B.ARCH

BACHELOR OF ARCHITECTURE

[5 YEAR FULL TIME UNDERGRADUATE DEGREE PROGRAM]

RECOGNISED BY THE COUNCIL OF ARCHITECTURE, NEW DELHI

REGULATIONS, CURRICULUM AND SYLLABUS

2024 – 2025 Batch (New Syllabus)

CHOICE BASED CREDIT SYSTEM
(CBCS)

FACULTY OF ARCHITECTURE, DESIGN AND PLANNING

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University Established Under Section 3 of UGC Act 1956)

Pollachi Main Road, Eachanari Post, Coimbatore – 641 021. INDIA

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(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)

B.ARCH - REGULATIONS

2024 - 2025 batch (credit system)

These regulations are effective from the academic year 2024 – 2025 and applicable to the candidates admitted to B. Arch during 2024 – 2025 and onwards.

The B.Arch. Degree program (professional, under-graduate level) aims at producing architecture professionals who will assume a major leadership role in shaping the built environment, the quality of which is the major determinant of the quality of life. The main goal is to inculcate the ability to visualize, conceive, formulate and design according to various requirements & needs.

1 ADMISSION

1.1 Candidates seeking admission to the first semester of the ten semesters B. Arch Degree Programme: Should have compulsorily passed the

"(a) National Aptitude Test in Architecture (NATA) conducted by COA (or) either by NTA (i. eJEE) and

(b)he/she has passed an examination at the end of the 10+2 scheme of examination with physics, chemistry and mathematics subjects or passed 10+3 Diploma Examinations with the mathematics as compulsory subject.

(c)Reservation of seats and relaxation in percentage of marks obtained in the qualifying examination for admission shall be as per the reservation policy of Central Government or the respective State Governments."

1.2 Lateral Entry Admission

As per council of architecture norms **No lateral entry admission** directly into any higher semester is possible in this course.

1.3 Migration

The University may at its discretion permit B. Arch candidates from other institutions to migrate subject to the maximum number of students not exceeding the permitted maximum intake in a class as well as satisfying other academic requirements.

2. PROGRAMME OFFERED

2.1 Faculty of Architecture, Design and Planning (FADP) offers. Arch (Bachelor of Architecture - 5-year duration)

2.2INTAKE

Total intake is 80 in the current batch as approved by the Council of Architecture, New Delhi.

3. MODE OF STUDY

In this mode of study only full-time B.Arch. degree is being offered, the candidates are required to attend regular classes so as to satisfy University attendance and assessment requirements.

4. STRUCTURE OF PROGRAMMES

4.1 Every Programme will have curricula with syllabi consisting of theory, studio and practical:

(i) General core courses comprising History and Theory of Architecture, Materials and Construction, Building Services.

(ii) Core courses of Architectural Design, Architectural Graphics, Climate responsive architecture, Urban Design, Interior Design, and Architectural Conservation.

(iii) Elective courses for specialization in related fields such as Physical Planning, Energy Efficient Buildings, Product Design, and Architectural Journalism.

(iv) Interdisciplinary courses such as Structures, Landscape Design, Mathematics, Environmental Science, Urban Economics and Sociology, Survey and Levelling,

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Estimation and Costing etc.

(v) Skill based courses such as Art and Craft, Workshop practice, computer applications, construction purchase, practical training, seminar presentation, project work, educational tours, case studies etc.

There shall be a certain minimum number of core courses and sufficient number of elective courses that can be opted by the student. The blend of different courses shall be so designed that the student, at the end of the Programme, would have been trained not only in his / her relevant professional field but also would have developed as a socially conscious human being.

4.2 Each semester curriculum shall normally have a blend of lecture, studio and practical courses, not exceeding 7 in total per semester.

4.3 The prescribed credits required for the award of the degree shall be within the limits Specified Below.

PROGRAMME	MANDATORY CREDITS (minimum)
B. Arch.	**269**

4.4 The **medium of instruction for all Courses, Examinations, Seminars, Presentations and Project / Thesis / Dissertation reports are English.**

5. DURATION OF THE PROGRAMME

5.1 The Architecture course shall be of minimum duration of 5 academic years or 10 semesters of 15 to 18 working weeks (90 work days) each, inclusive of six months or one semester of approximately 16 working weeks of practical training. The Dean shall ensure that every teacher imparts instruction as per the number of periods / hours specified in the syllabus and that the teacher teaches the full content of the specified syllabus for the course being taught

5.2 The Curriculum structure of the Architecture course is framed as per COA norms under the Choice Based Credit System.

5.3 A candidate shall not be permitted to enroll for the Architectural Design course in a semester unless he has completed the Architectural Design course of the previous semester.

5.4 A candidate shall not be permitted to enroll for the tenth semester Architectural Design Thesis or dissertation or project course unless he has successfully completed Practical Training or Internship.

5.5 The candidate shall be awarded the degree in Architecture course by the University or Institution for having earned the minimum credits as specified in the curriculum

5.6 The Architecture Course shall be completed in a maximum period of 8 years. However, in special circumstances by the approval of the committee the candidate may be granted an extra 1 year by the University or Institution to complete the course. This shall be given only once to the candidate and treated as zero year

5.7 The Dean may arrange additional classes for improvement, special coaching, conduct of model test etc., over and above the specified periods. But for the purpose of calculation of attendance requirement or writing the end semester examinations by the students 540 hours conducted within the specified academic schedule alone shall be taken into account and the overall percentage of attendance shall be calculated accordingly.

5.8 In case a candidate is not able to complete the course in the prescribed duration, the University or Institution may provide an exit option for the candidate if he has completed and earned all credits for the first three years of study.

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6. REQUIREMENTS FOR COMPLETION OF THE SEMESTER

6.1 Ideally every student is expected to attend all classes and secure 100% attendance. However, in order to allow for certain unavoidable circumstances, the student is expected to attend at least 75% of the classes and the conduct of the candidate has been satisfactory during the course.

6.2 A candidate who has secured attendance between 65% and 74% (both included), due to medical reasons (Hospitalization / Accident / Specific Illness) or due to participation in University / District / State / National / International level sports or due to participation in Seminar / Conference / Workshop / Training Programme / Voluntary Service / Extension activities or similar Program With prior permission from the Registrar shall be given exemption from prescribed attendance requirements and shall be permitted to appear for the examination on the recommendation of the Head of the Department concerned and Dean to condone the lack of attendance. The Head of the Department has to verify and certify the genuineness of the case before recommending it to the Dean.

6.3 A candidate who has secured less than 65% of attendance in any semester will not be permitted to take the regular examination and has to continue the study in the subsequent semester. The candidate has to redo the course by re-joining the semester in which attendance is less than 65% with proper approval of the Registrar.

7. FACULTY ADVISER

To help the students in planning their courses of study and for general advice on the academic Programme, the Dean/Head of the Department will attach a certain number of students to a teacher of the Department who shall function as **Faculty Adviser** for those students throughout their period of study. Such Faculty Advisers shall advise the students and monitor the courses undergone by the students, check the attendance and progress of the students attached to him/her and counsel them periodically. If necessary, the faculty adviser may display the cumulative attendance particulars in the Department notice board and also discuss with or inform the Parents/Guardian about the progress of the students.

8. CLASS COMMITTEE

8.1. Every class shall have a class committee consisting of teachers of the class concerned, student representatives [two boys and two girls] and the concerned Dean/Head of the Department. It is like the 'Quality Circle' (more commonly used in industries) with the overall goal of improving the teaching-learning process. The functions of the class committee include

- Solving problems experienced by students in the studios, class room and in the laboratories.
- Clarifying the regulations of the degree Programme and the details of rules therein particularly clause 4 and 5 which should be displayed on department Notice-Board.
- Informing the student representatives, the academic schedule including the dates of assessments and the syllabus coverage for each assessment.
- Informing the student representatives, the details of Regulations regarding weightage used for each assessment. In the case of practical courses (laboratory / drawing / Thesis / seminar etc.) the breakup of marks for each experiment / exercise /module of work, should be clearly discussed in the class committee meeting and informed to the students.
- Analysing the performance of the students of the class after each test and finding the ways and means of solving problems, if any.

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- Identifying the weak students, if any and requesting the teachers concerned to provide some additional help or guidance or coaching to such weak students.

8.2 The class committee for a class under a particular branch is normally constituted by the Head of the Department.

8.3 The class committee shall be constituted within the first week of each semester.

8.4 At least 4 student representatives (usually 2 boys and 2 girls) shall be included in the class committee.

8.5 The Chairperson of the Class Committee may convene the meeting of the class committee.

8.6 The Dean may participate in any Class Committee of the institution.

8.7 The Chairperson is required to prepare the minutes of every meeting, submit the same to Dean within two days of the meeting and arrange to circulate it among the students and teachers concerned. If there are some points in the minutes requiring action by the Management, the same shall be brought to the notice of the Registrar by the HOD through the Dean.

8.8 Two or three subsequent meetings may be held in a semester at suitable intervals. During these meetings the student members representing the entire class, shall meaningfully interact and express the opinions and suggestions of the other students of the class in order to improve the effectiveness of the teaching-learning process.

9. PROCEDURE FOR AWARDING MARKS FOR INTERNAL ASSESSMENT

9.1 Every teacher is required to maintain an 'ATTENDANCE AND ASSESSMENT RECORD'(Log Book) which consists of attendance marked in each lecture, studio or practical or Thesis work class, the test marks and the record of class work (topic covered), separately for each course. This should be submitted to the Head of the department periodically (at least three times in a semester) for checking the syllabus coverage and the records of test marks and attendance. The Head of the Department shall sign with date after due verification. At the end of the semester, the record should be verified by the Dean who will keep this document in safe custody (for five years). Records of attendance and assessment of both current and previous semesters shall be submitted for Inspection to the team appointed by the University/any other approved body.

9.2Continuous Internal Assessment (CIA): The performance of students in each subject will be continuously assessed by the respective teachers as per the guidelines given below:

9.2.1 THEORY COURSES:

S. No.	CATEGORY	MAXIMUM MARKS
1.	Attendance	5
2.	CIA-I – Model exam- Written	10
3.	CIA- II- Viva / Review	10
3.	Physical Model	10
4.	Site Visit	5
Continuous Internal Assessment: TOTAL		**40**

9.2.2 PATTERN OF TEST QUESTION PAPER: (Theory courses)

INSTRUCTION	REMARKS
Maximum Marks	50 marks for all Tests
Duration	2 Hours
Part – A	Five-mark Questions (4 x 5 = 20 Marks); Choice: 4 out of 6
Part- B	Ten-mark Questions (3 x 10 = 30 Marks); Choice: 3 out of 5

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9.2.3 STUDIO COURSES:

S. No	CATEGORY	MAXIMUM PERCENTAGE
1.	Internal Jury (5 Reviews)	35
2.	Attendance	5
Continuous Internal Assessment: TOTAL		40*

PRACTICAL COURSES:

S. No	CATEGORY	MAXIMUM PERCENTAGE
1.	Internal Jury (Exercise/sheet valuation) **	35
2.	Attendance	5
Continuous Internal Assessment: TOTAL		40*

* - proportionate increase for all categories will be based on the total marks allotted for Continuous Internal Assessment for the concerned course.
** - No of Exercise/Sheets depends on particular subject.

9.3 ATTENDANCE

Marks Distribution for Attendance

S. No.	Attendance %	Marks
1	Between 91 % and 100%	5
2	Between 86 % and 90%	4
3	Between 81 % and 85%	3
4	Between 76 % and 80%	2
5	Less than 75 %	0

10. REQUIREMENTS FOR APPEARING FOR UNIVERSITY EXAMINATION

A candidate shall normally be permitted to appear for the University Examination of any semester commencing from I semester if he/she has satisfied the semester completion and attendance requirements and has registered for examination in all courses of the semester. Registration is mandatory for Semester Examinations as well as Arrears Examinations failing which the candidate will not be permitted to move to the higher semester. A candidate already appeared for subjects or any subject in a semester and passed the examination is not entitled to reappear in the same subject or subjects of the semester for improvement of grades / marks.

11. END SEMESTER EXAMINATIONS

End Semester Examination (ESE): End Semester Examination will be held at the end of each semester for each subject, which consists of 100 marks later scaled down to 60marks.

11.1 PATTERN OF ESE QUESTION PAPER: (Theory courses)

INSTRUCTION	REMARKS
Maximum Marks	100 marks for all Semester Examinations.
Duration	3 Hours
Part – A	Six-mark Questions (**5 x 6 =30 Marks**); Choice: 5 out of 8.
Part- B	Fourteen-mark Questions **(5 x 14 =70 Marks);** Choice: either or type with two questions from every unit.

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11.2 PATTERN OF ESE QUESTION PAPER: (Practical & Studio courses)

The ESE for practical and studio subjects shall be conducted as an examination and/or as a final jury (viva-voce) for marks as per scheme of examination (attached Annexure A) comprising external architect/related professionals with minimum 3 years' experience in practice or teaching.

12. PASSING REQUIREMENTS

12.1 Passing minimum: **The passing minimum for CIA is 50% (i.e.,20 out of 40 marks). The passing minimum for ESE is 50% (i.e. 30 out of 60 marks). The overall passing minimum for every course is 50% i.e., 50 out of 100 marks (Sum of his/her score in internal and external examination).**

12.2 If the candidate fails to secure a pass in a particular Theory course as per clause 12.1, it is mandatory that candidate shall register and reappear for the examination in the subsequent semester as an arrear when examination is conducted in that course. Further the candidate should continue to register and reappear for the examination till a **pass** is secured in End Semester Examination of such arrear subjects.

The Continuous Internal Assessment marks obtained by the candidate in the first appearance shall be retained by the Office of the Controller of Examinations and improved CIA marks may be considered for all subsequent attempts till the candidate secure a pass.

12.3 If the candidate fails to secure a pass in a particular Studio/Practical course as per clause 12.1, the candidate shall register and reappear for the examination in that course within 20days from day in which results are published. Further the candidate should continue to register and reappear for the examination till a **pass** is secured in End Semester Examination of such arrear subjects.

The Continuous Internal Assessment marks obtained by the candidate in the first appearance shall be retained by the Office of the Controller of Examinations and improved CIA marks may be considered for all subsequent attempts till the candidate secure a pass.

13. AWARD OF LETTER GRADES

13.1 All assessments of a course will be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, letter grades, each carrying certain number of points, will be awarded as per the range of total marks (out of 100) obtained by the candidate in each subject as detailed below:

Letter grade	Marks Range	Grade Point	Description
O	91 - 100	10	OUTSTANDING
A+	81-90	9	EXCELLENT
A	71-80	8	VERY GOOD
B+	66-70	7	GOOD
B	61-65	6	ABOVE AVERAGE
C	55-60	5	AVERAGE
D	50-54	4	PASS
RA	<50		REAPPEARANCE
AB		0	ABSENT

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13.2 GRADE SHEET

After results are declared, Grade Sheets will be issued to each student which will contain the following details:

i. The list of courses enrolled during the semester and the grade scored.
ii. The Grade Point Average (**GPA**) for the semester and
iii. The Cumulative Grade Point Average (**CGPA**) of all courses enrolled from first semester onwards.

GPA is the ratio of the sum of the products of the number of credits (**C**) of courses enrolled and the points corresponding to the grades (**GP**)corresponding to the grades scored in those courses, taken for all the courses, to the sum of the number of credits of all the courses in the semester to the sum of the credits of all courses registered.

$$\textbf{GPA} = \frac{\textbf{Sum of [C * GP]}}{\textbf{Sum of C}}$$

CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester. **"RA** grade will be excluded for calculating **GPA** and **CGPA**.

13.3 Whenever students, having arrear subjects, appear for the end semester examination during which there are no regular batch of students writing the same subjects, then, the letter grades for the arrears subjects shall be awarded based on the range of marks.

13.4REVALUATION

A candidate can apply for revaluation of his/her semester examination answer paper in a theory course, within 2 weeks from the declaration of results, on payment of a prescribed fee through proper application to the Controller of Examinations through the Head of the Department and Dean. **A candidate can apply for revaluation of answer scripts for not exceeding 5 subjects at a time.** Photocopies of answer scripts will be issued to candidate are paid prescribed fees. The Controller of Examination will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Department and Dean. Revaluation is not permitted for Practical Courses, Seminars, and Practical Training and for Thesis Work.

14. ELIGIBILITY FOR THE AWARD OF THE DEGREE

A student shall be declared to be eligible for the award of the Degree if he/she has:

- Successfully gained the required number of total credits as specified in the Curriculum corresponding to his/her Programme within the stipulated time.
- Successful completion of Thesis, Practical Training and Study Tours and other requirements as stipulated in the curriculum.
- No disciplinary action is pending against him/her.

15. CLASSIFICATION OF THE DEGREE AWARDED

15.1 A candidate who qualifies for the award of the Degree having passed the examination in all the courses in his/her first appearance within the specified minimum number of semesters and securing a **CGPA of not less than 8.00** shall be declared to have passed the examination in **First Class with Distinction.** For this purpose, the withdrawal from examination will not be construed as an appearance. Further, the authorized break of study will not be counted for the purpose of classification.

15.2 A candidate who qualifies for the award of the Degree having passed the examination in all the courses within the specified minimum number of semesters plus one semester (i.e. n+1 semesters), and

securing **CGPA of not less than 6.50** shall be declared to have passed the examination in **First Class**. For this purpose, the withdrawal from examination will not be construed as an appearance. Further, the authorized break of study will not be counted for the purpose of classification.

15.3 All other candidates (not covered in clauses 15.1 and 15.2) who qualify for the award of the degree shall be declared to have passed the examination in **Second Class**.

15.4 A candidate who is absent in semester examination in a course / Thesis after having enrolled for the same shall be considered to have appeared in that examination for the purpose of classification.

16. PROVISION FOR WITHDRAWAL FROM END-SEMESTER EXAMINATION

16.1. A candidate, May for valid reasons and on prior application, be granted permission to withdraw from appearing for the examination of any one course or consecutive examinations of more than one course in a semester examination.

16.2. Such withdrawal shall be permitted only once during the entire period of study of the degree Programme

16.3. Withdrawal application is valid only if it is made within 10 days prior to the commencement of the examination in that course or courses and recommended by the Head of the Department and Dean and approved by the Registrar.

16.4. Notwithstanding the requirement of mandatory TEN days' notice, applications for withdrawal for special cases under extraordinary conditions will be considered on the merit of the case.

16.5. Withdrawal shall not be construed as an appearance for the eligibility of a candidate for First Class with Distinction. This provision is not applicable to those who seek withdrawal during X semester.

16.6. Withdrawal from the End semester examination is **NOT** applicable to arrears subjects of previous semesters.

16.7. The candidate shall reappear for the withdrawn courses during the examination conducted in the subsequent semester.

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17. PROVISION FOR AUTHORISED BREAK OF STUDY

17.1. **Break of Study shall be granted only once for valid reasons for a maximum of one year during the entire period of study of the degree Programme.** However, in extraordinary situation the candidate may apply for additional break of study not exceeding another one year by paying prescribed fee for break of study. If a candidate intends to temporarily discontinue the Programme in the middle of the semester for valid reasons, and to re-join the Programme in a subsequent year, permission may be granted based on the merits of the case provided he / she applies to the Registrar, but not later than the last date for registering for the end semester examination of the semester in question, through the Head of the Department and Dean stating the reasons therefore and the probable date of re-joining the Programme.

17.2. The candidate thus permitted to re-join the Programme after the break shall be governed by the Curriculum and Regulations in force at the time of re-joining. Such candidates may have to do additional courses as per the Regulations in force at that period of time

17.3. The authorized break of study (for a maximum of one year) will not be counted for the duration specified for passing all the courses for the purpose of classification. However, additional break of study granted will be counted for the purpose of classification

17.4. The total period for completion of the Programme reckoned from, the commencement of the first semester to which the candidate was admitted shall not exceed the maximum period

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specified in clause 4.1 irrespective of the period of break of study (vide clause 17.3) in order that he/she may be eligible for the award of the degree

17.5. If any student is detained for want of requisite attendance, progress and good conduct, the period spent in that semester shall not be considered as permitted 'Break of Study' or 'Withdrawal'

18. PRACTICAL TRAINING

18.1 As a part of the degree requirement, all candidates have to mandatorily undergo Practical Training in the 7th semester under a registered Architect (with not less than 3 years of experience) for a period of 6 months (with a minimum of 90 working days in a semester)

18.2 Internal Assessment (520 marks) for Practical Training will be evaluated by the Architect for Drawings/Detailing, Application of knowledge & skill, Professional attitude. (For 400 marks) under whom the candidate has been trained, and by the Training Co-coordinator (for 120 marks) of the Faculty of Architecture for each semester.

18.3 End semester exam (ESE - 780 marks) for Practical Training will be held as a Viva-Voce examined by a jury comprising external architect members (for 390 marks) and by internal members of the Training Committee (for 390 marks) of the Faculty of Architecture for each semester.

18.4 Upon passing both the CIA and the ESE with the minimum required marks (50% of marks), the candidate shall also be certified by the Faculty of Architecture to have successfully completed the practical training.

18.5 A Training Committee shall be established well before the commencement of the practical training for the purpose of overseeing and regulating all aspects of the student's practical training and shall comprise minimum three faculty members from the faculty of Architecture & minimum one external member from practice/industry. The HOD/Dean shall be the Convener; and the concerned class tutor of the batch shall be the Coordinator of this committee respectively.

19. DISSERTATION II

19.1 As a part of the degree requirement, all candidates have to submit a Dissertation II in the 10th semester under a faculty guide and/or external guide. This Dissertation II is to be submitted individually by each candidate and is intended to assess individual research, methodology and design skills as a culmination of the knowledge accumulated throughout the course. This Dissertation II shall be submitted as drawings, reports, models, slides, presentations, walkthroughs etc.

19.2 The Dissertation II selection, scope, criteria for evaluation, periodic reviews and all other matters related to the Dissertation II except Final ESE shall be decided by the Dissertation II Committee of the Faculty of Architecture the decision of the committee has to be approved by Vice Chancellor/Registrar before the commencement of the review process.

19.3 Continuous Internal Assessment (CIA- 360 marks) for Dissertation II shall be held as a Viva-Voce examined by a jury comprising the Dissertation II Committee (for 180 marks) and by the Dissertation II Guide (for 180 marks) of the Faculty of Architecture. Four to six reviews are to be conducted which needs to be decided by Dissertation II committee. The same to be approved by Vice Chancellor/Registrar, before the commencement of the review process.

19.4 End Semester Examination (ESE- 540 marks) for Dissertation II shall be held as a Viva-Voce examined by a jury comprising external architect members (for 270 marks) and by internal members of the Dissertation II Committee (for 270 marks) of the Faculty of Architecture.

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19.5 A Dissertation II Committee shall be established well before the commencement of the Dissertation II for the purpose of overseeing and regulating all aspects of the student's Dissertation II work and shall comprise minimum two faculty members from the concerned department, minimum one external faculty member from academic background and another one external members from practicing background. The Hod/Dean shall be the Convener; and the concerned class tutor of the batch shall be the Coordinator of this committee respectively.

20. ELECTIVES

Electives shall be theory, practical or studio subject to satisfying their course requirements.

21. STUDY TOURS / NASA & CLUB ACTIVITIES

As part of the degree requirement, all candidates have to mandatorily visit places and buildings of Architectural Interest as a Study Tour for a prescribed duration of 28 to 35 days, during any stage of the course. Such study tours may be planned and conducted in two or three parts and preferably during the vacation period. Upon completing such tours, a candidate shall be certified by the Faculty of Architecture to have successfully completed the study tours.

NASA / ZONASA / CLUB will have activities related to the Architecture, Art and Design related extra-curricular events including participation in the above competitions.

22. DISCIPLINE

Every student is required to observe disciplined and decorous behaviour both inside and outside the college and not to indulge in any activity which will tend to bring down the prestige of the University. The erring student will be referred to the Disciplinary Committee constituted by the University, to enquire into acts of indiscipline and recommend the University about the disciplinary action to be taken. If a student indulges in malpractice in any of the University / Internal Examination he / she shall be liable for punitive action as prescribed by the university from time to time.

23. REVISION OF REGULATION AND CURRICULUM

The University may from time-to-time revise, amend or change the Regulations, Scheme of Examinations and syllabi if found necessary at any stage of the course

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B. ARCH– CURRICULUM
2024-2025 batch (New syllabus)

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

Bachelor of Architecture curriculum is designed to prepare the graduates having knowledge and skilful aptitude

I. To become a successful Professional
II. To imbibe and implant a strong foundation in Architectural Design Skills involving advanced Technological science and social concern.
III. To learn the theoretical aspects, critical thinking process and Practices in the field of Architecture and design.
IV. To update themselves of new developments in the field of architecture
V. To become a thinker and entrepreneur who can direct creative vision, explorations, services and products towards a better future in an interconnected world..

PROGRAMME OUTCOME (PO):

1. Aim to gain knowledge of Building Science, Technology, Engineering, Architecture and Humanities.
2. Ability to understand and analyse theoretical knowledge and to apply the principles, elements and construction details and techniques in Architectural Design.
3. Ability to identify social, economic, environmental and cultural issues and to restructure the evolution of Design accordingly.
4. Ability to understand ethical and professional responsibilities.
5. Ability to review the technological developments in the profession of architecture and construction.
6. Ability to understand real life situation of Architectural Practice.
7. Ability to follow and inspire high ethical values in professional practice.

PROGRAMME SPECIFIC OUTCOME (PSO):

1. Ability to gain overall knowledge in the field of Architecture and Design and contribute the best to the development of the society and the country.
2. Ability to become a successful professional to create a sustainable living environment.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table

PEO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
I				■	■	■	■	■	■
II	■		■					■	■
III		■	■					■	■
IV					■	■		■	■
V				■		■	■	■	■

COURSE MATRIX CHART

	Design Based	Science and Technology Based
Semester I	Theory of Architecture, Architectural Design - I	Mathematics in Architecture, Architectural Graphics – I, Architectural career and Communication Skills, Building Materials and Construction – I, Yoga for Human Excellence
Semester II	History of Architecture – I, Architectural Design –II, Model making and Architectural Delineation	Concept of Building structures, Environmental studies in Architecture, Building materials and construction - II, Architectural Graphics and Computer Studio
Semester III	History of Architecture-II, Architectural Design –III, Design of Structures- I,	Building materials and construction- III, Concept of Building Services, Climatology and Building Physics, Surveying levelling and Site Planning.
Semester IV	Architectural Design - IV, Design of Structures- II, History of Architecture-III PE-Climate Responsive Design, Furniture Design, Lights and Colour.	Building Services I, Building materials and construction- IV, Computer Studio- II. PE- Vernacular Architecture
Semester V	Architectural Design - V, Contemporary Architecture, Interior Design PE- Lighting Design. Acoustics in Architecture, Product Design	Computer Studio- III, PE-Building Maintenance and Repair, Building Services for Special Buildings, Graphic Design
Semester VI	Progressive Architecture, Architectural Design –VI, Architectural Detailing & Working Drawing, Estimation and Specification, Landscape Architecture PE- Vaastu and principles of Traditional Indian Architecture, Computational Design Process	Building Codes and Regulations, PE-Project cost and Contract Management
Semester VII	Housing, Urban Design Architectural design –VII PE - Parametric Architecture and Modelling, Sustainable Architecture	Architectural Conservation. PE- Earthquake Resistance Architecture, Integrated Building Management System, Innovative and Alternative Building Technique, Architecture Journalism and Photography
Semester VIII	Research Methods and Field studies, Architectural Design -IX- (Urban Design), Dissertation - I PE- Industrial Architecture	Project Management . PE- Real Estate Management, Green Buildings and Code Compliance, Advance Practice and Technique in Conservation, Planning Legislation and Professional Practice, Building Performance Analysis, BIM based Construction Management, GIS Modelling in Urban and Regional Planning.
Sem IX	Practical Training	

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Semester X	Professional Practice, Research in Architecture and Ethical Publishing Strategies , Dissertation - II	

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B. ARCH - CURRICULUM
2024-2025 batch (New syllabus)
Choice Based Credit System

Subject Legend: ART – Theory -0, ARP – Practical-1, ARS – Studio-2, ARE – Elective-3,
L- Lecture, T- Theory, P/S- Practical /Studio C- Credits
Abbreviation: CIA – Continuous Internal Assessment; ESE – End Semester Exam

Exam Hours: Theory (T)-3 Hrs. Practical (P)-6 Hrs. Studio(S) - 6 hrs.

Professional Core Courses (PC) Building Sciences & Applied Engineering (BS & AE)
Professional Elective (PE) Open Elective (OE)
Professional Ability Enhancement Compulsory Course (PAECC) Skill Enhancement Course (SEC)

EN - Entrepreneur Oriented Courses -Green
EM- Employability Oriented Courses –Blue
SD- Skill Development Oriented Courses –Red

Course code	Name of the course	Course type	EN, EM ,SD	Objectives and outcomes		Instruction hours / week			Credit(s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	Total
										40	60	100
SEMESTER - I												
THEORY COURSES												
24ART101	**Theory of Architecture**	PC	SD	III	3,PSO 1,PSO2	2	-	-	**2**	40	60	100
24ART102	Mathematics in Architecture	SEC	SD	III	1, PSO1,PSO2	2	-	-	**2**	40	60	100
PRACTICAL AND STUDIO COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**Total**
										40	**60**	**100**
24ARP111	Architectural Career and Communication Skills	PC	EN	III	2,7,PSO 1,PSO2	1	-	-	**3**	60	90	150
24ARS112	Architectural Graphics - I	PC	SD	I, II	1,2 PSO1,PSO2	1	-	3	**3**	60	90	150
24ARS121	Architectural Design -I	PC	EN	I, II, III, IV	2,6,7 PSO1,PSO2	-	-	10	**10**	200	300	500
24ARS122	Building Materials and Construction-I	BS & AE	EM	I, IV, V	2,4 PSO1,PSO2	1	-	5	**4**	80	120	200
24AROES*	Open Elective					1	-	-	-	100	-	100

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		OE	SD	V	PSO1							
Semester Total						**8**	**-**	**18**	**24**	**580**	**720**	**1300**
24AROES141 Sports and Yoga												

SEMESTER – II												
THEORY COURSES												
24ART201	**History of Architecture - I**	PC	SD	III	3,PSO1, PSO2	2	-	-	**2**	40	60	100
24ART202	Concept of Building Structures	BS & AE	EM	II, III	2 ,PSO1,PSO2	2	-	-	**2**	40	60	100
24ART203	Environmental Studies in Architecture	BS & AE	EM	II, III	3,6,PSO1	2	-	-	**2**	40	60	100
PRACTICAL AND STUDIO COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ARP211	**Architectural Graphics and Computer Studio**	SEC	SD	I, II, IV	2,5,PSO1,PSO2	1	-	3	**3**	60	90	150
24ARS221	Architectural Design –II	PC	EN	I, II, III, IV	2,6,7 PSO1,PSO2	-	-	10	**10**	200	300	500
24ARS222	Building Materials and Construction – II	BS & AE	EM	I, IV, V	2,4 PSO1,PSO2	1	-	5	**4**	80	120	200
24AROES*	Open Elective 1	OE	SD	V	PSO1	1		3	3	60	90	150
Semester Total						**9**	**-**	**21**	**26**	**520**	**780**	**1300**
***24AROES241 Model Making and Architectural Delineation**												

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SEMESTER - III												
THEORY COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ART301	**History of Architecture - II**	PC	SD	III	3,PSO1,PSO2	2	-	-	**2**	40	60	100
24ART302	Design of Structures - I	BS & AE	EM	II, III	2,PSO1,PSO2	2	-	-	**2**	40	60	100
24ART303	Concept of Building Services	BS & AE	EM	I, IV, V	2,4 PSO1,PSO2	2	-	-	**2**	40	60	100
PRACTICAL AND STUDIO COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ARP311	Surveying , Levelling and Site Planning	BS & AE	EM	II, III	2,PSO1,PSO2	1	-	3	**3**	60	90	150
24ARS321	Architectural Design -III	PC	EN	I, II, III, IV	2,6,7 PSO1,PSO2	-	-	10	**10**	200	300	500
24ARS322	Building Materials and Construction – III	BS & AE	EM	I, IV, V	2,4 PSO1,PSO2	1	-	5	**4**	80	120	200
24ARS323	Climatology and Building Physics	BS & AE	EM	III, IV	2,5 ,PSO1, PSO2	1	-	3	**3**	60	90	150
Semester Total						**9**	-	**21**	**26**	**520**	**780**	**1300**

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SEMESTER - IV												
THEORY COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ART401	History of Architecture - III	PC	SD	III	3,PSO1 ,PSO2	2	-	-	**2**	40	60	100
24ART402	Design of Structures – II	BS & AE	EM	II, III	2,PSO1 ,PSO2	2	-	-	**2**	40	60	100
PRACTICAL AND STUDIO COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ARP411	Computer Studio - II	SEC	SD	I, II, IV	2,5,PSO1,PSO2	1	-	3	**3**	60	90	150
24ARS421	Architectural Design –IV	PC	EN	I, II, III, IV	2,6,7PSO1,PSO2	-	-	10	**10**	200	300	500
24ARS422	Building Materials and Construction – IV	BS & AE	EM	I, IV, V	2,4 ,PSO1, PSO2	1	-	5	**4**	80	120	200
24ARS423	Building Services	BS & AE	EM	III, IV	2,5 ,PSO1, PSO2	1	-	5	**4**	80	120	200
24ARES*	Elective 2	PE		II,IV	1,2,7,PSO1,PSO2	1		3	**3**	60	90	150
Semester Total						**8**		**26**	**28**	**560**	**840**	**1400**

ELECTIVES:
*24ARES431 Climate Responsive Design
*24ARES432 Furniture, Light and Colour Design
*24ARES433 Vernacular Architecture

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SEMESTER - V

THEORY COURSES

Course code	Name of the course	Course type	EN, EM, SD	Objectives and outcomes		Instruction hours / week			Credit(s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	PEOs
										40	60	100
24ART501	Contemporary Architecture	PC	EM	III, IV	2,3 PSO1,PSO2	2	-	-	**2**	40	60	100
24ART502	Interior Design	PC	EM	I, II, IV	2,5 PSO1,PSO2	2	-	-	**2**	40	60	100

PRACTICAL AND STUDIO COURSES

Course code	Name of the course	Course type	EN, EM, SD	Objectives and outcomes		Instruction hours / week			Credit (s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	PEOs
										40	60	100
24ARP511	Computer Studio - III	SEC	SD	I, II, IV	2,5 PSO1,PSO2	1	-	5	**4**	80	120	200
24ARS521	Architectural Design -V	PC	EN	I, II, III, IV	2,6,7 PSO1,PSO2	-	-	10	**10**	200	300	500
24ARES*	Elective 3	PE		I, IV	5,6,7 PSO1,PSO2	1	-	5	**4**	80	120	200
24ARES**	Elective 4	PE		I, IV	5,6,7 PSO1,PSO2	1	-	5	**4**	80	120	200
Semester Total						7	-	**25**	**26**	**520**	**780**	**1300**

List of Elective subjects-***

*24ARES531 Building Maintenance and Repair
*24ARES532 Building Services for Special Buildings
*24ARES533 Lighting Design

**24ARES534 Acoustics in Architecture
**24ARES535 Product Design
**24ARES536 Set Design

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SEMESTER - VI												
THEORY COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ART601	Building Codes and Regulations	PC	EM	III, IV	2,3,5	2	-	-	**2**	40	60	100
24ART602	Progressive Architecture	PC	EM	III, IV	2,3,5	2	-	-	**2**	40	60	100
PRACTICAL AND STUDIO COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ARS621	Architectural Design –VI	PC	EN	I, II, III, IV	2,6,7 PSO1,PSO2	-	-	10	**10**	200	300	500
24ARS622	Architectural Detailing and Working Drawing	BS & AE	EM	I, IV, V	1,5,6 PSO1,PSO2	2	-	4	**4**	80	120	200
24ARS623	Estimation and Specification	PC	EM	I	5,PSO1,PSO2	2	-	4	**4**	80	120	200
24ARS624	Landscape Architecture	PC	EM	I, II, IV	2,5 PSO1,PSO2	2	-	4	**4**	80	120	200
24ARES*	Elective 5	PE		I, IV	5,6,7 PSO1,PSO2	1	-	3	**3**	60	90	150
Semester Total						**11**	-	**25**	**29**	**580**	**870**	**1450**

List of Elective subjects

*24ARES631 Vastu and Principles of Traditional Indian Architecture
*24ARES632 Computational Design Process
*24ARES633 Project Cost and Contract Management

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SEMESTER - VII

THEORY COURSES

Course code	Name of the course	Course type	EN, EM, SD	Objectives and outcomes		Instruction hours / week			Credit(s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	PEOs
										40	60	100
24ART701	Urban Design	PC	EM	III, IV	2,3,5	2	-	-	**2**	40	60	100
24ART702	Housing	PC	EM	III, IV	2,3,5	2	-	-	**2**	40	60	100

PRACTICAL AND STUDIO COURSES

Course code	Name of the course	Course type	EN, EM, SD	Objectives and outcomes		Instruction hours / week			Credit(s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	PEOs
										40	60	100
24ARS721	Architectural Design –VII	PC	EN	I, II, III, IV	2,6,7 PSO1,PSO2	-	-	14	**14**	200	300	500
24ARS722	Architectural Conservation	PC	EM	II, III	1,3,5 PSO1,PSO2	1	-	3	**3**	60	90	150
24ARES*	Elective 6	PE		I, IV	5,6,7 PSO1,PSO2	1	-	3	**3**	60	90	150
24ARES**	Elective 7	PE		I, IV	5,6,7 PSO1,PSO2	1	-	3	**3**	60	90	150
Semester Total						**7**	**-**	**23**	**27**	**460**	**690**	**1150**

List of Elective subjects

*24ARES731 Sustainable and Resilient Building Design
*24ARES732 Parametric Architecture and Modelling
*24ARES733 Earthquake Resistance Architecture

**24ARES734 Architecture Journalism and Photography
**24ARES735 Innovative and Alternative Building Technique
**24ARES736 Integrated Building Management Systems

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SEMESTER VIII

THEORY COURSES

Course code	Name of the course	Course type	EN, EM, SD	Objectives and outcomes		Instruction hours / week			Credit(s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	PEOs
										40	60	100
24ART801	Project Management	PC	EN	I, V	4,5,6,7	2	-	-	**2**	40	60	100
24ART802	Research Methods and Field Studies	PAECC	EM	III, IV	2,5	2	-	-	**2**	40	60	100

PRACTICAL AND STUDIO COURSES

Course code	Name of the course	Course type	EN, EM, SD	Objectives and outcomes		Instruction hours / week			Credit(s)	Maximum Marks		
				PEOs	POs	L	T	P/S		CIA	ESE	PEOs
										40	60	100
24ARS821	Architectural Design -IX	PC	EN	III, IV	2,5,7	2	-	12	**14**	280	420	700
24ARS822	**Dissertation -I**	PAECC	EM	I, II, III, IV	2,6,7	-	-	6	**3**	60	90	150
24ARES*	Elective 9	PE		I, IV	5,6,7	1	-	3	**3**	60	90	150
24ARES**	Elective 10	PE		I, IV	5,6,7	1	-	3	**3**	60	90	150
Semester Total						**8**	**-**	**24**	**27**	**540**	**810**	**1350**

List of Elective subjects

*24ARES831 Green Buildings and Code Compliance
*24ARES832 Advanced Practice and Technique in Conservation
*24ARES833 Real Estate Management
*24ARES834 Planning Legislation and Professional Practice

**24ARES835 Building Performance Analysis
**24ARES836 Industrial Architecture
**24ARES837 BIM based Construction Management
**24ARES838 GIS Modelling in Urban and Regional Planning

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SEMESTER – IX												
PRACTICAL AND STUDIO COURSE												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ARP911	Practical Training	PAECC	EN	I, IV,V	1,4,5,6,7	-	-	26	**26**	520	780	1300
Semester Total						-	-	**26**	**26**	**520**	**780**	**1300**

SEMESTER X												
PRACTICAL AND STUDIO COURSES												
Course code	**Name of the course**	**Course type**	**EN, EM, SD**	**Objectives and outcomes**		**Instruction hours / week**			**Credit(s)**	**Maximum Marks**		
				PEOs	**POs**	**L**	**T**	**P/S**		**CIA**	**ESE**	**PEOs**
										40	**60**	**100**
24ARS1021	Professional practice	PAECC	EN	I, V	2	2	-	3	**4**	80	120	200
24ARS1022	Research in Architecture and Ethical Publishing Strategies	PAECC	EM	I, V	2	2	-	3	**4**	80	120	200
24ARS1023	Dissertation - II	PC	EN	I, II, III, IV, V	4,5,6,7	-	-	18	**18**	360	540	900
						4	-	**24**	**26**	**520**	**780**	**1300**

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SEMESTER-I

24ART101	**THEORY OF ARCHITECTURE**									**SEMESTER-I**	
Marks	**Internal**	**40**	**External**				**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0	**Credits**				**2**

COURSE OBJECTIVE:

- To teach the fundamental concepts and components of architecture, ensuring that students develop a solid understanding of its basics.
- To explore how natural elements and human senses influence architectural design through guided analysis and case studies.
- To apply design principles effectively in the creation and evaluation of architectural forms and spaces.
- To evaluate architecture as a medium of expression and assess its impact on human experience.
- To foster the conceptualization and critical assessment of architectural ideas across various historical and contemporary contexts.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Remember the fundamental elements of architecture and their roles in architectural design.	Remember
CO2	Understand the dynamic interaction between natural elements and architectural elements in design.	Understand
CO3	Analyse the effects of natural elements on architectural design and human perception.	Analyse
CO4	Apply design principles to architectural forms and spaces, considering various scales and contexts.	Applying
CO5	Evaluate how architecture serves as an expressive medium and its impact on human experience.	Evaluate
CO6	Create architectural ideas and philosophies from different historical and contemporary contexts.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**L**	**M**	**S**	**M**
CO2	**S**	**S**	**L**	**-**	**-**	**-**	**L**	**S**	**M**
CO3	**S**	**M**	**L**	**M**	**-**	**L**	**S**	**S**	**S**
CO4	**M**	**S**	**M**	**L**	**-**	**L**	**S**	**S**	**M**
CO5	**S**	**M**	**S**	**M**	**L**	**L**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**M**	**L**	**M**	**S**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - ARCHITECTURE - ITS ELEMENTS

Defining Architecture; an overview of the complexities of various layers and factors involved in Architecture. - Architecture as an organic entity and its components - function, form, structure, skin, material, circulation, Character etc. - Architecture as a building entity and its elements - floor, walls, columns, roof, openings, stairs, etc; - their definition, evolution, attributes and spatial roles - Form/space making and its elements - points, lines, planes and volume; Various configuration of these elements in space making.

UNIT II - NATURE AND MAN - ARCHITECTURE AS AN INTERFACE

Nature - its five basic elements - earth (material, site, vegetation etc), water (rain, humidity etc), fire (light, temperature, radiation), wind (ventilation), sky (space); The dynamic interactions between elements of nature and elements of architecture - Human being – the five basic senses - their role in perception of built environment - vision (light, color, views etc), hearing (sound, noise, silence), tactility (texture, thermal and physical feeling), smell, spiritual. The Functional, psychological and aesthetic relevance in architecture - The demonstration of architecture as an experiential interface between human senses and his environment –explained with relevant Architectural examples. Case studies of relevant architectural examples and exercises.

UNIT III - ARCHITECTURAL DESIGN - ITS PRINCIPLES

Introduction to Design; A brief overview of design and its principles in other fields. (Arts, crafts, nature etc); Architectural design - its tools (elements), objectives (experience and expression) and means (principles)- Principles of Design - proportion, scale, order, repetition, rhythm, harmony, balance, emphasis, hierarchy, symmetry, axis, datum etc; Application of design principles at various levels - site level, building level and detail level Evolution of architectural form - Basic 3d forms, Transformation of form, principles involved space, spatial relationships and spatial organization, principles involved. ---- Relevant examples from modern and traditional architecture. Case studies of relevant modern and traditional architectural examples and exercises.

UNIT IV - EXPRESSION AND EXPERIENCE IN ARCHITECTURE

Architecture as an expressive medium, semiotics involved in various elements, aspects, and principles of architecture; Examples of spatial narratives - Experiencing architecture Aspects influencing the experience and expression - place, people, society, culture, history, tradition, time etc. Case studies through works of architects.

UNIT V - CONCEPTS IN ARCHITECTURE

Conceptualizing architecture, various approaches - Understanding Concepts behind the various architectural manifestations in relevant traditional, historical, vernacular examples Understanding Concepts, ideas, philosophy behind the works of few architects choosing from the modern, post modern and contemporary periods in the context of the West and India.

TOTAL : 30 PERIODS

REFERENCES:

1. Francis D.K. Ching, “Architecture-Form, Space and Order”, Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, “Analysing Architecture”, Routledge, London, 2003.
3. Pramar V.S., “Design Fundamentals in Architecture”, Somaiya Publications Private Ltd., New Delhi, 1973.
4. Yatin Pandya, “Elements of Space making”, Mapin 2007.
5. Leland M.- Roth, “Understanding Architecture: Its Elements- History, and Meaning”, Icon Editions, 1993
6. Haze J Conway, Rowan Roenisch, “Understanding Architecture”, Routledge 2005

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REFERENCES:

1. Hanno Rauterberg, “Talking Architecture, Interview with Architects”, Prestel 12008 The A-Z of Modern Architecture-Taschen 2007.
2. Leland M.Roth, “Understanding Architecture: Its Experience History and Meaning”, Craftsman house, 1994.
2. Peter von Meiss, “Elements of architecture – from form to place”, Spon Press 1977.
3. Rudolf Arnheim, “The dynamics of architectural form”, University of California Press, 1977.
4. Neils Prak, “The language of Architecture”, Mounton & Co., 1968.
5. Paul Alan Johnson, “The Theory of Architecture – Concepts and themes”, Van Nostrand Reinhold Co., New York, 1994.
6. Helen Marie Evans and Carla David Dunneshil, “An invitation to design”, Macmillan Publishing Co. Inc., New York, 1982.
7. Anthony Antoniades, “Poetics of architecture: Theory of design, Wiley 2008
8. Steen Eiler Rasmussen, “Experiencing Architecture”, MIT Press 1964
9. Peter von Meiss, “Elements of Architecture - From Form to Place”, Span Press, 1992
10. Bryan Lawson, “How Designers Think”, Architectural Press Ltd" London, 1980.

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24ART102	MATHEMATICS IN ARCHITECTURE								SEMESTER-I
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0	**Credits**			**2**

COURSE OBJECTIVE:

- To provide a strong foundation in coordinate geometry, focusing on the relationship between points, vectors, and lines.
- To enhance students' understanding of basic statistical measures and their practical applications in data representation.
- To develop the ability to compute surface areas and volumes for various 3D geometric objects.
- To explore the geometric principles in architecture, including ratios, proportions, and the application of natural structures.
- To introduce the geometry of Platonic solids and parametric design, emphasizing its role in architectural aesthetics and structural integrity.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the principles of points, vectors, and coordinate systems in geometry.	Understand
CO2	Analyse the equations of lines and conic sections in parametric, implicit, and explicit forms.	Analyse
CO3	Compute statistical measures like mean, median, mode, standard deviation, and represent data graphically.	Apply
CO4	Apply surface areas and volumes for basic 3D objects such as cubes, cylinders, and cones.	Apply
CO5	Evaluate architectural applications of geometry, including the golden ratio and fractal geometry.	Evaluate
CO6	Create geometric models using parametric design principles and explore the geometry of Platonic solids.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**-**	**-**	**L**	**-**	**M**	**-**
CO2	**S**	**L**	**-**	**M**	**-**	**-**	**-**	**L**	**L**
CO3	**L**	**S**	**-**	**-**	**M**	**-**	**-**	**M**	**L**
CO4	**L**	**S**	**-**	**L**	**-**	**-**	**-**	**M**	**L**
CO5	**S**	**M**	**-**	**-**	**M**	**-**	**-**	**L**	**L**
CO6	**S**	**M**	**-**	**-**	**M**	**-**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

UNIT-I CO-ORDINATE GEOMETRY

Points, vectors and coordinate systems – Vector Algebra – Points vs. Vectors – Rotation about an arbitrary axis – Parametric, Implicit and Explicit Equations – Lines – Parametric equations of lines – Implicit equation of lines – Distance from a point to a line – Conic sections – Parametric equation of conics.

UNIT II - BASIC STATISTICS

Arithmetic Mean, Median, Mode, Standard Deviation and Variance. Relation and Correlation– Graphical display of data in statistics through charts and graphs such as bar charts, histograms etc

UNIT III - AREA AND VOLUME CALCULATIONS

Surface Area and Volume Calculation- for simple 3D objects- cube, cuboid, cylinder, cone, sphere, pyramid, prisms and their frustum.

UNIT IV - GEOMETRY IN ARCHITECTURE

Ratio and Systems of proportion – definition and derivation of golden ratio - Fractal geometry – Fibonacci series. Biomimicry - Principles and emulation of natural structures. Geometry of Muqarnas. – Making models for understanding the dimensions.

UNIT V - PLATONIC SOLIDS& CODING APPLICATIONS

Geometry of Platonic Solids.(Concept and Application).Physical modelling of simple and complex geometric forms. Importance of Geometry in Architecture- Geometry in architecture, Geometry for strength,

performance, Aesthetics and ambience. - Making models for understanding the dimensions. - Digital Geometry and Parametric Design - Parametric modeling principles for geometrically complex forms

TOTAL : 30 PERIODS

REFERENCES:

1. Grewal B.S., “Higher Engineering Mathematics”, Khanna Publishers, New Delhi,41st Edition, 2011.
2. Bali N., Goyal M. and Watkins C., “Advanced Engineering Mathematics”, Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
3. Ramana B.V., “Higher Engineering Mathematics”, Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.
4. Greenberg M.D., “Advanced Engineering Mathematics”, Pearson Education, New Delhi, 2nd Edition, 5th Reprint, 2009.
5. Gupta S.C and Kapoor V.K., “Fundamentals of Mathematical Statistics”, Sultan Chand & Sons, New Delhi, 9th Edition,1996.
6. The Golden Ratio: The Divine Beauty of Mathematics Book by Gary B. Meisner

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24ARP111	ARCHITECTURAL CAREERS AND COMMUNICATION SKILLS									SEMESTER-I
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To introduce students to the architectural career path, duties, and responsibilities of architects, both historically and in contemporary practice.
- To develop students' understanding of visual communication principles, including typography, color theory, and visual storytelling.
- To explore the roles of architects in both architectural and interior design, emphasizing design capabilities and professional responsibilities.
- To familiarize students with careers in heritage conservation, vernacular, and sustainable architecture.
- To provide an understanding of urban design, landscape architecture, and the management roles within architectural projects.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the duties and responsibilities of architects, as well as historical and contemporary perspectives on the profession.	Understand
CO2	Apply the principles of visual communication, including typography, color theory, and Gestalt principles, in architectural presentations.	Apply
CO3	Analyse architectural and interior design concepts, and understand the role of architects in design processes and communication.	Analyse
CO4	Evaluate careers in heritage conservation, vernacular architecture, and sustainable design, and understand their importance in modern architecture.	Apply
CO5	Understand the principles of urban design, landscape architecture, and planning, and Analyse case studies of urban development projects.	Understand
CO6	Apply project management principles in architecture, with an understanding of construction management roles and responsibilities.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**L**	**M**	**S**	**M**
CO2	**S**	**S**	**L**	**-**	**-**	**-**	**L**	**S**	**M**
CO3	**S**	**M**	**L**	**M**	**-**	**L**	**S**	**S**	**S**
CO4	**M**	**S**	**M**	**L**	**-**	**L**	**S**	**S**	**M**
CO5	**S**	**M**	**S**	**M**	**L**	**L**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**M**	**L**	**M**	**S**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - ARCHITECTURE COURSE – CAREER PATH and VISUAL COMMUNICATION

Introduction to the Architectural career path –Duties and responsibilities of the Architect- Overview of the architectural profession, Historical perspectives on architectural practice, Current trends and challenges in the field. Visual Representation - Visual storytelling, Gestalt principles and their relevance to visual communication, Principles of typography: hierarchy, contrast, alignment, and spacing; Fundamentals of color theory: hue, value, saturation, and color harmony; Psychological and cultural associations of color.

UNIT II - ARCHITECTURAL DESIGN AND INTERIOR DESIGN

Introduction to the Architectural Design –World level exposure – cop of the Career expansion in different office environments. – Introduction to interior Design – roles and Responsibilities – Design capability – specialization etc. Role of architects in the design process. Architectural Communication - Introduction to architectural terminology and vocabulary - Overview of presentation techniques in architecture - Architectural debates

UNIT III - HERITAGE –CONSERVATION, VERNACULAR ARCHITECTURE AND SUSTAINABLE ARCHITECTURE

Careers in historic preservation and cultural heritage management, - Introduction to Vernacular Architecture – Concepts of sustainability in architecture - Careers in sustainable design and environmental architecture.

UNIT IV - URBAN DESIGN, LANDSCAPE DESIGN AND PLANNING

Role and scope of urban Landscape Architecture - Principles of urban planning and design, Career paths in urban planning, zoning, and development, Case studies of urban development projects.

UNIT V - MANAGEMENT STREAM IN ARCHITECTURE

Role of construction managers in architectural projects, Skills and qualifications needed for a career in construction management, project management principles and practices.

TOTAL : 60 PERIODS

REFERENCES:

1. Architecture without Architects: A Short Introduction to Non-pedigreed Architecture by Bernard Rudofsky.
2. Climatically Responsive Energy Efficient Architecture, PLEA/SPA, New Delhi - 1995.
3. Ching, Francis D.K. Interior Design Illustrated, V.N.R. Pub. NY 1987.
4. Geoffry& Susan Jellicoe: landscape of Man: shaping the environment from pre-history to the present day.
5. Whyte, William H. The Social Life of Small Urban Spaces. Washington D.C.: Conservation Foundation, 1980.

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24ARS112	ARCHITECTURAL GRAPHICS - I									SEMESTER-I
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To introduce students to the fundamentals of architectural drafting, including lettering, line types, and scaled drawings.
- To develop the ability to create two-dimensional orthographic projections of simple and complex geometric objects.
- To guide students in creating three-dimensional geometric projections, such as isometric, axonometric, and oblique drawings.
- To teach students how to produce accurate orthographic drawings of architectural components, including doors, windows, and staircases.
- To enhance students' skills in creating detailed three-dimensional architectural drawings and understanding the principles of architectural detailing.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the principles of architectural drafting, including architectural lettering, line types, and composition of drawings.	Understand
CO2	Apply knowledge of orthographic projections to create two-dimensional drawings of simple and complex objects.	Apply
CO3	Create accurate three-dimensional geometric forms using isometric, axonometric, and oblique projections.	Create
CO4	Analyse and produce orthographic projections of architectural components, such as doors, windows, and staircases.	Analyse,
CO5	Apply metric projection techniques to generate detailed three-dimensional architectural drawings.	Apply
CO6	Evaluate and refine architectural drawings, enhancing detailing accuracy in both two-dimensional and three-dimensional forms.	Evaluate

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	-	-	**M**	-	-	**S**	-
CO2	**S**	**S**	-	**M**	**M**	-	**S**	**S**	**L**
CO3	**S**	**S**	-	**M**	**L**	-	**S**	**S**	**L**
CO4	**S**	**S**	-	**M**	**M**	-	**S**	**S**	-
CO5	**S**	**S**	-	-	**L**	-	**S**	**S**	**L**
CO6	**S**	**S**	-	-	**M**	-	**S**	**S**	-

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO ARCHITECTURAL GRAPHICS

Introduction to fundamentals of architectural drafting – Architectural Lettering, Line type, value etc. Learning scaled drawings through basic geometry etc. Composition of various drawings- list of drawings-Title blocks dimensioning – scale drawings- details – representations – arrows – material hatches etc

UNIT II - GEOMETRICAL DRAWINGS – TWO DIMENSIONAL DRAWINGS - ORTHOGRAPHIC PROJECTIONS

Orthographic projections to scale of single- and two-dimensional geometric forms - Simple and complex objects- straight, curvilinear etc.- Plans, Sections, Elevations of solid, hollow objects, etc.

UNIT III - GEOMETRICAL DRAWINGS - THREE DIMENSIONAL DRAWINGS - METRIC PROJECTIONS

Isometric, Axonometric, Oblique Projections as three dimensional geometric forms- Scaled drawings of three dimensional forms as Simple and Combined Solids.

UNIT IV - MEASURED DRAWING – 1 - TWO AND DIMENSIONAL DRAWINGS - Orthographic projections of Architectural Components to scale, such as Doors, Windows, Columns, Staircase. Handrails etc. Detailed two dimensional drawings, to scale, of small-scale Floor plans etc.

UNIT V - ARCHITECTURAL DRAWING AND DETAILING - THREE DIMENSIONAL DRAWINGS

- Metric projections of Architectural Components to scale such as Doors, Windows, Columns, Staircase. Handrails etc., Detailed three dimensional drawings, to scale of small scale Floor plans etc.,

TOTAL : 60 PERIODS

REFERENCES:

1. Francis D. K. Ching; Design Drawing; John Wiley & Sons; 2010
2. Rerdow Yee; Architecture Drawing - A Visual Compendium of Types & Methods; John Wiley & Sons; 2012
3. John Montague; Basic Perspective Drawing - A Visual Approach; John Wiley & Sons; 5th edition 2010.
4. Mo Zell; The Architecture Drawing Course - Understand the principles & master the practices; Thames & Hudson; 2014
5. Tokyo Musashino Academy of Art - Introduction to Pencil Drawing, Graphic - Shaw Publishing Co. Ltd., Japan, 1991.
6. Francis D. K. Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964,2002
7. Griffin, A.W. and Brunicardi, V.A., “Introduction to Architectural Presentation Graphics”, Prentice Hall, 1998
8. Ciriello, M., “Architectural Design Graphics”, McGraw-Hill, 2002

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24ARS121	ARCHITECTURAL DESIGN - I									SEMESTER-I
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	10	**Credits**			**10**

COURSE OBJECTIVE:

- To introduce students to the concept of design, including the changing role of the designer and the design process.
- To familiarize students with the basic elements of design, including line, shape, texture, and color, through practical explorations in mixed media and collage.
- To guide students in understanding and applying the principles of design, such as unity, balance, and contrast, in both two- and three-dimensional compositions.
- To develop students' ability to approach design problems creatively, using various methods such as shape grammar, fluidity, and biomimicry.
- To provide an introduction to architectural design, emphasizing key elements such as site, orientation, materials, and historical precedents.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the design process and the changing role of the designer, applying these concepts to creative projects.	Understand
CO2	Analyse the basic elements of design, such as line, texture, and color, through mixed media exercises.	Analyse
CO3	Apply the principles of design, including unity, balance, and rhythm, in both two- and three-dimensional compositions.	Apply
CO4	Create design solutions using innovative techniques such as parametric design, biomimicry, and shape grammar.	Create
CO5	Analyse architectural design fundamentals, including site, materials, and climate, in relation to the built environment.	Analyse
CO6	Create design exercises and models, refining them based on principles of design and architectural context.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

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CONTENT

DESIGN DEFINITION:
Design Thinking: What is Design? Changing Role of the Designer; Route map of the Design Process; Components of Design Problems; Measurement, Criteria & Judgment in Design; Types and Styles of Thinking – Creative thinking, Guiding Principles.

BASIC ELEMENTS OF DESIGN
Introduction to Elements of design.-Properties, qualities, and characteristics of (I) line, (ii) direction, (iii) shape, (iv) size, (v) texture, (vi) space (vii) time and motion (viii) value and (vii) colour Exploration in mixed media & collage to convey a specific theme and meaning. Analytical Studies to be undertaken in two and three dimensions using various materials and tools.

PRINCIPLES OF DESIGN:
The principles of design relationships/ Composition – Unity & Harmony, Balance, Scale & Proportion, Contrast and Emphasis, and Rhythm. Exploration in mixed media & collage to convey specific theme and meaning. -Analytical Studies will be undertaken in two and three dimensions using various media.

DESIGN EXCERCISES AND MODEL:
Design thought process – Sketching various process designs- Subjective – Objective – principles of design – oriented design –design context – Shape grammar – Fluidity – Parametric – Bio mimicry etc. -evolution of design – model making

INTRODUCTION TO ARCHITECTURAL DESIGN:
Lecture introduction into the discipline of architecture, highlighting fundamentals that contribute to the complex totality that constitute a work of architecture: Placing Architecture (Site, Orientation, Climate, City and Landscape); History & Precedent; Materials & Construction; Representation and Realization

TOTAL : 60 PERIODS

REFERENCES:

1. Owen Cappleman& Michael Jack Jordon, Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold New York, 1993., latest edition 2015
2. Charles Wallschlacgerm& Cynthia Busic-Snyder, Basic Visual Concepts and
3. Principles for Artists, Architects and Designers, McGraw Hill, New York 1992., 2014
4. Ching, F.D.K., “Design Drawing”, Van Nostrand Reinhold, 1998, 2016

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24ARS122	BUILDING MATERIALS AND CONSTRUCTION - I								SEMESTER-I
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5	**Credits**			**4**

COURSE OBJECTIVE:

- To introduce students to the key components and sections of load-bearing and RCC structures.
- To familiarize students with traditional rural building materials such as bamboo, thatch, and straw, and their traditional construction techniques.
- To provide students with knowledge of mud, stone, and lime as building materials, focusing on their uses and traditional construction methods.
- To explore the properties and applications of bamboo in construction, including walls, roofs, floors, and furniture.
- To teach students about timber joinery and roofing techniques, including traditional methods used in windows, doors, and furniture construction.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the typical sections of load-bearing and RCC structures, identifying key components.	Understand
CO2	Explore the properties and uses of traditional rural materials like bamboo, thatch, and straw, and apply traditional construction techniques.	Analyse,
CO3	Analyse the applications of mud, stone, and lime in building construction, focusing on traditional wall, floor, and foundation techniques.	Analyse
CO4	Apply knowledge of bamboo as a building material, including techniques for walls, roofs, and furniture construction.	Apply
CO5	Understand the traditional timber joinery and roofing methods, including techniques like the king post, queen post, and Madras terrace.	Understand
CO6	Evaluate building materials and construction methods through site visits, material samples, and detailed drawings.	Evaluate

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - BUILDING SECTION AND COMPONENTS
Typical section for load bearing and R. C. C structures

UNIT II - TRADITIONAL RURAL MATERIALS
Introduction to rural building concepts - Bamboo, thatch, tile, straw bale etc. - properties- uses – traditional techniques of construction

UNIT III - MUD, STONE & LIME
Mud- wall- flooring-plastering- mud bricks etc.-Stone- Wall- Floor-Foundations-Lime- Plastering-adhesive - properties- uses – traditional techniques of construction

UNIT IV - BAMBOO
Bamboo- types-techniques- Wall- Roof -Floor- Furniture – bamboo joints -properties- uses – traditional techniques of construction etc.

UNIT V - TIMBER-ROOFING AND JOINERY
Timber truss- lean to, King post, Queen post, closed couple etc.-Joinery – Windows, Doors, Furniture, column etc.-Roofing materials and techniques-madras terrace- Mangalore tiles – Pot tiles- properties- uses – traditional techniques of construction
All units – material Sample Collections and Site Visit and detailed drawings

TOTAL : 90 PERIODS

REFERENCES:

1. Don A. Watson, 'Construction Materials and Processes', McGraw Hill, 1972.
2. W.B. McKay, 'Building Construction', Person India, Vol, 1 2013, Vol II, 2012.
3. S.C Rangwala 'Building Construction' Charotar Publishing House, India, 2016.
4. S.K.Sharma, 'A Text book of Building Construction', S. Chand & Co Ltd., New Delhi, 1998.
5. S.K. Duggal, 'Building Materials', New Age International Publishers, 2016.
6. R.J. S. Spence and D.J. Cook, 'Building Materials in Developing Countries', John Wiley and sons 1983.
7. S. C. Rangwala, 'Engineering Materials', Charotar Publishing House India, 2015.
8. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge, 2010.

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24AROES141	SPORTS AND YOGA									SEMESTER-I
Marks	**Internal**	**100**	**External**			**0**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	0	**Credits**			**0**

COURSE OBJECTIVES:

- To explain the importance of physical education and highlight the significance of physical fitness and wellness.
- To describe the components of physical fitness and promote the adoption of a healthy lifestyle for preventing health risks.
- To introduce the fundamentals of anatomy and physiology in sports and yoga, emphasizing their effects on the body systems.
- To teach the benefits of yoga and pranayama for improving concentration, posture, and overall well-being.
- To provide corrective measures for posture deformities through exercises and relaxation techniques.

COURSE OUTCOMES:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the importance of physical education and its role in promoting physical fitness and wellness.	Understand
CO2	Apply knowledge of the components of physical fitness to develop and demonstrate a healthy lifestyle.	Apply
CO3	Analyse the effects of exercise on various body systems and understand the concept of correct posture.	Analyse
CO4	Apply corrective measures for posture deformities and promote physical well-being through proper exercise techniques.	Apply
CO5	Understand the various yoga postures and pranayama techniques for enhancing concentration and relaxation.	Understand
CO6	Evaluate the benefits of yoga, pranayama, and meditation for improving concentration, reducing stress, and promoting holistic health.	Evaluate

Unit I - INTRODUCTION TO PHYSICAL FITNESS

Explain importance of physical education - Describe importance of Physical Fitness & Wellness - Explain the components of physical fitness - Demonstrate healthy life style - Prevent health threats by changing life style.

Unit II - FUNDAMENTALS OF ANATOMY & PHYSIOLOGY IN SPORTS & YOGA

Explain importance of anatomy and physiology - Describe effects of exercise in various body systems - Describe concept of correct posture - Explain corrective measures for posture deformities.

Unit III - YOGA & PRANAYAMA

Explain importance of yoga - Perform various pranayama for increasing concentration - Use meditation and other relaxation techniques for improving concentration.

TOTAL : 45 PERIODS

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REFERENCES:

1. Ajmer Singh, Modern Trends and Physical Education class 11 & class 12, Kalyani Publication, New Delhi ISBN: 9789327264319.
2. B.K.S. Iyengar, Light on Yoga, Thomson's Publication, New Delhi ISBN: 8172235011
3. V.K.Sharma, Health and Physical Education, NCERT Books; Class11,12 Saraswati House Publication, New Delhi
4. Acharya Yatendra, Yoga and Stress Management, Fingerprint Publishing ISBN: 938905303X
5. Swami Vivekanand, Patanjali Yoga Sutras, Fingerprint Publishing ISBN 9389567351.
Page 15
Karpagam Academy of Higher Education (Deemed to be University), Coimbatore – 641 021
6. Ramdev, Pranayam Rahasya, Patanjali-Divya Prakashan, Haridwar ISBN: 9788189235017
7. Ramdev, Yoga its Philosophy & Practice, Divya Prakashan, Haridwar.

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SEMESTER-II

24ART201	HISTORY OF ARCHITECTURE - I								SEMESTER- II
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0	**Credits**			**2**

COURSE OBJECTIVE:

- To introduce students to the significance of historical architecture and the evolution of early human shelters, such as those in Catalunya and the Indus Valley Civilization.
- To explore the architectural developments during the Buddhist period, focusing on Hinayana and Mahayana styles, rock-cut caves, and key structures like Sanchi Stupa and Asoka's pillars.
- To provide an understanding of South Indian temple architecture, emphasizing the Dravidian style and the contributions of the Pallavas in rock-cut and structural temples.
- To study the progression of Dravidian architecture, focusing on the evolution of Vimanas, Gopurams, and complex temple layouts under the Cholas and Pandyas.
- To examine the architectural contributions of the Vijayanagara and Nayak periods, highlighting the addition of mandapas and the development of temple cities.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the importance of architectural history and early human shelter developments, including those in the Indus Valley and West Asia.	Understand,
CO2	Analyse the architectural features of Buddhist structures, including rock-cut caves, stupas, and pillars from the Asoka period.	Analyse
CO3	Understand the origins of Dravidian temple architecture, focusing on key structures from the Pallava period, such as the Shore Temple and Kailasanatha Temple.	Understand,
CO4	Evaluate the architectural advancements under the Cholas and Pandyas, focusing on temple complexes, Vimanas, and Gopurams.	Evaluate
CO5	Analyse the contributions of Vijayanagara and Nayak architectural styles, with a focus on temple cities and mandapas.	Analyse, Create
CO6	Apply historical knowledge of architectural styles through site visits and research, understanding the evolution of South Indian architecture.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**L**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**L**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**L**
CO6	**S**	**M**	**S**	**L**	**L**	**L**	**L**	**L**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION – BEGINNING OF ARCHITECTURE

Relevance of history- The old stone age- The middle stone age- The new Stone Age. Development of shelter Catalunya, Indus valley Civilization(Harappa and Mohenjo-Daro) West Asia- The evolution of Sumerian and Persian cultures-Outline of architectural character- Ziggurat at Urnammu- Palace of Sargon, Palace at Persepolis

UNIT 1 - BUDDHIST STYLE

Hinayana and Mahayana Buddhism - Interaction of Hellenic & Indian Ideas in Northern India - Architectural Production during Asoka's rule - Asoka Pillar, Saranath,Rock cut caves at Barabar, Sanchi Stupa. Salient features of a Chaitya hall and Vihara, Rock cut architecture in the Western and Eastern Ghats - Karli, Viharas at Nasik, Rani gumpha, Udayagiri. Takti Bahai, Gandhara.

UNIT III - INTRODUCTION TO SOUTH INDIAN ARCHITECTURE- DRAVIDIAN STYLE

Introduction to temple architecture - Brief history of South India and temple architecture of temple towns -Dravidian Order - Rock cut and structural temples under Pallavas: Shore temple, Mahabalipuram and Kailasanatha temple, Kanchipuram.

UNIT IV - DRAVIDIAN ARCHITECTURE

Development of Vimana, Walled enclosures Gopurams under Cholas- Brihadeeswara Temple Thanjavur ,Darasuram Temple-Kumbakonam, Pandya-Evolution of form of Gopuram-Complexity in temple plan due to complexity in ritual – Meenakshi Amman temple, Madurai, Sri Villiputhur Andal temple.

UNIT V - DRAVIDIAN – VIJAYANAGARA, NAYAK - STYLES.

Vijayanagara- Addition of mandapas-eg-Someshwara temple, Kolar city Karnataka. Nayak- Temple cities, addition of Gopurams to existing temples-Thousand pillared mandapas**.**

TOTAL : 30 PERIODS

REFERENCES:

1. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983.
2. Satish Grover, The Architecture of India (Buddhist and Hindu Period), Vikas Publishing Housing Pvt. Ltd., New Delhi, 1981.
3. Christoper Tadgelli, The History of Architecture in India from the Dawn of civilization to the end of the Raj, Longmon Group U.K.Ltd., London, 1990.
4. Islamic Architecture, Form, Function and Meaning, Robert Hillenbrand, Edinburgh University Press, 1994.
5. Brown Percy, Indian Architecture (Islamic Period) Taraporevala and Sons, Bombay, 1983.
6. Satish Grover, The Architecture of India (Islamic) Vikas Publishing House Pvt. Ltd., New Delhi, 1981.
7. Christopher Tadgell - The History of Architecture in India - Penguin Books (India) Ltd., New Delhi 1990.
8. Francis D.K. Ching, A Global History of Architecture, John Willey & Sons Publishers, New Jersey,2007.
9. K.A NilakantaSastri,'A History of South India: From the prehistoric Times to the fall of Vijayanagara'- Oxford University press, 2007.

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24ART202	CONCEPT OF BUILDING STRUCTURES								SEMESTER-II
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To introduce various structural systems, including load-bearing, RCC, and steel structures.
- To explain the effects of different loads on buildings and the properties of structural materials.
- To familiarize students with RCC building components and their technical specifications.
- To study steel building components and their applications.
- To explore structural mechanics concepts through case studies

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand different types of structural systems and their applications in historical and contemporary architecture.	Understand
CO2	Analyse the effects of various types of loads on buildings and understand the properties of structural materials like steel, concrete, and wood.	Analyse
CO3	Apply knowledge of RCC building components and their specifications in structural design.	Apply
CO4	Understand the types and properties of steel structures, including rolled sections and members.	Understand
CO5	Analyse the principles of structural mechanics, such as stress, strain, and bending moments, and evaluate case studies of structural failures and successes.	Analyse
CO6	Apply structural design considerations in real-world architectural projects.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO STRUCTURES

Types of Structural Systems- load bearing – masonry –Framed - R.C.C and steel structures- various developments of structural system from the history-current developments and futuristic building concepts in structural systems etc.

UNIT II - BASIC STRUCTURAL CONCEPTS AND MATERIALS

Various types of loads in buildings – live load, dead load, wind load etc. - earth quake and seismic load and combination – general properties of structural material- steel – concrete – R.C.C – wood – brick – stone etc.

UNIT III - R.C.C BUILDING COMPONENTS

Structural specification of the materials, components- Explanation of structural components and its strength and use- Beam-Plinth beam, Lintel, Sill, Roof beam, cantilevered beam -Slab-R.C.C slab- one-way, two-way, cantilevered slab- Column- types-technical specifications– Footing- – Staircase

UNI IV - STEEL BUILDING COMPONENT

Types of structural steel – properties- rolled steel sections – tension members -compression members etc.

UNIT V - STRUCTURAL MECHANICS AND CASE STUDIES

Resolution – force – concepts of stress and strain – tensile stress- compressive and shear stress – bending movement and shear force for various loads and support conditions**. Design Considerations and Case Studies-Analysis of case studies featuring notable structural failures and successes.**

TOTAL : 30 PERIODS

REFERENCES:

1. R.K.Bansal – A text book on Engineering Mechanics, Lakshmi Publications, Delhi, 2005.
2. R.K.Bansal – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.
3. P.C.Punmia, Strengthof Materials and Theory of Structures; Vol.I, Lakshmi Publications, Delhi 1994.
4. S. Ramamrutham, Strength of Materials – Dhanpatrai& Sons, Delhi, 1990.
5. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989.
6. R.K. Rajput – Strength of Materials, S. Chand & Company Ltd. New Delhi 1996.

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24ART203	ENVIRONMENTAL STUDIES IN ARCHITECTURE								SEMESTER-II
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To introduce the concepts of environmental studies and ecosystems, including energy flow and ecological succession.
- To explain the types and impacts of natural resources, including renewable and non-renewable resources, and land and water issues.
- To understand biodiversity levels, services, and conservation strategies, focusing on India's biodiversity and threats.
- To study environmental pollution types, effects, control measures, and relevant environmental laws.
- To explore the impact of architecture on sustainability, including climatic influences and energy efficiency in the built environment.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the structure and functions of ecosystems, including energy flow, food chains, and ecological succession.	Understand
CO2	Analyse the types of natural resources, their use, and the impacts of land and water issues.	Analyse
CO3	Evaluate biodiversity levels and conservation methods, with a focus on India's biodiversity and threats.	Analyse
CO4	Understand the causes and control measures of various types of pollution and familiarize with environmental laws.	Understand
CO5	Assess the impact of architectural practices on sustainability and energy efficiency in the built environment.	Create
CO6	Understand the structure and functions of ecosystems, including energy flow, food chains, and ecological succession.	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION - ENVIRONMENTAL STUDIES & ECOSYSTEMS

Environment Definition, Scope and importance; Ecosystem, Structure and functions of ecosystem. Energy flow, Food chains and food webs, Ecological succession. Classification of ecosystem. Forest ecosystem, Grassland Ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT II - NATURAL RESOURCES - RENEWABLE AND NON-RENEWABLE RESOURCES

Natural resources - Renewable and Non – Renewable resources. Land resources and land use change, Land degradation, soil erosion and desertification. Forest resources - Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water resources - Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water. Use of alternate energy sources

UNIT III - BIODIVERSITY AND ITS CONSERVATION

Levels of biological diversity - genetic, species and ecosystem diversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. Bio-geographical classification of India. Biodiversity patterns (global, National and local levels).Hot-spots of biodiversity. India as a mega-diversity nation. Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

UNIT IV - ENVIRONMENTAL POLLUTION AND ACTS

Definition, causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution. Nuclear hazards and human health risks. Solid waste management and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Environment Laws (Environment Protection Act, Air Act, Water Act, Wildlife Protection Act, Forest Conservation Act).Case studies.

UNIT V - ARCHITECTURE & BUILT ENVIRONMENT Sustainability – Socio, economic & Environmental -Climatic Influences-Climate & Urban built environment- heat Island -Environmental impacts – Energy consumption- Energy Efficiency etc.

TOTAL : 30 PERIODS

REFERENCES:

1. Anonymous. 2004. A text book for Environmental Studies, University Grants Commission and Bharat Vidypeeth Institute of Environmental Education Research, New Delhi.
2. Anubha Kaushik., and Kaushik, C.P. 2004. Perspectives in Environmental Studies. New Age International Pvt. Ltd. Publications, New Delhi.
3. Arvind Kumar. 2004. A Textbook of Environmental Science. APH Publishing Corporation, New Delhi.
4. Daniel, B. Botkin., and Edward, A. Keller. 1995. Environmental Science John Wiley and Sons, Inc., New York.
5. Mishra, D.D. 2010. Fundamental Concepts in Environmental Studies. S.Chand& Company Pvt. Ltd., New Delhi.
6. Odum, E.P., Odum, H.T. and Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
7. Rajagopalan, R. 2016. Environmental Studies: From Crisis to Cure, Oxford University Press.
8. Sing, J.S., Sing. S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand & Publishing Company, New Delhi.
9. Singh, M.P., Singh, B.S., and Soma, S. Dey. 2004. Conservation of Biodiversity and Natural Resources' Publishing House, New Delhi.
10. Tripathy. S.N. and Sunakar Panda. (2004). Fundamentals of Environmental Studies (2nd ed.). Vrianda Publications Private Ltd, New Delhi.

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24ARP211	ARCHITECTURAL GRAPHICS AND COMPUTER STUDIO									SEMESTER-II
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To introduce digital drafting basics and the representation of common design symbols.
- To teach architectural drafting techniques, including geometry basics, precision tools, and layer management.
- To familiarize students with drafting documentation practices, including layout, annotation, and dimensions.
- To apply drafting skills in a mini project, involving drawings such as plans, elevations, sections, and details.
- To develop a comprehensive project involving drafting details, such as working drawings and electrical plans.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand and apply digital drafting basics and design symbols for effective representation.	Understand
CO2	Utilize drafting tools and techniques, including geometry basics, layers, and properties in architectural design.	Apply
CO3	Develop drafting documentation skills, including layout, annotation, and revisions.	Create
CO4	Create and present a mini project with comprehensive architectural drawings.	Create
CO5	Execute a detailed project involving various drafting aspects such as working and electrical drawings.	Create
CO6	Understand and apply digital drafting basics and design symbols for effective representation.	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - DRAFTING BASICS

Introduction to Digital Drafting – Representation and symbols of Design – door, window, materials, glass, etc.

UNIT II - DRAFTING FOR ARCHITECTURAL DESIGN

Geometry Basics – Creating tools – Editing tools - Precision – Layers – Properties – Blocks – Hatches

UNIT III - DRAFTING DOCUMENTATION

Layout – Annotation – Dimensions – Revisions – Print

UNIT IV - MINI PROJECT:

Mini Project – Drawings – Plan – Elevation – Section – Details

UNIT V - PROJECT WORK:

Project of drafting details – Examples like working drawing – electrical drawing etc.

TOTAL : 60 PERIODS

REFERENCES:

1. Deke McClelland, 'Photoshop 7 Bible Professional Edition', Wiley John & Son INC, New York, 2000.
2. Aouad, 'Computer Aided Design guide for Architecture, Engineering and construction', Sponprocess, 2012.
3. Mohammed Saleh Uddin, 'Digital Architecture – 3D Computer Graphics from 50 top designers', 1999.
4. Scott Onstott, 'AutoCAD 2015 and AutoCAD LT 2015 Essentials', Autodesk Official press, 2014.
5. Fiorello. J. A., 'CAD for Interiors beyond the basics', Wiley publications, 2011.

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24ARS221	ARCHITECTURAL DESIGN - II									SEMESTER-II
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	10	**Credits**			**10**

COURSE OBJECTIVE:

- Understanding a Simple Design Programme and the Components of the Design Problem.
- Investigate and Acquire the Knowledge to address the various aspects of the Design Problem and Process
- Develop Ability to Communicate Design Ideas throughout the Design Stages with multiple media.
- Ability to conceptualize a design idea by Sketching and other techniques
- Ability to do a frame work of Design methodology
- Ability to understand the process of Design and deliver the Architectural Design with Technical Drawings

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the basic functional aspect of designing simple building type and its relevant spatial organization.	Understand
CO2	Learn and reciprocate and sensitize the design/concept to the environment and the design skill of the project	Understand
CO3	Transform the theoretical ideas to the tangible output of design	Apply
CO4	Understand the space organization, space- volume design approach	Understand
CO5	Research, Analyse and Deliver an Architectural Design.	Analyse
CO6	Communicate effectively through the design idea	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

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CONTENT

DESIGN PROCESS

Design Process: Basics: Drawing skills, Conventions, Abstraction and Expression; Application: Analysis, Exploration, Discovery and Verification; Communication: Process, Individual Design, Team Design, and Public Design. Evolution from Program and Conditions to Concept & Design - Graphical Representation of the Process.

SPACE STANDARDS

The study of space standards and anthropometrics related to each problem. Anthropometry as related to physically handicapped and elderly persons is required to be studied. Different Techniques shall be used for presentation.

DESIGN STRTATEGIES AND METHODS

Design Strategies and Methods. Designing in Context; Design & Function; Constituents of Design; Working with materials and Structures; Arriving at Ideas. Methods: Nature & Geometry as generators; Music and Mathematics as models; Precedent; Responses to Site; Generative Processes. Traditional Methods, New Methods, the Three Stage Process – Divergence, Transformation, Convergence; Choosing Design Strategies.

DESIGN EXCERCICES-I

Horizontal movement - single bay - passive energy type spaces. Design Exercises shall be simple functional units with universal access compliance such as: Toilet for a physically handicapped person. Hostel room, bed room, kitchen, Shop, Workshop, pavilions, snack bar;

DESIGN EXCERCISES-II

The problems involve simple space organization. Design Exercises shall be multiple spaces and understanding their inter-relationships, such as: Residence, petrol bunk, fire station, police station, Cottage for an elderly couple.

The basics of building anatomy from parapet to foundation and an overview of the different building materials shall be explained at the beginning of the design studio.

TOTAL : 150 PERIODS

REFERENCES:

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Education; 4th edition, 2014..
2. Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2011.
3. Ernst Neuferts Architects Data, Blackwell 2012.
4. Ramsey et al, Architectural Graphic Standards, Wiley 2008.

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24ARS222	BUILDING MATERIALS AND CONSTRUCTION - II								SEMESTER-II
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5	**Credits**			**4**

COURSE OBJECTIVE:

- Understand the design process, including drawing skills and concept development.
- Study space standards and anthropometrics for diverse user needs.
- Explore and apply various design strategies and methods.
- Complete design exercises involving functional units with universal access.
- Design complex projects with multiple spaces, understanding their inter-relationships.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand and apply the design process, including drawing skills, abstraction, and graphical representation.	Understand
CO2	Apply space standards and anthropometric considerations in design, including for special needs.	Apply
CO3	Develop and implement design strategies and methods, including contextual and material-based approaches.	Create
CO4	Complete design exercises involving functional units with universal access compliance.	Create
CO5	Design and present complex projects involving multiple spaces, understanding their inter-relationships.	Create
CO6	Understand and apply the design process, including drawing skills, abstraction, and graphical representation.	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - R.C.C –FOOTING

Detailed drawings and specs- BOQ.Footing-isolated, combined, continuous- Rectangular, Square. Hands on training to understand bar bending, stirrups rod and extra rod for a typical footing.

UNIT II - R.C.C - COLUMN

Column marking layouts- types-detailed drawings ,hands on training on sample column marking

UNIT III - R.C.C - PLINTH, GRADE AND LINTEL BEAMS

General arrangement drawings and detailed drawings, site visit and discussion with laymen to understand the site level structural importance

UNIT IV - R.C.C -BEAM AND SLAB

General arrangement drawings. Detailed beam drawings/ sections. Site visit and discussion with laymen to understand the site level structural importands.

UNIT V - R.C.C - STAIRCASE

Types-doglegged- bifurcated-quarter turn- Spiral – helical- handrail and baluster detail etc. Parallel update in current trending staircase installations(floating, staircase ,folded plate etc.,)

TOTAL : 90 PERIODS

REFERENCES:

1. M.S.Shetty, 'Concrete Technology', S.Chand, 2005.
2. S.K. Duggal, 'Building Materials', New Age International Publishers, 2016.
3. B.C.Punmia et al, 'Building Construction', Laxmi Publications, 2016.
4. T.D Ahuja and G.S. Birdie, 'Fundamentals of Building Construction', Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996
5. S.P Arora and S.P Bindra, 'A Text Book of Building Construction', Dhanpat Rai Publishing Company Pvt. Ltd, 2010.
6. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge, 2010.
7. S.N Sinha, 'Reinforced Concrete Design', Tata-McGraw Hill, New Delhi, 2002
8. R. Chudley et al**,** 'Construction Technology', Heinemann, 2011

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24AROES241	MODEL MAKING AND ARCHITECTURAL DELINEATION								SEMESTER-II
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To introduce the fundamentals of model making and various tools for architectural representation.
- To explore diagramming techniques for architectural delineation including conceptual sketches and projections.
- To understand and apply different model making techniques and materials for architectural design.
- To develop skills in creating presentation models with appropriate scales and techniques.
- To utilize study models as tools in the architectural design process, including presentation and visual communication.

COURSE OUTCOMES:

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

COs	Course Outcomes	Blooms Level
CO1	Understand and apply different model making techniques and tools for architectural representation.	Understand
CO2	Create and Analyse conceptual sketches and diagrams using various techniques for architectural delineation.	Create
CO3	Utilize various model making materials and techniques to explore design processes and fabrication.	Apply
CO4	Develop and present architectural models in different scales and techniques for effective design communication.	Create
CO5	Incorporate study models into design presentations, enhancing visual communication through effective photography and presentation techniques.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**S**	**S**	**M**	**L**	**S**	**M**
CO2	**S**	**S**	**L**	**S**	**M**	**M**	**L**	**S**	**L**
C03	**S**	**L**	**L**	**-**	**M**	**-**	**-**	**L**	**S**
CO4	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	**S**	**L**	**-**	**-**	**L**	**-**	**M**	**L**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO MODEL MAKING

Importance of model making in architectural design, types of architectural models and their purposes. Free hand sketching in architectural representation- pen, charcoal, ink, water colour, paints,mixed media,collages, lino cutting, print making as tools.

UNIT II - DIAGRAMMING

Conceptual sketches - Plan, section, elevation, perspectives, isometric / oblique projections, axonometric / parallel projection, photography and montage as techniques in Architecturaldelineation from study till presentation. Unit I & II can be explored by way of assignments that require study, analysis, documentationwith weightage given to representational expression and techniques.

UNIT III - DESIGN PROCESSES AND MODEL MAKING TECHNIQUES

Generative / geometry, fractals, parametrics / material explorations (both in traditionalmaterials like mount, Foam, thermacoel, clay, plaster of Paris, paper Mache, wood and newage materials like polystyrene, Aerocon blocks, plastics, meshes, and processes likecarpentry, casting, moulding, welding ,laser cutting etc. Overview of materials commonly used in architectural model making.

Unit III can be explored with exercises that involve research through a process for examplenature to structure and the evolution of a structural system that can be fabricated to scale.

UNIT IV - PRESENTATION MODELS

Understanding scale and proportion in architectural models, Guidelines for choosing appropriate scales for different design stages and presentation purposes. Exploration in varying scales of models through instruction in techniques- Residential tour - Historic / Contemporary buildings - Exercises involving topography, textures, landscapes, human elements etc.

UNIT V - STUDY MODELS AS A TOOL IN ARCHITECTURAL DESIGN PROCESS

Techniques for effectively presenting architectural models, Photography and lighting considerations for capturing model images, incorporating models into design presentations and portfolios. Enhancing visual communication and representation.

TOTAL : 60 PERIODS

REFERENCES:

1. Mo Zell – The Architectural Design course, Understand the Principles and MasterThe Practices, Thames, and Hudson, 2008.
2. Neil Bingham – 100 Year of Architectural Drawings 1900 – 2000, Laurence King,2013
3. Robert. W Gill – Rendering with Pen + Ink - Thames, and Hudson – 2007.
4. Leon Krier Drawing for Architecture – Michael God well – 2007
5. Marco Frascari - Eleven Exercises in the art of Architectural Drawing, Routledge, 2011
6. Natascha Meuser, Construction and manual Architectural Drawings, DOM Publisher, 2012
7. Rendow Yee, Architectural Drawing A visual Compendium of Types and Methods,Wiley, 2013
8. David Dernie, Architectural Drawing, Laurence King, 2010.
9. Lorraine Farrelly, Representational Techniques, AVA, 2011.

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SEMESTER-III

24ART301	**HISTORY OF ARCHITECTURE - II**									**SEMESTER- III**	
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**		**3**
Instruction Hours /week		**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To provide an overview of Islamic architecture and its historical influences, particularly in India.
- To explore the development and characteristics of provincial and Mughal architectural styles.
- To understand the architectural developments and characteristics of West Asian styles, including Egyptian and Mayan architecture.
- To study Greek architectural orders and their significance in classical architecture.
- To examine Roman architecture, including building systems, typologies, and engineering achievements.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Analyse the history and characteristics of Islamic architecture and its development in India.	Analyse
CO2	Compare and contrast provincial and Mughal architectural styles with specific examples from different regions.	Analyse
CO3	Describe the architectural characteristics and influences of West Asian styles, including Egyptian and Mayan architecture.	Understand
CO4	Identify the Greek architectural orders and their application in notable structures.	Apply
CO5	Assess Roman architectural achievements, including building systems and typologies, and their impact on architecture.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**L**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**L**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**L**
CO6	**S**	**M**	**S**	**L**	**L**	**L**	**L**	**L**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO ISLAMIC ARCHITECTURE

History of Islam- Influences on Islamic Architecture - character of Islamic architecture with examples. Sources of Islamic Architecture in India and influences on them - Brief history development of Architectural style during the rule of the slave, Khilji, Tuqlaq Sayyid and Lodhi Dynasties - important Examples for each period.

UNIT II - PROVINCIAL & MUGHAL STYLES

Development of the provincial styles in different regions - Punjab, Jaunpur, Bengal, Gujarat, Malwa, the Deccan (Bijapur, Golconda, Bidar and Gulbarga) - important examples for each style.

Development of the Mughal style under the different rulers - Babur, Shershah, Humayun, Akbar, Jahangir, Shahjahan, Aurangazeb - important examples - development of the Mughal garden - important examples.

UNIT III - WEST ASIAN ARCHITECTURE

Introduction to West Asian Style - Egypt: Factors influencing Architecture - Outline of Architectural Character, Evolution of Pyramids – Great Pyramid of Cheops, Giza, , Architecture characteristics of Egyptian temples - Great temple of Ammon, Karnak, Temple of ramses, Abu Simbel. Mayan: Outline of Architectural Character – City of Chichen Itza- El Castillo, Temple of Warriors, The Great Ballcourt – Tikal and Teotihuacan - Pyramid of the Sun, Pyramid of the Moon.

UNITI V - GREEK

Outline of architectural character - Orders in architecture - Doric Ionic, Corinthian, Acropolis, Athens; Parthenon, Erecthion, Theatre Epidaurus

UNIT V - ROMAN

Outline of architectural character: roman orders (Doric, ionic, Corinthian, Tuscan and composite)

Building Systems - Use of arches, vaults and columns

Building Typology: Religious Buildings – Temple (Pantheon); Civic Buildings – Baths (Thermae of Caraculla), Theatres (Colloseum), Circus (Circus Maximus), Palace (Forum Romanum); Engineering works – Aqueducts, bridges

Paris-Westminster Abbey, Hampton court palace, London, Doges Palace, Venice, Milam Cathedral.

TOTAL : 30 PERIODS

REFERENCES:

1. Sir Banister Fletcher, A History of architecture, CBS publications (Indian Edition) 20th Edition 2002.
2. Archana Venkatesan, Crispin Branfoot‘ In Andal’s Garden” -Marg’s quarterly publications.
3. George Mitchell , Indira Viswanathan Peterson ’The great Temple of Thanjavur” -Marg’s quarterly publications.
4. Christopher Tadgell, ’The history of Architecture in India-From the dawn of civilization to the end of Raj’-Phaidon 2002.
5. Burton Stein,’ A history of India’, John Wiley & Sons 2010.
6. K.A NilakantaSastri, ’A History of South India: From the prehistoric Times to the fall of Vijayanagara’- Oxford University press, 2007.

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24ART302	DESIGN OF STRUCTURES - I								SEMESTER-III
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To understand the principles and design procedures for various types of footings in structural engineering.
- To learn the design techniques for different types of columns, including short rectangular, square, and circular columns.
- To apply design methods for various types of beams, including simply supported and continuous beams.
- To master the design principles for different types of slabs, including one-way and two-way slabs.
- To design different types of staircases with a focus on dog-legged staircases

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Describe and design various types of footings, including shallow and deep foundations.	Understand
CO2	Design different types of columns, including axially loaded, rectangular, square, and circular columns.	Apply
CO3	Apply design principles to various types of beams, including simply supported and continuous beams.	Apply
CO4	Design one-way and two-way slabs, and understand their applications in structural design.	Analyse
CO5	Design dog-legged staircases and understand their structural requirements.	Create
CO1	Describe and design various types of footings, including shallow and deep foundations.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - DESIGN OF FOOTINGS
Types – shallow and deep foundation- Design of rectangular Footing.

UNIT II - DESIGN OF COLUMNS
Types of columns –Axially Loaded columns — Design of short Rectangular Square and circular columns

UNIT III - DESIGN OF BEAMS
Types of Beams - Simply supported- rectangular beams- continuous beam- Design of Rectangular Beams

UNIT IV - DESIGN OF SLABS
Types-one way – two ways – rectangular slab- simple supported- Design of one way and two way slab.

UNIT V - DESIGN OF STAIRCASE
Types of Staircases — Design of dog-legged Staircase

TOTAL : 30 PERIODS

REFERENCES:

1. R.K. Bansal, 'A Text Book on Strength of Materials', Laxmi Publications, New Delhi,2006
2. B.C. Punmia et al, 'SMTS-I, Strength of Materials', Laxmi Publications, 2015.
3. M.M. Ratwani& V.N. Vazirani, 'Analysis of Structures, Vol. 1', Khanna Publishers,Delhi 2012
4. Timoshenko, S.P. and D.H. Young, 'Elements of Strength of Materials', 5th edition, East
5. West Press, 2011.
6. A.R. Jain and B.K.Jain, 'Theory and analysis of structures', Vol. 1, Nemchand and Bros,
7. Roorkee, 1987.
8. R.K. Rajput, 'Strength of Materials', S.Chand, 2006.

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24ART303	CONCEPT OF BUILDING SERVICES								SEMESTER-III
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE :

- To understand water characteristics, including sources, quality, quantity, and the need for water treatment.
- To learn the fundamentals of sewage treatment and sewerage systems, including environmental sanitation and rainwater disposal.
- To understand electrical systems and principles of illumination, including electricity basics, protective devices, and illumination theory.
- To grasp mechanical systems, focusing on pumps, hot water boilers, and basic refrigeration principles.
- To explore the fundamentals of acoustics, including sound waves, noise control, and acoustic measurements.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Describe the characteristics of water, including sources, quality, impurities, and treatment needs.	Understand
CO2	Explain the fundamentals of sewage treatment, sewerage systems, and environmental sanitation.	Apply
CO3	Apply principles of electrical systems and illumination in real-world scenarios.	Apply
CO4	Describe the mechanical systems principles, including pumps, boilers, and refrigeration.	Understand
CO5	Analyse acoustic properties and apply noise control techniques in building design.	Analyse

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - WATER CHARACTERISTICS AND QUALITY

Surface and ground water sources - quality/quantity - nature of impurities – need for treatment

UNIT II - FUNDAMENTALS OF SEWAGE TREATMENT AND SEWERAGE SYSTEMS

Environmental sanitation - Sanitation in buildings. Arrangement of sewerage systems in Housing - Rainwater disposal and storm water drainage from buildings.

UNIT III - ELECTRICAL SYSTEMS AND ILLUMINATION

a) Basics of electricity - Single/Three phase supply - Protective devices in electrical installations - Earthing for safety -Types of earthing - ISI specifications. b) Principles of illumination: Modern theory of light - Synthesis of light - Additive and subtractive synthesis of colour -Luminous flux - Candela - Solid angle illumination - Utilization factor - depreciation factor - MSCP - MHCP -Laws of illumination.

UNIT IV - MECHANICAL SYSTEMS

a) Pumps – uses & types and their selection, installation and maintenance, Hot Water Boilers.b) Basic refrigeration principles: Thermodynamics - Heat - Temperature, measurement transfer - Change of state Sensible heat - Latent heat of fusion, evaporation, sublimation - Saturation temperature - Super heated vapour -subcooled liquid - pressure temperature relationship for liquids – Refrigerants.

UNIT V - FUNDAMENTALS OF ACOUSTICS

Sound waves, frequency, intensity, wave length, measure of sound, decibel scale, speech and music frequencies.Types of noises, transmission of noise, transmission loss, noise control and sound insulation and remedial measures, determination of density of a given building material, absorption co-efficient and measurements, choice of absorption material, resonance, reverberation, echo, exercises involving reverberation time and absorption co-efficient.

TOTAL : 30 PERIODS

REFERENCES :

1. William H.Severns and Julian R.Fellows, Airconditioning and Refrigeration, John Wiley and Sons, London, 1988.
2. Robert D.Finch, Introduction to Acoustics, Prentice Hall of India Private Limited, New Dehli, 2008.
3. MARK J. HAMMER MARK J. HAMMER, JR, Water and Wastewater Technology, PHI Learning Private Limited, NewDelhi. 2009.
4. M.N.Rao, A.K.Datta, Waste Water Treatment, Oxford & IBH PUBLISHING CO. PVT. LTD,New Delhi,2007.
5. Section 11. Sanitary Appliances and Water Fittings.IS Code- SP: 21-1983.
6. Hand book on Water Supply and Drainage with Special emphasis on plumbing IS Code – SP : 35 – 1987.
7. Part of Section 1: Water Supply. IS CODE – SP : 7 – 1992.
8. IS Code of Basis Requirements for Water supply drainage and sanitation. IS Code – IS 1172: 1983.
9. Code of Practice for Water Supply in Buildings. IS Code – IS 2065: 1983.

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24ARP311	SURVEYING , LEVELLING AND SITE PLANNING								SEMESTER-III
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To introduce the principles and methods of chain surveying and leveling, including various instruments and techniques.
- To understand and apply theodolite surveying techniques, including measurement of angles and setting out angles.
- To explore contouring methods and their applications in surveying.
- To understand the use of modern surveying tools like Total Station, GIS, LIDAR, and photogrammetric surveys.
- To Analyse and plan sites effectively, considering various site characteristics and preparing site analysis diagrams.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Describe and apply principles of chain surveying and levelling, including methods of contouring.	Understand
CO2	Perform theodolite surveying techniques to measure angles and solve related problems.	Apply
CO3	Demonstrate contouring techniques and their applications in surveying.	Apply
CO4	Utilize Total Station, GIS, LIDAR, and photogrammetric methods for modern surveying practices.	Analyse
CO5	Conduct site analysis and planning, considering factors such as accessibility, land characteristics, and climate.	Analyse
CO6	Student will learn about the item planning principles, methods and its applications in architectural design.	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO CHAIN SURVEY AND LEVELLING

Chain survey- principles- classification- instruments used, ranging, reciprocal ranging, Levelling, methods of levelling, booking and reduction of levels, longitudinal levelling, cross sectioning, errors in levelling, problems in levelling, contouring- plane table survey – radiation, Intersection, traversing and resection (experiment – 2nos)

UNIT II - THEODILITE SURVEY

To understand Theodolite survey, measurement of horizontal and vertical angles, problems tackled like centre line of building, setting out angles- Rise and fall method- Dumpy level, ***Traversing method, Cutting and Filling Method,*** etc.

UNIT III - CONTOURING

Characteristics of contours, direct and indirect methods of contouring

UNIT IV - TOTAL STATION, GIS, LIDAR AND PHOTOGRAMMETRIC SURVEY

Total Station Survey- Introduction of GIS and GPS, LIDAR – Light detection and ranging scan, Photogrammetric survey, Aerial survey – Drone etc

UNIT V - SITE INVENTORY, SITE ANALYSIS AND SITE PLANNING

Importance of site analysis - factors involved in accessibility - site characteristics - land, contours, water shed, climate and topography, preparation of site analysis diagram . Survey Camp (Outdoors)

TOTAL : 60 PERIODS

REFERENCES:

1. Kevin Lynch, 'Site Planning', Third Edition, MIT Press, 1984.
2. Edward. T. White, 'Site Analysis', Archi Basic Press, 2014.
3. B.C.Punmia et al, 'Surveying Vol.I', Seventeenth Edition, Laxmi Publications, 2016..
4. Joseph De.Chiarra and Lee Coppleman, 'Urban Planning and Design Criteria', Van Nostrand Reinhold Co., 1982.
5. Strom Steven, 'Site Engineering for Landscape Architects', John Wiley & Sons, 2013.
6. P.B.Shahani, 'Text of Surveying Vol.I', Oxford and IBH Publishing Co, 1980
7. 'Development Control Rules', CMDA 2008.
8. Genevieve S. Baudoin, 'Interpreting Site: Studies in Perception, Representation, and Design', Routledge, 2015

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24ARS321	ARCHITECTURAL DESIGN - III								SEMESTER-III
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	10	**Credits**			**10**

COURSE OBJECTIVE:

- To create understanding of human-built environment as a holistic, living entity from macro to micro scales, and shaped by geographic and socio-cultural forces as well as by historic, political and economic factors, through study of and design within the context of rural settlements.
- Understanding the Design Programme and the Components of the Design Problem & Investigate and Acquire the Knowledge to address the various aspects of the Design Problem and Process
- Develop Ability to Communicate Design Ideas throughout the Design Stages with multiple media & Ability to conceptualize a design idea by Sketching and other techniques
- Ability to do a frame work of Design methodology
- Ability to provide authentic documentation report and research papers supporting through proper Architectural & Technical Drawings
- To enable a comprehensive **study of rural settlement** and architecture in order to understand them as exemplar of collective design that evolved through various parameters.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Analyse the distinctive features and challenges of rural environments, including economic and infrastructure aspects.	Analyse
CO2	Apply participatory design methods and involve rural communities in the design process.	Apply
CO3	Conduct field surveys and case studies in rural areas to gather and Analyse data effectively.	Analyse
CO4	Document and preserve the historical and cultural heritage of rural areas through various research methods.	Apply
CO5	Student will understand the essence of rural planning	Understand
CO5	Design sustainable and culturally sensitive solutions tailored to the needs and traditions of rural communities.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**L**	**L**
CO2	**L**	**L**	-	-	-	-	-	**L**	**L**
CO3	**L**	**S**	-	-	-	-	-	**M**	**L**
CO4	**L**	**S**	-	-	-	-	-	**M**	**L**
CO5	**L**	**L**	-	-	-	-	-	**L**	**L**

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CONTENT:

Understanding Rural Contexts: Students would learn about the distinctive features of rural environments, including population density, economic activities, infrastructure limitations, and community dynamics. The aim is to equip designers with the knowledge and skills necessary to address the unique challenges and opportunities presented by rural contexts.

Students might explore participatory design methods, community workshops, and ways to involve residents in the design process.

Case Studies and Fieldwork: Hands-on learning through case studies and field visits to rural areas could be a significant part of the course, allowing students to gain practical insights and apply theoretical knowledge in real-world contexts. Field surveys involve collecting data through direct observation, interviews, questionnaires, and focus group discussions in rural areas.

Historical and Cultural Documentation: Documenting the historical and cultural heritage of rural areas is important for preserving traditions, promoting cultural tourism, and fostering community identity. This may involve archival research, oral history interviews, heritage mapping, and documentation of traditional practices, rituals, and folklore.

Cultural Sensitivity: Understanding and respecting the cultural heritage and traditions of rural communities is essential. The course may cover topics like vernacular architecture, cultural preservation, and inclusive design.

Design for Sustainability: Given the importance of sustainability in rural areas, the course might delve into eco-friendly design practices, resource management, and ways to minimize environmental impact.

TOTAL : 150 PERIODS

REFERENCES:

1. Amos Rapoport, 'House, Form and Culture', Prentice Hall, 1969.
2. Bernard Rudofsky, 'Architecture without Architects', MoMA, 1964.
3. Rajendra Kumar Sharma, 'Rural Sociology', Atlantic, 2011.
4. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional 2001.
5. Ramachandran H, 'Village Clusters and Rural Development', Concept Publications, 1980.
6. A Strategic Perspective" by Katar Singh,2009.
7. Traditional Architecture: Timeless Building for the 21st Century by Neelkanth Chhaya
8. Rural Architecture of Northern India" by Madhu Jain,

.

24ARS322	BUILDING MATERIALS AND CONSTRUCTION - III									SEMESTER- III
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5	**Credits**			**4**

COURSE OBJECTIVE:

- To understand the importance and types of architectural models and freehand sketching techniques.
- To create and interpret conceptual sketches, including plans, sections, elevations, and perspectives.
- To explore generative and parametric design processes, including traditional and new materials and techniques.
- To apply appropriate scales for different presentation stages and techniques in model making.
- To use models effectively in presentations, including photography and lighting for visual communication.
- To evaluate and critique architectural models based on design principles and practical applications.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Describe and design steel foundations, including structural sections, connections, and roof trusses.	Understand
CO2	Design and detail various types of steel columns and joints, including site-specific layouts.	Apply
CO3	Create detailed drawings for steel beams, trusses, roofs, and space frames, including current architectural trends.	Create
CO4	Develop detailed drawings for steel floors and staircases, understanding their structural implications.	Create
CO5	Explore and design steel components for doors, windows, partitions, and furniture, with an emphasis on safety and market applications.	Create
CO6	Apply metal innovatively in building projects.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - STEEL - BUILDING FOOTING

Steel foundation – Structural steel sections - types of connections in steel -steel in foundations, columns and beams - different types of steel roof trusses including north light truss - space frames - materials for roof covering. Steel staircases and handrails, balustersgeneral arrangement and detailed drawings

UNIT II - STEEL COLUMN, JOINTS- TYPES

Column marking layouts- types-detailed drawings. site visit to pre engineering building

UNIT III - STEEL BEAMS AND TRUSS AND ROOF

General arrangement drawings and detailed drawings- north light – Space frames – roof covering etc. expert talk about current architectural exploration.

UNIT IV - STEEL FLOORS AND STAIRCASE

Staircase- detailed drawings

Floor- Detailed drawings

UNIT V - DOOR, WINDOWS AND PARTITIONS

Safety door- dock door- cold storage door-etc

Partitions, Furniture etc- Steel doors and windows – safety doors, dock doors, cold storage doors, revolving doors - collapsible gates - rolling shutters. Steel in furniture and other interior uses. site visit for market study.

TOTAL : 90 PERIODS

REFERENCES:

1. P.C Varghese, 'Building Materials', Prentice Hall of India, 2015.
2. S.K. Duggal, 'Building Materials', New Age International Publishers, 2016.
3. B.C.Punmia et al, 'Building Construction', Laxmi Publications, 2016.
4. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge, 2010
5. Mark Lawson, Peter Trebilcock, 'Architectural Design in Steel', Taylor and Francis, 2004.
6. Terri Meyer Boake, 'Understanding Steel Design', Birkhauser, 2011.

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24ARS323	CLIMATOLOGY AND BUILDING PHYSICS								SEMESTER-III
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To study about global climate and the influencing factors of climate change in environment
- To understand about the overall climate for a certain location
- To understand about the Microclimatic factors and its influences in a built environment
- To understand about the solar geometry and its impacts in a building
- To understand the daylighting, air movement principles & its applications for human comfort with good indoor environmental quality
- To understand about the Classification of climate and Design strategies recommendations for each climatic Zone

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the whole climatic scenario of the world	Understand
CO2	Learn about the Solar geometry, sun path its irradiation effects and control	Understand
CO3	Learn about heat transfer in buildings due to materials and design implications.	Apply
CO4	Understand about the Various ventilation principles and techniques for good ventilation	Understand
CO5	Assess hybrid design strategies and its design applications for different climatic zones	Evaluate
CO6	Develop the skill of creating a climatic design for any building with optimum recommendations.	Create

Blooms keyword: Remembering, Understanding, Applying, Analyzing, Evaluating, Creating

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

UNIT I - ECOLOGY, CLIMATE AND THERMAL COMFORT

Introduction and understanding of ecology of the planet, Earth formation, resources sun-Latitude, longitude,

Altitude-Factors that determine climate -Climatic zones of the world, India –Climate classifications - characteristics- Climatic Changes Thermal comfort parameters – standards – ASHRAE,ISHRAE,EPW,-Climatic data and design recommendations- Mahoney's tables,

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Psychrometric chart, Bioclimatic chart and Microclimate- -Built forms – Natural and manmade features – vegetation- Urban heat Island effects

UNIT II - BUILDING PHYSICS- SOLAR CONCEPTS

Sun movement -Sun path diagram – Solstice –Solar shading –Material properties of heat transfer -Wall, roof, ground, fenestration materials– Heat Transfer mechanisms - Conductivity, Resistivity, Surface resistance and air cavities– Air to air transmittance (U value) –Time lag and decrement factor –heat gain and loss calculations

UNIT III - BUILDING PHYSICS - VENTILATION CONCEPTS

Ventilation concepts- Built form and effects - Air currents-windward and leeward side pressure – Air movement through the buildings – Fenestration techniques– Window Floor Ratio- ventilation percentage- Thermally induced air currents – Stack effect, Venturi effect , Fin walls etc.,

UNIT IV - BUILDING PHYSICS -LIGHTING CONCEPTS

Day lighting concepts – Natural lighting – Daylight level –Day light Factor- Illuminance levels -design sky
illuminance-Artificial lighting – Lighting techniques – Types of lighting -Artificial lighting calculation for a Small Space

UNIT V - CLIMATIC DESIGN STRATEGIES

Passive design –-Cooling and heating techniques and Applications – Passive and Active solar-Direct gain systems - Glazed walls, Bay windows,
sun space- Indirect gain systems-Trombe wall, Solar Chimney, Roof pond, Roof radiation trap, Solarium etc.
Cooling Technique and Applications– Evaporative cooling, earth berming, Wind Towers, earth air tunnels, Air Vents, Insulation,Thermal wall ,various roof profiles etc

TOTAL : 60 PERIODS

REFERENCES:

1. B. Givoni, Man, 'Climate and Architecture', Architectural Sciences Series, Applied Science Publishers Ltd.,London, 1981
2. B. Givoni, 'Passive and Low Energy Cooling of building', Van Nostrand Reinhold, NewYork,1994 and latest version
3. Mili Majunder, Teri – Energy – Efficient Bldgs. in India – Thomson Press, New Delhi – 2001
4. Arvind Krishnan, Szokolay et.al, 'Climate Responsive Architecture- A Design Handbook for Energy Efficient Buildings', Tata McGraw Hill, 2017.Heating, Cooling and Lighting – Norbert Lechner, October 2014
5. Mark Dekay, G. Z. Brown, Sun,Wind and light – Architectural Design Strategies ,Feb 2013
6. N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi.2012
7. O.H. Koenigsberger and others (1993), Manual of Tropical Housing and Building –Part I - Climate design, Orient Longman, Madras, India
8. Martin Evans, 'Housing Climate and Comfort', Architectural Press, London, 1980.
9. Benjamin H. Evans, 'Day lighting in Architecture', Mcgraw Hill, 1981.
10. BIS – Indian Standards – Services ,Lighting , Approach to sustainability
11. Olgyay. (2015, September 1). Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and Expanded Edition.
12. Lechner, N. (2008, November 24). Heating, Cooling, Lighting: Sustainable Design Methods for Architects. https://doi.org/10.1604/9780470048092

SEMESTER-IV

24ART401	HISTORY OF ARCHITECTURE - III								SEMESTER- IV
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To examine Romanesque architecture, focusing on arches, vaults, and key examples from Italy, France, and England.
- To understand Gothic architectural evolution and structural innovations through notable examples.
- To study the phases of Italian Renaissance architecture and significant works by major architects.
- To explore Northern Renaissance architecture and the contributions of key figures like Sir Christopher Wren.
- To identify and Analyse the features of Baroque architecture using prominent examples.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the principles of Romanesque architecture, including the use of arches and vaults, and identify key examples.	Understand
CO2	Analyse the development and structural systems of Gothic architecture through examples like Notre Dame and Westminster Abbey.	Analyse
CO3	Understand the phases of Italian Renaissance architecture and the contributions of architects such as Alberti and Michelangelo.	Understand
CO4	Evaluate the characteristics of Northern Renaissance architecture and the works of Sir Christopher Wren and Inigo Jones.	Apply
CO5	Analyse the features of Baroque architecture through significant structures like the Winter Palace.	Analyse
CO6	Create a comparative analysis of architectural styles and their influences across different periods and regions.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**L**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**L**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**L**
CO6	**S**	**M**	**S**	**L**	**L**	**L**	**L**	**L**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - ROMANESQUE

Factors influencing architecture - Building Systems - Use of arches, vaults, columns, piers, buttresses and roofs. Outline of architectural character of Italy, France and England - Examples: Pisa complex, Italy Abbay aux Hommes, Caen, Tower of London.

UNIT II - GOTHIC

Outline of Architectural character - evolution of vaulting and development of structural systems - Examples: Notre Dame, Paris - Westminster Abbey, Hampton Court Palace, London, Doges Palace, Venice, Milan Cathedral.

UNIT III - ITALIAN RENAISSANCE

Renaissance – Introduction. Italian Renaissance - three phases – early Renaissance (Alberti - S. Andrea, Brunelleschi - Cathedral of Florence, Pazzi Chapel, Basilica San Lorenzo) , High Renaissance (Bramante - Santa Maria delle Grazie) , Late Renaissance (Michelangelo, Palladio -St. Peter's Basilica, Villa Capra La Rotonda)

UNIT IV - NORTHERN RENAISSANCE

Northern Renaissance – Introduction; Characteristics of English Renaissance – Works of Sir Christopher Wren, Inigo Jones.

UNIT V - BAROQUE

Baroque – Features and Elements of Baroque - St Paul's Cathedral, Palace of Versailles., Winter Palace in Saint Petersburg.

TOTAL : 30 PERIODS

REFERENCES:

1. Francis D.K. Ching ‘A global history of Architecture ‘-John Wiley’s sons, 2nd edition 2010
2. Spiro Kostof-A history of Architecture-Setting and Rituals, -Oxford university, Press London,1986
3. Sir Banister Fletcher, A History of architecture, -CBS publications (Indian Edition) 20th Edition 2002.
4. Percy brown, ‘Indian Architecture (Islamic Period)’-Taraprevala and Sons, Bombay, 2014.
5. Robert Hillenbrand, ‘Islamic Architecture-Form, Function and Meaning,’-Columbia University Press, 2004.
6. RomilaThapar,’Thepenquin history of early India’,-Penguin, 2015.
7. G.K.Hraskar- The great Ages of world architecture-Dhanpat Rai Publications
8. Sharmin Khan, History of Islamic Architecture-Delhi sultan, Mughal and Provincial periods-CBS publications

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24ART402	DESIGN OF STRUCTURES - II								SEMESTER-IV
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To get introduced to basic structural members in timber and steel.
- To give knowledge to design different timber components in a building.
- To enable an understanding of the types, efficiency and strength, advantages and disadvantages of rivet and welded joints in steel.
- To enable the design of tension (beams) and compression (columns) steel members in a building under different conditions.
- To gain understanding in Timber beams
- To Understand the concept of Structural system of Steel sections

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand about Various Timber sections	Understand
CO2	Understand about the design timber beams and columns by applying the code provisions.	Understand
CO3	Understand about the Steel Sections and its usage.	Understand
CO4	Design steel joints for maximum efficiency and strength.	Apply
CO5	Design tension and compression members for different conditions by applying the code provisions	Create
CO6	Design different types of laterally unsupported & supported beams for different conditions.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - STEEL SECTIONS AND WELDED JOINTS

Types of Steel -Properties of structural steel – I.S. rolled sections – Concept of Limit State Design - design of fillet weld

UNIT II - TENSION MEMBERS

Types of Tension members and sections –modes of failure - Design of plate and angle tension members-design of built-up tension Members

UNIT III - COMPRESSION MEMBERS

Types of compression members and sections - short and slender columns - Effective Length - Slenderness ratio - Design of single section and built-up section

UNIT IV - STEEL BEAMS

Types of steel Beam sections - General specs- Design of Laterally supported beams

UNIT V - TIMBER BEAMS

Grading – design of timber beams etc

TOTAL : 30 PERIODS

REFERENCES:

1. M.R. Shiyekar, 'Limit State Design in Structural Steel', PHI Learning Private Limited, 2010.
2. N. Subramanian, 'Design of Steel Structures', Oxford Higher Education, 2008.
3. S.K. Duggal, 'Limit State Design of Steel Structures', McGraw Hill Education, Private Limited,2010.
4. Dr. V. L. Shah & Prof. Veena Gore, 'Limit State Design of Steel Structures', Structures Publications, Pune, 2012.
5. S.S. Bhavikatti, 'Design of Steel Structures by Limit State Method as per IS800-2007', I.K.International Publishing House Pvt, Ltd, 2012.

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24ARP411	COMPUTER STUDIO - II									SEMESTER-IV
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To introduce 3D modeling basics and its importance in design.
- To familiarize with 3D software interface and essential tools.
- To develop skills in creating and manipulating 3D models with materials and textures.
- To understand rendering techniques, including lighting and camera views.
- To apply 3D modeling skills in a project using AI tools for rendering.
- To develop the skill of video presentations as required in architectural practice.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the basics of 3D modeling, including different types of models and their significance.	Understand
CO2	Analyse 3D software tools for navigation, editing, and viewing.	Apply
CO3	Create and manipulate 3D models, incorporating materials and textures using solid and mesh modeling techniques.	Create
CO4	Evaluate and implement rendering techniques, including materials, lighting, and camera views for effective visualization.	Apply
CO5	Apply 3D modelling and rendering skills to a project, using AI tools and plugins for practical application.	Apply
CO6	Understand about the latest developments of digital applications in Architecture	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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CONTENT

To Develop the Skill of Digital based tools and gain knowledge and understanding of the recent Software in the industry and to become proficient in all the aspects related to the Architecture

1. Advanced three-dimensional drafting and rendering
2. Animations and Walkthroughs
3. Simulating the building model
4. Applications of Building Information Modelling
5. Applications of working drawings

UNIT I - 3D FOUNDATIONS

Introduction to 3D – Types of 3D Models – Importance of 3D Modelling in Design Industry – Introduction to 3D Modelling software.

UNIT II - 3D SOFTWARE BASICS

Interface Introduction – Basic tools explanation – Navigation tools – Editing tools – view tools

UNIT III - MODELING WORKFLOW

Creation of 3D Models – Composition of models – Materials – Textures – Solid and Mesh Modeling – Manipulation of Models.

UNIT IV - VISUALIZATION

Understanding Rendering – Materials properties – Lighting – Leveraging camera views – Export and Import - Converting for Print.

UNIT V - PROJECT WORK

Project – 3D Modeling of Residence – rendering though Ai Tools (Sketchup Plugin)

TOTAL : 60 PERIODS

REFERENCES:

1. Rendering Techniques for mixed reality, Thomas Girlinger, Daniel Dauch, Andre Stork, Springer, Berlin, October 2009
2. 3D Computer Animated Walk Throughs, Clark Cory, Scott Meador, William Rosi, McGraw Hill 2009.
3. The Animation Book: A complete guide to animation and film making, Kit Laybourne, Three Rivers Press, December 1998
4. Creating a website, Matthew McDonald, Pogue Press, January 2009
5. Deke McClelland, 'Photoshop 7 Bible Professional Edition', Wiley John & Son INC, New York, 2000.
6. Aouad, 'Computer Aided Design guide for Architecture, Engineering and construction', Spon process, 2012.
7. Mohammed Saleh Uddin, 'Digital Architecture – 3D Computer Graphics from 50 top designers', 1999.

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24ARS421	ARCHITECTURAL DESIGN - IV								SEMESTER-IV
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	10	**Credits**			**10**

COURSE OBJECTIVE:

- To explore multi-space and multi-level planning for various building types, including data collection and case studies.
- To understand design and detailing considerations for accessibility, including design presentations and scaled models.
- To approach design processes stage-wise through architectural programming for diverse building types.
- To study visualization techniques, including rendering, material properties, and camera views.
- To develop and present a 3D model of a residence using AI tools for rendering.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the multi-space and multi-level planning principles to various small-scale buildings.	Understand
CO2	Analyse the present designs considering accessibility for physically handicapped persons through scaled models.	Analyse
CO3	Evaluate design processes and architectural programming for different building types.	Apply
CO4	Identify and apply visualization techniques, including rendering and lighting for architectural presentations.	Apply
CO5	Create and render a 3D model of a residence using AI tools to demonstrate design concepts.	Create
CO6	Communicate effectively through the design ideas	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

CONTENT

Multi space- Multi level planning in small scale, small span, horizontal movement and simple vertical movement, data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for physically handicapped persons - Concepts and presentation of design with scaled models -Examples: Gated community, Institutional buildings: banks, Nursery or Primary

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/Secondary schools, primary health centre, school for children with learning disabilities, neighbourhood market, Municipal office, Cafeteria, Multicuisine Restaurant etc.
Design Process to be approached stage wise through Architectural Programming

TOTAL : 150 PERIODS

REFERENCES:

1. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.
2. Kevin Lynch, 'Site Planning', MIT Press, Cambridge, 1967.
3. Steen Eiler Rasmussen, Experiencing Architecture; MIT Press; 1959.
4. Kent C. Bloomer and Charles W. Moore, 'Body, Memory, and Architecture', Yale University Press, 1977.
5. Juhani Pallasmaa, 'The Eyes of the Skin - Architecture and the Senses', John Wiley: New York, 2005.
6. Julius Panero, Martin Zelnik, 'Human Dimension and Interior Space', Whitney Library of Design, 1975.
7. Richard P. Dober, 'Campus Planning', Reinhold Book Corporation, 1963.
8. Sam F.Miller, 'Design Process: A Primer for Architectural and Interior Design', Van Nostrand Reinhold, 1995. Dudek M, 'Schools and Kindergartens', Birkhauser 2007

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24ARS422	BUILDING MATERIALS AND CONSTRUCTION - IV									SEMESTER- IV
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5	**Credits**			**4**

COURSE OBJECTIVE:

- To give an introduction to liquid storage structure and retaining wall
- To give an introduction about retaining wall
- To understand about the design of R.C.C slabs & footing
- To give an introduction to glass, plastic and related materials in building construction.
- To understand about the Applications of Glass in Building Industry
- To provide familiarity with advanced building construction techniques (shell structures) and materials as well as design with them.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand about the Liquid storage structure design calculations and applications	Understand
CO2	Learn and understand about Retaining wall	Understand
CO3	Learn about the Structural design of R.C.C slab & Footing	Apply
CO4	Gain Knowledge of glass, plastics, paints and finishes in building construction	Understand
CO5	Become familiar with advanced materials and Analyse construction techniques of shell structures	Analyse
CO6	Knowledge in designing the R.C.C slab and footing	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

UNIT I - LIQUID STORAGE STRUCTURE

Rectangular and water tank-design and detailing .Both UG and Overhead Storage

UNIT II - RETAINING WALL

Cantilever and counterfort retaining wall.

UNIT III - R.C.C SLABS and FOOTING

Design of r.c.c. -circular slab- detailing, Design of raft footing-Detailing of flat slab.

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UNIT IV - PRE-FABRICATION TECHNOLOGY

Introduction to Pre-Fabrication Technology, types, Applications, Detailing.

UNIT V - GLASS, PLASTICS-CLADDING- FLOORING-PAINTING

Glass- types, properties, uses – technical specs etcPlastics – properties, uses – technical specs- current development in building industry-Stone, ACP, wood, Glass, curtain wall, Structural glazing, (reflected ceiling plan),Flooring – techniques – specs –etcPainting – types-specs – applications

TOTAL : 90 PERIODS

REFERENCES:

1. S.K. Duggal, 'Building Materials', New Age International Publishers, 2016.
2. B.C.Punmia et al, 'Building Construction', Laxmi Publications, 2016.
3. S.P Arora and S.P Bindra, 'A Text Book of Building Construction', Dhanpat Rai Publishing Company Pvt. Ltd, 2010.
4. M.S.Shetty, 'Concrete Technology', S.Chand, 2005.
5. Arthur Lyons, 'Materials for Architects and Builders- An Introduction' Arnold, London, 1997.
6. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and other research organizations.
7. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge, 2010
8. R.M. Davis, 'Plastics in Building Construction', Battersea College of Technology, Blackie, London, 1966
9. 'IS 7883. Code of Practice for the Use of Glass in Buildings ', Bureau of Indian Standards,2013.

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24ARS423	BUILDING SERVICES								SEMESTER-IV
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5	**Credits**			**4**

COURSE OBJECTIVE :

- To understand the principles of water treatment and distribution, including sedimentation, filtration, and relevant building regulations.
- To explore sewage treatment processes, including primary and secondary treatment.
- To examine plumbing systems, materials, fixtures, and plumbing codes for different building types.
- To study electrical systems and lighting design, wiring, load calculation, and lighting fixtures.
- To understand air-conditioning systems, including components, cooling loads, and fire protection measures.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the principles of water treatment and distribution systems in buildings.	Understand
CO2	Analyse sewage treatment methods and refuse disposal systems used in buildings.	Analyse
CO3	Evaluate plumbing systems, materials, and construction details, and apply relevant plumbing codes.	Evaluate
CO4	Apply electrical systems and lighting design principles for various building types.	Apply
CO5	Analyse and design air-conditioning systems, including components and fire protection measures.	Analyse
CO6	Create detailed layouts and specifications for water, sewage, plumbing, electrical, and air-conditioning systems.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - WATER TREATMENT AND DISTRIBUTION

Water supply systems - water supply project – sedimentation - Sand filtration - sand filters - rapid sand filters - Pressure filters - sterilization and disinfection. Distribution systems in buildings - Types of pipes used - Laying, jointing, testing - prevention of water wastage and reuse of water - Internal water supply in buildings - Relevant byelaws and regulations.

UNIT II - SEWAGE TREATMENT AND REFUSE DISPOSAL

a) Primary and secondary treatment Activated sludge - Intermittent and trickling sand filters - Arrangement of sewerage systems in buildings - sewage treatment plantb) Refuge Disposal: Collection, conveyance and disposal of town refuse systems

UNIT III - PLUMBING SYSTEMS

Materials and construction details of sewers and connections – plumbing fixtures - testing for water tightness – plumbing system for building types. Relevant Plumbing Codes

UNIT IV - ELECTRICAL SYSTEMS AND LIGHTING DESIGN

Study of electrical layout in Building - Types of wires, wiring systems and their choice - Main and distribution boards –transformers, generators and switch gears - Electrical load calculation. Classification of lighting - Artificial light sources - spectral energy distribution - luminous efficiency - colour temperature -colour rendering – lighting fixtures. Electrical Layout drawing

UNIT V - AIR-CONDITIONING SYSTEM AND APPLICATIONS

Vapour compression cycle - compressors - evaporators - Refrigerant control devices - electric motors - Starters - Air handling units - Cooling towers. Window type and packaged air-conditioners - chilled water plant - fan coil systems - water piping - cooling load -Airconditioning systems for different types of buildings - Protection against fire to be caused by A.C.Systems.

TOTAL : 90 PERIODS

REFERENCES :

1. Robert D.Finch, Introduction to Acoustics, Prentice Hall of India Private Limited, New Dehli, 2008.
2. MARK J. HAMMER MARK J. HAMMER, JR, Water and Wastewater Technology, PHI Learning Private Limited, NewDelhi. 2009.
3. M.N.Rao, A.K.Datta, Waste Water Treatment, Oxford & IBH PUBLISHING CO. PVT. LTD,New Delhi,2007.
4. S.P.Arora,S.P.Bindra, Building Construction, dhanpat rai publication, New Delhi. 2009.
5. Hand book on Water Supply and Drainage with Special emphasis on plumbing IS Code – SP : 35 – 1987.
6. Part of Section 1: Water Supply. IS CODE – SP : 7 – 1992.
7. IS Code of Basis Requirements for Water supply drainage and sanitation. IS Code – IS 1172: 1983.
8. Code of Practice for Water Supply in Buildings. IS Code – IS 2065: 1983.
9. William H.Severns and Julian R.Fellows, Airconditioning and Refrigeration, John Wiley and Sons, London, 1988.
10. D.J.Groomet - Noise, Building and People - Pergumon Press - 1977.

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ELECTIVES - SEMESTER-IV

24ARES431	CLIMATE RESPONSIVE DESIGN								SEMESTER-IV
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To study about climatic classification and recommendation
- To understand about the fundamental considerations for the climatic design
- To understand deeply the climatic design by project work
- To understand the climatic design by small scale project and a large scale project
- To understand the basics of the climate based software for graphical climatic data and analysis

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the overall climatic classification of the world	Understand
CO2	Learn about the fundamental considerations of the climatic design	Apply
CO3	Learn about design decisions by doing a project work.	Apply
CO4	Understand about the climatic design iterative process by overall understanding of the climate.	Understand
CO5	Understand the fundamentals of the climate-based software	Understand
CO6	Develop the skill of doing a climatic design for any building through manual design process and software analysis.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - CLIMATIC CLASSIFICATION AND RECOMMENDATIONS

Introduction to Climatic classification – world –Indian classification- climatic design recommendations- strategies for warm humid, cold, moderate, hot and dry and composite climatic zones- assignments involving collection of case studies all over the world.

UNIT II - CLIMATIC DESIGN

Climatic design – fundamental design considerations – orientation, massing, fenestration , building foot print etc.-exercises and case studies of the design process for various climate responsive buildings – vernacular and modern examples

UNIT III - CLIMATIC DESIGN- PROJECT WORK-1

Climatic design – project work – design exercises involving small scale projects with passive mode and mixed mode systems

UNIT IV - CLIMATIC DESIGN- PROJECT WORK-2

Climatic design – project work – design exercises involving large scale projects – buildings with passive mod,
mixed mode and full mode systems.

UNIT V - SIMULATION AND ANALYSIS

Introduction to software for climate data reading and analysis- Energy plus weather(EPW) files - Graphical format - software for building geometry and climatic analysis – daylight, irradiation simulation and analysis- design project simulations with software.

TOTAL : 60 PERIODS

REFERENCES:

1. B. Givoni, Man, 'Climate and Architecture', Architectural Sciences Series, Applied Science Publishers Ltd.,
London, 1981
2. B. Givoni, 'Passive and Low Energy Cooling of building', Van Nostrand Reinhold, NewYork,1994 and latest version
3. Mili Majunder, Teri – Energy – Efficient Bldgs. in India – Thomson Press, New Delhi – 2001
4. Arvind Krishnan, Szokolay et.al, 'Climate Responsive Architecture- A Design Handbook for Energy Efficient Buildings', Tata McGraw Hill, 2017.Heating, Cooling and Lighting – Norbert Lechner, October 2014
5. Mark Dekay, G. Z. Brown, Sun,Wind and light – Architectural Design Strategies ,Feb 2013
6. N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi.2012
7. O.H. Koenigsberger and others (1993), Manual of Tropical Housing and Building –Part I - Climate design,
Orient Longman, Madras, India
8. Martin Evans, 'Housing Climate and Comfort', Architectural Press, London, 1980.
9. Benjamin H. Evans, 'Day lighting in Architecture', Mcgraw Hill, 1981.
10. BIS – Indian Standards – Services ,Lighting , Approach to sustainability
11. Olgyay. (2015, September 1). Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and Expanded Edition.
12. Lechner, N. (2008, November 24). Heating, Cooling, Lighting: Sustainable Design Methods for Architects. https://doi.org/10.1604/9780470048092

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24ARES432	FURNITURE , LIGHT AND COLOUR DESIGN								SEMESTER-IV
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To introduce climatic classification and design recommendations for various climatic zones.
- To understand climatic design fundamentals through case studies and design exercises.
- To apply climatic design principles in small-scale projects with passive and mixed-mode systems.
- To develop large-scale projects using passive, mixed-mode, and full-mode climatic design strategies.
- To use software for climate data analysis and simulation in design projects.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the climatic classification and design recommendations for different climatic zones.	Understand
CO2	Create climate-responsive buildings considering fundamental design factors.	Create
CO3	Create small-scale design projects incorporating passive and mixed-mode systems for climate response.	Create
CO4	Develop large-scale projects with integrated climatic design strategies, including passive and mixed-mode systems.	Apply
CO5	Evaluate and simulate climatic design using software tools for energy and daylight analysis.	Apply
CO6	Use software tools to perform comprehensive simulations for design projects based on climatic data.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - TYPES OF FURNITURE AND PROCESS OF MANUFACTURE

Furniture categories, exploration of the idea of furniture, role of furniture in interior design, Design approaches in furniture design.

Assignment: Measured drawing of a piece of furniture – plan, elevation and drawings on full scale

An introduction of various manufacturing processes most frequently adopted in furniture design such as Injection Mouldings, investment casting, sheet metal work, die casting, blow- moulding, vacuum - forming etc.

UNIT II - STYLES OF FURNITURES AND FUNCTION AND UTILITY

Brief overview of the evolution of furniture from Ancient to present: Various stylistic transformations. Furniture designers and movements.Analysis of furniture in terms of human values, social conditions, technology and design criteria.

Functional and formal issues in design: study and evaluation of popular dictums such as "Form follows function", Form and function are one", "God is in Details" etc. Evaluation of visual design: study of Gestalt theory of design – law of enclosure, law of proximity, law of continuity etc.Human factors, engineering and ergonomic considerations: principles of universal design and their application in furniture design.

UNIT III - INTRODUCTION TO DAYLIGHTING, ARTIFICIAL LIGHTING AND EFFECT OFCOLOR IN LIGHTING

Nature flight–Wave length, Photometric quantities–intensity,Flux,illumination and luminance, visual efficiency, sources of light, day light factor concept, design sky concept, day lighting requirements.

Electric lamps – incandescent, fluorescent, sodium vapor, mercury, halogenandneon. Different types of lights in interior and exterior – task lighting, special purpose lighting. Calculation of artificial lighting,Guidelines for lighting design, Glare in artificial lighting.

Colors, color schemes - Monochromatic, analogous, complementary color schemes, triadic and tetradic schemes, effects of color in different areas, color temperature, psychological effects of color in interiors,Factors affecting color, Prang theory – Color wheel, Munsellsystem and Oswald system.

UNIT IV - LUMINARES& FIXTURES

Definition, different luminaries for lighting, lighting control system- benefits & application, Impact of lighting, fixture types - free standing or portable, fixed, light fixture control.Lighting accessories- switches, sockets, fused connection units, lamp holders, ceiling roses etc.

UNIT V - EXCERCISE

Study of projects based on different lighting concepts used in interiors and exteriors.

Seating Design: Different types of seating with a focus on the following – Functionality, Aesthetics, Style, Human factors and ergonomics

The other component to be considered is the cost of the designed furniture piece.

Assignment: Design with wood, metal and combination of materials. Drawings, details and prototype making.Market survey of available products and economics of products.

TOTAL : 60 PERIODS

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REFERENCES:
FURNITURE DESIGN

1. Joseph Aronson, The Encyclopedia of Furniture: Third Edition ,2061
2. Bradley Quinn, Mid-Century Modern: Interiors, Furniture, Design Details, Conran Octopus Interiors, 2006.
3. Jim Postell, Furniture Design, Wiley publishers, 2007.
4. Edward Lucie-Smith , Furniture: A Concise History (World of Art) , Thames and Hudson, 2085
5. Robbie. G. Blakemore, History of Interior Design and Furniture: From Ancient Egypt to Nineteenth-Century Europe, Wiley publishers, 2005.
6. John.F. Pile, Interior Design, 2nd edition, illustrated, H.N.Abrams, 2095.

LIGHT AND COLOUR

1. The Art of living- Randall whitehead, 2003
2. Lighting design, sourcebook- Randall whitehead, 2002
3. Light right- M.K.Halpeth,T.Senthil kumar, G.Harikumar 2004
4. Conceptsof lighting, Lighting design in Architecture- Torquil Barker 2097

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24ARES433	VERNACULAR ARCHITECTURE									SEMESTER-IV
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To introduce the study of vernacular architecture as a process and not a product.
- To provide an overview of the various approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the different regions of the country.
- To gain Knowledge about the methods & techniques of Vernacular Architecture and climatic considerations & Design aspects of vernacular Architecture
- To gain understanding about socio- economic aspects of the vernacular & Traditional Architecture

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the Indian vernacular architecture as a process and to also provide an overview of various approaches and concepts towards its study.	Understand
CO2	Gain Knowledge of vernacular architectural forms in different regions.	Understand
CO3	Gain understanding of the impact of colonial rule on vernacular architecture in India	Apply
CO4	Understand about the climatic consideration & Design aspects	Understand
CO5	Understand the socio-economic aspects existed in the various regions through the study of vernacular Architecture	Understand
CO6	Gain knowledge in the vernacular methods of construction and ways to incorporate in this modern architecture.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - HUMAN SETTLEMENTS AND THEIR DETERMINANTS

Determinants of morphology of human settlements – climate, culture, socio-economic aspects, geography, etc.Differentiating between rural and urban settlements.Overview of settlement evolution in India.Relation between settlement morphology and architecture. Discussion of the terms traditional architecture, regional architecture, indigenous architecture, vernacular architecture, etc.,

UNIT II - STUDY OF VERNACULAR/ REGIONAL ARCHITECTURE

Vernacular/ regional architecture as a process and responsive design. Concepts, approaches, survey and study of vernacular/ regional architecture -aesthetic, architectural, anthropological, etc., General aspects to be studied in vernacular/ regional architecture of India –climatic response, forms, spatial planning, socio-cultural aspects, symbolism, colour, art, materials of construction and construction technique, etc.,

UNIT III - SETTLEMENT MORPHOLOGY AND REGIONAL ARCHITECTURE OF GUJARAT AND RAJASTHAN

Determinants and morphology of rural and urban settlements in Gujarat.Vernacular/ regional architecture of Gujarat as particular productions.Determinants and morphology of rural and urban settlements in Rajasthan.Vernacular/ regional architecture of Rajasthan as particular productions.

UNIT IV - SETTLEMENT MORPHOLOGY AND REGIONAL ARCHITECTURE OFKASHMIR AND BENGAL

Determinants and morphology of settlements in Kashmir.Vernacular/ regional architecture of Kashmir as particular productions.Determinants and morphology of settlements in Bengal.Vernacular/ regional architecture of Bengal as particular productions.Colonial and modern influences.

UNIT V - SETTLEMENT MORPHOLOGY AND REGIONAL ARCHITECTURE OF TAMILNADU AND KERALA

Determinants and morphology of settlements in Kerala.Vernacular/ regional architecture of Kashmir as particular productions.Determinants and morphology of rural and urban settlements in Tamil Nadu.Vernacular/ regional architecture of Tamil Nadu as particular productions.Colonial and modern influences. Examples of Adaptations in contemporary Architecture – works of Laurie baker, Hasan Fathy, Anil Laul, Gerard Da Cunha. - Building centres – Auroville, Annangpur, Nizamuddin Building Centre. Basics of architecture heritage conservation.

TOTAL : 60 PERIODS

REFERENCES:

1. Bernard Rudofsky, 'Architecture without Architects', University of New Mexico Press, 1987.
2. Paul Oliver, 'Encyclopedia of Vernacular Architecture of the World', Routledge, 2007.
3. Amos Rapoport, 'House, Form and Culture', Prentice Hall Inc. 1969.
4. Carmen Kagal, 'Vistara- The Architecture of India', The Festival of India, 1986.
5. Kosambi D.D, 'The Culture and Civilisation of Ancient India in Historical Outline', Vikas,1997.
6. R W Brunskill, 'Illustrated Handbook on Vernacular Architecture', Faber and Faber, 2000.
7. V.S. Pramar, 'Haveli – Wooden Houses and Mansions of Gujarat', Mapin, 1989.
8. Kulbushanshan Jain and Minakshi Jain, 'Mud Architecture of the Indian Desert', Aadi Centre, Ahmadabad, 1992.
9. G.H.R. Tillotson, 'The Tradition of Indian Architecture: Continuity, Controversy, Change since 1850', Oxford University Press, Delhi, 1989.
10. S. Muthiah et al, 'The Chettiar Heritage', Chettiar Heritage, 2017.
11. Weber. W and Yannas. S, 'Lessons from Vernacular Architecture', Routledge, 2014.

SEMESTER- V

24ART501	**CONTEMPORARY ARCHITECTURE**									**SEMESTER-V**	
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**		**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0	**Credits**				**2**

COURSE OBJECTIVE:

- To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs in the Indian context.
- To give an outline of architectural approaches across the world from late 20th century.
- To study in detail the different post-modern directions in architecture.
- To provide information about the Alternate Practice
- To understand about the evolution of Architectural design of pre – independence

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the spread and varied later directions of modern architecture across the world	Understand
CO2	Apply their knowledge familiar with contemporary forces and directions in architecture across the world and in India	Apply
CO3	Understand about the post-independence architecture in India contemporaneous with the rest of the world, along with its own particular influences.	Understand
CO4	Understand about the post-independence revolution of design in India	Understand
CO5	Apply their idea with the alternate practices	Apply
CO6	Gain knowledge in recent trends of Architecture & Design.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**L**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**L**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**L**
CO6	**S**	**M**	**S**	**L**	**L**	**L**	**L**	**L**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - PRE-INDEPENDENCE & POST- INDEPENDENCE ARCHITECTURE

Architecture in India (Pre independence): The Architecture of the Princely States of Jaipur, Calcutta, Chennai and Mysore.

Architecture in India(Post-Independence): Works of public nature in Chandigarh and Ahmedabad.

UNIT II - MODERN ARCHITECTURE

Modern Architecture in India-1: Ideas and works of BV Doshi and Charles Correa

Modern Architecture in India- 2: Ideas and works of Raj Rewal, Achyut Kanvinde and Uttam Jain

Modern Architecture in India-3: Enrichment of Indian experience- Cost effectiveness and local influences. Lauire Baker and Anant Raje

UNIT III - HIGH-TECH ARCHITECTURE

Last phase of Modern Architecture: Ideas and works of Richard Meier, Charles Moore and Bernard Tschumi , Ideas and works of Frank O Gehry

High-tech architecture or Structural Expressionism-1: An architectural style that emerged in the 1970s: The High-tech architecture practitioners include British architects Sir Norman Foster, Sir Richard Rogers, Sir Michael Hopkins.

UNIT IV - POST-MODERN HIGH-TECH ARCHITECTURE

Development of Postmodernism with its origins in the alleged failure of Modern architecture from 1950s, and spreading in the 1970s and its continuous influence on present-day architecture. Ideas and works of Michael Graves, James Stirling, Robert Venturi etc.

UNIT V - RECENT TRENDS IN INDIAN ARCHITECTURE

Recent developments in architecture of India – works of Selected architects – Current architecture practice.

Sanjay Mohe, Christopher benninger, Hafeez contractor, Chitra Viswanath, Sanjaypuri,etc

TOTAL : 30 PERIODS

REFERENCES:

1. Kenneth Frampton, 'Modern Architecture: A Critical History', Thames & Hudson, London, 2007.
2. William J. Curtis, 'Modern Architecture since 1900', Phaidon Press, 1996.
3. Diane Ghirardo , 'Architecture after Modernism', Thames & Hudson, London, 1990.
4. Elie G. Haddad, David Rifkind, 'A Critical History of Contemporary Architecture: 1960-2010', Routledge, 2016.
5. Bhatt and Scriver, 'Contemporary Indian Architecture- After the Masters', University of Washington Press, 1991
6. Bahga et al, 'Modern Architecture in India - Post Independence Perspective', Galgotia, 1993

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24ART502	INTERIOR DESIGN								SEMESTER-V
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0	**Credits**			**2**

COURSE OBJECTIVES:

- To introduce the profession of interior design and bring out its role and Ergonomics in interior designing.
- To inform about the various components of interior space and give an understanding of the design aspects involved in each.
- To gain better understanding as regard the History of furniture, Anthropometric data in space designing for various activities.
- To become aware of the planning principles for designing various interior spaces.
- To apply one's aesthetics and creative abilities in making attractive and functional interiors.

COURSE OUTCOMES:

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

COs	Course Outcomes	Blooms Level
CO1	Recognize the elements and principles of design and their applications.	Understand
CO2	Demonstrate competency in the design process.	Apply
CO 3	Demonstrate competency in the use of design fundamentals as principal tools in establishing design criteria and developing the overall design process.	Apply
CO 4	Practice the application of basic rules of space planning and organization.	Apply
CO 5	Produce design compositions and develop presentation skills.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**L**
CO 3	**S**	**S**	**M**	**L**	**L**	**L**	**L**	**S**	**M**
CO 4	**S**	**M**	**S**	**L**	**L**	**M**	**L**	**M**	**S**
CO 5	**S**	**S**	**M**	**L**	**M**	**L**	**L**	**M**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - INTERIOR SPACES AND FURNITURE ACROSS HISTORY

Outline of the characteristics of representative/ exemplary interior spaces, interior decoration and furniture in the Western world from the beginnings to twentieth century. Outline of characteristics of representative/ exemplary interior spaces, interior decoration and furniture in India across the ages, including living folk traditions.

UNIT II - INTRODUCTION TO INTERIOR DESIGN

Introduction to the professions of interior decoration, interior design and furniture design, bringing out their origin, evolution and current scope of work.Definition and process of interior design. Introduction to the design of interior spaces as related to typology, function and themes. Vocabulary of design in terms of elements (point, line, shape, form, space, colour, light, pattern, texture) and principles (balance, proportion, scale, rhythm, hierarchy, unity, contrast, harmony, emphasis, movement) with specific reference to examples from interior design.

UNIT III - COMPONENTS OF INTERIOR SPACE

Role of interior treatment and finishes in the experience of interior spaces. Outline of the design of components such as floors, ceilings, walls, partitions, window treatments and accessories based on parameters such as Context, function, ambience, materials, properties, methods of construction, colour, texture. Study of representative examples.

UNIT IV - COMPONENTS OF INTERIOR SPACE - II

Role of lighting in the experience of interior spaces. Outline of different types of interior lighting systems and fixtures based on their effects and suitability in different contexts. Study of representative examples.Role of landscaping in the experience of interior space. Outline of interior landscaping elements such as rocks, plants, water, flowers, fountains, paving, artefacts. Their physical properties and effects on spaces. Study of Representative examples.

UNIT V - COMPONENTS OF INTERIOR SPACE - III

Introduction to furniture design as related to parameters such as human comfort and function (including anthropometrics and ergonomics), built in or freestanding, materials and methods of construction, cultural particularities, changing trends and lifestyles, innovations and design ideas.

TOTAL : 30 PERIODS

REFERENCES :

1. Francis D.K.Ching, 'Interior Design Illustrated', John Wiley & Sons, 2012.
2. Joseph DeChiara, Julius Panero, Martin Zelnik, 'Time Saver’s Standards for Interior Design',McGraw-Hill Professional, 2001.
3. John F. Pile, 'Interior Design', Pearson Prentice Hall, 2007.
4. Jan Pieper, George Michell, 'The Impulse to Adorn- Studies in Traditional Indian Architecture',Marg Publications, 1982.
5. Aronson J, 'The Encyclopaedia of Furniture', Potter Style, 1965.
6. Pat Kirkham, Susan Weber, Editors, 'History of Design: Decorative Arts and Material Culture,1400-2000', Yale University Press, 2013.

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7. John F.Pile, Judith Gura, 'A History of Interior Design', Wiley, 2013.
8. Helen Marie Evans, 'An Invitation to Design', Macmillan Pub Co, 1982.
9.Julius Penero and Martin Zelnik, 'Human Dimensions and Interior Space', Whitney Library ofDesign, 1979.
10.Kathryn B. Hiesinger and George H. Marcus, 'Landmarks of Twentieth Century Design; Abbey Ville Press, 1995.
11. Susanne Slesin and Stafford Cliff, 'Indian Style', Thames and Hudson,1990.
12. Rosemary Kilmer, W. Otie Kilmer, 'Construction Drawings and Details for Interiors: Basic Skills',John Wiley & Sons, 2009.

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24ARP511	COMPUTER STUDIO - III								SEMESTER-V
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5	**Credits**			**4**

COURSE OBJECTIVE:

- To develop the advanced Digital knowledge and skills
- To develop the skills of two-dimensional rendering
- To develop the skill and knowledge of the Building information Modelling
- To develop the Skill related to building visualization,
- To develop the skill of multimedia presentations, brochures

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the use of digital tools in the realm of visual composition	Understand
CO2	Understand the drafting & Details through Software	Understand
CO3	Develop the skill of 3D visualization and rendering.	Apply
CO4	Understand the concept of BIM- building information modelling through the specific software	Understand
CO5	Gain the Skill of Multimedia & video making presentations required for Architectural practice	Apply
CO6	Gain knowledge about the latest developments of digital applications in Architecture	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

.

CONTENT

1. Advanced techniques in rendering with differential lighting for realistic rendering

2. Advanced level Animations and Walkthroughs

3. Simulation features of radiation, wind – Computational fluid dynamics, shadows, daylighting

Recommended software:

RHINO, GRASSHOPPER, VECTORWORKS,
PLUGINS-LADYBUG, OPENSTUDIO, DAYSIM, RADIANCE, SEFAIRA
ECOTECT, REVIT SIMULATIONS

TOTAL : 90 PERIODS

REFERENCES:

1.Rendering Techniques for mixed reality, Thomas Girlinger, Daniel Dauch, Andre Stork, Springer, Berlin, October 2009

2.3D Computer Animated Walk Throughs, Clark Cory, Scott Meador, William Rosi, McGraw Hill 2009.

3.The Animation Book: A complete guide to animation and film making, Kit Laybourne, Three Rivers Press, December 1998

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24ARS521	ARCHITECTURAL DESIGN - V								SEMESTER-V
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	10	**Credits**			**10**

COURSE OBJECTIVE:

- Understanding Complex Design Programme and the Components of the Design Problem.
- Investigate and Acquire the Knowledge to address the various aspects of the Design Problem and Process
- Develop Ability to Communicate Design Ideas throughout the Design Stages with multiple media.
- Ability to do a frame work of Design methodology
- Ability to understand the process of Design and deliver the Architectural Design with Technical Drawings

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the basic functional aspect of designing simple building type and its relevant spatial organization	Understand
CO2	Learn, reciprocate and sensitize the design/concept to the environment and the design skill of the project	Understand
CO3	Transform the theoretical ideas to the tangible output of design.	Apply
CO4	Understand the space organization, space- volume design approach in large scale projects	Understand
CO5	Research, Analyse and Deliver a Mixed-use Architectural Design.	Analyse
CO6	Communicate effectively through the design ideas	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

.

CONTENT

Small complexes - multi planning circulation analysis - massing problems involving building technology - Design and detailing for movement of physically handicapped and elderly persons within and around buildings. Examples, shopping Centre (Commercial), Apartments (residential)Nursing home (institutional) home for aged. Construction and manipulation of three-dimensional building data bases, Rendering 3D images. Presentation techniques, preparing scaled models using different materials.

Design Process to be approached stage wise through Architectural Programming. Site Planning fundamentals as relevant to mid-scale projects to be introduced in the design.
Building services to be applied in Architectural design.

TOTAL : 150 PERIODS

REFERENCES:

1. Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.
2. Ernst Neuferts Architects Data', Blackwell ,2002.
3. Stephen A. Kliment, Editor 'Building Type Basics' Series, Wiley.
4. Wolfgang Preiser, Korydon H. Smith, 'Universal Design Handbook', 2nd Edition, McGraw-Hill, 2010.
5. Rem Koolhaas et al, 'Project on the City II: The Harvard Guide to Shopping', Taschen, 2001.
6. Peter Coleman, 'Shopping Environments: Evolution, Planning and Design', Routledge, 2006.
7. LMVRDV, 'FARMAX- Excursions on Density', 010 Publishers, 2006.
8. Jos Boys, 'Disability, Space, Architecture: A Reader', Routledge, 2017.
9. Emily Talen, 'Design for Diversity', Routledge, 2012.
10. luis Alexandre Casanovas Blanco (Ed), 'After Belonging: Objects, Spaces, and Territories of the Ways We Stay in Transit', Lars Muller Publishers, 2016.
11. Manuel Gausa, 'Housing: New Alternatives, New Systems', Birkhäuser Basel 1999

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ELECTIVES 1 - SEMESTER- V

24ARES531	BUILDING MAINTENANCE AND REPAIR								SEMESTER-V
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5			**Credits**	**4**

COURSE OBJECTIVE:

- Develop the knowledge in maintenance factors of energy intensive Building construction industry.
- To gain detailed information about restoration and retrofitting of buildings
- To develop the understanding of the importance of sustainable building development.
- To gain detailed information about cause and effect of building deterioration and defects.
- To develop the knowledge about material, methods and techniques of maintenance, repair and restoration

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Understand the influence of environmental and biological elements, chemicals and pollutions on the life expectancy of buildings	Understand
CO2	Understand to identify the building defects types, classification and investigation.	Understand
CO3	Gain knowledge in measures to prevent and control common defects in buildings, maintenance philosophy, phases of maintenance	Apply
CO4	Gain knowledge in fundamental Strengthening measures	Apply
CO5	Gain knowledge in various materials for repair and techniques for repair.	Apply
CO6	Gain deep understanding about materials and methods for conservation & restoration work.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION

Life expectancy of different types of buildings, influence of environmental elements: heat, moisture, Precipitation and frost on buildings, effect of biological agents like fungus, moss, plants, trees, algae, termite

Control prevention, chemical attack on building materials & components, aspects of fire &fire prevention on buildings, impact of pollution on buildings.

UNIT II - BUILDING DEFECTS

Common defects in buildings - Building failures- Causes and effects, Non-destructive testing methods, Cracks

in buildings: types, classification, investigation.

UNIT III - PREVENTIVE AND STRENGTHENING

Measures to prevent & control common defects in buildings, Maintenance philosophy, phases of maintenance: routine preventive and curative maintenance, Fundamental Strengthening measures: beam strengthening, column strengthening, shoring, under pinning and jacketing.

UNIT IV - BUILDING REPAIRS

Materials for repair: special mortar & concrete, chemicals, special cements & high grade concrete, admixtures, techniques for repair, Surface repair: material selection, surface preparation, rust eliminators &polymers coating, Repair of cracks in concrete & masonry: methods of repair, epoxy injection, mortar repair for cracks: geniting& shotcreting, Waterproofing of concrete roofs.

UNIT V - INTRODUCTION TO CONSERVATION

Introduction to conservation, Materials and methods for conservation & restoration work with specific

case studies, Adaptive reuse of buildings, advantages. Retrofitting, case studies, recycling of building components and materials with case studies.

TOTAL : 90 PERIODS

REFERENCES:

1. Chandler, I. (1992). Repair and Renovation of Modern Buildings.McGraw-Hill.
2. Danish Standards Association. (2004). Repair of Concrete Structure to En 1504: A guide for renovation of concrete structures repair materials and systems according to the EN 1504 series. Boston: Elsevier.
3. Guha, P. K. (2011). Maintenance and Repairs of Buildings. New Delhi: New Central Book Agency
4. Nayak, B. S. (2013). A Manual of Maintenance Engineering. New Delhi: Khanna Publishers.
5. Roger, G. and Hall, F. (2013). Building Services Handbook. New York : Routledge.

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24ARES532	BUILDING SERVICES FOR SPECIAL BUILDINGS								SEMESTER-V
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5			**Credits**	**4**

COURSE OBJECTIVE:

- To impart advanced technical and practical knowledge in building services
- To gain knowledge of special services through preparation of service drawing and details.
- To understand about the water distribution for high rise structures
- To gain understanding about the Sewage & Drainage for high rise buildings
- To gain knowledge about Electrical installation for high rise buildings

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Understand and design high rise buildings with essential services	Understand
CO2	Gain knowledge in advanced services	Understand
CO3	Understand about Safety standards for special buildings	Apply
CO4	Gain knowledge about Fire safety service standards for all types of buildings	Apply
CO5	Gain knowledge in Building management systems	Understand
CO6	Gain Knowledge about the integration of services for Multi storied structures	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - WATER DISTRIBUTION FOR HIGH RISE / CAMPUS DEVELOPMENT

External water distribution layout- header pipe- U G sump – Puddle flange – water riser pipes – water calculation for campus – water meter – water irrigation – vision for landscaping- water management – Internal water distribution layout – toilet details- plumbing – kitchen –and utilities – types of pipes and joints – fixtures and fittings – shaft details

UNIT II - SEWAGE AND DRAINAGE FOR HIGH RISE AND CAMPUS DEVELOPMENT

External sewage and drainage layout – Gully trap -Collection chamber – manholes – invert level – sewage treatment plant – grey water supply and calculation –saucer drain – rain water harvesting and terrace rain water piping system

Internal sewage systems – toilet details – Trap details – pipes and joints –vent pipes – plumbing system types- fixtures

UNIT III - ELECTRCIAL INSTALLATION FOR HISH RISE AND CAMPUS DESIGN

Electrical panel details- basic SLD (single line diagram)-external cable layout – external lighting layout –false ceiling layout - internal lighting layout – internal raw and UPS power layout – cable tray and cable trunk layout - Vertical shaft details

UNIT IV - HEATING VENTILATION& AIR CONDITIONING SYSTEMS IN HIGH RISE AND CAMPUS DESIGN

Different types of chillers and layout –external chiller piping system – AHU details – false ceiling layout – supply and return air diffuser details – ducting layout – Vertical shaft – VRV – VAV systems- Sound attenuator.

UNIT V - FIRE FIGHTING&BMS SYSTEMS IN HIGH RISE&CAMPUS DESIGN

UG sump for Firefighting- fire hydrant systems – external routing – internal hydrant systems – hose reel hydrant – foam hydrant -overhead tank – False ceiling layout -Fire detection – smoke detectors - Sprinklers -Glass break system - fire alarm system –Internal fire piping layout IBMS(Integrated Building Management Systems)- types of IBMS- Control room details – Internal Routing details – sensors – CCTV – access control – burglar control etc. Drawings: Integrated Service layout – Internal and External – cross section details

TOTAL : 90 PERIODS

REFERENCES:

1. William H.Severns and Julian R.Fellows, Airconditioning and Refrigeration, John Wiley and Sons, London, 1988.
2. Robert D.Finch, Introduction to Acoustics, Prentice Hall of India Private Limited, New Dehli, 2008.
3. MARK J. HAMMER MARK J. HAMMER, JR, Water and Wastewater Technology, PHI Learning Private Limited, New Delhi. 2009.
4. M.N.Rao, A.K.Datta, Waste Water Treatment, Oxford & IBH PUBLISHING CO. PVT. LTD,New Delhi,2007.
5. Section 11. Sanitary Appliances and Water Fittings. IS Code- SP: 21-1983.
6. Hand book on Water Supply and Drainage with Special emphasis on plumbing IS Code – SP: 35 – 1987.
7. Part of Section 1: Water Supply. IS CODE – SP: 7 – 1992

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24ARES533	LIGHTING DESIGN								SEMESTER-V
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5			**Credits**	**4**

COURSE OBJECTIVE:

- To Understand the Basic Principles of Light.
- To understand the importance of design of products and accessories in the design of interiors.
- To analyse on past and current trends and to arrive at solutions for future.
- Hand skilled products and manufacturing techniques using latest technologies.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the basic principles of light.	Understand
CO2	Understand the importance of design of products and accessories in the design of interiors.	Understand
CO3	Analyse on past and current trends and to arrive at solutions for future.	Analyse
CO4	Create Hand skilled products and learn manufacturing techniques using latest technologies.	Create
CO5	Apply Lighting design in building construction	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**
CO5	**M**	**S**	**-**	**-**	**S**	**M**	**-**	**L**	**L**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION TO DAY LIGHTING

Nature of light – Wavelength, intensity, Flux, illumination and luminance, visual efficiency, sources of light, day light factor concept, day lighting requirements.

UNIT II - ARTIFICIAL LIGHTING

Different types of lights in interior and exterior - task lighting, special purpose lighting.
Electric lamps – incandescent, fluorescent, sodium vapour, mercury, halogen and neon.
Guidelines for lighting design and Calculation of artificial lighting.

UNIT III - LUMINARIES AND FIXTURES

Different luminaries for lighting, lighting control system.
Impact of lighting, fixture types - free standing or portable, fixed, light fixture control.
Lighting accessories- switches, sockets, fused connection units, lamp holders, ceiling roses etc.

UNIT IV - TYPES OF LIGHTING

The Local & general lighting, Applied lighting, Architectural lighting, Recessed lighting, Luminous walls & ceilings

UNIT V - LIGHTING IN INTERIOR AND EXTERIOR

The activities with special reference to light requirement in the Cultural and social aspects of lighting, Physiology of vision, Lighting sources: Natural lighting and artificial lighting (traditional to modern), Light measurements and units of measurement of lighting

TOTAL : 90 PERIODS

REFERENCES :

1. Gary Gordon, Interior lighting for designers, John Wiley & Sons Inc.
2. Interior lighting for Designers, Third edition – Gary Gordon & Jamco L. Nuckolls – John Wiley & Sons, New York, 1995.
3. De Chiara Joseph & Callender John, Time Saver Standards for Architectural Types & Interior
4. Design & Space Planning, Mc Graw Hill Book Co.
5. Whitehead R, Home Lighting Ideas Bedrooms & Baths, Rockport Publishers, Masachusetts

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ELECTIVES 2 - SEMESTER- V

24ARES534	ACOUSTICS IN ARCHITECTURE							SEMESTER-V
Marks	**Internal**	**80**	**External**		**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5		**Credits**	**4**

COURSE OBJECTIVE:

- To Understand the Basic Principles of Physics of Sound.
- To Get familiarized with sound system equipment, available in the market.
- To familiarize the student with laws as per National Building Code of India/BIS.
- To understand about the technologies related to noise control.
- To learn about acoustical design principles and factors.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the theoretical concepts of acoustics.	Understand
CO2	Understand the basis of noise reduction and design applications of noise control.	Apply
CO3	Get familiarized with sound system equipment, available in market.	Apply
CO4	Get familiarize the student with laws as per National Building Code of India /BIS.	Apply
CO5	Understand about the technologies related to noise control	Understand
CO6	Learn about acoustical design principles and factors.	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION

Terminology and unit. Characteristics of audible sound – Propagation, Velocity, Frequency, Pitch, Quality/timbre, Loudness and Intensity. Behaviour of audible sound in enclosures – Reflection, Absorption, Diffraction and Transmission of sound.

UNIT II - NOISE CONTROL

Noise and its types, Noise pollution. Sources of indoor noise, Indoor noise levels, Planning and design against indoor noise .Sources of outdoor noise, Traffic noise levels, Planning and design against outdoor (traffic & buildings in built-up area) noise. Identification of various sources of noise and recommendations to control them in various types of buildings e.g. – Residential, Educational, Hospital, Office, Hotels & Hostels, Industrial, Laboratories & Test houses, Miscellaneous buildings etc.

UNIT III - ACOUSTICAL DESIGN PRINCIPLES AND FACTORS

Acoustical design principles for Auditoriums, Cinema halls, Conference rooms etc. and factors viz. Site selection & planning, Dimensions, Shape, Seats & seating arrangements, Treatment of interior surfaces, Reverberation & sound absorption.

UNIT IV - ACOUSTICAL DESIGN

The understanding the audio needs and layout for projects e.g. Auditoriums, Cinema halls, Conference rooms. Constructional detailing, relation to walls/ partition, floor / ceiling/ opening/ windows/ doors. Insulating fittings and gadgets machine mounting and installation of machinery. Site visits with documentation in the form of sketches/ drawings/ photos

UNIT V - FIELD/MARKET SURVEYS

Familiarization and understanding of sound system equipment available in market manufactured by various brands e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories

TOTAL : 90 PERIODS

REFERENCES :

6. National Building Code of India.
7. National Electrical Code.
8. K. A. Siraskar, Acoustics in Building Design, Orient Longman Ltd., 1972.
9. S. Kandaswamy, Architectural Acoustics and Noise Control, Allied publishers Pvt. Ltd., 2005.
10. Catalogues of leading Audio equipments agencies e.g. Philips, Ahuja etc.

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24ARES535	PRODUCT DESIGN								SEMESTER-V
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5			**Credits**	**4**

COURSE OBJECTIVE:

- To gain Knowledge about the various styles of furniture
- To gain knowledge about the manufacturing of various materials/ product
- To learn about visual codes & Symbols
- To understand the importance of Artefacts, murals and Artwork
- Understanding the methods and techniques involved in furniture and product design.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain knowledge about the various furniture and products	Understand
CO2	Understand the needs of the industry demand and product value	Apply
CO3	Gain knowledge in Composite materials and Products	Apply
CO4	Gain knowledge about Packaging design	Apply
CO5	Gain knowledge about the House hold items / products	Apply
CO6	Create a Product design for the client	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO PRODUCT DESIGN

A brief introduction to Product Designing – Various elements – History of Product Design – Definition of Product Design, understanding of Product Design - Purpose of Product Design – Role of Product Designers.

UNIT II - HUMAN FACTORS

Definition of human factors, Application of human factors data. Human activities, their nature and effects. Man-machine system and physical environment. Human performance and system reliability. Information input and processing. Human control systems. Applied anthropometry – Human response to climate.

UNIT III - ASPECTS OF PRODUCT DESIGN

Visual, Auditory, Tactual, Olfactory human mechanisms, Physical space and arrangement. Visual display, process of seeing, visual discrimination, quantitative and qualitative visual display, Alphanumeric and related displays, Visual codes and symbols.

UNIT IV - PRODUCT DESIGN

Form, Colour, Symbols, User specific criteria, Material, Technology and recyclability, Packaging. Multiple Utility oriented approach to Product Design.

UNIT V - DESIGN EXERCISES

Design of Household elements, tools and devices – Spoon/Cutlery. Design of furniture – Chairs/Computer table, Kitchen racks, Cabinets etc. Design of Industrial Product – Watch Dial, Gear Wheels, Automobile Headlights etc. Element design for the physically and mentally different people.

TOTAL : 90 PERIODS

REFERENCES:

1. Time Saver Standards for Interior Design
2. Andrew Alpern, Handbook of Specialty Elements in Architecture, McGrawhill Co., USA, 1982.
3. Francis D.K.Ching, Interior Design Illustrated, VNR Publications, New York, 1987.
4. An invitation to Design, Helen Marie Evans.

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24ARES536	SET DESIGN								SEMESTER-V
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	5			**Credits**	**4**

COURSE OBJECTIVE:

- Knowledge about the various styles of sets manufactured in various materials is vital to an designer for a foray into the film industry.
- Understanding the methods and techniques involved in set designs.
- Understand the practical steps to create a set design for live performance, e.g research, developing ideas, meetings, developing and testing designs, presenting and realising designs
- Understand the skills required to create a set design for theatre and film, e.g. model-making techniques, technical drawings, use of materials, stage craft basics
- Understand different roles available in the live performance industry and film industry

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Identify and discuss the principles inherent to set design for the theatre, including collaboration, accommodation of creative expression, and literary values	Understand
CO2	Demonstrate an ability to identify and integrate form and function, and the elicitation of emotional, intellectual and aesthetic response to a design.	Apply
CO3	Apply the fundamental technical skills required to the design processes inherent to set design for the theatre	Apply
CO4	Apply script analysis, planning, period and style research, graphic communication and expression ideas or concepts into a design for the theatre.	Apply
CO5	Demonstrate an understanding of how to use dramatic literature, drawn from a variety of periods and styles, as a vehicle for developing stage design.	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - FILM AND SOCIETY

Examination of the twentieth-century culture and society through film. Critical analysis of cultural and social conflicts are portrayed and worked out in popular films, and examination of how motion pictures create a window into modern society. Film as cultural texts to better understand history and culture manifestations.

UNIT II - HISTORY AND THEATER FILM SET DESIGN

Investigation the production methods, dramatic theory and conventions, and scene design of various performance media since the popularization of the motion picture, and how it has influenced all entertainment design in the 20th and 21st centuries.

UNIT III - GRAPHIC DESIGN AND TYPOGRAPHY FOR EXHIBIT DESIGN

Principles of layout for creating effective visual signage and explore the unique problems, technique, theory, and approaches of signage in film, theatre, and other forms of mediated exhibition. Introduction to the design applications for building signage.

UNIT IV - SET DESIGN AND CONCEPT WRAP

Introduction to the basic concepts, through theory and practice, of scene design in theatre, film, and other fine arts and entertainment media. learn how to Analyse scripts for proper scenery, how to conceptualize designs that will translate into actual sets, and develop visual thinking within the creative process.

UNIT V - STAGE DESIGN

Stage design process from inception to performance, script analysis, visual arts analysis, research skills, and the application of principles and elements of design. Understanding stage setting through language, color, and architectural analysis.

TOTAL : 90 PERIODS

REFERENCES:

1. Time saver standards for building types, DeChiara and Callender, Mc Graw hill company 2001

2. Neufert Architect’s data, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd 2002

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SEMESTER- VI

24ART601	BUILDING CODES AND REGULATIONS								SEMESTER- VI
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To develop understanding of the duties and liabilities of an architect
- To gain knowledge of bye-laws that relate to the building
- To understand about the environment in the Indian context.
- To Understand about legislation of corporation areas and Panchayat
- To understand about legislation of Industries

COURSE OUTCOME:

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

CO1	Able to read and understand government related documents and incorporate it in practice	Understand
CO2	Understand the building regulations and follow accordingly	Understand
CO3	Understand about the legislation of corporation areas	Apply
CO4	Understand about the legislation of panchayat	Understand
CO5	Understand about the legislation of Industries	Understand
CO6	Design buildings as per the recent norms and standards	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**M**	**S**	**M**	**L**	**L**	**L**	**-**	**M**	**-**
CO2	**S**	**S**	**M**	**M**	**M**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**M**	**-**	**M**	**-**	**-**	**M**	**L**
CO4	**S**	**M**	**L**	**S**	**-**	**M**	**-**	**S**	**M**
CO5	**S**	**M**	**M**	**L**	**-**	**M**	**-**	**S**	**L**
CO6	**S**	**M**	**S**	**L**	**-**	**-**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - LEGISLATION - CORPORATION AREAS
New – Combined development control rules for Tamilnadu 2019

UNIT II - LEGISLATION - PANCHAYATS
The Panchayat Building Rules 1942 –New development rules for Panchayat

UNIT III - LEGISLATION - INDUSTRIES AND FACTORIES
The Tamil Nadu Factory Rules 1950, New development control rules for Industries, Tamilnadu 2019

UNIT IV - EMERGING AREAS OF IMPORTANCE
Need for special rules on architectural control and development, Town Planning development regulations, urban development regulations, Special buildings etc RERA- real estate act rules

UNIT V - SPECIAL LEGISLATION
Environmental Acts and Laws - Special Rules governingHill Area Development -Coastal area development and management - Heritage Act of India - Consumer protection act and their relevant provisions- OTHER norms- HAKA,CRSnorms, MOEF , FMB DRAWINGS - Approval drawings.

TOTAL : 30 PERIODS

REFERENCES:

1. Publications of COA, IIA Hand book on Professional Practice, The Architects publishing Corporation of India, Recent Edition
2. D.C. Rules for Chennai Metropolitan Area-(recent edition) and updated rules
3. TNBCDR- recent Tamilnadu Regulations
4. Environmental Laws of India (Recent Edition)
5. The Tamil Nadu Hill Areas- Special Building Rules& Coastal regulation – Recent version
6. Heritage Act, Consumer Protection Act & Indian Easements Act

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24ART602	PROGRESSIVE ARCHITECTURE									SEMESTER- VI
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0	**Credits**			**2**

COURSE OBJECTIVE:

- To understand and acquire knowledge in advanced architectural concepts and ideologies.
- To gain Knowledge about the future concepts of eminent architects
- To understand about the material usage in the current trend of architecture
- To gain knowledge about the Concept of biomimicry
- To gain understanding about energy integration and zero energy developments

COURSE OUTCOME:

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

CO1	Understand and evolve futuristic design ideas and concepts	Understand
CO2	Integrate various aspects of design thinking of future	Apply
CO3	Understand about the parametric design concepts and applications	Apply
CO4	Understand about the concept of Biomimicry	Understand
CO5	Gain knowledge about the Adaptive reuse	Understand
CO6	Gain knowledge about energy integration and zero energy development.	Apply

Mapping with Programme Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**S**	**S**	**S**	**S**	**L**	**L**	**L**	**M**	**S**
CO2	**S**	**L**	**L**	**S**	**M**	**L**	**L**	**L**	**S**
CO3	**L**	**S**	**L**	**S**	**M**	**L**	**L**	**M**	**S**
CO4	**L**	**S**	**L**	**S**	**L**	**L**	**L**	**M**	**S**
CO5	**L**	**L**	**M**	**S**	**L**	**M**	**L**	**L**	**S**
CO6	**S**	**M**	**S**	**S**	**L**	**L**	**L**	**L**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - FUTURISTIC VISION

Future concepts as envisioned by Antonio Saint Elia, Frank Lloyd Wright, Corbusier.

UNIT II - FUTURISTIC TRENDS

Future trends being evolved by Marcos Novak, Neil Denari, Greg Lynn, Toyo Ito and others.

UNIT III - ARCHITECTURAL CONCEPTS AND IDEAS

Evolution of contemporary architectural concepts such as biomimicry, adaptive reuse, low cost development and urban regeneration.

UNIT IV - MATERIALS, TECHNOLOGY AND SYSTEMS

Futuristic building materials, building tectonics and systems of the future.

UNIT V - ENERGY INTEGRATION

“Zero energy” and “Energy +” buildings with emphasis on an integrated approach.

TOTAL : 30 PERIODS

REFERENCES:

1. Bell, J., “21st Century House”, Laurence King Publishing, 2006
2. Jodidio, P., “Building a New Millennium”, Vol.1 Taschen, 2003
3. Jodidio, P., “Architecture Now”, Vol. 2, Taschen, 2004
4. TerrimeyerBuake, 'Architectural Design in Steel', SPON, 2004.
5. Peter Silver et al, 'Structural Engineering for Architects', Laurence King, 2013.
6. Gillian Hunt, 'Architecture in the Cyberspace II', John Wiley & Sons, 2001.
7. L. Convey et al, 'Virtual Architecture', Batsford, 1995.
8. Rob Shields (ed.), 'Cultures of the internet: Virtual Spaces, Real Histories, Living bodies', Sage, London
9. John Beckman, 'The Virtual Dimension, Architecture, Representation and Crash Culture', Princeton Architecture Press, 1998.
10. William J Mitchell, City of Bits: Space, Place and the Infobahn',MIT Press, Cambridge, 1995.
11. Marcos Novak, 'Invisible Architecture: An Installation for the Greek Pavilion', Venice Biennale, 2000
12. Ali Rahim, 'Contemporary Process in Architecture', John Wiley & Sons, 2000.

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24ARS621	ARCHITECTURAL DESIGN - VI								SEMESTER- VI
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	10	**Credits**			**10**

COURSE OBJECTIVE:

- Understanding Complex Design Programme and the Components of the Design Problem.
- Investigate and Acquire the Knowledge to address the various aspects of the Design Problem and Process
- Develop Ability to Communicate Design Ideas throughout the Design Stages with multiple media.
- Ability to conceptualize a design idea by Sketching and other techniques
- Ability to understand the process of Design and deliver the Architectural Design with Technical Drawings

COURSE OUTCOME:

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

CO1	Understand the basic functional aspect of designing complex building type and its relevant spatial organization.	Understand
CO2	Learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project	Apply
CO3	Transform the theoretical ideas to the tangible output of design	Apply
CO4	Understand the space organization, space- volume design approach in large scale projects	Understand
CO5	Research, Analyse and Deliver a Campus Design.	Analyse
CO6	Communicate effectively through the design ideas	Apply

Mapping with Programme Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

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CONTENT

Building & site-level services as an integral part of the design of large public buildings.
Design of a medium to high-rise building in a dense urban setting. The problem should attempt to bring out a comprehension of the framework that outlines a building interior, the structural system and the services core, and the relation of this interior with the exterior environment through the building skin. Students should be able to demonstrate through their design their understanding of energy efficient systems, structural systems, services and construction systems.

The project should be of high service complexity with mechanical systems for air conditioning, parking and other services, and include the integration of active energy systems. The project should be seen as a culmination of understanding for conceptualization and realization of individual building design including structural and construction systems.

Site Analysis and Design programme Formulation of design programme of an appropriate scale pertaining to the functions of the identified development project including relevant studies of MEP standards, statutory limitations, etc. Preparation of built form programme/environmental programme

The project should be of high service complexity with mechanical systems for air conditioning, parking and other services, and include the integration of active energy systems.

Introduction to National Building Codes, building bye laws and regulations, their need and relevance. Application of building bye laws for structural, earthquake and fire safety and universal accessibility, statutory provisions environment related services.

TOTAL : 150 PERIODS

REFERENCES:

1. Kate Nesbitt, 'Theorizing a New Agenda for Architecture', Princeton Architectural Press, 1996.
2. Neil Leach, 'Rethinking Architecture', Routledge, 2000.
3. Harry Francis Mallgrave and David Goodman, 'An Introduction to Architectural Theory-1968 to the Present', Wiley Blackwell, 2011.
4. Stephen A. Kliment, Editor 'Building Type Basics' Series, Wiley.
5. Mitchell WJ, 'Imagining MIT: Designing a campus for the 21st century', MIT Press, 2007.
6. Himanshu Burte, 'Space For Engagement', Seagull Books, 2008.
7. Mark Garcia, 'The Diagrams of Architecture', Wiley 2010.
8. Bjarke Ingels, 'Yes is More', Taschen, 2009.
9. Time Saver Standards for Building types" ,De. Chiara and Callender, McGraw – Hill Co., N.Y., 1973
10. Planning the Architects Hand Book - Edward. D. Mills, Butterworth, London, 1985

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24ARS622	ARCHITECTURAL DETAILING AND WORKING DRAWING								SEMESTER- VI
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	2	**T**	0	**P/ S**	4	**Credits**			**4**

COURSE OBJECTIVE:

- To enable students to appreciate the challenges in detailing for both the newly designed buildings as well as while carrying out additions and alterations to existing buildings.
- To enable students to understand the various Fittings, Furniture & Equipment (FFE) that are needed in buildings and their installation methods.
- To create architectural, structural &services drawings for construction .
- To refer & integrate all the architectural and supporting working drawings
- To design, incorporate and detail architectural and interior components of the architectural design project

COURSE OUTCOME:

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

CO1	Understanding of all the aspects that go into the making of a building through study of drawings related to construction.	Understand
CO2	Ability to resolve spatial concerns with technical aspects and services of a building.	Apply
CO3	Understand to design and detail components within a building.	Apply
CO4	Gain knowledge in interior detailing and planning	Understand
CO5	Gain knowledge in Interior furniture, fixtures as per the functionality	Apply
CO6	Understand the installation methods of cladding, integrated services by means of detailed drawings etc	Apply

Mapping with Programme Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**S**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**S**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**S**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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CONTENT

Part 1 - DETAILING OF RESIDENTIAL BUILDING

Detailing of a residence – ***Site plan*** **-** Building marking drawing, Working Drawings- Plan, ***Elevation*** **-** Section- Longitudinal ,Transverse sections, chord sections, Door Window schedule, Centre line column marking drawing, door and window joinery details – Flooring layout – ***finishing details– kitchen layout***- toilet layout – Electrical layout and Plumbing layout – ***(both building and site level)*** **-** Terrace RWP details -Staircase details – Interior details **-** Detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting, Exercises of the above through case studies and drawings.

Part 2 - DETAILING OF COMMERCIAL BUILDINGS

A)Detailing of a commercial building – **Site plan** **-** Building marking drawing, Working Drawings- Plan,
Elevation-Section- Longitudinal ,Transverse sections, chords sections, Door Window schedule, Centre line
column marking drawing, door and window joinery details – Flooring layout **- finishing details** – toilet layout –
Electrical layout and Plumbing layout**(both building and site level)** – Terrace RWP details -Staircase details –
Interior details **-** Detailing of built-in elements like cabinets, toilets, toilet fitting, Structural Glazing, Staircase,
Flooring
B)Detailing of shop-fronts, office spaces for commercial buildings including detailing of crucial elements such
as entrance porches, main doors, show-windows, enclosed and air-conditioned atrium spaces.
C) Detailing of façade and selected spaces for apartment buildings, hotels and hostels.
D) Detailing of façade and selected spaces for official buildings including detailing of crucial elements such as Reception area, cabins ,meeting rooms cafeteria, open office spaces and lift lobby spaces.
E)Detailing of addition and alteration of existing building façade and spaces for present need. All Exercises of the above through case studies and drawings.

TOTAL : 90 PERIODS

REFERENCES:

1. Joseph De Chiara, Michael Crosby, 'Time Saver Standards for Building Types', McGraw Hill Co, 2001.
2. Richardson Dietruck, 'Big Idea and Small Building', Thames and Hudson, 2002.
3. Edward D Mills, 'Planning–The Architect's Handbook, Butterworths, 1985.
4. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge, 2010.
5. Susan Dawson, 'Architect’s Working Details -Volume 1-10', E- Map Construct, 2004.

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24ARS623	ESTIMATION AND SPECIFICATION								SEMESTER-VI
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	4	**Credits**			**4**

COURSE OBJECTIVE:

- To provide the student adequate knowledge to write the specifications for a given item of work
- To gain knowledge in specification
- To gain Knowledge in Estimation of Civil Work, Carpentry work
- To gain Knowledge in the estimation of Plumbing work
- To understand to work out the unit cost of individual items based on their specifications and arrive at the overall cost of the project.

COURSE OUTCOME:

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

CO1	Understand and write specification for the given item of work	Understand
CO2	Gain knowledge & Understanding of Estimation of civil work	Understand, Apply
CO3	Gain knowledge about estimation of Carpentry work	Understand, Apply
CO4	Gain knowledge about estimation of plumbing work	Understand, Apply
CO5	Calculate the quantities on site with Field measurement book	Apply
CO6	Learn about various calculation of bill of quantities for Interiors	Apply

Mapping with Programme Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**M**	**S**	**M**	**L**	**L**	**L**	**-**	**M**	**-**
CO2	**S**	**S**	**M**	**M**	**M**	**-**	**-**	**S**	**M**
CO3	**S**	**S**	**M**	**-**	**M**	**-**	**-**	**M**	**M**
CO4	**S**	**M**	**L**	**S**	**-**	**M**	**-**	**S**	**M**
CO5	**S**	**M**	**M**	**L**	**-**	**M**	**-**	**S**	**M**
CO6	**S**	**M**	**S**	**L**	**-**	**-**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

UNIT I - SPECIFICATION

Necessity of specification, importance of specification, - How to write specification, - Types of Specification, -Principles of Specification writing, - Important aspects of the design of specification – sources of information – Classification of Specification.

UNIT II - SPECIFICATION WRITING

Brief Specification for 1st class, 2nd class, 3rd class building. Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second-class brickwork, Damp proof course, ceramic tiles/marble flooring and dado work, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace. Interior design- Specification

UNIT III - ESTIMATION

Types & purpose, Approximate estimate of buildings – Bill of quality, - Requirement for preparing estimation, factors to be considered, - principles of measurement and billing, contingencies, Elementary billing and measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work – abstract of an estimate.

UNIT IV - DETAILED ESTIMATE – PART-1

Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, wood work, iron works etc

UNIT V - DETAILED ESTIMATE – PART-2

Deriving detailed estimate for items of work such as -plastering, painting, flooring, weathering course for a single storied building using Centre line method and long and short wall method. Estimate of a Small building Interior- wood work, falseceiling, fixtures etc – Residential

TOTAL : 90 PERIODS

REFERENCES:

1. Rangwala. S.C, 'Estimating, Costing and Valuation (Professional practice)', Charotar Publishing House,1984
2. M.Chakraborthi, 'Estimating, Costing, Specification and Valuation in Civil Engineering, Chakraborthi, 2010.
3. B.N. Dutta, 'Estimating and Costing' UBS Publishers and Distributors,2000.
4. S.SangaReddi and P.L.Meiyappan, 'Construction Management', Kumaran Publication, Coimbatore.
5. Gurcharan Singh and Jagdish Singh, 'Estimating Costing and Valuation', Standard Publishers Distributors, 2012.
6. 'I.S.1200-1968 Methods of Measurements of Buildings and Civil Engineering works'.
7. Latest schedule of rates of P.W.D.
8. Latest Data book of P.W.D.
9. PWD Standard Specifications. Govt Publication.

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24ARS624	LANDSCAPE ARCHITECTURE								SEMESTER-VI
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	4	**Credits**			**4**

COURSE OBJECTIVE:

- To teach them to enhance & improve the quality of built environment, functionally and aesthetically.
- To stress on the role of landscape design in sustainability, to provide an overview of ecological balance and impacts of human activities and the need for environmental protection and landscape conservation.
- To study the historical method of garden Design
- To understand the significance of urban landscape.
- To provide familiarity with the various elements of landscape architecture and the principle of landscape design.

COURSE OUTCOME:

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

CO1	Understand the role of landscape design with respect to macro scale of sustainability and ecology	Understand
CO2	Understand the micro scale of shaping of outdoor environments.	Understand
CO3	Gain Knowledge about the elements of landscape design and their scope.	Understand
CO4	Sensitivity towards evolution of different garden and landscape design across time and context.	Apply
CO5	Understand the urban scale landscape design.	Apply
CO6	Landscape design with respect to site planning and different functional typologies of spaces	Create

Mapping with Programme Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**M**	**S**	**M**	**L**	**L**	**L**	**-**	**M**	**-**
CO2	**S**	**S**	**M**	**M**	**M**	**-**	**-**	**S**	**M**
CO3	**S**	**S**	**M**	**-**	**M**	**-**	**-**	**M**	**M**
CO4	**S**	**M**	**L**	**S**	**-**	**M**	**-**	**S**	**M**
CO5	**S**	**M**	**M**	**L**	**-**	**M**	**-**	**S**	**M**
CO6	**S**	**M**	**S**	**L**	**-**	**-**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO LANDSCAPE ARCHITECTURE

Introduction to Landscape Architecture - its scope and role in Architecture and Planning. Importance of Geology, Hydrology, Flora and Fauna with Landscape Design.Environmental impact assessment.Reclamation and restoration of derelict lands.

UNIT I - HISTORICAL OVERVIEW OF LANDSCAPE ARCHITECTURE

Human civilisations and attitude to nature and landscapes across history and cultures. Outline of Japanese, Italian Renaissance, French , English and Mughal gardens. Outline of landscape and garden design in Indian history. Gardens depicted in Sanskrit literature, Nandavanams and residential gardens of South India. Public parks and residential gardens of the colonial period.Contemporary public landscape projects.Study of notable examples.Spatial development in landscape design.

UNIT III - ELEMENTS IN LANDSCAPE DESIGN

Introduction to hard and soft landscape elements. Basic principles of Landscape Design - natural elements - Landforms, rock water, vegetation - plant types - Structural characteristics of plants, colour - climate and their role in landscape design - and the Visual composition- Identification of native trees and Indian shrubs , Man made elements - garden furniture, lighting fixtures, signage and sign boards, paving materials, surface drainage, planter boxes, garden shelters and water fountains.

UNIT IV - SITE PLANNING

Organisation of spaces in the outdoor environment. - Creating spaces with plants – Planting Design . Role of circulation and built form in shaping the environment. Role of landscape design in design of neighbourhood parks, children’s play area and campus development.

UNIT V - LANDSCAPING OF FUNCTIONAL AREAS

Urban open spaces and principle of urban landscape. Contemporary urban landscape issues and Case studies .Street landscaping, landscape design for waterfront areas and functional areas in urban centres.Green infrastructure including green roofs and walls. Detailed Drawings of Basic Landscape elements.

TOTAL : 90 PERIODS

REFERENCES:

1. Motloch, J.L., 'An Introduction to Landscape Design', John Wiley and Sons,2001.
2. Michael Laurie, 'Introduction to Landscape Architecture', Elsevier, 1986.
3. Sauter D; 'Landscape Construction', Cengage Learning, Third edition, 2010.
4. Geoffrey And Susan Jellico, 'The Landscape of Man', Thames And Hudson, 1985.
5. 'Time Saver Standards for Landscape Architecture', McGraw Hill, Inc, 1997.
6. Grant W Reid, 'From Concept to Form in Landscape Design', Wiley, 2007.
7. Albert J. Rutledge, 'Anatomy of a Park', McGraw-Hill Book Company, 1971.
8. Richard P. Dober, 'Campus Landscape', John Wiley and Sons; 2000.
9. Strom Steven, 'Site Engineering for Landscape Architects', John Wiley and Sons, 2013.
10. Brian Hacket, 'Planting Design', Mc Graw Hill Inc, 1976.
11. T.K. Bose and Chowdhury, 'Tropical Garden Plants in Colour', NayaUdyog, 2011.
12. Rahoul B Singh, 'Gardens of Delight- Indian Gardens through the Ages', Lustre Press, Roli Books, 2008.

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ELECTIVES - SEMESTER- VI

24ARES631	**VASTU AND PRINCIPLES OF TRADITIONAL INDIAN ARCHITECTURE**								**SEMESTER-VI**	
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To introduce the principles of Vastu and Vaastu and relationship between building and site.
- To familiarize the students with the units of measurement in traditional architecture.
- To introduce concepts of orientation and Cosmo gram according to the Vaastu Purusha Mandala.
- To learn about the planning aspects of all residential, commercial & other buildings
- To study the detailing and design of various building components and their material and method of construction.

COURSE OUTCOME:

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

CO1	Understand the principles of vastu and Vastu.	Understand
CO2	Understand the traditional site planning principles and its application in the present context.	Understand
CO3	Understand the relevance of vastu and Architecture.	Understand
CO4	Gain Knowledge in various material usage as per the principles of vastu.	Apply
CO5	Gain knowledge in Architectural design in accordance with vastu.	Apply

Mapping with Programme Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**L**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**L**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**L**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO VASTU AND VAASTU

Vastu and Vaastu -its definition and classification -Relationship to earth.
Features of good building site -good building shapes -macro, micro, enclosed and bmc

spaces -relationship between built space, living organism and universe -impact of built space on human psyche.

UNIT II - MEASUREMENT SYSTEMS

Units of measurement -Tala system and Hasta system of measures -Theory of vibration -vibration as time, equation of time and space -Time space relationship and measurement of the same.

UNIT III - VAASTU AND SITE PLANNING

Orientation of building, site, layout and settlement -positive and negative energies -importance of cardinal and ordinal directions -The celestial grid or mandala and its types. The Vaastu Purusha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs.Simple design of residential buildings.

UNIT IV - VASSTU -PLANNING &DETAILING

Location of Room—Window Placements etc- Building heights -Base and basement -wall and roof specifications -column and beam designs -Pitched roof and domical roofs -significance of pyramid -Use of wood, stone, metal, brick and time -marking technology, corbelling technology, jointing technology -foundations for heavy and light structures -Landscaping in and around buildings -Aesthetics in Indian Architecture. E.g: Temple Vasstu, Street Orientation

UNIT V - VASSTU & CLIMATIC SCIENCE

Vasstu – Relevance to each climatic zone -Tamilnadu, Kerala etc- Planning Principles – Geometry

TOTAL : 60 PERIODS

REFERENCES:

1. Dr.V.GanapatiSthapati -:Sthapatya Veda" Dakshina Publishing House, Chennai-41, India, 2001.
2. Stella Kramrisch -The Hindu Temple Vol.IMotitalBanarsidass Publishers Pvt. Ltd., Delhi -1991.
3. K.S.SubramanyaSastri -Maya Matam -Thanjavur Maharaja Sarjoji Saraswathi Mahal Library -Thanjavur -1966.
4. Dr.V.GanapatiSthapati -:Sthapatya Veda" Dakshina Publishing House, Chennai-41, India, 2001 .
5. Bruno Dagens -Mayamatam, Vol.I& II IGNCA and Motilal Bamarsidars Publishers Pvt. Ltd., Delhi -1994.
6. Dr.V.GanapatiSthapati -Vastu Purusha Mandalam, Dakshina Publishing House, Chennai, 1998.
7. Ananda Kentish Coomaraswamy,Symbolism of Indian Architecture" – Historical Research Documentation Programme, Jaipur, 1983

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24ARES632	COMPUTATIONAL DESIGN PROCESS								SEMESTER-VI
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVES

- To provide an overview of various contemporary design processes and its relation to computation.
- To provide focus on invention rather than application of predefined ideas.
- To develop students basic skills in using parametric tools such as Rhino Grasshopper.
- Learn fundamental methods of physics simulation and iterative behaviour
- Develop research through parametric exploration and Refine data visualisation and process animation skills

COURSE OUTCOME:

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

CO1	Familiar with digital tools and techniques in the realm of contemporary design processes	Understand
CO2	Develop new idea in design process using digital tools.	Create
CO3	Evolve design as process to form	Analyse
CO4	Explore new ideas in design	Create
CO5	Develop iterations in Designs in 3d	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - CONTEMPORARY PROCESS AND ARCHITECTURAL WORKS

Ideas and works of architects related to contemporary processes. The architects to include Greg Lynn, Reiser + Umemotto, Lars Spuybroek / NOX Architects, UN studio, Diller Scofidio, Dominique Perrault, Decoi, Marcos Novak, Foreign Office Architects, Asymptote, Herzog and de Meuron, Neil Denari, Serie Architects, BIG Architects and other contemporary Architects.

UNIT II - INTRODUCTION TO 3D MODELLING

Introduction to Rhino 3D Interface with working tools, Nurbs ,Solid and Mesh Modelling, 2D Splines, and working with objects. Coordinate Systems, Arrays, Modifier stack – bend, Tween, Revolve Compound objects -Boolean, loft, etc.,

UNIT III - GEOMETRIES AND SURFACES

Fractal Geometry and their properties – Architectural applications , Works of Zvi Hecker– Shape Grammar - hapes, rules and Label , Rhino SubD for Organic Modelling, Bridge in Rhino, L System for Form Finding

UNIT IV - DESIGN PROCESSES USING TOOLS

Introduction to Grasshopper, Basic scripting for Form Finding using Grasshopper.

UNIT V - DESIGN EXERCISE

Project Small exercises which will be based on the primary stage form development using Rhino and Grasshopper. Example: Kiosk, Pavilion, Furniture Design, Panel design

TOTAL : 60 PERIODS

REFERENCES:

1. Gips, James. “Computer implementation of shape grammars.”In NSF/MIT workshop on shape computation, vol. 55, p. 56. Cambridge, MA: Massachusetts Institute of Technology, 1999.
2. Andy Payne; The Grasshopper Primer_Second Edition.
3. Peter Eisenmann; Diagram Diaries, Universe,1999.
4. Grey Lynn, 'The Folded, The Pliant and The Supple, Animate form', Princeton Arch.
5. The Nature of Code: Simulating Natural Systems with Processing by Daniel Shiffman

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24ARES633	PROJECT COST AND CONTRACT MANAGEMENT								SEMESTER-VI
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To disseminate knowledge about the application of project management processes during the pre-construction phase of a project life cycle.
- To expose the students to the selection process of different contract types, legal compliance, various international and national contract forms for different types of project.
- To outline the contractual procedures including tendering process, pre-qualification of contractors, evaluation of contract bids, preparation of contract documents, and awarding of contracts.
- To expose the students to the contractual issues and related contract administration and dispute resolution procedures.
- To Analyse the causes and effect of cost and time overruns and relating them to the relevant clauses of contract to prevent litigations.
- To identify the process of negotiation, claims management, conflicts and dispute management.

COURSE OUTCOME:

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

CO1	Know how to manage a project in terms of cost management, cost analysis, accounting and fund flow analysis.	Understand
CO2	Understand legal requirements and compliance of construction contracts for the sale and use of urban and rural lands.	Understand
CO3	Classify different types of contract and tenders, and preparation of contract documents	Apply
CO4	Categorize the role of labour regulations, insurances in the contract documents for contract administration.	Apply
CO5	Analyse the causes and effect of cost and time overruns and relating them to the relevant clauses of contract to prevent litigations.	Analyse
CO6	Identify the process of negotiation, claims management, conflicts and dispute management.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**M**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**M**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**M**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**L**
CO6	**S**	**M**	**S**	**L**	**L**	**L**	**L**	**L**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - COST MANAGEMENT

Cost management processes; Cost determination, management and control; Risk in cost; Life Cycle Cost analysis; Time-cost assessment; Estimation types, parametric and elemental methods of estimation, preliminary cost estimations, cost indices, analysis of rates, analysis of material, labour and equipment component, rationale of contingencies, detailed estimation, schedule of rates, preparation of bills of quantities and justification documentation.

UNIT II - COST ANALYSIS AND ACCOUNTING

Cost analysis - direct cost, indirect costs, and slope of the project activities, optimization of cost and schedule through network contraction – applications in construction industry. Cost control in construction projects, importance of cost control and its objectives, classification and codes. Management Accounting, Nature and scope of management accounting, cost accounting, financial accounting and its limitation, accounting procedures.

UNIT III - CONTRACT DOCUMENTS AND TENDERS

Various types of construction contracts, general and special conditions of contract, comparative study of contract conditions - construction contract as a legal proposal, agreement, consideration, contract Planning, tender documents, tendering process - pre-tendering, bid organization, invitation, receipts and evaluation negotiations, award of work,- prequalification methods (rating/ evaluation and enlisting of construction agencies), bid review and evaluation, methods of subcontracting; Contract close-out; Defect liability and performance guarantee; Undertaking works at Contractor's risk and cost; Construction Contract Documents – drawings as construction contract document –specifications as construction document – construction contract conditions.

UNIT IV - LABOUR REGULATIONS, INSURANCES AND CONTRACT ADMINISTRATION

Construction specific labour laws and regulations, The Building and Construction Workers (regulation of employment and conditions of service) Act, 1996, Workmen's Compensation Act, Payment of Wages Act, The Employees Provident Fund and Miscellaneous provisions Act 1996;Insurance in construction works; CAR (contractor all risk policy) Premium determination and risk reduction; duties of employer, contractor, interpretation of contract, Breach of contract – changes during the contract – changes dealing with differing site conditions – claims - cost escalation – time delays and extensions, compensation, notices and termination.

UNIT V - DISPUTES AND ARBITRATION

Types of disputes in construction contracts – methods of dispute resolution processes – alternative dispute resolution and dispute review mechanisms – Dispute Resolution Board proceedings - arbitration and conciliation act 1996 – Arbitration proceedings - managerial approach to dispute minimization – conduct of arbitration proceedings – arbitration award and termination proceedings – powers of arbitrator.

TOTAL : 60 PERIODS

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REFERENCES:

1. M. N. Arora: “Management accounting”, Himalaya Publishing House.
2. Mueller, F.W. Integrated cost and schedule control for construction projects.
3. Pilcher, R. “Project Cost Control in Construction.” Collins, London, 1992
4. Gobourne: Cost control in the construction industry.
5. Chris Hendrickson and Tung Au: Project Management for Construction
6. Shutt R.C. (1995), “Economics for the construction industry,” Longman Scientific and Technical, England.1.GajariaG.T and Kishore Gajaria, Laws Relating to Building and Engineering Contracts in India, LexisNexis Butterworths India, 2000
7. 2.Jimmie Hinze, Construction Contracts, 3rd Edition, McGraw-Hill, 2010
8. 3.Joseph Bockrath and Fredric Plotnick Contracts and the Legal Environment for Engineers and Architects, 6th Edition, McGraw-Hill, 2010
9. 4.Kwaku A. Tenah and Jose M Guevara., Fundamentals of construction Management and organization, Reston Publishing Company, 1985

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SEMESTER- VII

24ART701	**URBAN DESIGN**									**SEMESTER-VII**	
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**		**3**
Instruction Hours /week		**L**	2	**T**	0	**P/S**	0			**Credits**	**2**

COURSE OBJECTIVE:

- To provide knowledge of design of urban spaces including renewal and development.
- To understand the Evolution and transformation of urban areas
- To understand the urban design & town Planning principles
- To understand the transformation of urban Settlement pattern
- To understand the methods & Proposals of Urban Redevelopment

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain knowledge in urban spaces, formation and transformation	Understand
CO2	Understand the organization of urban spaces	Understand
CO3	Understand about the morphological development of the space in time	Understand
CO4	Understand the importance of urban renewal	Understand
CO5	Understand the urban Regeneration	Understand
CO6	Design large scale urban renewal projects	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**L**	**L**	**L**	**L**	**M**	**S**
CO2	**S**	**L**	**L**	**L**	**M**	**L**	**L**	**L**	**S**
CO3	**L**	**S**	**L**	**L**	**M**	**L**	**L**	**M**	**S**
CO4	**L**	**S**	**L**	**L**	**L**	**L**	**L**	**M**	**S**
CO5	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**S**
CO6	**S**	**M**	**S**	**L**	**L**	**L**	**L**	**L**	**L**

S-Strong; M-Medium; L-Low

UNIT I - INTRODUCTION TO URBAN DESIGN

Relationship between Architecture, Urban Design and Town Planning - Perception of city form and pattern – Townscape elements **components of urban space and their interdependencies, outline of issues/aspects of urban space and articulation , scope and objective of urban design.** Behavioural issues in urban design – principles of urban spatial organization, urban scale, urban spaces, urban massing, and quality of urban enclosure.

UNIT II - ROLE OF PUBLIC SPACE IN URBAN AREAS

Introduction to public spaces.Evolution of public spaces.Comparative analysis of public spaces, their organization and articulation.**Place making and identity, morphology.** Visualization of image of the city and its elements, perceptions of urban environment

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UNIT III - ORGANIZATION OF SPACE

Understanding, organizing and articulation of spaces for residential, commercial, industrial and recreational areas.***Ideas of imageability and townscape: Cullen, Lynch – place and genius loci collective memory-Rossi-***
social aspects of urban space : life on streets and between buildings , Jane Jacobs and William Whyte.

UNIT IV - ISSUES IN URBAN SPACE

Causes and consequences of urban blight and obsolescence – slums and shanties – methods of conducting surveys, analysis and presentation of data, prevention of formation of slums and squatter settlements.Environmental and management issues. ***Contemporary approaches: idea of urban catalyst , transit***
metropolis, urban sprawl.

UNIT V - URBAN REDEVELOPMENT

Objectives, surveys programs of urban redevelopment and public involvement and participation.*Community*
participation, privatizes public realm, effects and role of real estate. TOD, urban heritage and conservation and Sustainable design ideas

TOTAL : 30 PERIODS

REFERENCES:

1. A.E.J. Morris, 'History of Urban Form before the Industrial Revolution', Prentice Hall, 1996.
2. Edmund Bacon, 'Design of Cities', Penguin, 1976.
3. Gordon Cullen, 'The Concise Townscape', The Architectural Press, 1978.
4. Michelle Provoost et al., 'Dutchtown', NAI Publishers, Rotterdam, 1999.
5. 'Time Saver Standards for Urban Design', Donald Natson, McGraw Hill, 2003.
6. Kevin Lynch, 'The Image of the City' MIT Press, 1960.
7. Rithchie. A, 'Sustainable Urban Design: An Environmental Approach', Taylor & Francis, 2000.
8. Tridib Banerjee, Anastasia Loukaitou-Sideris, Editors, 'Companion to Urban Design', Routledge, 2014.
9. Malcolm Moor, 'Urban Design Futures', Routledge, 2006.
10. Geoffrey Broadbent, 'Emerging Concepts in Urban Space Design', Taylor & Francis, 2003.

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24ART702	HOUSING									SEMESTER-VII
Marks	**Internal**	**40**	**External**				**60**	**Total**	**100**	**Exam Hours**	**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0				**Credits**	**2**

COURSE OBJECTIVE:

- Understanding of the various issues involved in urban housing
- Understand the various issues of Rural housing
- Understand about the planning and design solutions for low-income groups.
- Understanding about the housing Policies & Agencies involved
- Understanding about the housing design aspects in a larger scale

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Understand the various schemes and policies in Housing in India	Understand
CO2	Understand the importance of socio-economic aspects of the People and need for Housing	Understand
CO3	Gain knowledge about housing standards	Understand
CO4	Gain knowledge about the Housing design Process	Apply
CO5	Learn about government housing, private& cooperative housing	Apply
CO6	Arrive at design ideas for large scale Housing Projects	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

UNIT I - INTRODUCTION TO HOUSING
Review of housing typology, Housing demand and supply – Calculation of future need.
Housing resources and options available in housing

UNIT II - 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.

UNIT III - SOCIO ECONOMIC ASPECTS
Social factors influencing Housing Design, affordability, economic factors and housing concepts – Slum – rehabilitation and resettlement schemes

UNIT IV - HOUSING STANDARDS

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

UNIT V - 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.

TOTAL : 30 PERIODS

REFERENCES:

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. Christopher Alexander, 'A Pattern Language', Oxford University press, New York 1977.
7. Leuris S, 'Front to back: A Design Agenda for Urban Housing', Architectural Press, 2006.
8. S.K.Sharma, 'Mane A New Initiative in Public Housing', Housing & Urban Development Corporation, 1991.
9. 'Sustainable Building Design Manual: Vol 1 and 2',The Energy Research Institute, 2004.

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24ARS721	ARCHITECTURAL DESIGN - VII								SEMESTER-VII
Marks	**Internal**	**200**	**External**			**300**	**Total**	**500**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	14	**Credits**			**14**

COURSE OBJECTIVE:

- Understanding Complex Design Programme and the Components of the Design Problem.
- Investigate and Acquire the Knowledge to address the various aspects of the Design Problem and Process
- Develop Ability to Communicate Design Ideas throughout the Design Stages with multiple media.
- Ability to do a frame work of Design methodology
- Ability to understand the process of Design and deliver the Architectural Design with Technical Drawings

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the basic functional aspect of designing complex building type and its relevant spatial organization.	Understand
CO2	Learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project	Understand
CO3	Transform the theoretical ideas to the tangible output of design.	Apply
CO4	Understand the space organization, space- volume design approach in large scale projects	Apply
CO5	Research, Analyse and Deliver a Urban Design proposal	Analyse
CO6	Communicate effectively through the design ideas	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**S**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**S**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**S**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

.

CONTENT

Design of advanced and complex problems – URBAN LEVEL - comprising group multi storied structures and infrastructure - with regard to climatic conditions, orientation, services, circulation problems relating to large developments Design and detailing for movement and use by handicapped persons within and around building and campuses to be addressed – examples: campus design, urban centres, Housing for Senior citizens- Urban and regional planning etc

TOTAL : 210 PERIODS

REFERENCES:

1. Kate Nesbitt, 'Theorizing a New Agenda for Architecture', Princeton Architectural Press, 1996.
2. Neil Leach, 'Rethinking Architecture', Routledge, 2000.
3. Harry Francis Mallgrave and David Goodman, 'An Introduction to Architectural Theory- 1968 to the Present', Wiley Blackwell, 2011.
4. Stephen A. Kliment, Editor 'Building Type Basics' Series, Wiley.
5. Mitchell WJ, 'Imagining MIT: Designing a campus for the 21st century', MIT Press, 2007.
6. Himanshu Burte, 'Space for Engagement', Seagull Books, 2008.
7. Mark Garcia, 'The Diagrams of Architecture', Wiley 2010.
8. Bjarke Ingels, 'Yes is More', Taschen, 2009.

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24ARS722	ARCHITECTURAL CONSERVATION								SEMESTER-VII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To introduce the various issues and practices of conservation, conservation practice in the country
- To familiarize the students with the status of conservation in India
- To teach them about the various agencies involved in the field of conservation worldwide and their policies.
- To know about the various guidelines for the preservation, conservation and restoration of buildings.
- To inform the students about the character and issues in our heritage towns through case studies.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the importance of heritage, issues and practices of conservation through case studies.	Understand
CO2	Familiar with historic materials and their properties, different technologies for investigating masonry, foundation and also traditional and modern repair methods	Understand
CO3	Gain knowledge about the government agencies involved in Conservation	Understand
CO4	Understand the methods of urban Conservation	Apply
CO5	Gain knowledge about various methods of Conservation techniques and Design	Apply
CO6	Gain knowledge about various policies involved in Conservation and practice in India	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION TO CONSERVATION

Conservation- Need, Debate and purpose. ;
Defining Conservation, Preservation and Adaptive reuse. Distinction between Architectural and Urban Conservation. International agencies like ICCROM, UNESCO and their role in Conservation. Museum conservation – monument conservation and the role of Archeological Survey of India – role of INTACH – Central and state government policies and legislations.

UNIT II - CONSERVATION IN INDIA

Over view of monumental and urban conservation through projects- select case studies of sites such as Hampi, Golconda, Mahabalipuram -craft Issues of conservation. Understanding the character and issues of historic towns and cities like Srirangaram, Kumbakonam and Kanchipuram - historic districts and heritage precincts.

UNIT III - CONSERVATION PRACTICE

Search and review of relevant literature and sources related to heritage building/monument, period, style, and historicity.

UNIT IV - SITE VISIT AND DOCUMENTATION:

Detailed documentation of the identified historic city/Area by studying the physical, socio-economic, environmental and governance aspects.Understanding its setting, significance and determinants that shaped the building.

UNIT V - ANALYSIS AND ASSESMENT:

Analysis and Identification of the important issues with respect to material, construction, style, morphological aspects, transformations.Identifying various threats due to natural or man-made causes of defects/deteriorations and various degrees of its condition assessment at city and area level.
(Deliverables shall include drawings and report. Progressive presentations shall be made for reviews at various stages).

TOTAL : 60 PERIODS

REFERENCES:

1. Bernard Fielden, 'Conservation of Historic Buildings', Architectural Press, 2003.
2. Bernard Fielden, 'Guidelines for Conservation - A Technical Manual', INTACH, 1989.
3. MS Mathews, 'Conservation Engineering', Universitat Karlsruhe, 1998.
4. J. Kirk Irwin, 'Historic Preservation Handbook', McGraw Hill, 2003.
5. Donald Appleyard, 'The Conservation of European Cities', M.I.T. Press, Massachusetts, 1979.
6. Publications of INTACH
7. James M. Fitch, Historic Preservation: Curatorial Management of the Built World by University Press1990

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ELECTIVES – 1
SEMESTER- VII

24ARES 731	**SUSTAINABLE AND RESILIENT BUILDING DESIGN**									**SEMESTER-VII**	
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**		**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**		**3**

COURSE OBJECTIVE:

- To understand the impacts of environment today and to follow the steps to sustainability
- To work towards sustainable development and to understand low impact construction practices,
- To understand the life cycle costs and alternative energy resources.
- To familiarize the students with the various rating systems for building practices with case studies.
- Through case studies to understand the concept of sustainable communities and the economic and social dimensions.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand about climate change and the need for the sustainable buildings	Understand
CO2	Understand the energy-based concepts and resource optimisation	Understand
CO3	Understand about the environmental impacts of today and Follow the Sustainable approach	Understand
CO4	Gain ability to design energy efficient buildings	Apply
CO5	Understand the green concepts and apply them in every aspect and approach towards sustainable architecture	Understand
CO6	Understand about the building simulation for energy analysis and for various design solutions	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODCUTION TO SUSTAINABILITY

Introduction to Sustainable principles and practices – Carrying capacity, concepts of sustainable development– Ethics and Visions of sustainability. Eco system and food chain, natural cycles – Ecological foot print – Climate change and Sustainability-World population – GDP – Carbon emissions–steps by the organizations etc. Importance of water, energy, materials and community in architecture for sustainable development.

UNIT II - CLIMATE CHANGE AND THE BUILT ENVIRONMENT

Climate Change: Status, challenges and opportunities-outdoor thermal comfort-climate resilient development strategies-low carbon development strategies-climate and weather data-thermal comfort and adaptation in built environment-the impact of IEQ on human health-ventilation and its relationship to IAQ-low environmental impact building materials.

UNIT III - PASSIVE DESIGN STRATEGIES

The concept of passive buildings- thermal comfort requirements- site and microclimate-orientation-solar geometry-passive solar design-thermal mass- passive heating/ cooling strategies window placement - daylighting shading device. Case studies on building designed with passive heating and cooling techniques.

UNIT IV - NET ZERO ENERGY BUILDING DESIGN

Net zero energy buildings: Definitions, concepts and classification system – net zero energy building systems, technologies and applications – Net Zero ratings in India and Case studies.

UNIT V - BUILDING PERFORMANCE ANALYSIS AND SIMULATION

Introduction to Building performance analysis, impact of envelope design in building's performance, methodology for BPA simulation, Introduction to Building Performance simulation Software Such as Design Builder, Comfen, Revit 2022 Energy Optimisation Analysis and Autodesk Insight 360.

TOTAL : 60 PERIODS

REFERENCES:

1. Iyengar, K. 2015. Sustainable Architectural Design: An Overview, Routledge.
2. Chiras, D. 2002. The Solar House: Passive Heating and Cooling. Chelsea Green Publishing.
3. James, M. 2015. Net Zero Energy Buildings Passive House+ Renewables, Low Carbon Production:
4. Attia, shady. 2018. Net Zero Energy Buildings (NZEB): Concepts, Frameworks and Roadmap for Project Analysis and Implementation. Butterworth-Heinemann.
5. 8. O.H. Koenigsberger and others (1993), Manual of Tropical Housing and Building –Part I – Climate design, Orient Longman, Madras, India.
6. Heating, Cooling and Lighting – Norbert Lechner, October 2015

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24ARES732	PARAMETRIC ARCHITECTURE AND MODELLING							SEMESTER-VII
Marks	**Internal**	**60**	**External**		**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3		**Credits**	**3**

COURSE OBJECTIVES:

- To understand the recent development of parametric design in architecture both as a discourse and as a tool.
- To impart training in parametric tools by 2D and 3D modelling through projects.To enable the use of parametric platform to develop a design from the initial stages to the final outcome.
- To provide a brief yet systematic conceptual framework to parametric design in contemporary architectural practices.
- To develop students basic skills in using parametric tools such as Rhino Grasshopper.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Use parametric software to generate design variants	Understand
CO2	Gain knowledge in Understanding of emergent possibilities in digital design, analysis and fabrication	Understand
CO3	Get Awareness to the machines, different methods of fabrication and the workability with materials.	Understand
CO4	Correlate between the design processes and Digital Prototype or Model attribute.	Apply
CO5	Develop new ideas in Design	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - ELEMENTS OF PARAMETRIC DESIGN AND DESIGN PATTERNS

Introduction to Parametric design, Historical development of parametric design, The structure of parametric design processes, their characteristics and parametric design approaches.

UNIT II - FUNDAMENTAL CONCEPTS OF GEOMETRIC MODELLING

Spatial coordinates, Projections, Boolean operations, Formal transformations, Free form surface creation, Surface development and deformations aimed at architecture applications, Discretization and meshing, Digital prototyping and geometry reconstruction. Concepts in computational geometry applied to parametric architectural geometry modelling for form development.

UNIT III - PARAMETRIC MODELLING TECHNIQUES AND TOOLS

Introduction of tools for model design parametrically to illustrate the construction of geometrical relationships among complex shapes. Focus on hands-on techniques that can be applied to the design process, to extend the efficiency and productivity of work during the process. Use of software like Rhino, Grasshopper, Kangaroo, Lunch Box, Lady Bug, Weaverbird.

UNIT IV - PARAMETRIC DESIGN AND ENVIRONMENT

Kinetic Design in Architecture, Responsive Façade based on Behavioural Aspects, Materials used in Parametric Design

UNIT V - DIGITAL FABRICATION

Advance 3D Modelling and tools, Different manufacturing processes like Additive, Subtractive

- CNC cutting
- CNC milling
- Laser Cutting
- 3D Printing (SLS & FDM)

TOTAL : 60 PERIODS

REFERENCES:

1. Piker, Daniel. “Kangaroo: form finding with computational physics.” Architectural Design 83, no. 2 (2013): 136-137.
2. Ingels, Bjarke. Hot to cold: an odyssey of architectural adaptation. No. 72: 504 72: MedioAmbiente. BIG Bjarke Ingels Group., 2015.
3. Schumacher, Patrik. “Parametricism: A new global style for architecture and urban design.” Architectural Design 79, no. 4 (2009): 14-23.
4. Sakamoto, Tomoko, ed. From control to design: parametric/algorithmic architecture. Actar-D, 2008
5. Robert Woodbury Parametric; Design for Architecture
6. Lisa Iwamoto ; Digital Fabrications: Architectural and Material Techniques
7. Luca Caneparo; Digital Fabrication in Architecture, Engineering and Construction
8. Christopher Breorkram ; Material Strategies in Digital Fabrication
9. Mark Burry Jordi BonetiArmengol, Jos Tomlow, Antoni Gaudi ; Gaudi: Unseen

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24ARES733	EARTHQUAKE RESISTANCE ARCHITECTURE								SEMESTER-VII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To understand the fundamentals of Earthquake and the basic terminology
- To familiarize the students with design codes and building configuration
- To understand the site planning and performance of ground & Buildings
- To understand the impacts in urban level due to earth quake and solution for mitigation
- To understand the various types of construction details to be adopted in a seismic prone area.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the formation and causes of earthquakes	Understand
CO2	Understand the factors to be considered in the design of buildings	Understand
CO3	Understand the services to resist earthquakes.	Understand
CO4	Familiar with the Seismic Design Codes & configurations	Apply
CO5	Understand about designing earth quake resistant structures	Understand
CO6	Learn about urban level planning strategies for earth quake resistance	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

UNIT I - FUNDAMENTALS OF EARTHQUAKES

Earth's structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India. Predictability, intensity and measurement of earthquake Basic terms- fault line, focus, epicenter, focal depth etc.

UNIT II - SITE PLANNING, PERFORMANCE OF GROUND AND BUILDINGS

Historical experience, site selection and development b) Earthquake effects on ground, soil rupture, liquefaction, landslides. Behavior of various types of building structures, equipment, lifelines, collapse patterns Behavior of non-structural elements like services, fixtures in earthquake-prone zones

.

UNIT III - SEISMIC DESIGN CODES AND BUILDING CONFIGURATION

Seismic design code provisions – Introduction to Indian codes b) Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildingslikeshort stories, short columns etc.

UNIT IV - VARIOUS TYPES OF CONSTRUCTION DETAILS

Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures.Seismic design and detailing of RC and steel buildingsDesign of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components. Earthquakes at Bhuj, Lattur, etc., Cyclones in coastal Andhra pradesh & Orissa, Land slides in Nilgiris, Himachal etc, Floods in Bangladesh, and Droughts in Rajasthan & Tsunami in Tamil Nadu. Design guidelines for disaster resistant construction at appropriate situations - Engineering, architectural, landscape & planning solutions for floods, tropical cyclones & Tsunami

UNIT V - URBAN PLANNING AND DESIGN

Vulnerability of existing buildings, facilities planning, fires after earthquake, socioeconomic impact after earthquakes. Architectural design assignment- Institutional masonry building with horizontal spread and
height restriction, multistoried RC framed apartment or commercial building.

TOTAL : 60 PERIODS

REFERENCES:

1. Guidelines for earthquake resistant non-engineered construction, National Information Centre of earthquake engineering (NICEE, IIT Kanpur, India)
2. C.V.R Murthy, Andrew Charlson. “Earthquake design concepts”, NICEE, IIT Kanpur India.
3. Ian Davis (1987) Safe shelter within unsafe cities” Disaster vulnerability and rapid urbanization, Open House International, UK
4. Socio-economic developmental record- Vol.12, No.1, Jan-Feb 2005
5. Learning from Practice- A review of Architectural design and construction experience

.

ELECTIVES – 2

24ARES734	**ARCHITECTURE JOURNALISM AND PHOTOGRAPHY**									**SEMESTER-VII**	
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**		**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**		**3**

COURSE OBJECTIVE:

- To introduce general skills necessary for the practice of professional journalism.
- To introduce the fundamentals of writing, explain different strategies and their criticism.
- To give good exposure to architectural journalism.
- To introduce photojournalism, bring out importance/ contributions of photography
- To gain knowledge in modern photography techniques.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain the ability to critically think and analyse about the effects of architecture on society as well as the tools to enable recording of the same	Understand
CO2	Express by means of effective communication, writing and video documentation	Apply
CO3	Learn about the composition of content in Architecture Journals	Understand
CO4	Learn about Photography and Photo Journalism	Understand
CO5	Document, analyse and critic the work by means of interview and data collection	Apply
CO6	Develop the proficiency in Field program, interviews and Architectural Document witting	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**S**	**S**	**M**	**L**	**S**	**M**
CO2	**S**	**S**	**L**	**S**	**M**	**M**	**L**	**S**	**L**
CO3	**S**	**S**	**L**	**S**	**S**	**M**	**L**	**S**	**M**
CO4	**S**	**S**	**L**	**S**	**M**	**M**	**L**	**S**	**L**
CO5	**S**	**S**	**L**	**S**	**S**	**M**	**L**	**S**	**M**
CO6	**S**	**S**	**L**	**S**	**M**	**M**	**L**	**S**	**L**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION TO ARCHITECTURE JOURNALISM AND PHOTOGRAPHY

Overview of architectural journalism and photography; Historical and contemporary perspectives on architectural storytelling; Ethical considerations and responsibilities in architectural journalism and photography.

UNIT II - ARCHITECTURAL WRITING AND STORYTELLING

Principles of journalistic writing and storytelling; Techniques for researching, interviewing, and reporting on architectural topics; Crafting compelling narratives and features on architecture and urbanism.

UNIT III - ARCHITECTURAL PHOTOGRAPHY BASICS

Fundamentals of photography: exposure, composition, lighting; Introduction to architectural photography techniques and equipment; Field trips and hands-on exercises in architectural photography

UNIT IV - ADVANCED ARCHITECTURAL PHOTOGRAPHY

Advanced composition techniques for architectural photography; Digital image processing and post-production workflow; Developing a personal style and vision in architectural photography.

UNIT V - MULTIMEDIA STORYTELLING AND FINAL PROJECT

Exploring multimedia formats for architectural storytelling (e.g., audio, video, interactive media); Integration of text, images, and multimedia in architectural journalism. Final project: produce a multimedia architectural feature or portfolio showcasing their skills in journalism and photography.

TOTAL : 60 PERIODS

REFERENCES:

1. Edward Jay Friedlander and John Lee, 'Feature Writing for Newspapers and Magazines', 4th edition, Longman, 2000.
2. David Fuller & Patricia Waugh, eds., 'The Arts and Sciences of Criticism', Oxford: Oxford University Press, 1999.
3. James Foust, 'Online Journalism Principles and Practices of News for the Web', Holcomb Hathaway Publishers, Scottsdale, AZ, 2005.
4. M. Harris, 'Professional Architectural Photography', Focal Press, 2001.
5. M. Harris, 'Professional Interior Photography', Focal Press, 2002
6. Martin Huckerby, 'The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries'. UNESCO/Thomson Foundation/ Common wealth Broadcasting Association, 2005.
7. S. J. Award, 'Philosophical Foundations of Global Journalism Ethics', Journal of Mass Media Ethics, Vol. 20, No. 1, 3-21, 2005.
8. M. Heinrich, 'Basics Architectural Photography', Bikhauser Verlag AG, 2008.
9. Gerry Kopelow, 'Architectural Photography: The Professional Way', Princeton Architectural Press, 2007
10. Photography and Architecture - 1839-1939 by Eve Blau and Edward Kaufman
11. Writing about Architecture - Mastering the Language of Buildings and Cities by Alexandra Lange

.

12. Architectural Photography - Composition, Capture, and Digital Image Processing by Adrian Schulz
13. The Architecture of Image - Existential Space in Cinema by Juhani Pallasmaa
14. Digital Storytelling: Capturing Lives, Creating Community by Joe Lambert
15. Multimedia Journalism - A Practical Guide by Andy Bull

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24ARES735	INNOVATIVE AND ALTERNATIVE BUILDIING TECHNIQUE								SEMESTER-VII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVES:

- To enable the students to understand the alternative building techniques other than conventional ones with relation to economic and environmental outcomes.
- To provide focus on Alternative Building Materials.
- To know how recycled materials can be used in construction.
- To provide knowledge in earth materials.

COURSE OUTCOMEs:

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

COs	Course Outcomes	Blooms Level
CO1	Learn new Building Techniques	Understand
CO2	Awareness to New Building Materials.	Apply
CO3	Gain knowledge in Understanding sustainable Building Materials.	Understand
CO4	Learn how Earth building materials can be used in construction	Apply
CO5	Gain knowledge in Recycled building materials	Understand
CO6	Create sustainable living environment	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO5	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION TO ALTERNATE BUILDING TECHNIQUES

Introduction Types of alternative building techniques like, Earth, Flyash, Bamboo, Thatch, Ferro-cement, etc. Advantages of alternative building techniques over conventional methods. Alternativemethods of construction related to different materials and their comparison. Upgradation,modification and revision of various methods of construction.

UNIT II - EARTH MATERIALS

Composite materials made from earth like rammed earth, compressed stabilised earth blocks, stacked earth, sun dried clay bricks, steam cured blocks, Wattle and Daub. Filler slab, Jack arch roof.

UNIT III - BAMBOO

Bamboo Characteristics, advantages and disadvantages, needs and usage of various methods of construction like walling, flooring and roofing techniques. Preservation of bamboo, bamboo tiles, shingles, bamboo joints.

UNIT IV - RECYCLED WASTE MATERIALS

Recycled Waste Materials Types of waste used in construction. Benefits of using recycled waste materials. Materials made out from waste paper, wood, plastic bottles, plastic bags, earthen materials, steel, aluminium, copper, bricks, gypsum, straw, wool, carpets etc, Techniques of using these materials in building construction.

UNIT V - EXERCISE

Project : Hands-on Experience and workshop on any of the above mentioned Building Techniques and study on above materials with an example.

TOTAL : 60 PERIODS

REFERENCES:

1. Lewis Davidson Gotlieb, Environment and design in housing, The Mc.Millan Corp, New York.
2. Housing and building in hot-humid and hot dry climate/
3. Low-cost housing in developing countries/ Mathur,

.

24ARES736	INTEGRATED BUILDING MANAGEMENT SYSTEMS								SEMESTER-VII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To familiarize the student with minimum safety requirements for a high-rise building
- To understand the codes of NBC.
- To gain knowledge about the safety codes & practice
- T deeply understand the Building Address System & Automation Systems
- To study fire alarm systems and fire suppression systems and their installation.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the practice of safety standards	Understand
CO2	Gain knowledge in Fire safety standards & practice considerations	Understand
CO3	Understand about the integrated building management systems	Understand
CO4	Understand in building automation systems	Understand
CO5	Familiar with integrated services for multi-storied buildings	Apply
CO6	Develop the proficiency in Field program, interviews and Architectural Document witting	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT I - SAFETY REQUIREMENTS

Minimum safety requirements for a building, particularly for a high rise building as per the National Building Code.

UNIT II - FIRE ALARM SYSTEMS

Objectives of a Fire Alarm System, Essential components of a Fire Alarm System, Technology of detection, Type of Statutory Standards followed in direction, Explanation on the essential clauses, various types of technologies employed in the Fire Alarm System, basic knowledge on how a Fire Alarm System is designed and installed

UNIT III - FIRE SUPPRESSION SYSTEMS

Objectives of a Fire Suppression System, Explanation on fire triangle, Essential components of a Fire Suppression System, different types of Fire Suppression Systems, Type of Statutory Standards followed in Suppression, Explanation on the essential clauses and basic knowledge on how a Fire Suppression System is designed and installed.

UNIT IV - SECURITY SYSTEMS

Introduction to different types of Security Systems and why they are required. Introduction to Access Control, CCTV, Intruder Alarm and Perimeter protection Systems, Essential components of each system, various types of technologies employed in these Systems, basic knowledge on how they are designed and installed.

UNIT V - AUTOMATION SYSTEMS

The objectives of the Building Automation system (BAS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

TOTAL : 60 PERIODS

REFERENCES:

1. Building Automation Systems – A Practical Guide to selection and implementation – Author: Maurice Eyke
2. National Building Code of India 1983 (SP 7:1983 Part IV) – Published by Bureau of Indian Standards
3. IS 2189 – Selection, Installation and Maintenance of Automatic fire Detection and Alarm System – Code of Practice (3rd Revision) – Published by Bureau of Indian Standards.
The Principles and Practice of Closed-Circuit Television – Author: Mike Constant and Peter Turnbull
Rules of Automatic Sprinkler Installation – 2nd Edition – Published by Tariff Advisory Committee.
6. Fire Suppression Detection System – Author: John L. Bryan
7. Design and Application of Security/Fire Alarm system – Author: John E. Traister.

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SEMESTER- VIII

24ART801	**PROJECT MANAGEMENT**									**SEMESTER-VIII**	
Marks	**Internal**	**40**	**External**			**60**	**Total**	**100**	**Exam Hours**		**3**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	0			**Credits**		**2**

COURSE OBJECTIVE:

- To give an overview of project management.
- To understand about the market potential in the current scenario and to learn about urban level policy & Decisions
- Stimulating an awareness of the issues involved in international project management.
- To introduce different management techniques suitable for planning and construction projects.
- To enable understanding of management systems for accomplishing the task efficiently in terms of quality, time and cost.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain knowledge in the concepts of Project Management	Understand
CO2	Learn about urban level policies in Project Management	Apply
CO3	Understand the Current scenario through case studies	Understand
CO4	Understand a project from concept to commissioning, feasibility study and facility programme, design, construction to commissioning.	Understand
CO5	Apply project management techniques in achieving objectives of a project like client needs, quality, time and cost.	Apply
CO6	Know the principles of management, construction scheduling, scope definition and team roles	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**S**	**M**	**S**	**M**
CO2	**S**	**S**	**L**	**-**	**-**	**S**	**L**	**S**	**M**
CO3	**S**	**M**	**L**	**M**	**-**	**S**	**S**	**S**	**S**
CO4	**M**	**S**	**M**	**L**	**-**	**S**	**S**	**S**	**M**
CO5	**S**	**M**	**S**	**M**	**L**	**S**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**M**	**L**	**S**	**S**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - INTRODUCTION TO PROJECT MANAGEMENT

Project management concepts. Objectives, planning, scheduling. Controlling and role of decision.In project management. Traditional management system. Gantt's approach. Load chart. Progresschart .Development of bar chart, merits and demerits. CPM networks, merits and demerits. PERT network. Introduction to the theory of probability and statistics.

UNIT II - PROJECT PROGRAMMING AND CRITICAL PATH METHOD

Project network.Events activity.Dummy.Network rules.Graphical guidelines for Network.Numbering the events.Cycles.Development of network-planning for network construction.Modelsof network construction.Steps in development of network. Work break down structure. Hierarchies.Critical path method - process, activity time estimate, earliest event time, latest allowable occurrencetime, start and finish time of activity, float, critical activity and critical path problems.

UNIT III - RESOURCE PLANNING

Cost model- project cost, direct cost, indirect cost, slope curve, total project cost. Optimum durationcontracting the network for cost optimisation. Steps in cost optimisation, updating, resourceallocation, resource smoothing, resource levelling.

UNIT IV - COMPUTERISED PROJECT MANAGEMENT

Creating a new project, building task. Creating resources and assessing costs, refining project.Project tracking, recording actual.Reporting on progress.Analysing financial progress.Introductionto BIM.

UNIT V - CONCEPT TO COMMISSIONING

Project feasibility study.Real estate and regulatory strategies.Facility programming and planning.Design management. EPC.testing and commissioning.

TOTAL : 30 PERIODS

REFERENCES:

1. Dr. B.C. Punmia and K.K. Khandelwal, 'Project Planning and Control with PERT and CPM', Laxmi Publications, 2018.
2. Elaine Marmel, 'Microsoft Project 2016 Bible', Prentice Hall, 2016.
3. Sam Kubba, 'Green Construction Project Management and Cost Oversight', Elsevier, 2010.

REFERENCES

1. Jerome D. Wiest and Ferdinand K. Levy, 'A Management Guide to PERT/CPM',

.

24ART802	RESEARCH METHODS AND FIELD STUDIES									SEMESTER-VIII
Marks	Internal	40	External			60	Total	100	Exam Hours	3
Instruction Hours /week	L	2	T	0	P/S	0			Credits	2

COURSE OBJECTIVE:

- To learn the importance research and to undertake research and field studies
- To understand the research applications in architectural design.
- To understand the different methods and the techniques as relevant to the design profession
- To understand the experimental research methods, understand about different survey methods
- To apply research in evaluation and appraisal of architectural design projects.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the research methodology and research methods	Understand
CO2	Understand the various analytical methods in research	Apply
CO3	Understand the experimental methods of Research	Understand
CO4	Learn about the survey methods and documentation	Understand
CO5	Know to collect relevant data, compile and document	Apply
CO6	Critically analyse the data and present it as a document	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**S**	**M**	**M**	**M**	**S**	**S**
CO2	**S**	**S**	**L**	**S**	**L**	**-**	**M**	**S**	**S**
CO3	**S**	**S**	**L**	**S**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**S**	**M**	**-**	**M**	**S**	**S**
CO5	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**

S-Strong; M-Medium; L-Low

.

UNIT I - INTRODUCTION TO RESEARCH METHODOLOGY

Introduction to independent research Project, Importance. Purpose and scope of research and field studies in Architecture and allied fields. Application in architecture in terms of design, technology, environment, economic and behavioural areas.

UNIT II - RESEARCH METHODS

Sequence – Aim, Objectives, Scope, Limitations, Research questions & Hypothesis, Results and Conclusion and various methods of Architectural research, Identification of problem, Understanding Variables Hypothesis formulation and Testing.

UNIT III - ANALYTICAL METHODS

Understanding and applying qualitative analytical interpretative correlation, quasi experimental, experimental, simulation and modelling techniques in Architectural design.

UNIT IV - SURVEY AND FIELD STUDY METHODS

Pilot studies field surveys and collection of samples – physical, Architectural, Environmental organizational, preparation and Analysis of Data sheets and Questionnaires.

UNIT V - DOCUMENTATION AND PRESENTATION

Preparation and analysis of data sheets and questionnaires. Arriving at conclusions from the research at field studies. Understanding Report writing, Ethics in Writing and publications.

TOTAL : 30 PERIODS

REFERENCES:

1.Knight. A and Ruddock L., "Advanced Research Methods in build Environment", John Wiley & Sons 2008.

2.Groat L, and Wang D, "Architectural Research Methods". Secon Edition, John Wiley & Sons, 2013.

3.Gibbs J P "Urban Research Methods", (revised) Von Nostrand 1988.

4.Kothari C R, Research Methodology – Methods and Techniques", New Age International 2004.

5.Khanzode V V, "Research Methodology – Techniques and Trends", APH Publishing, 1995.

6. Research Methodology; C.R.Kothari; New Age International (P) Ltd.

7. Research Methods in the Social Sciences, By Nachmias, C. F. and Nachmias, D., 5th Ed 1996 Great Britain: St. Martin's Press Inc

8. Visual research methods in design, By Sanoff, H, 1991 USA : Van Nostrand Reinhold

9. Research & Publication Ethics, Authored By Singh Upendra Pratap (Dr), Ahlawat Sakshi (Ms), Sharma Sushma(Dr) Publisher: Sultan Chand & Sons, 2023

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24ARS821	ARCHITECTURAL DESIGN - IX								SEMESTER-VIII
Marks	**Internal**	**280**	**External**			**420**	**Total**	**700**	**Exam Hours**	**6**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	12	**Credits**			**14**

COURSE OBJECTIVE:

- To create an opportunity for coordinated group tasks to understand various urban attributes.
- To conduct physical, socio-economic, cultural, etc. studies through data collection, analysis, and presentations to identify various urban issues
- To propose urban design interventions concerning the urban context with architectural design solutions through specialized aspects of Landscaping, Town planning, Place Making, Community design, etc.
- To explore and Analyse, experience and document urban contexts and to understand the notion of public space and streets.
- To appreciate the difference between urban design as opposed to urban development and planning.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the basic functional aspect of designing complex building type and its relevant spatial organization.	Understand
CO2	Transform the theoretical ideas to the tangible output of design.	Apply
CO3	Provide urban design and development solution to meet context-specific needs.	Apply
CO4	Understand the space organization, space- volume design approach in large scale projects	Understand
CO5	Research, Analyse and Deliver a Urban Design proposal	Analyse

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**S**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**S**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**S**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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CONTENT

Understanding the Correlation of design issues to land and surrounding areas the influences of neighborhoods on the design development. The project may focus to address varied components including large scale urban interventions, guidelines for heritage areas, adaptive reuse, transportation nodes and infrastructure additions, densification along transit nodes and corridors revitalization and renewal of urban fragments, new communities and community development, multi-use urban complexes, conservation and reuse of building in the context, Redevelopment of historic city center, revitalization of traditional urban cores, Greenfield / Brownfield development, urban waterfront development, Market squares etc.

Consideration of topics such as human behavior, socio-economics, environment, and technology concerning urban context through the study of history, morphology, typology, people's perception, land use, transportation, byelaws, environmental resources/ status.
Documenting and analyzing infrastructure, ecological services, status of resources, condition of livability and deriving meaning, relating to physical form, depicting concepts of development/ change. Analysis and inferences from Observations, drawings, context models etc. Charrette and dialogue on urban themes and regulations.

Exercises and Drawings - on Broad contextual interventions, site, location, historic significance, transport patterns, densities, etc,. Exploration of variations and their impact.

A design proposal that addresses needs, resource management, environmental management, infrastructure development, principles for sustainable development, form-based codes, smart technologies, urban inserts, conservation strategies, heritage management, and design demonstration.

TOTAL : 210 PERIODS

REFERENCES:

1. Jonathan Barnett, 'An Introduction to Urban Design', Harper and Row; 1982
2. Cavallo, R. et al, 'New Urban Configurations', IOS Press, 2014.
3. Henriette Steiner & Maximilian Sternberg, 'Phenomenologies of the City: Studies in the History and Philosophy of Architecture', Routledge 2015.
4. Jan Gehl, 'Life between Buildings- Using Public Space', ArkitektensForleg 1987.
5. Time Savers Standard for Urban Design', Donald Watson, McGraw Hill, 2005.
6. Malcolm Moore & Jon Rowland Eds, 'Urban Design Futures', Routledge, 2006.
7. Gosling and Maitland, 'Urban Design', St. Martin's Press, 1984.
8. Kevin Lynch, 'Site Planning', MIT Press, Cambridge 1967.
9. Kevin Lynch, 'The Image of the City', MIT Press, 1960.
10. Jeremy till et al, 'Spatial Agency: Other Ways of Doing Architecture', Routledge, 2011
11. Balsavar Durganand, An Understanding of a City as a Process in Time, CEPT Published Thesis, 2015 Mode of evaluation: Projects - Continuous Assessment, Final Assessment.
12. Vibhuti Sachdev, Tillotson, The making of an Indian City- Building Jaipur, Reaktion Books, 2012
13. De Chiara, J., & Koppelman, L. (1975). Urban planning and design criteria. Van Nostrand Reinhold Company
14. Cartwright, R. M. (1980). The design of urban space. The design of urban space.
15. Gosling, D., & Maitland, B. (1984). Concepts of urban design.

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24ARS822	DISSERTATION - I								SEMESTER-VIII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	6	**Credits**			**3**

COURSE OBJECTIVE:

- To inculcate the spirit of research in architecture.
- To enable the acquisition of in-depth knowledge in a specific aspect/ issue in the discipline of architecture as well as develop perspectives on the same through reading, study, analysis and thought.
- To facilitate the development of a coherent line of thinking and express it through clear writing.
- To serve as prelude to Thesis.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Learn to research on a specific interested topic and collect appropriate data	Understand
CO2	Develop the skill of analytical approach towards the related topic	Analyse
CO3	Develop a coherent line of thought based on point of view, observation, analysis and study	Apply
CO4	Prepare a dissertation report which is based on accepted norms of technical writing.	Apply
CO5	Become prepared for the larger thesis project.	Analyse

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**S**	**M**	**M**	**M**	**S**	**S**
CO2	**S**	**S**	**M**	**S**	**L**	**-**	**M**	**S**	**S**
CO3	**S**	**S**	**M**	**S**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**S**	**M**	**-**	**M**	**S**	**S**
CO5	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**

S-Strong; M-Medium; L-Low

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CONTENT

Identification of Dissertation Topic and Area, Hypothesis Formulation, Objectives and Methodology. Importance, Purpose and Scope of the Dissertation in architecture in terms of design, technology, environment, economic and behavioural areas.
Related Research, Literature and Field Studies. Submission of the above in report form.

TOTAL : 90 PERIODS

REFERENCES:

1.. Knight, A. and Ruddock,L., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
2. Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
3. Kothari, C.R., "Research Methodology- Methods and Techniques", New Age International. 2004.
4. Wayne C Booth, Joseph M Williams, Gregory G. Colomb, 'The Craft of Research', 2nd Edition, University of Chicago Press, 2008.
5. Ranjith Kumar, 'Research Methodology- A Step by Step Guide for Beginners', Sage Publications, 2005.
6. John W Creswell, 'Research Design: Qualitative, Quantitative and Mixed Methods Approaches', Sage Publications, 2002. B.Arch 2020- 21
82 Karpagam Academy of Higher Education (Deemed to be University), Coimbatore – 641 021.

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ELECTIVES – 1

24ARES831	**GREEN BUILDINGS AND CODE COMPLIANCE**									**SEMESTER-VIII**	
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**		**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**		**3**

COURSE OBJECTIVE:

- To develop and acquire knowledge about the Green buildings
- To Gain knowledge about the green Building codes and code compliance Process
- To understand the Indian and International green building codes
- To understand the design ideas for the green building
- To understand about energy usage and code compliance.

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Understand the basic concept of Green buildings	Understand
CO2	Gain knowledge in various green rating systems around the world	Understand
CO3	Understand the criteria involved in the green rating systems	Apply
CO4	Learn about the design techniques to be followed as per codes	Apply
CO5	Learn about the documentation of project for green Building certification	Apply
CO 6	Gain knowledge about the green building design aspects	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**L**	**M**	**S**	**M**
CO2	**S**	**S**	**L**	**-**	**-**	**-**	**L**	**S**	**M**
CO3	**S**	**M**	**L**	**M**	**-**	**L**	**S**	**S**	**S**
CO4	**M**	**S**	**M**	**L**	**-**	**L**	**S**	**S**	**M**
CO5	**S**	**M**	**S**	**M**	**L**	**L**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**M**	**L**	**M**	**S**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT I - GREEN BUILDING CODES & CERTIFICATION

Green building design – benefits – rating systems – Introduction to USGBC, IGBC codes- for various types of buildings – campus rating-Cities rating -factory – health care -Schools- Interiors etc LEED, GRIHA, ECBC, super ECBC, CASBEE- japan, BREEAM, Green Building Council of Australia (GBCA),PEARL- Abu Dhabi ,Green building Imitative (GBI)etc- HK- BEAM - Hong Kong, Prescriptive method- Building performance method variations, WELL etc

UNIT II - ENERGY USAGE AND CODE COMPLIANCE

Energy – Global Energy consumption -Conventional systems – Modern systems – Energy bills – Equipment & Utility-Embodied energy -Energy performance Assessment- Energy ratings – ECBC guidelines – ECBC CODE compliance & Certification- ECBC, ECBC+, Super ECBC, ECO – NIWAS Samhita 2018, Part – I (Building Envelope), ECO – NIWAS Samhita 2021, (Code Compliance and Part – II:(Electro mechanical, and Renewable Energy Systems), ECO NIWAS TOOL.

UNIT III - USGBC & IGBC CODES & COMPLIANCE

USGBC – LEED &IGBC codes – all credits & ratings- Compliance Process & Certification

UNIT IV - GRIHA RATINGS AND COMPLIANCE

GRIHA codes – all credits & ratings – Compliance Process & Certification

UNIT V - GREEN BUILDING CASE STUDIES AND DESIGN

Green building design – requirements & Design

TOTAL : 60 PERIODS

REFERENCES:

1. Nayak, J. K., Prajapati, J. A., 2006. *Handbook on Energy Conscious Buildings*, Prepared under the
   interactive R&D Project No. 3/4(03)99-SEC between Indian Institute of Technology, Bombay, and
   Solar Energy Centre, Ministry of New and Renewable Energy, Government of India.
2. Slessor,1997 "*Eco-Tech: Sustainable Architecture and High Technology*"- Thames and Hudson
3. Mostaedi (A) – Carles Broto 2002 "*Sustainable Architecture: Low tech houses*"
4. Yeang Ken, 2006 "*Eco-design: A manual for Ecological Design*" Wiley Academy
5. ECO – NIWAS Samhita 2018, Part – I (Building Envelope),
6. ECO – NIWAS Samhita 2021, (Code Compliance and Part – II :(Electro mechanical and Renewable Energy Systems), ECO NIWAS TOOL.
7. ALL ASHRAE standards, USGBC, IGBC Guide, GRIHA manual
8. All NPTEL , SWAYAM courses related to the Topics to be referred

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24ARES832	ADVANCED PRACTICE AND TECHNIQUE IN CONSERVATION								SEMESTER-VIII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To introduce the various techniques and practices in documenting heritage.
- To teach them about the various technology involved in the field of conservation worldwide and their benefits
- To Know about the various methodology and approach for the preservation, conservation and restoration of buildings.
- To inform the students about the interdisciplinary character and new paradigm technicalities.
- To expose the students to various modes and techniques in organizing data including manual documentation/inspection recording systems.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the importance of documenting heritage, issues and practices of conservation through case studies.	Understand
CO2	Familiarize with historic materials and different technologies for investigating masonry, foundation and also traditional and modern repair methods	Apply
CO3	Gain knowledge about the advanced tools and methods involved in urban conservation.	Apply
CO4	Gain knowledge about various methods of Conservation techniques and Design	Understand
CO5	Use new technique in conservation	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**L**	**M**	**S**	**M**
CO2	**S**	**S**	**L**	**-**	**-**	**-**	**L**	**S**	**M**
CO3	**S**	**M**	**L**	**M**	**-**	**L**	**S**	**S**	**S**
CO4	**M**	**S**	**M**	**L**	**-**	**L**	**S**	**S**	**M**
CO5	**S**	**M**	**S**	**M**	**L**	**L**	**M**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT-I INTRODUCTION TO DOCUMENTATION NEED IN CONSERVATION

Understanding and need for documenting different types of heritage components. Introduction to various methods of documentation. Standards of documentation. Methods of inventory, survey questioners and data recordings.

UNIT-II APPROPRIATE TECHNIQUES FOR VARIOUS SCALES:

Difference between data and documentation. Appropriate documentation techniques of various scales and components of cultural resources. Application of documentation techniques. Communicating documentation including technical skills and competence.

UNIT-III HERITAGE APPLICATIONS OF GEOSPATIAL DATA

Heritage applications of Geospatial Data – Review of GIS fundamentals, Geo-visualisation with integration of cartography and historic maps, image analysis and exploratory data analysis for visual exploration, analysis, synthesis and graphic presentation of geospatial data regarding heritage resources**.**

UNIT-IV PHOTOGRAMMETRY:

Understanding the technique – photogrammetry- in heritage documentation and conservation. Terrain Mapping and Analysis: Experimental case documentation, Applications, Parameters and Analysis of data to conserve the heritage structures and fabrics.

UNIT-V DATA DISPLAY AND REPORTING:

Data display, data query and data analysis; Report on basic elements of GIS modelling and photogrammetry. Process Models for specific heritage conservation applications.
(Deliverables shall include drawings and report. Progressive presentations shall be made for reviews at various stages).

TOTAL : 60 PERIODS

REFERENCES:

1. Advanced Surveying -- R. Agor
2. Measurement and Recording of Historic Buildings – Donhead, 1993Swallow, Peter
3. Surveying Historic Buildings, Donhead, 1996 Watt,D& Swallow P
4. Guide to recording Historic Buildings, Butterworth, 1990.
5. Architectural Heritage: Inventory and Documentation, Methods in Europe, Council of Europe, 1992 Proceedings, French Ministry
6. Manual on Systems of Inventorying Immovable Cultural Property, UNESCO, 1984 Meredith H. Sykes
7. Digital Heritage: Applying Digital Imaging to Cultural Heritage, 2006 MacDonald, Lindsay, ed.
8. Digital Applications for Cultural and Heritage Institutions (Ashgate) James Hemsle, Vito Cappellini, Gerd Stanke
9. Analyzing Complex Survey Data Eun Sul Lee and Ronald N. Forthofer Geographic Information Analysis David
10. O'Sullivan and David J. Unwin Making Maps: a Visual Guide to Map Design for GIS John Krygier and Denis

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24ARES833	REAL ESTATE MANAGEMENT								SEMESTER-VIII	
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To give an overview of real estate development
- To understand about the market potential in the current scenario
- Stimulating an awareness of the issues involved in international real estate
- To learn about urban level policy & Decisions
- To learn about various differences in Real Estate market conditions all over the world

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain knowledge in the concepts of Real estate development	Understand
CO2	Understand about Property development	Understand
CO3	Apply urban level policies in Real estate management	Apply
CO4	Learn about the corporate Real estate management	Apply
CO 5	Gain knowledge in Project financing and development	Understand
CO 6	Understand the Current scenario through case studies	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**S**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**S**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**S**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

UNIT-I FUNDAMENTALS & CONCEPTS

Fundamentals of real estate development – concepts – techniques – recognizing institutional elements- Physical/Economic Characteristics, Types of Real Estate, Techniques & Sequential events in Real Estate Development Process- surveys and data rationalization; Development planning – preparation and interpretation

UNIT-II PRE PROJECT-STUDIES AND EVENTS

Project feasibility – options – development financing – analysis of development sites and case studies – integrated case study on specific development project. Site-Inventory, Evaluation& Feasibility Studies, Understanding & Analysis of Trends and Market Trajectories (Micro and Macro market), Factors affecting real estate demand, Development Team assembly

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UNIT-III MARKET LAYOUT/DEVELOPMENT PLANNING & APPROVAL PROCESS

Planning objectives, Layout Planning Parameters-Plot, Road Network, Infrastructure and open spaces, Efficiency of Layout/Development, Master plan & Detailed Development Plan. Front end clearances and Approvals from various authorities.

UNIT-IV FIELD SURVEY

Real estate value- market survey – case studies through field survey

UNIT-V RESEARCHING AND DATA COLLECTION

Library and archives. Internet: New information and the role of internet. Finding and evaluating sources. Misuse. Test for reliability. Ethics. Methods of data collection- Primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling. Collecting data from secondary sources. Research writing in general and its components. Developing the outline, referencing, writing the bibliography, presentation, etc.

TOTAL : 60 PERIODS

REFERENCES:

1. Fillmore W Galaty, "Modern Real estate practice" (2002); Dearborn Trade Publishing, NewYork,U.S.A.
2. Gerald R Cortesi, "Mastering Real estate principles" (2001); Dearborn Trade Publishing, NewYork, U.S.A.
3. Mike .E. Miles, "Real estate development – Principles & Process 3rd edition, (2000); Urban Land Institute, ULI – Washington DC
4. Richard B Peiser& Anne B. Frej, "Professional real estate development" – The ULI guide to the business – (2003), Urban Land Institute U.S.A.
5. Tanya Davis, "Real estate developer's handbook", (2007), Atlantic pub company, Ocala, USA.
6. John Ratcliffe; "Urban Planning & Real estate development, (2004); Taylor & Francis pub. U.K.
7. David Falk; "The fundamentals of Real estate finance", (2005).USA
8. Valuation of Immovable properties" (Under Direct Taxes) edn(2002), Grish Chand Gupta,

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24ARES834	PLANNING LEGISLATION AND PROFESSIONAL PRACTICE								SEMESTER-VIII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To make the students aware and understand the relevance of constitution and legislation in relation to spatial planning.
- The course also facilitates students to experience implications of the existing legislations relating to planning and its importance and shortcomings.
- The students are exposed to problems and prospects of town planning in terms of professional practice.
- To study the inclusion in planning and development process
- To revies policies, programmes and legislation in planning and acts and rules of governing bodies

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain Knowledge in various Acts/Laws relating to spatial planning will enable the students to apply them in professional practice as well as apply in their day-to-day life.	Understand
CO2	Orient towards the significance of planning rules and regulations would help students to deal urban and regional planning issues within framework of human rights and environmental protection.	Understand
CO3	Know about the role of state and central in planning	Apply
CO4	Learn about the legislations related to urban planning and development	Apply
CO 5	Understand the basic concept of law and Indian constitution acts, regulations related to urban planning	Understand
CO 6	Gain knowledge in Professional role responsibility and planning consultancy service	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**S**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**S**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**S**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT-I CONCEPT OF PLANNING LEGISLATION

The concept of law, legislation, ordinance, bill, Act Regulation and by-laws, concept of Eminent Domain and Police Powers. Indian constitution, national goals - Rights of ownership and development of property - Statutory control as a positive tool in plan preparation and implementation.

UNIT-II ACTS AND RULES GOVERNING LOCAL BODIES

Panchayat Act, Municipality Act, Corporation Act, TNULB Act, Improvement Trust Act, Development Authorities Act, Land Acquisition Act 1986, Rent Control Act, Apartment Ownership Act 1983. Provisions in the above acts related to functions, powers, role and responsibilities of local bodies including elected representatives and officers.

UNIT-III ACTS RELATED TO PLANNING AND IMPLICATIONS OF LAWS AND LEGISLATION ON DEVELOPMENT

Review of Town and Country Planning Act of Tamil Nadu, Urban Development Act, Public Health Act, Slum Improvement Act, State Housing Board Act, and National Rehabilitation and Resettlement Policy (2007) - Social Impact mitigation, National Environmental Policy (2006). Development management - Law relating to utilities and services.

UNIT-IV PROFESSIONAL PRACTICE

Professional role responsibility and planning consultancy service - Professional ethics-code of conduct and professional charge - Role of inter disciplinary group, role in decision making processes and the process in relation to varied consultancy assignment of planning.

UNIT-V PROFESSIONAL INSTITUTIONS

Aim and objectives of professional institutions , Private and international town planning organizations - Institution buildings and setting up private practice and work, Career options and prospects – Case studies.

TOTAL : 60 PERIODS

REFERENCES:

1. Anil Chaturvedi, ‘District Administration’, Sage Publications India Pvt. Ltd, New Delhi, 1988.
2. Ashok Kumar Jain, ‘Low Carbon City: Policy, Planning and Practice’ Discovery Publishing House, 2009
3. B.I.S., ‘National Building Code of India’, ISI, New Delhi. 1980
4. C.K.Bikseswaran,‘The Madras Building (Lease and Rent Control Act), 1960, Sitaraman and Co., Madras.1964
5. Gopal Bhargava, ‘Socio-economic and Legal Implications of Urban Land Ceiling and Regulations’, Abhinav Publishing Company, New Delhi.1983
6. Government of Tamil Nadu, ’The Tamil Nadu Town and Country Planning Act, 1971, Govt of Tamil Nadu. 1976
7. Govt. of India, ‘The Land Acquisition Act, Ministry of Housing and Urban Development, New Delhi. 1894
8. Joshi. A, ‘Town Planning: Regeneration of Cities’ New India Publishing, 2008
9. Patsy Healey, Robert Upton, ‘Crossing Borders: International Exchange and Planning Practices’ Routledge, 201

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ELECTIVES – 2

24ARES835	**BUILDING PERFORMANCE ANALYSIS**									**SEMESTER-VIII**	
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**		**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**		**3**

COURSE OBJECTIVE:

- To Understand the principles of Sustainable building through Simulation process
- To learn the simulation techniques with digital applications, and to get quantifiable results by usage of various building simulation analysis software.
- To Understand the Effective methods of Day lighting through Simulation
- To Understand the Effective methods of Reduction of Solar Radiation through Simulation
- To Understand the effects of Indoor thermal comfort through Simulation and Energy performance Index of a Building

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Understand the effects of indoor comfort through software simulation and analysis	Understand
CO2	Achieve a quantitative result of thermal analysis by software simulations	Understand
CO3	Effectively use the modelling tools and techniques	Apply
CO4	Design a building with good thermal comfort with optimum design solutions	Create
CO 5	Give quantitative results of Day lighting and Ventilation of a building	Analyse
CO 6	Understand and give an energy performance index of a building.	Understand

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**L**	**M**	**S**	**L**	**-**	**S**	**M**
CO2	**M**	**S**	**L**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**
CO4	**S**	**L**	**L**	**S**	**S**	**-**	**-**	**S**	**M**
CO5	**S**	**M**	**L**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**L**	**S**	**S**	**M**	**-**	**S**	**M**

S-Strong; M-Medium; L-Low

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UNIT-I BUILDING PERFORMANCE-DATA FILES
Building Performance Analysis - Design Optimization and Visualization using Building Information Modelling. - use of Epw file – TMY data extraction – IMD files

UNIT-II DAYLIGHTING, IRRADIATION AND WIND ANALYSIS
Building Performance Analysis - Day lighting, Shading and Ventilation.

UNIT-III ENERGY ANALYSIS
Building Performance Analysis - Whole building energy analysis.

UNIT-IV MODELLING TOOLS
Building Performance Analysis - Modeling Tools and Techniques.

UNIT-V SIMULATION TOOLS
Building Performance Analysis - Simulation Tools and Techniques.

Suggested software: CLIMATE CONSULTANT, HEED, SBEED, OPAQUE, ECOTECT, SKETCHUP – OPEN STUDIO, OPTIVENT, ENERGY PLUS, DAYSIM -RADIANCE, COOLVENT, RHINO-GRASSHOPPER-LADY BUG, DIVA, DRAGONFLY, SEFAIRA, IES-VE, VELUX and recent software

TOTAL : 60 PERIODS

REFERENCES:

1. Autodesk Manuals for BIM tools such as CAD, REVIT, ECOTECT
2. Rhino tutorials, Sefaira tutorials
3. Climate consultant Tutorials, ClimaPlus- Climabox, Design Builder tutorials
4. Computational fluid Dynamics – Tutorials,
5. Open Studio – Tutorials
6. Mamoria C.B and S.V.Gankar, Personnel Management, Himalaya Publishing House. 2003.
7. Stephen E. Condrey, Handbook of Human Resources Administration, Jossey – Bass,2010
8. Dwivedi R.S., Human Relations and Organisational Behaviour, Macmillan 2001.
9. Austen A.D., Managing Construction Projects: A guide to Processes and Procedures, International Labour Organisation, 1984.
10. Geoffrey D.Taylor, Materials in Construction, Longman, 2002.
11. Gopala Krishnan, Handbook of Materials management, PHI Learning Pvt. Ltd., 1993.

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24ARES836	INDUSTRIAL ARCHITECTURE							SEMESTER-VIII
Marks	Internal	60	External		90	Total	150	Exam Hours	6
Instruction Hours /week	L	1	T	0	P/S	3		Credits	3

COURSE OBJECTIVE:

- To introduce about Industrial design building and architecture and understand the various types.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understand the application of Industrial buildings	Understand
CO2	Gain knowledge about the pre fabrication systems	Understand
CO3	Design large scale Industrial buildings	Create

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	S	S	S	M	S	L	-	S	S
CO2	M	S	S	M	S	-	-	S	S
CO3	S	M	S	S	S	M	-	S	S

S-Strong; M-Medium; L-Low

UNIT -I INTRODUCTION

Five-year plans and thrust in housing – Issues in Urban Housing – use of modern building materials – application of modern technology – meaning of industrial building system.

UNIT -II APPLICATION OF INDUSTRIAL BUILDING SYSTEM

Feasibility of using industrial building system in Residential and Non-Residential buildings – manufacturing of building components – Technology requirements for industrial building system – use of Industrial building system as an option for disaster mitigation.

UNIT- III MODULAR CO-ORDINATION AND INDUSTRIALISED SYSTEM

Concept and definition of Modular dimensional discipline – Advantages and Limitations of modular principle –Components of residential buildings – precast elements.

UNIT- IV PRE-FABRICATION SYSTEM

Objective and necessity – Off-site on-site prefabrication elements and construction joints – architectural and technical limitations.

UNIT- V PROCEDURES AND ORGANISATION

Equipment used – manufacturing processes – transportation of components – assembly and finishing – Structural, social and economic issues related to industrial building system.

TOTAL : 60 PERIODS

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REFERENCES:

1. Industrial Building and Modular Design Henrik Missen – C & CK, UK 1972.
2. Albert G.H.Dietz, Laurence Secotter – "Industrialized Building Systems for Housing" – MIT, special summer session, 1970 USA.
3. "Industrialized Building Construction" – Proceedings of National Seminar, Nov-17-18, 2000, Indian Concrete Institute, Mumbai.
4. "Innovative Construction Materials" – Proceedings of Seminar, Jan 20-21,2001, Veermata Jeejabai Technical Institute, Mumbai.

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24ARES837	BIM BASED CONSTRUCTION MANAGEMENT								SEMESTER-VIII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3			**Credits**	**3**

COURSE OBJECTIVE:

- To equip the students with necessary BIM based construction management background
- To comprehend the aspects of construction elements and management skills.
- To recap students about the computer-based concepts of building engineering, structures and management concepts related to architecture on BIM based platform.
- To understand about fundamentals of BIM
- To learn about facility management with BIM.

COURSE OUTCOME:
Upon completion of this course, the student will be able to:

COs	Course Outcomes	Blooms Level
CO1	Equip with the software-based construction management background to comprehend the aspects of construction elements and management skills.	Understand
CO2	Comprehend the aspects of construction elements and management skills.	Understand
CO3	Learn about the computer-based concepts of building engineering, structures and management concepts related to architecture on BIM based platform.	Apply
CO4	Understand about fundamentals of BIM	Understand
CO 5	Know about impacts and functions of BIM.	Apply
CO 6	Learn about facility management with BIM.	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**S**	**M**	**S**	**L**	**-**	**S**	**S**
CO2	**M**	**S**	**S**	**M**	**S**	**-**	**-**	**S**	**S**
CO3	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**
CO4	**S**	**L**	**S**	**S**	**S**	**-**	**-**	**S**	**S**
CO5	**S**	**M**	**S**	**S**	**S**	**-**	**L**	**S**	**S**
CO6	**S**	**M**	**S**	**S**	**S**	**M**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT-I FUNDAMENTALS OF BIM

Fundamentals and practical use of information technologies in the construction industry; basic concepts of building information modelling (BIM).

UNIT-II REVIEW OF BIM BASED TECHNOLOGY

Review of software and technology available for BIM; practical use of BIM including design and clash detection.

UNIT-III IMPACTS AND FUNCTIONS OF BIM

Impact of BIM on construction management functions; construction scheduling and sequencing using BIM; cost estimating using BIM.

UNIT-IV FACILITY MANAGEMENT WITH BIM

Facility management with BIM; integrated approach to navigate BIM as a multi-disciplinary design, analysis, construction, and facility management technology.

UNIT-V PROJECT WORK

Class exercise to create a BIM model and to use it in scheduling, sequencing, cost estimating, management, and simulation of a construction project.

TOTAL : 60 PERIODS

REFERENCES:

1. All BIM Based Tutorials

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24ARES838	GIS MODELLING IN URBAN AND REGIONAL PLANNING								SEMESTER-VIII
Marks	**Internal**	**60**	**External**			**90**	**Total**	**150**	**Exam Hours**	**6**
Instruction Hours /week	**L**	1	**T**	0	**P/S**	3	**Credits**			**3**

COURSE OBJECTIVE:

- To train the candidate in building GIS models for urban and regional planning applications with hands on experience of spatial data, attribute data input and experiment with GIS analysis. Note: This is offered as a practical in the computer lab and does not involve setting of question paper as in theory paper.
- Study the principles and applications of remote sensing
- To study the sources of demographic data in GIS application
- Study about automated mapping and facility management through GIS
- Evolve ideas of land use suitability analysis and to study about the objectives and functions of GIS models in urban and regional planning

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Understanding of the concepts, techniques, methods used by an urban planner to treat spatially cities by preparing urban land use models using GIS.	Understand
CO2	Learn about the data bases for different survey techniques	Understand
CO3	Learn about data tabulation and interpretation of data gathered	Understand
CO4	Generate Automated maps and report generation using GIS mapping	Create
CO 5	Learn about Analytical planning Techniques and presentation	Apply
CO 6	Learn about urban land use mapping	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**S**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**S**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**S**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT-I INTRODUCTION

Definition, map and map analysis, automated cartography, history and development of GIS, Hardware requirement, system concepts, co-ordinate systems, standard GIS Packages.

UNIT-II SPATIAL DATA INPUT

Defining the objectives of GIS planning problems, Types of data, spatial and non spatial data, data structure, points, lines, polygon, vector and raster, files and file organization, database, data entry, digitizer, scanner, Dbase, files and data formats, data compression.

UNIT-III ATTRIBUTE DATA INPUT

Role of attribute data in defining geographic features – adding attribute data file – topology generation – Joining attribute data to its geographic features. Satellite images as input to GIS.

UNIT-IV SPATIAL ANALYSIS USING GIS

Performing overlay functions – manipulating attribute data – GIS modelling, GIS data processing (Digitization , topology building and metadata creation), Data structures and modelling ,Automated mapping and facility management (AM/FM). – map and report generation.

UNIT-V URBAN LAND USE MODELING

Need for model - Land suitability analysis, urban land use modelling, Change demand modelling.

TOTAL : 60 PERIODS

REFERENCES:

1. Brail K.R. 'Integrating GIS into Urban and Regional Planning. Alternative approaches for developing countries. Regional development Dialogue, Vol.11, No.3, UNCRD, Japan, 1990.
2. Cartwright T.J. 'Information Systems for Urban and Management in Developing Countries. The Concept and Reality, Computers, Environment and Urban Systems Vol.15, 1991.
3. David J. Maguire, Michael Batty, Michael F. Goodchild, 'GIS, spatial analysis, and modeling' ESRI Press, 2005
4. ERSI, 'Understanding GIS. The ARCI INFO. Methods, ERSI, USA. 1992
5. Fotheringham, Peter Rogerson, 'Spatial Analysis And GIS' CRC Press, 2004
6. Ian N. Gregory, Paul S. Ell 'Historical GIS: Technologies, Methodologies, and Scholarship' Cambridge University Press, 2007
7. Klosterman R.E., 'Micro Computer Packages for Planning Analysis', American Planning Association Journal, Autrenn, 1990.
8. Tomlin C.D., 'Geographic Information Systems and Cartographic Modeling, Prentice Hall, Englewood Cliffs

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SEMESTER- IX

24ARP911	PRACTICAL TRAINING								SEMESTER-IX
Marks	**Internal**	**520**	**External**			**780**	**Total**	**1300**	**Exam Hours**	**6**
Instruction Hours /week	**L**	0	**T**	0	**P/S**	26			**Credits**	**26**

COURSE OBJECTIVE:

- To introduce the challenges of architectural practice.
- To enable overall understanding of different stages in real life architectural projects in practice.
- To work from initiation of project, development of concepts into schematic drawings, approval process, presentations and release of working drawings
- To get involvement in office discussions and client meetings, integrating structural and service concerns, estimation and tendering processes, site supervision and coordination in the construction process
- To coordinate with the various levels of workman/contractors etc for execution of the Project

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Get overall idea of the nuances of architectural practice.	Understand
CO2	Understand about the total process that takes place in an Architectural firm	Understand
CO3	Understand the Specifications of a project, time involved and the execution process	Understand
CO4	Gain knowledge in architectural working drawings	Apply
CO5	Gain experience of client meetings & site Execution	Understand
CO6	Gain the maturity of Architectural design, and the experience gained from internship will be helpful in the thesis project	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**L**	**M**	**M**	**L**	**S**	**L**
CO2	**S**	**S**	**L**	**L**	**L**	**-**	**-**	**S**	**L**
CO3	**S**	**S**	**L**	**-**	**L**	**L**	**-**	**S**	**L**
CO4	**S**	**M**	**S**	**-**	**M**	**-**	**L**	**S**	**L**
CO5	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**
CO6	**S**	**S**	**M**	**L**	**M**	**L**	**-**	**S**	**L**

S-Strong; M-Medium; L-Low

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CONTENT

The choice of the place of training shall be Architectural Firms, Organizations, Development Authorities, etc. which are headed by eminent architects. The choice of the office shall be approved by the Training Committee of the Faculty of Architecture. The practical training, primarily involves learning in the office and on the site. The progress of training shall be assessed periodically by reports from the employers of trainees and by the Training Committee of the Faculty of Architecture.

The evaluation of the practical training will be based on the following features.

- Client meeting and interaction
- Site visits, verification and measurements
- Concept and scheme development
- Construction documents / drawings
- Training portfolio

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SEMESTER- X

24ARS1021	PROFESSIONAL PRACTICE							SEMESTER- X
Marks	**Internal**	**80**	**External**		**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	3		**Credits**	**4**

COURSE OBJECTIVE:

- To give an introduction to the architectural profession
- To know about the role of professional bodies , statutory bodies as well as ethics of the profession and legal aspects and legislations associated with the profession.
- To give familiarity with basic aspects of running an architectural practice.
- To know about the tenders & market Evaluations in Architectural practice
- To give exposure to the processes involved in taking up and completing an architectural project.

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain knowledge of the role of professional and statutory bodies.	Understand
CO2	Become familiar with the process involved in an Architecture Project	Understand
CO3	Gain knowledge about the Scale of Services and Fees for an Architect	Understand
CO4	Understand the code of conduct and ethical values of the Profession	Understand
CO 5	Know about the Tender & Contract	Apply
CO 6	Have idea about the participation, award in an Architectural competition	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**S**	**M**	**M**	**M**	**S**	**S**
CO2	**S**	**S**	**L**	**S**	**L**	**-**	**M**	**S**	**S**
CO3	**S**	**S**	**L**	**S**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**S**	**M**	**-**	**M**	**S**	**S**
CO5	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**

S-Strong; M-Medium; L-Low

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UNIT-I ARCHITECT -PROFESSION- SERVICES AND SCALE OF FEES

Role of architect in society - relationship with client and contractor - code of conduct – management of an architect's office - elementary accountancy -Conditions of engagement of an architect - normal additional, special and partial services – scale of fees for various services - claiming of fees

UNIT-II LEGISLATION

Salient features of various acts such as Architects Act 1972 and recent regulations , Development control rules for CMDA & Tamil Nadu. **Hill area development – coastal area development and management – Heritage act of India INTACH, ASI. Role of urban arts commission – need for special rules on architectural control and development**

Approval from authority for sanction of building plans/building permit under the provision of Building

Byelaws, Master plan and Local Body Acts.

UNIT-III TENDER AND CONTRACT

Definition – types of easements- acquisition, extinction and protection of easements-Calling for tenders - tender documents - open and closed tenders - item rate, lumpsum, labor and demolition tender - conditions of tender - submission of tender - scrutiny and recommendations-Conditions of contract - Form of contract articles of agreement - Contractor's bill certification

UNIT-IV EASEMENTS AND ARBITRATION

Definition – types of easements- acquisition, extinction and protection of easements-Arbitration in disputes - arbitration agreement - sole arbitration - umpire - excepted matters – award

UNIT-V ARCHITECTURAL COMPETITIONS

Open and closed competitions - appointment of assessors - duties of assessors - instructions to participants - rejection of entries - award of premium – guidelines prescribed by COA AND IIA for promotion and conduct of competition.

TOTAL : 75 PERIODS

REFERENCES:

1. Architects Act 1972, -Arbitration Act,196 – Factories Act,1948- person with disabilities act 1995
2. Publications of Council of Architecture
3. Roshan Namavati, 'Professional Practice', Lakhani Book Depot, Mumbai, 2016.
4. Ar. V.S. Apte, 'Architectural Practice and Procedure', Mrs. Padmaja Bhide, 2008.
5. Madhav Deobhakta, 'Architectural Practice in India', COA, 2007.
6. J.J.Scott, 'Architect’s Practice', Butterworth, London 1985.
7. Development Regulations of Second Master Plan for Chennai Metropolitan Area-2026. (Second Master plan of CMA).Etc

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24ARS1022	RESEARCH IN ARCHITECTURE AND ETHICAL PUBLISHING STRATEGIES								SEMESTER- X
Marks	**Internal**	**80**	**External**			**120**	**Total**	**200**	**Exam Hours**	**6**
Instruction Hours /week	**L**	2	**T**	0	**P/S**	3			**Credits**	**4**

COURSE OBJECTIVES:

- The basic thought of introducing the subject is to enable students with intense theoretical knowledge, structured thought, strong interest to proceed research in focused manner
- To understand the various types and streams of research in the Architecture and allied field of studies
- To enable in-depth knowledge about the different types of Architectural research in Occupants Scale, Building Scale and Societal Scale's
- To formulate a research plan through application of research techniques, data collection, analysis and interpretation numerically & visually.
- To understand the methods of writing and presenting a research report.

COURSE OUTCOMES:

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

COs	Course Outcomes	Blooms Level
CO1	Understand Architectural research needs toward multidisciplinary approach and aims essential for societal change.	Understand
CO2	Explore Research in Architecture which amplified, draw together, and encourage individual studies in order to advance research in a holistic approach	Analyse
CO3	Continuing Architectural research studies in profession and academics will enhances better social impact on new developments.	Apply
CO4	Enlightens Occupant scale: Individual/group/clusters etc., in delivering better health and well being environments.	Create
CO 5	Perform various building scale, type, performances etc., from pre delivery of project and in managing the same	Evaluate
CO 6	Work in societal scale, economy, equity, environmental impact, climate change and community participation etc., enable report writing and publishing skill set at bachelors level	Evaluate

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	**S**	**S**	**M**	**S**	**M**	**M**	**M**	**S**	**S**
CO2	**S**	**S**	**L**	**S**	**L**	**-**	**M**	**S**	**S**
CO3	**S**	**S**	**L**	**S**	**L**	**L**	**-**	**S**	**S**
CO4	**S**	**M**	**S**	**S**	**M**	**-**	**M**	**S**	**S**
CO5	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**
CO6	**S**	**S**	**M**	**S**	**M**	**L**	**M**	**S**	**S**

S-Strong; M-Medium; L-Low

CONTENT:

PARTI INTRODUCTION TO STATISTICS AND ASSESSMENT OF ARCHITECTURAL RESEARCH MODULES

Introduction to the simple statistical methods of analysing numerical data – frequencies / percentages, mean / median / mode, correlation, chi square test – inferring from the data and interpreting the meaning of those inferences. Use of MS Excel for statistical data analysis. Presentation & Reporting: Presentation of the Data: Techniques of presenting the numerical data – graphical (pie charts, bar charts, line graphs etc.), tabulations, verbal qualitative data, architectural drawings / maps. Technical model making for research assessment and interpretation, Software's Associated Research in Architecture

PARTII REPORTING AND PUBLISHING – THE RESEARCH IN ARCHITECTURE

Introduction & Basics of paper Writing; Abstract, Different sections of a research report, technical writing and language (tense, voice, etc.), formatting of a report. Journal Identification Scope and nature of processes in ethical publishing & its relevance in Higher education Institutions & Industry.

TOTAL : 75 PERIODS

REFERENCES:

1. Sanoff, H. (1991). Visual Research Methods in Design. New York: John Wiley & Sons.
2. Kothari, C.R. and Garg, G., Research Methodology: Methods and Techniques, New Age International Publishers.
3. Anderson, J. and Poole, M. (1998). Thesis and assignment writing. Brisbane: John Wiley.
4. Borden, I. and Ray, K. R. (2006). The dissertation: an architecture student's handbook. 2nd Ed.Oxford: Architectural Press.
5. Fink, A. (1998). Conducting research literature reviews: from paper to the Internet. Thousand Oaks: Sage.
6. Murray, R. (2005). Writing for academic journals. Berkshire: Maidenhead, Open University Press.
7. Research Methodology; C.R.Kothari; New Age International (P) Ltd.
8. Research Methodology; D. K. Bhattachary; Excel Books
9. Research Methodology; Goodday& Hack
10. The Practice of Social Research, by Babbie, E. 3rd Ed.,1983 Belmont :Wadsworth Publishing Co..
11. Research Design: Qualitaitve, quantitative and mixed methods approaches
12. By Creswell, J. W., 2nd Ed, 2003.Thousand Oaks : Sage
13. Research Design: Qualitative & Quantitative Approaches, 1994 Thousand Oaks : Sage
14. Surveys in Social Research, Jaipur, By De Vaus, D. A, 2003, Rawat Publications
15. Qualitative Data Analysis : A User Friendly Guide for Social Scientists, By Dey, I, 1993, London :Routledge
16. Architectural Research Methods, By Groat, L & Wang, D., 2002, NY : John Wiley and Sons Inc.
17. Research Methodology : Methods and Techniques By Kothari, C.R., 2005 New Delhi : Wishwa Prakashan
18. Research Methods in the Social Sciences, By Nachmias, C. F. and Nachmias, D., 5th Ed 1996 Great Britain: St. Martin's Press Inc
19. Handbook of Qualitative Research By Norman K Denzin and Yvonna S Lincoln (Eds.)
20. pp.377-392., 1994, Thousand Oaks : Sage Publications

21. Qualitative Evaluation Methods, By Patton, M. Q.,1980, Sage Publications
22. Methods of Architectural Programming, By Sanoff, H, 1977 Dowden Hutchinson and Ross, Inc. Vol.29,Community Development Series
23. Visual research methods in design, By Sanoff, H, 1991 USA : Van Nostrand Reinhold
24. Interpreting Qualitative Data : Methods for Analysing Talk, Text and Interaction By Silverman, D.,1993 , London: Sage Publication
25. Behavioral Methods in Environmental Design, By William Michelson (ed.),1982Stroudsberg, Pennylvania : Dowden Hutchinson and Ross. Inc.
26. Turabian's A Manual for Writers of Research Papers, Theses, and Dissertations [7th edition]
27.MLA Handbook for Writers of Research Papers [7th edition]

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24ARS1023	DISSERTATION - II							SEMESTER- X
Marks	Internal	360	External		540	Total	900	Exam Hours	6
Instruction Hours /week	L	0	T	0	P/S	18	Credits		18

COURSE OBJECTIVE:

- To ensure consolidation and application of the knowledge gained in preceding years of the programme.
- To develop the skill of Design in the context of a project of the student's choice.
- To enable addressing of specific projects through key, identified issues inherent in the project
- To enable development of thought processes in specific areas/aspects into a project.
- To facilitate development of ability to complete and handle projects independently

COURSE OUTCOME:

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

COs	Course Outcomes	Blooms Level
CO1	Gain an overall understanding of an Architectural project	Understand
CO2	Research, Analyse, synthesize and present his ideas	Analyse
CO3	Apply his skills developed in the previous years in this Project	Apply
CO4	Gain the ability to handle major architectural project of a larger scale	Understand
CO5	Able to design with all Socio, economic and Environmental aspects.	Apply
CO6	Become an expertise in his domain of architectural design	Apply

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	S	S	M	L	M	M	L	S	S
CO2	S	S	L	L	L	-	-	S	S
CO3	S	S	L	-	L	L	-	S	S
CO4	S	M	S	-	M	-	L	S	S
CO5	S	S	M	L	M	L	-	S	S
CO6	S	S	M	L	M	L	-	S	S

S-Strong; M-Medium; L-Low

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CONTENT

The main areas of study and analysis shall be Architecture, Urban design, Urban renewal and Human settlements, Environmental Design, Conservation, Landscape Design, Housing etc. However, the specific thrust should be architectural design of built environment.
Research Methods as applicable to architectural studies is to be taught as part of Thesis.

METHOD OF SUBMISSION
The final deliverables of the Thesis Project shall be submitted in the form of drawings, project report, physical/ digital models, presentations and walkthroughs. And Progressive presentations shall be made for reviews at various stages.

TOTAL : 270 PERIODS

REFERENCES:

1. Linda Grant and David Wang, 'Architectural Research Methods', John Wiley & Sons, 2002.
2.Joseph De Chiara, Michael J Crosbie, 'Time Saver Standards for Building Types', McGraw Hill Professional, 2001.

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