and Sociological aspects - UNO, NY, 1986
3. F.C.Cony et.al - Issue and problems in the prevention of disaster and housing - A review of experiences from recent disasters - Appropriate reconstruction and training information centre, 1978S.Ramani, Disaster management - Advanced course on modern trends in housing - SERC, Vol 2, Chennai, 1980.

Course Outcomes:

- Students are familiar about natural eco-systems, impact due to various natural disasters and their mitigation and management.
- Students exhibit an understanding of the paradigm shift in disaster management from response and recovery to prevention, preparation, mitigation and response and recovery.
- students are aware about the impact of climate change, sea level rise and adverse impacts of illumination.
- students can assess various aspects of Retrofitting of earthquake affected buildings.
- students can assess and explain about the process of prevention, preparation, mitigation, and management by studying past natural disasters in India.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	1	1	1	2	1	1	1	1	1	2			
CO2	2	1	1	1	1	1	2	1	1	1	1	1	2			
CO3	1	1	1	1	1	1	2	1	1	1	1	1	2			
CO4	1	1	1	3	1	3	2	1	1	1	1	1	2			
CO5	1	1	1	1	1	1	2	1	1	1	1	1	2			

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR416	ADVANCED CONSTRUCTION AND MATERIALS	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- Introduction of advanced construction materials, adaptation in various architectural buildings.
- Introduction to pre-engineered Concrete structures, adaptation in large span structures.
- Introduction and study of pre-engineered Steel structures, adaptation in steel frames/space frames and their components.
- Study of Glass systems and their adaptation in buildings.
- Study of advanced building materials and their application in the building industry.

UNIT 1

Advanced Construction Methods: Pre-stressed concrete beams slabs frames, lift slab construction, post-tensioning, multi-storied building frames, circular slabs and beams.

UNIT 2

Pre-Engineered (Pre-Cast) Concrete: Folded plates like V-type, trough type, pyramidal, prismatic and RCC geometrical staircases, hyperbolic paraboloids.

UNIT 3

Suspended roofs, Cable structures. Study of Pre- engineered building systems (steel), various components, forms and their advantages.

UNIT 4

Curtain walls: types of curtain walls, components, structural solutions, construction and erection. glass wall system-glass; sheet metal wall systems sheet metal cladding, architectural skins.

UNIT 5

Advanced Building Materials: Synthetic boards, fire proof/ resistant boards/tiles, acoustic materials, composite panels, and their applications, non- load-bearing gypsum blocks, Polycarbonate sheets, Aluminum Composite Panels, Stainless Steel, High-Density Fibre boards, Ready-Mix Concrete, Lightweight Concretes, Green Building construction materials.

Recommended Books

1. James Ambrose, Building Construction Enclosure System.
2. Andrea Deplazes (Ed), Constructing Architecture: Materials processes structures- A Handbook Second Extended edition.

3. Robert E Fischer, Engineering for Architecture 1989.
4. R Barry, The construction of Buildings Volume 4, 4th Edition.
5. Schall, Rolf. Curtain Walls: Design Manual. Reinhold Pub., New York, 1962.

Course Outcomes:

- Students get familiar with advanced construction materials and their adaptation in various architectural buildings.
- Students get familiar with pre-engineered Concrete structures and their adaptation in large-span structures.
- Students are familiar with pre-engineered Steel structures and their adaptation in steel frames/space frames and components.
- Students know about various Glass systems and their adaptation in buildings.
- Students understand various advanced building materials and their applications in the building industry.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR418	ARCHITECTURAL DESIGN-VI	L	T	ST	J	C
SDG No.		1	0	8	0	9

Course Objectives:

- To expose students to urban scale problems by enabling them to visualize the contextual part of a built form.
- To make them understand, as to what goes beyond the premise of a single building or an area and where its boundaries merge into surrounding built form with different land uses and activities.
- The design problem of Urban design scale is to be introduced, example; Redesigning of existing Urban area by studying and identifying the problems associated with it. The project would be a medium sized urban design intervention with an aerial specification of 500m-1000m limit.
- To understand the process of conducting physical, socio-economic, and traffic analysis: data collection, analysis and presentation as a prerequisite to the main design issues.
- The project should be substantiated by detailed site surveys and reading about urban design principles.

The design issues to be addressed:

I. Area establishment within the given Objectives

- Identification of the project through reconnaissance survey.
- Visualize the existing urban environment with objectives.

II. Delineation of the study area

- Initial data Collection.
- Prepare brief questions for responses.
- Reading the area for commonalities.
- Take response from the users.

III. Detailed data collection and analysis

- Mapping of collected data using techniques and methods Co-relating the various data for interrelationship.
- Use of both qualitative and quantitative data.
- Analyzing interrelationships of various identified factors.
- Examining the data for overall understanding of the information.
- Using different methods for analyses.
- Micro-level assessment of the study areas.
- Prepare activity wise layers.

IV. Extraction of inferences for interventions

- Picking up issues for addressing.
- Thinking about developing sensitive responses to the identified issues.
- Take case examples for better understanding (Readings through books or studying similar projects undertaken elsewhere)
- Prepare models for spatial analysis.
- Prepare quantitative data for existing and future proposals.

V. Formulation of the design programme and strategies for intervention

- Prepare the vision statement.
- Phasing of the project.
- Before and after images.
- Public private participation.
- Implementation of the design solutions.

VI. Design Demonstration & Viva voce

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

**Note: Only one major design exercise should be given. The final submission shall necessarily include a model for at least one of the problems.*

Reference:

1. Graphics in Urban design by BalllyMeeda, Neil Parkyn and David StuartWalton.
2. Responsive Environments by Ian Bentley.
3. Watson Donald;others,(2003) Time saverstandards for urban design, McGraw Hill, NY
4. Paddison Ronan Ed, (2001), Handbook of urban studies, Sage Publications, London
5. Hillier Bill ;Hanson Julienne, (1990), Social logic of space, Cambridge University press, NY
6. Local Master Plans or Development Plans.
7. Development Control Regulations- as per requirements.
8. Relevant case examples of Designed or executed projects.

Course Outcomes:

- Apply the experience gained during the previous semester design studios in current design projects
- To compare the built and un-built environment around.
- Organize to work in a team.
- Formulate and Highlight the issues and plot an appropriate program for a project.
- Justifies the environment for sensitivity.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	3	-	-	-	-	-	3	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	3	-	-	-	2	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR422	RESEARCH SEMINAR	L	T	ST	J	C
SDG No.		1	0	2	0	3

Course Objectives:

- To equip tools and methods needed to handle the scale of a project suitable for design thesis.
- To clarify relevance of topics suitable for thesis, process necessary for evolution of solutions
- To appreciate the process of research and make the students aware of its potential in the field of architecture
- To add effective skills for report writing, study of current practices and conventions.

The course provides students with a framework to understand some emerging concepts in architecture and projects of design complexity and equip the student with adequate architectural design research methods for the realization of thesis concept. During the course of study, the course of the thesis is developed, and the project articulated.

Introduction to architectural thesis Project, Difference between design thesis and design studio, selection of topics for architectural design thesis, design thesis topics based on building typologies, preparation of synopsis, Methodology of design thesis

Emerging concepts in architecture due to changes in social, economic, technological variables. Review of design projects related to real world instances and relevant to community at large. Review of projects of design complexity, involving themes, sub themes and architectural expression.

Research in architecture: Tools and Methods required to handle a design project. Scientific methods of research with special emphasis on architectural research methods. Architectural enquiry visual, observations, questionnaire formats of enquiry, Literature Review and case studies. Data analysis techniques interpretation of data.

Thesis report writing and presentation:

- Formats for presentation of data, case studies and analysis.
- Formats for presentation of thesis design- media appropriate in the architectural profession such as two-dimensional drawing, physical models, three-dimensional computer models.
- Report Writing: Techniques in report writing, presentation of contextual information relevant to interpretation of the data collected and design; reporting the design development from concept to design solution, explain the relation of the design to existing knowledge on the

topic in the form of coherently written thesis report.

The inputs to the students on various design thesis topics would be in the form of Expert /Guest Lectures.

Each student should select a topic related to any architectural design/research area, and collect necessary data, review literature on the chosen topic and present a written paper and seminar at the end of the semester.

Recommended books:

1. Mukhi, H.R. Technical Report Writing: Specially prepared for Technical and Competitive Examinations, New Delhi: SatyaPrakashan, 2000.
2. Barrass, Robert. Writing At Work \b a guide to better writing in administration, business and management, London: Routledge, 2003.
3. Seely, John. The Oxford guide to effective writing and speaking, 2nd ed., Oxford ; New York : Oxford University Press, 2005.
4. Jo Ray McCuen, Anthony Winkler. Readings for writers, 9th ed., Fort Worth : Harcourt Brace College Publishers, 1998.
5. Treece, Malra. Effective reports, 2nd ed., Boston: Allyn and Bacon, 1985.

Course Outcomes:

- Ability to select the right project and techniques of data interpretation to derive solutions.
- Enhanced ability to use tools, methods and enquiry to identify and analyze project needs.
- Ability to understand some emerging concepts in both national and international architecture and projects of design complexity.
- Research process as effective tool of study, formulation of idea, data collection, Analysis, synthesis and conclusion culminating into report writing as documented Academic resource.
- Ability to equip the student with adequate architectural design research methods for the realization of thesis concept and its transilation.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	3	-	2	-	2	-	3	2	1	-	2	-	2		
CO2	-	3	-	2	-	2	-	3	2	2	-	2	-	2		
CO3	-	3	2	2	-	2	-	3	2	1	-	2	-	2		
CO4	-	3	2	2	-	2	-	3	3	2	-	2	-	2		
CO5	-	3	-	2	-	2	-	3	2	1	-	2	-	2		

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR426	BUILDING INFORMATION MODELLING	L	T	ST	J	C
SDG No.		0	1	2	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:

Students will be able to

- 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.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR442	ENERGY EFFICIENT GREEN ARCHITECTURE	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To introduce the concept of energy efficiency and its need and importance in the field of architecture.
- To help comprehend various passive heating techniques which can be implemented at site or building level.
- To help comprehend various passive cooling techniques which can be implemented at site or building level.
- To introduce existing green building rating systems and explaining their evaluation process.
- To help analyze contemporary and innovative strategies to make the built environment energy efficient.

UNIT 1

Introduction to Energy Efficiency in Buildings: Definition of energy and its uses in buildings, Renewable and Non-Renewable energy sources. Significance of Energy Efficiency in the contemporary context, Simple passive design considerations involving Site Conditions, Building Orientation etc.

UNIT 2

Solar Passive Architecture- Passive Heating: Plan form and Building Envelope -Heat transfer and Thermal Performance of Walls and Roofs, Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain

UNIT 3

Passive Cooling: Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels

UNIT 4

Geen Buildings and Rating Systems: Efficient use of daylighting, energy reduction in artificial illumination, use of compact fluorescent lamps, use of grey water, waste recycling, reduction and reuse of water, Green building concepts and brief introduction to green rating systems such as LEED, GRIHA, etc.

UNIT 5

Contemporary and future trends: Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Thermal Energy Storage, Recycled and Reusable Building materials,

Nanotechnology, smart materials and the future of built environment,

References:

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999
2. Arvind Krishnan & Others, "Climate Responsive Architecture", A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001
3. Majumdar M, "Energy-efficient Building in India", TERI Press, 2000.
4. Givoni .B, "Passive and Low Energy Cooling of Buildings", Van Nostrand Reinhold, New York, 1994
5. Fuller Moore, "Environmental Control Systems", McGraw Hill INC, New Delhi - 1993
6. Sophia and Stefan Behling, Solpower, "The Evolution of Solar Architecture", Prestel, New York, 1996
7. Patrick Waterfield, "The Energy Efficient Home: A Complete Guide", Crowood press ltd, 2011.
8. Dean Hawkes, "Energy Efficient Buildings: Architecture, Engineering and Environment", W.W. Norton & Company, 2002
9. IGBC Code books for new constructions
10. GRIHA Code books for new buildings.
11. Ching, F. (2020). Green Building Illustrated, John Wiley & Sons.
12. Sayigh, A. (2014). Sustainability, energy and architecture. Oxford, UK: Academic Press

Course Outcomes:

- Ability to understand the concept of energy efficiency and its need and importance in the field of architecture.
- Ability to recall various passive heating techniques which can be implemented at site or building level.
- Ability to recall various passive cooling techniques which can be implemented at site or building level.
- Ability to interpret existing green building rating systems and explaining their evaluation process.
- Ability to analyze contemporary and innovative strategies to make the built environment energy efficient.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	1	3	3	2	2	2	1	3	2	1	-	-
CO2	3	3	3	1	1	3	3	2	2	2	1	3	2	1	-	-
CO3	3	3	3	1	1	3	3	2	2	2	1	3	2	1	-	-
CO4	3	3	3	1	1	3	3	2	2	2	1	3	2	1	-	-
CO5	3	3	3	1	1	3	3	2	2	2	1	3	2	1	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR444	APPROPRIATE TECHNOLOGY	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- to introduce about the utilization of natural and availability of raw materials and use of simple tools and techniques for their utilization.
- to introduce to the use to sustainable and appropriate technology construction is based mainly on uses of different methods.
- to impart knowledge about Indigenous and migrant techniques and using in construction of Vaults, Domes, etc.
- to help explore and study the modern construction techniques of bamboo in the construction of building elements.
- to enhance understanding about the properties of Ferro Cement and materials used in the construction.

Introduction to the concept of appropriate building technology suitable to the Indian context, for both rural and urban applications. The course shall endeavour to enrich the conventional knowledge with alternative/ innovative material and construction techniques. The course shall involve both theoretical and practical aspects of alternative materials and construction materials developed in the recent past.

UNIT 1

Study of soil and its composition and properties, suitability of soil for mud walls, stabilized soil blocks, block making machines.

UNIT 2

Wattle and daub walls, rammed earth walls, adobe walls, Waterproofing of mud walls.

UNIT 3

Walls, vaults and domes using soil cement blocks, Nubian vault roof.

UNIT 4

Use and applications of bamboo as an alternative material for walling and roofing.

UNIT 5

Ferro-Cement/ Micro-concrete, Fire-resistant thatch for roofing.

Recommended Books

1. VenuBharati, by Vinoo Kale, AproopNirman Nagpur.
2. Research notes and digests by CBRI Roorkee Burnt clay roofing, ferrocement roofing units.
3. Auroville Publications.
4. BMTPC Manuals.

Course Outcomes:

- Students will be able to understand the necessity of soil as building material and its strength and weakness
- Students will be able to understand the indigenous building construction techniques like wattle and daub, rammed earth etc.
- Students will be able to understand the construction of vaults , domes etc.
- Students will be able to understand Bamboo as a building material
- Students will be able to understand about the properties of Ferro Cement and materials used in the construction.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	-	2	-	-	3	3	-	-	-	-	-	-	-	-	-
CO2	3	-	2	-	-	3	3	-	-	-	-	-	-	-	-	-
CO3	3	-	2	-	-	3	3	-	-	-	-	-	-	-	-	-
CO4	3	-	2	-	-	3	3	-	-	-	-	-	-	-	-	-
CO5	3	-	2	-	-	2	3	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR448	GRAPHIC AND PRODUCT DESIGN	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course

Objectives:

- To develop an understanding the methods and techniques involved in product and furniture design with focus on integration of the design, graphics and manufacturing process for product design.
- To understand various aspects of design in graphics. Understand presentation skills, logos and advertisement making with Computer graphics.

UNIT 1

- A brief introduction to product designing.
- History of product design.

UNIT 2

- Understanding Ergonomics.
- Human activities, Anthropometry and application of Human factor data.

UNIT 3

- Method and techniques involved in product designing and furniture design.
- Understanding various manufacturing procedures(Metal, Ceramic, Glass and wood)
- Study of linkages and application in furniture, Study of packaging design

UNIT 4

- Elements of graphic design Letters, type face and points
- Analysing posters, advertisements, and logos.

UNIT 5

- Understanding graphics in daily life(Signage)
- Brand promotion,and advertisement making for both the print & electronic media.

Reference:

1. Elements of Design by Anderson, Donald M., Holt- Rinehart and Winston, New York (1961)
2. Ergonomic for beginners by Jan Dul, B. A. Weerdmeester, - CRC (1993)
3. Kathy Baxter and Catherine Courage, Understanding your users: A practical guide to user requirements methods, tools, and techniques
4. John Chris Jones, Design Methods,
5. Chris Lefteri, Materials for Design
6. Andrew H. Dent and Leslie Sherr, Material Innovation: Product Design
7. Indian Anthropometric Dimensions (for Ergonomic Design Practice) Debkumar Chakrabarti NID

Course Outcomes:

- Able to understand the Product Design importance and its relevance to Architecture.
- Ability to comprehend human dimensions and body movement to arrive at a usable product.
- Develop use of graphics as tool of presentation and 3D visualization in architectural works and product design.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	-	-	2	2	1	2	2	-	3	1	2		
CO2	3	2	3	2	3	-	-	-	3	2	1	2	2	2	-	-
CO3	1	2	3	2	3	-	-	-	3	2	1	3	1	2	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AIE402	BASICS OF GEOGRAPHIC INFORMATION SYSTEM	L	T	ST	J	C
SDG No.		2	0	1	0	3

Course Objectives:

- To explain the concept of GIS, its components, along with its advantages.
- To teach about different types of available data formats in GIS.
- To develop knowledge of spatial data structures details and input, management, and output processes
- To explain various technical aspects about GIS and its application.
- To help explore different possible areas of GIS application.

UNIT 1

Basic Concept of GIS Introduction, Information systems, spatial and non-spatial information, geographical concepts and terminology, advantages of GIS, basic components of GIS, commercially available GIS hardware and software, organisation of data in GIS.

UNIT 2

GIS Data: Input data, field data, statistical data, maps, aerial photographs, satellite data, points, lines and areas features, vector and raster data, advantages and disadvantages, data entry through keyboard, digitizers and scanners, digital data, GIS data formats and standards.

UNIT 3

Data Management: Data management, data base management system (DBMS), various data models, run length encoding, quad trees, data analysis, data layers, analysis of spatial and non-spatial data, data overlay and modelling, smart features of DBMS.

UNIT 4

Applications of GIS: Applications of GIS in map revision, landuse, agriculture, forestry, archaeology, municipal, geology, water resources, soil erosion, land suitability analysis, change detection.

UNIT 5

Case Study: A case study in GIS implementation, the consultant, the client, the initial applications, types of GIS analysis used for case study.

Recommended Book:

1. P.A. Burrough, Principles of Geographic Information System for Land Resources

Assessment, Monograph on Soil Resources Survey No, 12, Claredon, Press, Oxford, 1988.
2. E.T. Engaman, and R.J. Gurney, Remote Sensing in Hydrology, Chapman and Hall, London, 1991.

Course Outcomes:

- Students can explain the concept of GIS, its components, terminology along with its advantages.
- Students have developed the skills in collecting, editing different types of GIS data.
- Students can demonstrate expertise on database management in GIS.
- Students can explain various technical aspects about GIS and its application.
- Students can analyze and explore different possible areas of GIS application.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	3	-	-	-	-	-	-	-	2	2	-	-
CO2	2	1	-	-	3	-	-	-	-	-	-	-	2	2	-	-
CO3	2	1	-	-	3	-	-	-	-	-	-	-	2	2	-	-
CO4	2	1	-	-	3	-	-	-	-	-	-	-	2	2	-	-
CO5	2	1	-	-	3	-	-	-	-	-	-	-	2	2	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AIE406	MAINTENANCE AND REPAIR OF BUILDINGS	L	T	ST	J	C
SDG No.		2	0	1	0	3

Course Objectives:

- To impart building maintenance standards.
- To train in examining various damages to concrete structures.
- To help in assessing the damage to buildings.
- To familiarize with various types of repair materials.
- To enable evaluation and repair of cracks.

UNIT 1

Maintenance of Buildings: Introduction, Classification of maintenance works- Preventive, Remedial, Routine, and Special maintenance, Necessitation of the maintenance, Inspection periods, background of maintenance, maintenance processes.

UNIT 2

Durability and Deterioration of Concrete:

Factors influencing durability of concrete, causes of distress in concrete structures, shrinkage and creep in concrete, honey combing in concrete, Corrosion- Basic principle of corrosion, parameters influencing corrosion process, Damages due to corrosion.

UNIT 3

Damage Assessment:

Investigation of Damage- Observation, Assessment Procedure

Non-Destructive Testing Methods: Introduction, Non-Destructive Testing Methods, Surface Hardness Test, Ultrasonic Pulse velocity test,

Semi-Destructive Testing Systems: Core Sampling and Testing, Half -Cell potential survey.

UNIT 4

Repair Materials

Introduction, Materials selection – criteria for selection of repair materials, methodology for the selection of repair materials, Classification of repair materials, cementitious materials, polymer concrete and mortar, epoxy mortar, Bonding agents-Cement based slurries, Epoxies, Latex emulsions.

UNIT 5

Evaluation and Repair of Cracks:

Symptoms and Diagnosis of Distress, Evaluation of cracks, Selection of Repair Procedure, Repair of cracks-Preparation of Surface, Repair Techniques, Common types of repairs: Sealing of cracks, Flexible sealing, Providing additional steel, Stitching of cracks, Repair by jacketing, Auto-genous Healing..

Textbook(s):

1. B.Vidivelli, Rehabilitation of Concrete Structures, 1/e, Standard Publishers Distributors, 2018.
2. M.L.Gambhir, Concrete Technology: Theory and Practice, 4/e, Tata McGraw Hill Education Private Limited, 2013.
3. References:
4. P.K.Guha, Maintenance and Repair of Buildings, 1/e, New Central Book Agency(P) Ltd, 2011.
5. S.Mahaboob Basha, A textbook of Concrete Technology, 1/e, Anuradha Publications, 2011.
6. J.Bhattacharjee, Concrete Structures Repair Rehabilitation and Retrofitting, 1/e, CBS, 2017.
7. P.C.Varghese, Maintenance Repair and Rehabilitation and Minor works of Buildings, 1/e, Prentice Hall India Learning Private Limited, 2014.

Course Outcomes:

- Examine the building maintenance works
- Summarize the causes for deterioration of concrete
- Assess the extent of damage
- Select appropriate repair material
- Decide the appropriate repair technique

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	3	1	3	2	-	-	-	-	-	-	-	2	2	-	-
CO2	2	3	1	3	2	-	-	-	-	-	-	-	2	2	-	-
CO3	2	3	1	3	2	-	-	-	-	-	-	-	2	2	-	-
CO4	2	3	1	3	2	-	-	-	-	-	-	-	2	2	-	-
CO5	2	3	1	3	2	-	-	-	-	-	-	-	2	2	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR414	ROAD SAFETY AND CIVIC SENSE	L	T	ST	J	C
SDG No.		2	0	1	0	3

Course Objectives:

- To introduce the concept, principles, tools and aids of road safety and civic sense to the students of B.Arch.
- To acquiant them with the design and safety standards for roads.
- To inculcate the practice of safe road behaviour and civic sense among them.

UNIT 1

Introduction to Road Safety: Road as an active space, Types of Users, User Behaviour, Sensory Factors like Vision and Hearing in User Behaviour. Types of Vehicles: Heavy Vehicles, Light Motor Vehicle, Two Wheelers, Auto-Rickshaw, Bicycles and Cycle Rickshaw, Non-Motorised Vehicles. Vehicle Characteristics: Dimensions, Weight, Turning Radii, Braking Distance, Lighting System, Tyres, etc. Type of Hazards: Conflicts and Accidents.UNIT 2

UNIT 2

Typology of Roads: Components and Design: Road Classification: National Highways, State Highways, District Roads (MDR and ODR), Village Roads. Urban Road Classification: Expressways, Arterial, Sub-Arterial, Collector, Local, Service Roads, One-Way, Two-Way etc. Mountainous Roads, Speed Limits of the Road types.

Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Cycling Track, Green Strip, Curbs, Camber, etc. Spatial Standards for the Cross-Section Design. Relationship between Road Design and Road Safety

UNIT 3

Intersections: Types of Road Intersections: Basic Forms of at-grade Junctions (T, Y, Staggered, Skewed, Cross, Scissors, Rotary, etc. Grade Separated Junctions (with or without interchange): Three-Leg, Four-Leg, Multi-Leg, etc. Design of Intersections: Design and Spatial Standards for Traffic Islands, Turns, Turning Radii, Directional Lanes, Pedestrian Crossings, Median Openings, Traffic Calming Components like Speed Breakers and Table-Top Crossings etc. Design Considerations for Diverging, Merging, and Weaving Traffic. Location and Design for Traffic Signals.

UNIT 4

Pedestrian Circulation and Barrier Free Design: Requirement of Pedestrian Infrastructure: Sidewalks and Footpaths, Recommended Sidewalk Widths, Pedestrian Crossings, Pedestrian Bridges, Subways,

Cycle Tracks, etc. Barrier Free Design: Location and Design Standards for Ramps for Wheel Chair Access, Other Provisions like Tactile for Visually Challenged etc. Safety Provisions: Pedestrian Railings, Anti-skid Flooring, Pedestrian Signal, Walk Button, etc.

UNIT 5

Traffic Signs and Road Markings: Type for Traffic Signs: Principles and Types of Traffic Signs, Danger Signs, Prohibitory Signs, Mandatory Signs, Informatory Signs, Indication Signs, Direction Signs, Place Identification Signs, Route Marker Signs, etc. Reflective Signs, LED Signs. Static and Dynamic Signs. Standards for Traffic Signs: Location, Height and Maintenance of Traffic Signs. Types of Road Markings: Centre Lines, Traffic Lane Lines, Pavement Edge Lines, No Overtaking Zone Markings, Speed Markings, Hazard Markings, Stop Lines, Pedestrian Crossings, Cyclist Crossings, Route Direction Arrows, Word Messages, Marking at Intersections, etc. Material, Colour and Typography of the Markings**.**

UNIT 6

Traffic Signals, Traffic Control Aids, Street Lighting: Traffic Signals: Introduction, Advantages, and Disadvantages. Signal Indications: Vehicular, Pedestrian and Location of the Signals and its significance, Flashing signals, Warrant of Signals, Coordinated control of signals.

Traffic Control Aids: Roadway Delineators (Curved and Straight Sections), Hazard Markers, Object Markers, Speed Breakers, Table Top Crossings, Rumble Strips, Guard Rails, Crash Barriers etc. Street Lighting: Need for Street Lighting, Type of Lighting, Illumination Standard, Location and Intermediate Distance.

UNIT 7

Road Accidents: Nature and Types of Road Accidents (Grievously Injured, Slightly Injured, Minor Injury, Non-lnjury, etc.) The situation of Road Accidents in India (Yearly), Fatality Rates, etc. Factors (and Violations) that cause accidents, Prevention and First Aid to Victims Collision Diagrams and Condition Diagrams exercises. Traffic Management Measures and their influence in Accident Prevention.

UNIT 8

Road Safety and Civic Sense: Need for Road Safety, Category of Road Users and Road Safety Suggestions. Precautions for Driving in Difficult Conditions (Night, Rain, Fog, Skidding Conditions, Non-Functional Traffic Lights, etc.) Types of Breakdowns and Mechanical Failures. Accident Sign (Warning Light, Warning Triangle, etc.) Introduction to Concept of Civic Sense and its relationship to Road Safety: Importance of Civic Sense, Road Etiquettes and Road User Behaviour, Rules of Road, Right of the Way. Providing Assistance to Accident Victim.

Sensitisation against Road Rage.

UNIT 9

Traffic Regulations, Laws & Legislations: Indian Motor Vehicles Act (Chapter Vlll: Control of Traffic to be discussed in detail) Regulations Concerning Traffic: Cycles, Motor Cycles and Scooters, Rules for Pedestrian Traffic, Keep to the Left Rule, Overtaking Rules, Turning Rules, Priority Rules, Hand Signals, etc. Speed and Hazard Management. Penal Provisions.

National Road Safety Policy, Central Motor Vehicle Rules, State Motor Vehicle Rules Introduction to Good Practices.

References:

1. Introduction to Traffic Engineering, R Srinivasa Kumar
2. Traffic Engineering and Transport Planning, LR Kadiyali
3. Book on Road Safety Signage and Signs, Ministry of Road Transport and Highways, Government of India
4. MORT & H Pocketbook for Highway Engineers, 2019 (Third Revision)
5. Publications by UTTIPEC namely, Street Design Guidelines, UTTIPEC Guideline for Road Markings, UTTIPEC Guideline and Specification for Crash Barriers, Pedestrian Railing and dividers, UTTIPEC Standard Typical Crossing Design
6. Street Design Standards as provided in Timesavers, Neuferts etc.
7. Publications by Indian Road Congress.

Course Outcomes:

- Develop and conduct surveys to provide the data required for transportation planning
- Develop and calibrate trip generation rates for specific types of land use developments
- Categorize highway geometrics for different conditions
- Acquire knowledge on traffic characteristics, traffic studies, traffic control devices and intersections
- Understand principles of landscaping, policies related to transportation.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	2	1	2	2	2	2	2	1	1	1	2	-	-
CO2	3	3	3	2	1	2	2	2	2	2	1	2	1	2	-	-
CO3	3	3	3	3	1	2	2	2	2	2	1	2	1	2	-	-
CO4	3	2	2	-	-	3	3	3	2	2	2	2	1	2	-	-
CO5	2	2	3	-	-	2	2	2	2	3	2	2	1	2	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

IX – SEMESTER

INTERNSHIP

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR521	PRACTICAL TRAINING	0	0	0	**	30	600	-	600	VIVA
Total			**600**								

Students are eligible to undergo Practical Training at Architectural Firms, run by a Chief Architect, having at least FIVE years of Practical Experience. Registration Details of the Chief Architect with the Council of Architecture India, should be furnished by the Student.

Staff members are to be deputed once to the Architecture firms where the students are undergoing Practical Training, to have interaction with the Chief Architect and assess the performance of the students.

Students should submit the following particulars at the end of the Practical Training Programme:

1. Training Certificate given by the Chief Architect.
2. Work Log Book & Type of Works involved, duly certified by the Chief Architect.
3. Attendance Report and Leave Report.
4. Performance Certificate in sealed envelope given by the Chief Architect, rated in terms of the Student's (a) Punctuality, (b) Leadership qualities, (c) Communication Skills, (d) Technical understanding level, and (v) Site Supervision performance.
5. Set of Municipal Drawings made by the Student during practical training.
6. Set of Working Drawings made by the Student during practical training.
7. Set of Presentation Drawings made by the student during practical training.
8. Report of Estimation and Costing done by the Student
9. Report of Project Site Visits made by the Student.

Method of evaluation for 600 marks should be made available to the students before leaving for the practical training.

AAR521	PRACTICAL TRAINING	L	T	ST	J	C
SDG No.		0	0	0	**	30

Note: students have to undergo internship in anarchitectural firm for the total duration of the semester.**

Course Objectives:

- To bridge the transformation in between theoretical and practical domains by providing scope to get trained and interact with an experienced professional.
- To equip the students with required/basic technical knowledge on various aspects being involved in architectural practice.
- To make student expose and understand the required set of drawings and documents to be produced for appropriate execution of project.
- To introduce how to critically analyze the project cycle inclusive of post occupancy.
- To expose student to practical issues in a project during construction phase by involving the student in site visits and supervision practices.

Each candidate shall have to prepare a detailed report along with necessary drawings, sketches, measurement records, readings, observations, survey analysis, log sheets about the following aspects.

1. Critical appraisal: Post Occupancy Analysis of any building that the office has designed and executed. The building should be in use and the students may record the reactions of the users to support his appraisal in addition to photographs, drawings etc.

2. Site Supervision and practices – A detail report on minimum number of two site supervisions for any part of a building that has
been personally supervised by the student/ his supervisor. If the student does not get an opportunity to supervise their office work, he can give site report of any other work. It may include total site information, cross verification of as built drawings and statutory drawings, material palette and other necessary information.

3. Log Sheet and Training Certificate – A student shall fill the log sheets, as a record of his work on daily basis and shall submit the same, along with the performance certificate through confidential report from his employer. The student must maintain at least 90% of attendance.

4. A student shall submit all the working details prepared by him during his practical training along with estimates and specifications report of a small project or any special work done during his training such as any computer programme, lighting scheme, glazing details for energy efficiency and calculations, acoustical details, etc.

*The student is advised to adhere to the syllabus and keep constantly prepare and update

the training report on monthly basis while working in the office where he/she is undergoing the training, and prepare themselves ready for the viva-voce to be conducted at the school at the end of the Practical Training programme.

Course Outcomes:

- The student will be able understand on how theory & practical are works together in design and construction of buildings and its services.
- The course recognizes buildings as a dynamic structure that supports the people and technologies working within its four walls.
- The course builds competence to understand that an intelligent building is one which provides a productive and cost-effective environment through optimization of its four basic elements structure, systems, services and management and the interrelationship between them..

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	2	2	3	2	2	3	2	2	3	2	3	-	-
CO2	3	2	3	2	2	2	2	1	1	2	2	2	2	1	-	-
CO3	2	2	3	1	2	3	3	2	3	2	2	2	2	1	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

X – SEMESTER

Sl. No.	Course Code	Course Name	No. of Hrs. per week				Credits	Marks			End Exam Duration Hours
			L	T	ST	J		I	E	T	
1	AAR502	Professional Practice & Building Regulations	3	0	0	0	3	50	50	100	3
2	AAR 504	Entrepreneurship Skills for Architects	3	0	0	0	3	50	50	100	3
3	AAR522	Design Thesis	0	0	18	0	18	600	-	600	VIVA
4	AARxxx	**Program Elective-IV**	3	0	0	0	3	50	50	100	3
	AAR542	Intelligent Buildings									
	AAR544	Research Methods in Architecture									
	AAR546	Professional Ethics and Human Values									
Total			**9**	**0**	**18**	**0**	**27**	**750**	**150**	**900**	
Total Hrs. per week			**27**								

AAR502	PROFESSIONAL PRACTICE & BUILDING REGULATIONS	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To provide students with in-depth understanding of the origin and importance of Indian Institute of Architects, and the Council of Architecture, and to make students familiar with the liabilities, and obligations of a professional architect towards client, peers, and the society at large.
- To make the students familiar with common elements of various building bye-laws, and the National Building Code 2015.
- To make the students aware of the various options available after graduating from architecture and familiarize them with the pros and cons of the common ones - private practice, and salaried appointment.
- To introduce the students to CoA prescribed format of building contract and familiarize them with important aspects of the contract.
- To familiarize the students with CoA prescribed guidelines for architectural competitions.

UNIT 1

Role of Professional body - Indian Institute of Architects, its working, constitution and bye laws, categories of membership, election procedures. Code of conduct. Role of its conventions, Its publications etc. Architects Act'1972: Detailed study of the act and its provisions and recent amendments. Role and responsibilities of Council of Architecture. Role of its electorate, procedure of membership.

UNIT 2

Professional Responsibilities and Liabilities of the architects, Responsibilities of Client and Contractor(s), copy rights, scale of charges, variation of charges, mode of payment, termination of services. Arbitration. Specialized building services. Professional Service Tax.

Architectural Competitions: Its purpose, Types of Architectural competitions, Its guidelines for participation, prizes, assessment, etc.

UNIT 3

Architects in practice

a) Private practice - Partnership office management, methods of organization, filing, documentation and working.

b) Salaried appointment - Public sector, Private sector jobs, procedure of operation in government organization.

UNIT 4

Contracts and Construction process

Types of building contracts, their merits and de-merits. Preparation of tender documents, method of writing tenders, opening of tenders. Preparation of contract documents, general conditions of contract, interim certificates, defect liability periods, retention amount, security deposits, mobilization money and virtual completion.

UNIT 5

Review Contents of National Building Code.

Building bye laws, submission plans, Methods of municipal approval, Development Controls and Zoning regulations, and other regulatory aspects such as Master plan and Zonal plans.

Recommended Book:

1. Roshan Namavati; Professional Practice.
2. Code of Professional Practice : I. I. A.
3. Architect Act 1972.
4. Krishnamurthy K.G. & Ravindra S.V., Professional Practice (2014)
5. Handbook of Professional Documents- 2015, by Council of Architecture (CoA).
6. Online. Bye-laws of IIA. The Architects' Act 1972, and related regulations; Local Building Bye-laws (such as AP GO 168) National Building Code 2005.

Course Outcomes

- Student shall understand the roles of Indian Institute of Architects, and the Council of Architecture and
- Students shall be prepared for professional practice by understanding the liabilities, obligations, and responsibilities of a professional architect, and also understanding building bye-laws and regulations, and learning to apply the same.
- Students shall have learned about various prospects after graduation including professional practice or salaried appointment and evaluating the pros and cons of each
- Students shall be able to understand, analyze and evaluate various types of contracts, and will be able to issue Notice Inviting Tenders.
- Students shall understand the importance and types of competitions

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	1	3	3	3	3	3	1	3	1	3	-	-
CO2	2	2	1	1	1	3	3	3	3	3	1	3	1	3	-	-
CO3	1	1	1	1	1	3	3	3	3	3	1	3	1	3	-	-
CO4	1	2	2	1	1	3	3	3	3	3	2	3	1	3	-	-
CO5	2	2	2	2	1	3	2	3	3	3	1	3	1	3	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR504	ENTREPRENEURSHIP SKILLS FOR ARCHITECTS	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To study about entrepreneurships skills required for architects
- To study about the marketing, finance management & office management
- To equip with the fundamentals to deal with live building projects from its commencement to completion

UNIT 1

Introduction to entrepreneurship

The nature of entrepreneurship, characteristics that contribute to the success of entrepreneurs; aspects of small business ownership, steps to start the business.

UNIT 2

Architectural competitions & legislations

Regulations governing the conduct of competitions, open & closed competitions

Role of development authorities & urban arts commissions, Environmental acts & laws, special rules governing hill area development & coastal area management, heritage act of India etc. Pre-requisite for Indians to work in other countries & vice versa, emerging trends in architectural collaborations.

UNIT 3

Marketing & Finance Management

Principles of Business, Marketing, and Finance. Business Law, Advertising and Sales Promotion, principles to start & operate business, Code of conduct for architectural practice.

UNIT 4

Employee and Office Management

Understanding office management and project awarding; organization structure, responsibility towards employees, consultants & associates; maintenance of accounts; filing of records; balance sheet, Income tax; Service tax; Professional tax.

Various architectural services, additional services and scale of professional fees.

Building regulations related to submission of approval drawings to concerned public bodies.

UNIT 5

Social entrepreneurship and its relevance to the practice of architecture

Architects duty and responsibility towards society, Future-oriented design principles to increase the design organization's innovative and competitive qualities, Sustainability.

Recommended Books:

1. Architect and Entrepreneur: A Field Guide to Building, Branding, and Marketing Your Start up Design Business, Eric Reinhold.
2. Architects Practice, J.J.Scott.
3. COA. (2005). Handbook of Professional Documents. Council of Architecture.

Course Outcomes:

- Ability to learn about potential skill of entrepreneurship for architects
- Ability to understand the building bylaws, competition guideline.
- Ability to deal with clients and initiate building approval process.
- Ability to manage employee and finance management
- Ability to design habitable space for the society considering future oriented design principles

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	-	-	3	3	3	3	2	-	-	-	-
CO2	-	-	-	-	-	-	-	3	3	3	3	3	-	3	-	-
CO3	-	-	-	-	-	-	-	3	3	3	3	3	-	3	-	-
CO4																
CO5																

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR552	DESIGN THESIS	L	T	ST	J	C
SDG No.		0	0	18	0	18

Course Objectives:

- To encourage students to take-up a project of suitable scale, complexity and societal relevance.
- To guide them study the project with rigour of enquiry, to derive the real needs of the project.
- To sensitize applicable norms, standards, techniques of drawing development, report writing.
- To develop an ability to apply the knowledge gained to new situations.
- To develop abilities to present their work effectively at various forums.

Students should choose a topic of their choice in terms of design potential and/ or idea exploration to be taken up for completion. The topic could be project based with specific areas of study/ approach or study/ approach based leading to a project. If the latter, care should be taken to choose topics that can lead to sufficient architectural design component.
The areas of study/research/design can include any of the broad areas of the discipline - contemporary needs of society, history, theory, sustainability, structural or services-oriented design, projects that involve complex planning and integration of several aspects, appropriate architecture, urban design, contemporary processes, social housing, urban oriented architectural design, conservation oriented architectural design, etc.

Students have to submit and present their work for this project in following stages:

Stage I:
Thesis Synopsis Presentation, Data Collection & Case studies:
Students should submit the topic for approval with a rough outline of the nature of the project, area of interest, study and design scope, challenges, possible case studies, methodology and outcome.
Collection of literature data related to the chosen thesis topic. Case study of projects relevant to the thesis topic to be completed. Minimum of 2 case studies required to be done.

Stage II:
Site Analysis and Project Requirements
Detailed site analysis should reflect complete physical and environmental characteristics of the project site.
Project requirements should have complete requirement of the project under the scope, in terms of facilities and area with reference to the case studies made earlier.

Stage III:
Concept Design and Design Feasibility

This stage will have the following:

- Basic concept/principal ideas leading to the design
- Site Plan, zoning of activity spaces, movement patterns and building blocks.
- Schematic floor plans of all the buildings under the scope of the project
- Conceptual built form, in terms of elevations, sections, views, study models etc.

Stage IV:

Design Development

This stage should comprise of detail design of the project with the following drawings to suitable scale:

- Site plan
- Building plans of all the building units and all floors.
- Furniture layout for typical areas.
- Elevations and sections of all building units.
- Working Drawings (min 2 nos) and services drawing (min 2 nos).
- Study model
- Perspective/view of interior
- Walk through (optional)

Stage V:

Finalization of Project drawings

Students have to produce all the drawings of the previous review along with the corrected drawings based on the comments of that review for final approval on the design.

Stage VI:

Project Synopsis

Students must submit Thesis report (3 copies) summarizing the salient points of their project.

Stage VII:

Thesis report

Students must submit Thesis report (3 copies) comprising write ups, case studies and drawings in the format as specified by the school.

Stage VIII:

Final presentation to external jury

Final design, comprising project introductions, case study/literature study, site analysis and the final proposal and model, is to be submitted for assessment by a panel of jury members comprising of external experts.

Course Outcomes:

- students are developed with required abilities to derive apt architectural solution with high

quality drawings and technical write-up.

- students are confident to put-up to the challenges of the profession of architecture.
- Students are knowledgeable towards deriving the real needs of the projects, applicable norms, standards, techniques of drawing development, techniques of report writing.
- students have an ability to apply the knowledge gained to new situations.
- students can present their work effectively at various forums.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	1	3	3	3	1	3	3	1	1	3	3	-	-
CO2	1	2	3	3	1	3	2	1	3	3	1	3	3	3	-	-
CO3	3	3	3	3	3	3	2	1	3	3	1	3	3	3	-	-
CO4	3	3	3	3	2	3	2	1	3	3	1	2	3	3	-	-
CO5	1	1	3	1	3	3	3	2	3	3	1	2	3	3	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR542	INTELLIGENT BUILDINGS	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To develop orientation towards the need and advancement in technology contributing to the intelligent buildings concept.
- To inculcate the ideas of interface and components of building automation controls and techniques in an intelligent buildings.
- To introduce about various aspects of building intelligence and building automation.
- To introduce to various aspects of intelligent systems in buildings design.
- To enhance the insight about existing intelligent buildings in India and abroad through proper Case- Studies.

UNIT 1

Building Intelligence

- Introduction to intelligent Buildings - history and development
- Intelligent Buildings- Features and definitions
- Use of artificial intelligence in building systems
- Developments in technology contributing to the intelligent buildings concept

UNIT 2

Building Automation and Controls

- Interfaces and components of Building Automation Systems
- Hardware and software requirements of Building Automation System

UNIT 3

Building Automation Techniques

- Expert systems, genetic algorithms, Artificial Neural Networks Fuzzy Systems, and their application in Intelligent Buildings especially for HVAC, Electrical, Fire, Vertical Transportation, safety and security systems and energy management and design

UNIT 4

Various aspects of Intelligent Building Design

- Environmental controls- traditional building controls, Lighting control- integration of automatic lighting control for buildings
- Sensors, actuators, and end devices-including adjustable speed drives, chillers complete packaged air-conditioning, Fire and Life Safety integration with the automated buildings
- Security integration for the tenants of automated buildings
- Elevators integration for the tenants of automated buildings

UNIT 5

Case-studies of Intelligent Buildings from India and Abroad.

References:

1. Dubin, Freds; Energy Conservation Standards: For building design, construction, and operation.
2. ASHRAE Journals.

Course Outcomes:

- Students understand the need and advancement in technology contributing to the intelligent buildings concept.
- Students are familiar about the ideas of interface and components of building automation controls and techniques in an intelligent building.
- Students are knowledgeable about various aspects of building intelligence and building automation.
- Students are familiar about various aspects of intelligent systems in buildings design.
- Students acquired an insight about the existing intelligent buildings in India and abroad through proper Case- Studies.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1	3	2	2	1	1	1	1	1	1	1	-	-
CO2	2	1	1	1	3	1	1	1	1	1	1	1	1	1	-	-
CO3	2	1	1	1	3	1	1	1	1	1	1	1	1	1	-	-
CO4	2	1	1	1	3	1	1	1	1	1	1	1	1	1	-	-
CO5	2	1	1	1	3	1	1	1	1	1	1	1	1	1	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR544	RESEARCH METHODS IN ARCHITECTURE	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To appreciate the process of research and make the students aware of its potential in the field of architecture
- To equip knowledge to construct necessary tools of enquiry necessary for research, and ethics.
- To clarify relevance of a particular / predominant tool (s) for research in the Profession of Architecture.
- To equip tools and methods needed to handle the scale of a project suitable for Research at various levels at i.e. limiting to UG & PG level.
- To add effective skills for report writing, study of current practices and conventions.

UNIT 1

INTRODUCTION

Definition, Basic research issues and concepts, Orientation to research process, Types of research: quantitative, qualitative, co-relational, experimental, simulation and modeling, logical argumentation, case study and mixed methods

UNIT 2

ELEMENTS OF RESEARCH PROCESS: Finding topic- Writing and introduction- Stating a purpose of study identifying key research questions and hypotheses- Reviewing literature using theory, defining and stating the significance of the study, methods and procedures for data collection and analysis

UNIT 3

RESEARCHING AND DATA COLLECTION

Library and archives- The role of Internet, finding and evaluating sources of misuse, Test for reliability ethics- Methods of data collection- From primary sources: observation and recording, interviews: structured and unstructured, questionnaire, open ended and close ended questions, Problems encountered in collections data from secondary sources.

UNIT 4

REPORT WRITING

Writing and publishing the research works in journals- Research writing in general- Components: Referencing- Writing the Bibliography- Developing the outline, presentation, etc.

UNIT 5

REVIEW OF RESEARCH PAPERS & CASE STUDIES

Case studies illustrating how good research can be used from project inception to completion- review of research publications.

References:

1. Kothari C.R., Research Methodology: Methods and Techniques, 2nd Edition, New Age International Publication, 2004.
2. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", OxfordUniversityPress, New Delhi.
3. Marans, Daniel StokolsStokols. Specifications of Environmental Simulation: Research and Policy Issues. Springer Us, 2013.
4. Fraser, Murray. Design Research in Architecture an Overview. London: Ashgate, 2013.
5. Groat, Linda N, and David Wang. Architectural Research Methods, 2nd Edition. Wiley, 2013.
6. Hughes, Richard, and ShivaniTanna. Specifications of GPST Stage 3: Written and Simulation Exercises. Jp Medical Ltd, 2013.
7. Lin, Lin Huang. Specifications of Advanced Research on Computer Education, Simulation and Modeling. Springer, 2011.
8. Sharma, S C. Specifications of Operation Research: Simulation and Replacement Theory. Discovery Publishing House, 2006.

Course Outcomes:

- Ability to select and design the process of conducting the research through various stages.
- To sensitize about emerging concepts in architecture to suit changing needs of society
- Ability to understand Research Objectives in a comprehensive manner to understand individual ability to contribute to the same as a team member in the sub topic / component assigned or selected.
- Ability carry out the Research process as effective tool of study, formulation of idea, data collection, analysis, synthesis and conclusion culminating into report writing as documented Academic resource.
- Ability to translate the Research findings to derive solutions to the Design problems in general or to a particular context.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	3	3	3	3	-	-	-	3	-	-	3	2	3	-	-
CO2	-	-	3	3	3	-	-	3	-	-	-	-	1	2	3	-
CO3	-	-	-	-	-	-	-	-	3	-	3	-	2	3	-	-
CO4	-	-	-	-	-	-	-	-	3	-	3	-	2	3	-	-
CO5	-	-	-	-	-	-	-	-	-	3		-	2	3	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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

AAR546	PROFESSIONAL ETHICS AND HUMAN VALUES	L	T	ST	J	C
SDG No.		3	0	0	0	3

Course Objectives:

- To sensitize students about human values and their positive and negative impacts on human interactions and Society.
- To introduce the concept of architecture ethics and associated aspects.
- To present architecture as social experimentation and analyze the underlying aspects.
- To sensitize students about the safety, responsibility and basic human rights.
- To help co-relate professional ethics and global issues.

UNIT 1

Introduction: Morals, values and ethics, integrity, work ethic, service learning, civic virtue, respect for others, living peacefully, caring, sharing, honesty.

UNIT 2

Architectural Ethics: Senses of 'Architectural Ethics', variety of moral issues, types of inquiry, moral dilemmas, moral autonomy.

UNIT 3

Professional Ethics in the light of Right Understanding: Profession in context with the comprehensive Human goals, Ethical Competence, Silent features characterizing Ethical competence, Issues in professional ethics, Prevailing approach towards promotion of professional Ethics.

UNIT 4

Safety, Responsibilities and Rights: Safety and risk, assessment of safety and risk, risk benefit analysis and reducing risk, the Three Mile Island and Chernobyl case studies. Collegiality and loyalty, respect for authority, conflicts of interest, occupational crime, professional rights.

UNIT 5

Global Issues: Multinational corporations, environmental ethics, architects as managers, consulting architects, architects as expert witnesses and advisors, moral leadership.

References:

1. Charles D. Fleddermann, Engineering Ethics, Pearson Education / Prentice Hall, 2004
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, Engineering Ethics - Concepts and Cases, Wadsworth Thompson Learning, 2000
3. John R Boatright, Ethics and the Conduct of Business, Pearson Education, 2003
4. Edmund G Seebauer and Robert L Barry, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press, 2001.

Course Outcomes:

- Students are responsive about human values and their positive and negative impacts on human interactions and Society.
- Students understand the concept of architectural ethics and associated aspects.
- Students can analyze underlying human and social aspects of various architectural endeavors.
- Students are familiar about the safety, responsibility, and basic human rights.
- Students can co-relate professional ethics and global issues.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	3	2	3	3	-	-	-	-	-	-	-
CO2	-	-	-	-	-	2	1	1	1	-	-	-	-	-	-	-
CO3	-	-	-	-	-	1	2	1	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	1	2	1	-	-	-	-	-	-	-
CO5	-	-	-	-	-	2	3	3	2	-	-	-	-	-	-	-

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

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