SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
(An Autonomous Institution)

Puducherry

Regulations R-2023

for

B.Arch. Degree Programme

(With effect from academic year 2023-24)

VISION OF INSTITUTE

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

MISSION OF INSTITUTE

M1: Quality Education: To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

M2: Research and Innovation: To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship: To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values: To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

VISION OF SCHOOL OF ARCHITECTURE

To develop a vibrant knowledge - oriented environment and a centre of excellence in the field of architecture towards creating a sustainable humane habitat.

MISSION OF SCHOOL OF ARCHITECTURE

M1: To inculcate the culture of value – based education.

M2: To develop an ambient environment for research and sharing of knowledge.

M3: To enable learning towards excellence with professional disposition.

M4: To encourage creative innovation in the field of architecture.

M5: To sensitize role and design for sustainable humane habitat.

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SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
SCHOOL OF ARCHITECTURE
(Ten Semesters)

REGULATIONS 2023 (R-2023)
CHOICE BASED CREDIT SYSTEMS (CBCS)

1. INTRODUCTION

1.1 Sri Manakula Vinayagar Engineering College (SMVEC) envisions to foster knowledge, skills, attitude and values of the aspiring youths to enable them to become global citizens. To obtain this transformation, the institution has evolved a flexible academic curriculum designed in accordance with the Outcome Based Education (OBE) which is acquired by the learners of a programme under 'Learner Centric' Model.

1.2 School of Architecture shall be governed by the rules and regulations provided in this version of Academic Regulations (R-2023). The curriculum of each programme provides broad based knowledge, quality course content, academic flexibility, and scope for multi-disciplinary learning activities and opportunities for industry oriented projects.

1.3 The provisions made in this document shall govern the policies, procedures, curriculum, conduct of the examinations and evaluation systems.

1.4 The semester system shall be adopted for academic activities in the college. Normally, odd semester starts in second week of June and even semester starts in second week of December.

1.5 Stringent evaluation norms will be followed to maintain quality of engineering education. The examination system will be transparent and governed by the rules and regulations with time bounded activities.

Objectives of CBCS

- ❖ To shift focus from the teacher-centric to student-centric education.
- ❖ To allow students to choose inter-disciplinary, intra-disciplinary and skill oriented courses from the choices to provide more flexibility in learning system.
- ❖ To make education broad-based on par with global standards.
- ❖ To help the students to earn credits by choosing unique combination of courses.
- ❖ To create worldwide exposure to students by providing International Certificate Courses.
- ❖ To provide necessary training to students for gaining vital life skills through skill development programmes.
- ❖ To keep abreast of industrial requirements and societal needs, students are equipped through internship and inculcate the skill of converting Project into Product.

1.6 The rules and regulations shall be subjected to amendment made by the Academic

Council (AC) from time to time.

2. PRELIMINARY DEFINITIONS AND NOMENCLATURE

College	:	Sri Manakula Vinayagar Engineering College
University	:	Pondicherry University
Programme	:	B.Arch. Degree
Discipline/ Department	:	Branch or specialization of B.Arch Degree Programme.
Course	:	Theory/ Theory cum Studio / Studio courses that is normally studied in a semester. Eg: Introduction to Architecture, Foundational Design Studio, etc.,
Professional Core Course	:	Compulsory course in the curriculum
Professional Elective Course	:	A course that can be chosen from the listed courses by a student based on his/her interest which is not covered in professional core courses.
Head of the Institution	:	The Director cum Principal
Head of SOA / SMVEC	:	The Principal
Controller of Examinations (CoE)	:	The authority who is responsible for all Examination related activities of the institution
L – T – P/S – C	:	**L** - **L**ecture, **T** - **T**utorial, **P/S**- **P**ractical / Studio and **C** - **C**redits respectively
Curriculum	:	The various components / courses studied in each programme that provides an appropriate outcome in the chosen branch of study.
Semester Grade Point Average (SGPA)	:	Weightage of average grade points of courses in a semester.
Cumulative Grade Point Average (CGPA)	:	Weightage of average grade points of all courses in all semesters completed by a student
Odd semester	:	The Semester that is typically from June to November
Even semester	:	The Semester that is typically from December to May
Period	:	50 minutes duration of a Theory / Theory cum Studio / Studio class
Day	:	8 periods in a calendar day
Enrolment	:	Enlistment of a student on roll in an academic year
Arrear	:	A course in which a student has not fulfilled the examination passing criteria in the end semester examination.
CAT	:	Continuous Assessment Test
CAM	:	Continuous Assessment Marks
ESE	:	End Semester Examination
ESM	:	End Semester Examination Marks
PAEC	:	Professional Ability Enhancement Course
Regular Examination	:	End semester examination conducted for the courses prescribed in the curriculum of that semester.
Arrear Examination	:	End Semester examination conducted for the students who have not fulfilled the examination passing criteria in the previous attempt(s).

Supplementary Examination	:	An additional examination exclusively conducted in the fifth and eighth semester for the students with a maximum of two arrears overall.
First Attempt	:	Appearing for the end semester examination of a course in a semester for which the students have registered. If a student failed to appear for the end semester examination after registration, it is also treated as first attempt.
Academic Council (AC)	:	An Apex academic body having the power to scrutinize and approve the proposals with or without modification of the Board of Studies with regard to programme of study, academic regulations, curricula, syllabi and modifications thereof, instructional and evaluation arrangements, methods, and procedures relevant thereto, etc.,
Board of Studies (BoS)	:	An Apex academic body having the powers to approve the various courses, suggest teaching methodologies, coordinate research and other academic activities keeping in view the objectives of the college.
Academic Standing Committee (ASC)	:	ASC shall perform the functions under emergency situations which are subject to ratification by the Academic Council (AC).
Academic Appeal Board (AAB)	:	If a student finds some anomaly in the award of marks in the Continuous Assessment Test /End Semester examination, he/she can make an appeal to the *Academic Appeal Board* for review of marks awarded.
Department Advisory Committee (DAC)	:	The Committee that formulates a process to review the post implementation effects of curriculum and suggest various measures to ensure academic standard and its excellency of the course offered by the department.
Department Consultative Committee (DCC)	:	Reviews, revises and prepares curriculum structure based on the institutional policy and suggests improvements in syllabus of a course(s) prepared by course teacher(s) and forwards the curriculum to BoS for further recommendations. It monitors the academic progress and conduct of classes throughout the semester and takes appropriate corrective measures to improve the quality of curriculum delivery.
Programme Academic Coordinator (PAC)	:	Coordinates all the academic activities of the department viz. Curriculum revision, framing of syllabus, time table, re-registration of course(s), display and submission of attendance status and BoS meeting as a member secretary.
AICTE	:	All India Council for Technical Education
UGC	:	University Grants Commission
NBA	:	National Board of Accreditation
NAAC	:	National Assessment and Accreditation Council
CRC	:	Complaint Redressal Committee

3. PROGRAMME EDUCATIONAL OBJECTIVE

Bachelor of Architecture curriculum is designed to prepare the graduates having attitude and knowledge.

i. To enable a successful professional and technical career.
ii. To enable a strong foundation in Humanities and Sciences, Engineering Sciences and Architectural Design Skills.

iii. To impart knowledge of the theories and practices in the field of Architecture.
iv. Engage in life-long learning to keep themselves abreast of new developments.
v. To put into practice and inspire high ethical values and technical standards.

4. PROGRAMME OUTCOME

a. Ability to gain knowledge of Humanities, Sciences and Architecture.
b. Ability to understand elements of Architecture and apply basic principles in Architectural Design.
c. Ability to identify social, economic and cultural issues in Architectural Design.
d. Ability to analyze and apply theoretical knowledge to achieve Architectural Design solutions.
e. Ability to understand ethical and professional responsibilities.
f. Ability to review, comprehend and report technological developments.
g. Ability to understand real life situation of Architectural Practice.
h. Ability to communicate effectively and work in interdisciplinary groups.

5. ADMISSION ELIGIBILITY

5.1 All candidates need to satisfy the Norms by Council of Architecture – New Delhi, in order to get admitted in B.Arch Course.
5.2 Admission Eligibility will be revised time to time by Council of Architecture, For updates (www.coa.gov.in / www.nata.in)

6. STRUCTURE OF THE B.ARCH PROGRAMME

6.1 The complete Programme of study will consist of 6 categories of courses distributed over 10 semesters with two semesters per year as listed below:

1. ***BS- BASICSCIENCES***
2. ***HS - HUMANITIES and SOCIAL SCIENCES***
3. ***ES- ENGINEERING SCIENCES***
4. ***PC- PROFESSIONNALCORE***
5. ***PE- PROFESSIONALELECTIVE***
6. ***PAEC- PROFESSIONAL ABILITY ENHANCEMENT COURSES***

6.2 The B. Arch Programme will have a curriculum and course contents (syllabus) proposed by the Boards of Studies in Architecture and approved by the Academic Council.

1. Theory Courses such as Mathematics, Mechanics of Structure, Human Settlement, History of Architecture etc.
2. Theory cum Studio Courses such as Services on Water Supply and Waste Management, Site Surveying and Planning etc.
3. Design and Construction based Studio Courses comprising of Fundamental Arts Studio, Building Elements and Finishes, Architectural Model Making, Foundational Space Design Studio, Campus Design Studio.
4. Elective Courses for Specialization in related fields.
5. A Practical Training in the VIII Semester for exposure in the Architectural Profession.
6. Architectural Thesis in the X Semester.
7. Compulsory Educational Tour and Study / field / site visits.
8. NCC/NSS/NSO/YRC activities for character development.

6.2.1 Professional Training

Students have to undergo practical training for duration of one semester with minimum of 90 working days, during the VIII semester of the course in an approved Architectural firm under an Architect Registered with Council of Architecture India with a minimum of 5 years Professional Standing with the approval of Principal of the Institution. The training can also be undertaken in registered government organization such as CMDA, PWD and INTACH etc. The portfolio of the drawings done during the training period will be assessed at the end of the semester by internal faculty member. Moreover, it has to be certified by the concerned Architect/organization for the successful completion of the professional training. The students should arrange to send monthly progress reports from the respective offices imparting training

and completion certificate after the Training.

Internship Coordinator will be arranged to coordinate with respective offices for collecting weekly attendance of the students and submit to the institution.

Architectural Practical Training in Foreign Country shall be done under the registered Architect of that Country and to be approved and monitored by the Head of the Institution.

The college will provide 50% mark as internal whereas the external examiner will provide 50% mark in the Viva Voce at the end of Semester.

6.2.2 Educational Tour

Every student is required to undertake an educational tour approved by the department to various places in India.

South India Tour will be on Fourth Semester.
North India Tour will be on Seventh Semester.

The Educational tour should be evaluated internally based on an assignment submitted individually.

6.2.3 Site / Field Visit

Every student is required to undergo site or field visits each semester.

1. **Theory Courses** – To gain latest updates in building material and techniques in the Industry. (e.g. To learn the Manufacturing process of glass, students should undergo field visit to manufacturing industries)
2. **Theory cum Studio** - To get knowledge in latest building materials and Techniques used. (e.g. To understand the building services students are encouraged to visit ongoing project which has a various service components,(i.e.HVAC, PLUMBING,ELECTRICAL Etc.)
3. **Studio Courses** – To understand the basics of design students should undergo a site visit to renowned Architect designed Projects, starting from the first semester of the Programme.

6.2.4 Value Added Course/ Skill Development Course / Industry Relevant Course / Online Course

Table 6.2.4.1 Skill development mandatory Courses in our syllabus.

S.No	Course Code	Course Name	Credits
01	U23TS0102	Communication English (Sem -1)	3
02	U23TS0103	Fundamental Arts Studio (Sem -1)	3
03	U23ST0422	Computer Aided Design (Sem -4)	3
04	U23ST0210	Architectural Model Making (Sem -2)	3
05	U23EL0607	Technological Fabrication in Architecture	3
06	U23ST0105	Fundamental Design Studio	3
07	U23EL0920	Architectural Photography and Journalism	3
08	U23ST0209	Perspective and Measure Drawing	3
09	U23EL0714	Architectural Conservation	3

Training in the following Optional Certification Courses on Latest Software Tools that are useful and industry relevant for the Architecture Professionals to bridge the gap between Academia and Industry.
Photoshop, 3D Studio Max, Auto CAD, REVIT, Sketch Up, Lumion, V-Ray, Grasshopper, Illustrator, Rhino 3D,**COOHOM (Interior Design Software),Enscape (3D Rendering).**

6.3 Credits Assigned

Table 6.3.1 Credits are assigned to the courses based on the following general

Sl.NO	Subject Area	Credit per Semester										Credits Total
		I	II	III	IV	V	VI	VII	VIII	IX	X	
1	HS	6	3	3		3	3	3		6		**27**
2	BS	3		3	3							**9**
3	ES	3	6	3	6	6		3				**27**
4	PC	12	15	15	12	13	13	14		17	3	**114**
5	PE					3	6	6		3		**18**
6	PAEC				3		3		26		23	**55**
TOTAL		**24**	**24**	**24**	**24**	**25**	**25**	**26**	**16**	**26**	**26**	**250**
Non-Credit / mandatory		**NCC / NSS /YSR Rotaract**		**Rural Study Tour**		**All India Tour**						

6.4 The curriculum of any branch of the B. Arch Programme is designed to have 250 credits for the award of the B. Arch degree.

6.5 The medium of instruction, examination and project reports will be in English.

7. CLASSIFICATION AND NUMBERING OF COURSES

Each course is denoted by a unique code consisting of 9 alphanumeric characters. The details of the numbering scheme are shown in Fig. 1.

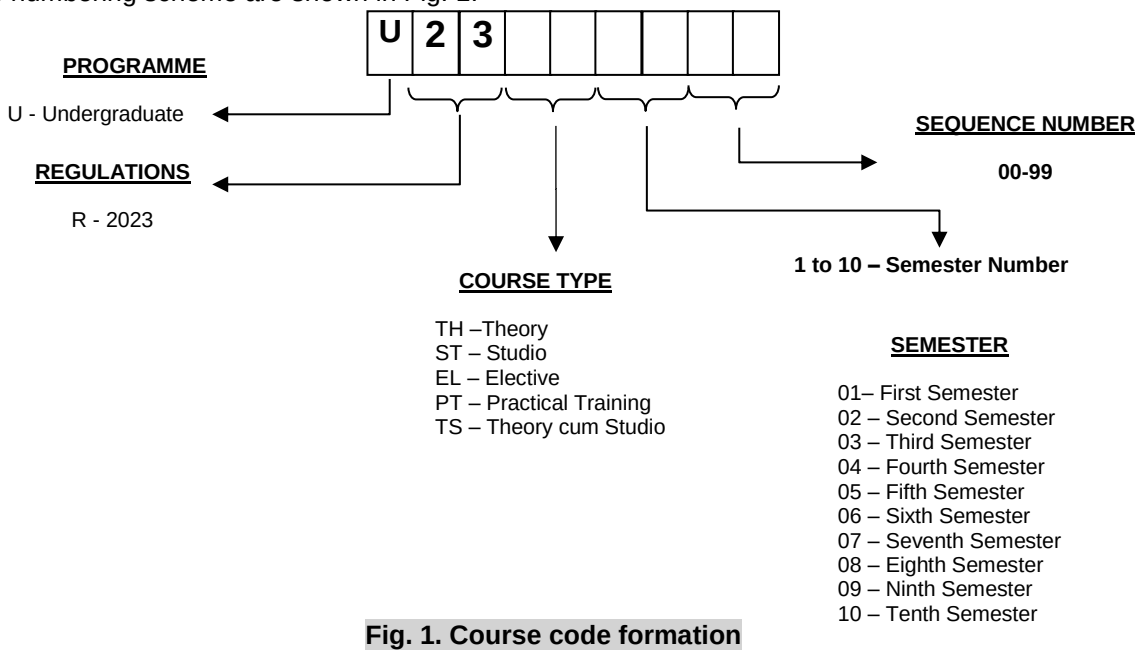

Fig. 1. Course code formation

8. CATEGORY OF COURSES

Core Courses:

There will be a Professional Core Course in every semester. This is the course which should compulsorily be studied by a candidate as a core requirement to complete the requirement

of a degree in a said discipline of study.

Elective Courses:
Elective course is a course which can be chosen from a pool of papers. It may be:

- Supportive to the discipline of study
- Providing an extended scope
- Enabling an exposure to some other discipline/domain,
- Nurturing candidate's proficiency/skill.

An elective may be "Discipline centric" called "Professional Elective."

9. DISCONTINUATION OF COURSE

If a candidate wishes to temporarily discontinue the course for valid reasons, he/she shall apply through the Head of the Institution in advance and obtain a written order from the College permitting discontinuance. A candidate after temporary discontinuance may rejoin the course only at the commencement of the semester at which he / she discontinued, provided he/she pays the prescribed fees to the Institution. However it may be noted the fees/Charges once paid shall not be refundable. The total period of completion of the course reckoned from the commencement of the first semester to which the candidate was admitted shall not in any case exceed 8 years, excluding the period of discontinuance.

10. PROVISION OF WITHDRAWAL

A Candidate may, for valid reason, and on the recommendation of the Head of Institution to withdraw from the writing the entire semester examination as one unit. The Withdrawal application is valid only if applied before 15 days to the commencement of End Semester examination. Withdrawal shall be permitted only once during the entire course. Other condition being satisfactory, candidates who withdraw are also eligible to be awarded DISTINCTION whereas they are not eligible to be awarded a rank.

In case of any emergency situation for withdrawing from the end semester examination without Prior Intimation, final decision can be taken by Principal and Controller of Examination.

11. MINIMUM AND MAXIMUM DURATION OF THE PROGRAMME

11.1 Each semester shall normally consist of 90 working days or 450 hours. A student is ordinarily expected to complete the B.Arch. programme in ten semesters for regular programme. However, a student may complete the programme at a slower pace by taking more time but in any case, not more than 16 semesters under regular programme excluding semester withdrawn on medical grounds.

11.2 In compliance with the rules and norms of COA, no student will be allowed to complete the B.Arch. degree in less than 10 full-semesters.

12. DISCIPLINE

12.1 Every student is required to maintain discipline and decorous behavior both inside and outside the College campus and not to indulge in any activity that will tend to bring down the prestige of the Organization.

12.2 Any act of indiscipline of a student is first to be considered by the Discipline and Welfare Committee of the Department/School for necessary action. If the issue demands more serious consideration, the act of indiscipline will be reported to the Head of the Institution, The Committee will enquire into the charges and recommend suitable action if the charges are substantiated. The Head of the Institution will take appropriate action on the recommendation of the Discipline and Welfare Committee of the Organization.

13. REQUIREMENT FOR APPEARING SEMESTER EXAMINATION

13.1 A Candidate shall be permitted to appear for semester examination only if:

1. He/ She secures not less than 75% overall attendance arrived at by taking into account the total number of periods in all subjects put together offered by the institution for the

semester under consideration. (Candidate who secure overall attendance greater than 60% and less than 75% have to pay a condonation fee as prescribed by the Institution along with a medical certificate obtained from a medical officer not below the rank of Asst Director)

2. He/ She earn a progress certificate from the Head of the Institution for having satisfactorily completed the course of study in all the subjects pertaining to that semester.

3. His/ Her conduct is found to be satisfactory as certified by the Head of the Institution. A candidate who has satisfied the requirement (1) to (2) shall be deemed to have satisfied the course requirements for the semester.

13.2 Scribe for End Semester Examination.

If any student is not in position to write end semester examination on account of temporary physical disability or injury due to accident and applies for a scribe (writer) with medical certificate obtained from a medical officer not below the rank of Assistant Director level, then a scribe shall be allowed / assigned by COE to such student. Normally, such scribe shall neither be a student or a degree holder of any technical programme having similar competency. The student shall, however, apply in a prescribed proforma to COE asking for permission letter to the student for using the scribe well in advance, not the day of examination to make necessary arrangements (Scriber, Separate Examination Hall etc.). COE shall then take the undertaking from the scribe in a prescribed proforma. Such student shall produce the permission letter from COE for using scribe to the invigilator. He/She should pay the TA/DA and other charges to the scribe. Scribe shall be allowed extra time as per norms of Controller of Examinations.

13.3 Differently Abled Candidate Examination.

In case any student is admitted with differently abled category. Students who can write but at much slower speed as compared to normal student, he/she may be allowed as extra time of 30 minutes for 50 marks paper and 60 minutes for 100 marks paper to write the examination for all the courses, provided he/she seeks permission from COE for extra writing time on account of his/her percentage of disability by producing necessary medical certificate from medical officer.

14. ASSESSMENT PROCEDURE

14.1 Theory Courses

All theory courses shall be assessed as per Table 14.1.1.

Table 14.1.1 Assessment method for Theory Courses

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

i). Continuous Assessment:

Continuous Assessment Marks shall be based on attendance, Continuous Assessment tests and assignments.

a. Attendance:

5 Marks for class attendance in the particular subject. The distribution of marks for

attendance is as follows:

5 marks for 95% and above
4 marks for 90% and above but below 95%
3 marks for 85% and above but below 90%
2 marks for 80% and above but below 85%
1 mark for 75% and above but below 80%

b. Continuous Assessment tests:

Continuous Assessment test carries 45 marks. Performance in all the tests will be taken for assessment as follows:

Table 14.1.2 Weightage of Assessment for Theory Courses

S. No	Test	Portion for Test	Test Marks	Duration of Test	Weightage for Internal Marks
1	CAT - 1	2 Units	50 (Converted to 100)	1 hour 30 Minutes	Best of 2 from 3 Test, 200 marks reduced to **45**
2	CAT - 2	2 Units	50 (Converted to 100)	1 hour 30 Minutes	
3	Model Exam	All 5 Units	100	3 hours	
Continuous Assessment Tests Marks for Theory courses					45

.

Improvement Test 1 & 2 is optional for the students those who want improvement in the internal marks based on their request to the department consultative committee.

ii). End Semester Examination:

The duration of examination shall be 3 hours with a maximum of 100 marks which will be reduced to 50.

iii). Question Paper Pattern – Theory

The question paper pattern of CAT, Model and End Semester Examination for Theory courses as per the Table 14.1.3, and 14.1.4 shall be followed.

Table 14.1.3 Question Paper pattern for CAT 1 and 2

2 Mark Questions	15 Mark Questions	Total Marks
10	2 (Out of 3 Questions)	50

Table 14.1.4 Question Paper pattern for Model and End Semester Examinations

2 Mark Questions	16 Mark Questions	Total Marks
10 (two questions from each unit)	5 (out of 5 Questions, one from each unit)	100

14.2 Theory Cum Studio Courses

All theory cum Studio courses shall be assessed as per Table 14.2.1.

Table 14.2.1 Assessment method for Theory Cum Studio Courses

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2*	Attendance	50	100
Marks	20		25	5		

* The Second assessment (CAT-2) will be in the form of Assignment / Miniature Models / Portfolio

i). Continuous Assessment:

Continuous Assessment Marks shall be based on attendance, Continuous Assessment tests and assignments.

a. Attendance:

5 Marks for class attendance in the particular subject. The distribution of marks for attendance is as follows:

5 marks for 95% and above
4 marks for 90% and above but below 95%
3 marks for 85% and above but below 90%
2 marks for 80% and above but below 85%
1 mark for 75% and above but below 80%

b. Continuous Assessment tests:

Continuous Assessment test carries 45 marks. Performance in all the tests will be taken for assessment as follows:

Table 14.2.2 Weightage of Assessment for Theory Courses

S. No	Test	Portion for Test	Test Marks	Duration of Test	Weightage for Internal Marks
1	CAT - 1	2 Units	50 (Converted to 100)	1 hour 30 Minutes	20 (Combined of 2 Test Marks)
2	Model Exam	All 5 Units	100	3 hours	
3	CAT - 2	All 5 Units Drawings	25	-	25 (Portfolio)
Continuous Assessment Tests Marks for Theory Cum Studio courses					45

.
Improvement Test 1 & 2 is optional for the students those who want improvement in the internal marks based on their request to the department consultative committee.

ii). End Semester Examination:

The duration of examination shall be 3 hours with a maximum of 100 marks which will be reduced to 50.

iii). Question Paper Pattern – Theory cum Studio

The question paper pattern of CAT, Model and End Semester Examination for Theory courses as per the Table 14.2.3, 14.2.4 and 14.2.5 shall be followed.

Table 14.2.3 Question Paper pattern for CAT 1

2 Mark Questions	15 Mark Questions	Total Marks
10	2 (Out of 3 Questions)	50

Table 14.2.4 Question Paper pattern for CAT 2

25 Marks	Total Marks
Drawing Portfolio as per the Syllabus	25

Table 14.2.5 Question Paper pattern for Model and End Semester Examinations

2 Mark Questions	20 Mark Questions	Total Marks
10 (two questions from each unit)	4 (out of 4 Questions, one from each unit, 4 th question option will be from unit-5)	100

14.3 Studio Courses

Studio-based courses (Course with Full Studio component – Foundational Space Design Studio, Rural Architectural Design Studio, Campus Design Studio, Urban Mixed Use Design Studio, Multi-Level Complex Design Studio, High Rise Commercial and Residential Design Studio etc.)

The portfolio of work will be evaluated individually for the total sessional marks of 50. End semester assessment will be done by **two numbers of duly appointed External examiners for Two days** through Viva –voce exam for the remaining 50 marks.

All Studio courses shall be assessed as per Table 14.3.1.

Table 14.3.1 Assessment method for Studio Courses

Assessment	Continuous Assessment Marks (CAM)				End Semester Viva Voce (ESE) Marks	Total Marks
	Concept	Design Development	Presentation	Attendance		
Marks	10	20	15	5	50	100

14.4 Professional Training

At the completion of a Professional Training the student will submit a portfolio duly signed by the Training Architect, which will be evaluated by **Two numbers of duly appointed examiner(s) for Two Days.**

Table 14.4.1 Assessment method for Professional Training

Assessment Tool	Weightage	Split up of Marks	
		Internal	External Viva-voce
Total in-semester Assessment	100%	45 + 5 for attendance (100 reduced to 45)	50 (100 reduced to 50)

Internal Marks will be based on the performance in Intern Office and Presentation of Portfolio submitted in College at the end of the Practical Training.

14.5 Thesis

B.Arch Thesis as for as possible should be socially relevant and attempt to improve existing Design standards in buildings. B.Arch. thesis work will be carried out individually by the students. The internal assessment for 50% of the marks will be done by a thesis review committee, comprising of a renowned practicing architect, Experienced Academic Expert the Head of institution and the guide at least once in a month to monitor the progress. At the completion of a Thesis the student will submit a Thesis report, the presentation drawings and models, which will be evaluated by two numbers of duly appointed examiner(s) for Two Days. The evaluation will be based on a viva voce examination of the project at the end of the semester for the remaining 50% of the marks. The grade will be awarded to the student on the basis of the total marks obtained by him/her out of 100.

The Thesis shall be submitted within **30 calendar days** from the last working day of the semester. If a student fails to submit, he/she will not be allowed to appear for the End Semester Viva Voce Examination.

Table 14.5.1 Assessment method for Thesis

Assessment tool	Weightage	Remarks		
Review 1	5 marks			
Review 2	10 marks			
Review 3	10 marks			
Review 4	10 marks			
Internal Review	10 marks			
Total in-semester assessment	45%(100 reduced to 45)	45% + 5% for attendance		
End semester viva-voce	50% (100 reduced to 50)	Split up of marks		
		Concept	Design Development	Presentation
		15	20	15

15. SCHEME OF END SEMESTER EXAMINATION

Table 15.1 Scheme of End Semester Examination

Course	Duration of End Semester Exam (In Hours)	Internal Assessment Marks	End Semester Exam marks	Total	Attendance Code
All Theory Courses	3 hrs.	50	50	100	Applicable
All Theory cum Studio Based courses	3 hrs.	50	50	100	Applicable
All Studio Based courses	Two Days (viva-voce)	50	50	100	Applicable
Professional Training	Two Days (viva-voce)	50	50	100	Applicable
Thesis	Two Days (viva-voce)	50	50	100	Applicable

Table 15.2 Marks requirement to pass the course

	Theory/ Elective courses			Theory cum Studio courses Drawing &construction-based studio courses			Design Based studio courses			Architectural Thesis			Professional Training		
	IA	ESE	TM	IA	ESE	TM	IA	ESE	TM	IA	ESE	TM	IA	ESE	TM
Max	50	50	100	50	50	100	50	50	100	50	50	100	50	50	100
Min	-	23	50	-	23	50	-	23	50	-	23	50	-	23	50
Min pass %	-	45	50	-	45	50	-	45	50	-	45	50	-	45	50

16. LETTER GRADES AND GRADE POINTS(GP)

Based on the aggregate of marks obtained through internal assessment and external assessment, each student is awarded a final letter grade at the end of the semester in each Course.

Table 16.1 Grade Points by Range of Total Marks.

Range of Total Marks	Letter Grade	Grade Points
90 to 100	S	10
80 to 89	A	9
70 to 79	B	8
60 to 69	C	7
55 to 59	D	6
50 to 54	E	5
0 to 49	F	0
Incomplete	FA	

16.1 'F' Denotes failure in the Course. 'FA' denotes absent / detained.

After results are declared, grade sheets will be issued to the students. The Grade sheets will contain the Following details:

(a) The College in which the candidate has studied.

(b) The list of courses enrolled during the Semester and the grades scored.

(c) The Grade Point Average (GPA) for the semester and The Cumulative Grade Point Average (CGPA) for all enrolled subjects from first semester onwards.

(d) GPA is the ratio of sum of the products of the number of credits © of courses registered and the corresponding grade points (GP) scored in those courses, taken for all the courses and sum of the number of credits of all the courses

GPA = (SUM OF (C x GP) / SUM OF C)

CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester. FA grades are to be executed for calculating GPA and CGPA.

The conversation of CGPA into percentage marks is as given below

% MARKS = (CGPA – 0.5) X 10

(e) COA Student Enrolment number will be mentioned in the Final Consolidated mark sheet.

17. REVALUATION FOR THEORY AND THEORY CUM STUDIO

A Candidate can apply for Revaluation for a theory course and theory cum studio course, within 2 weeks from the declaration of results, on payment of a prescribed fee through proper application to the Controller of Examination through the Head of Institution. Based on the recommendation, the candidate can register for revaluation through proper application to the Controller of Examination. The Controller of Examination will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Institution. Candidate can apply for revaluation of answer scripts not exceeding 5 subjects at a time.

Students can Apply Photocopy of Answer Scripts before applying revaluation.

Revaluation shall not be permitted for all Studio Courses, Professional training and Thesis where Viva- Voce Examination is involved.

17.1 Review for Theory and Theory cum Studio.

Candidates not satisfied with Revaluation can apply for Review of his/her examination answer paper in a theory course and theory cum studio, within the prescribed date on payment of a prescribed fee through proper application to controller of Examination through the Head of the institution. Candidates applying for photocopy-cum-Revaluation only are eligible to apply for review.

18. PROVISION TO CONDUCT THE SUPPLEMENTARY EXAMS

The Supplementary exams to be conducted to all Theory cum Studio and Studio courses within 30 days from declaration of the results, the improved portfolio will be submitted to the External in Viva Voce. However, the internal marks secured by the students earlier will be retained.

18.1 For Theory Courses, an additional supplementary examination exclusively conducted in the Fifth and Tenth Semester.

19. GRADE CARD

19.1 The grade card issued by the Controller of Examinations to each student, after the announcement of the results will contain the following:

1. The credits for each course registered for that semester,
2. The letter grade obtained in each course
3. The total number of credits earned by the student up to the end of that semester in each of the course categories
4. The Cumulative Grade Point Average (CGPA) and GPA of all the courses taken from the semester onwards.
5. In Consolidated Mark sheet Council of Architecture Student Enrolment Number to be printed.

19.2 Class/Distinction will be awarded to the students after they successfully complete the B.Arch. programme as per the norms stipulated in the following table:

Table.19.2.1 Class / Distinction

Category	CGPA (From I-X semesters)	Class / Distinction
Students who successfully complete the B.Arch. programme within the time duration of 10 semesters	< 6.5	Second Class
	≥ 6.5&< 8.5	First Class
	≥ 8.5	First Class with Distinction (only if no arrear history)
Students who cannot complete the B.Arch. programme in 10 semesters but complete it successfully within the time duration of 16 semesters.	≥ 6.5 &< 8.5	First Class
	< 6.5	Second Class

19.3 For the Award of Gold Medal for each branch of study, the CGPA secured from 1st to 10th semester alone should be considered and it is mandatory that the candidate should have passed all the subjects from 1st to 10th semester in the first attempt. Rank certificates would be issued to the first ten candidates.

20. ACADEMIC DISHONESTY

When a student is found responsible for a violation of the School of Architecture – Sri Manakula Vinayagar Engineering College code of conduct pertaining to academic dishonesty (Malpractice in Examinations), the Office of Controller of Examinations will initiate action based on the pre-approved procedures. Appropriate penalty or punishment will be awarded to the student and communication sent to the concerned Head of the Institution.

21. ELIGIBILITY FOR AWARD OF THE B. ARCH DEGREE

A student shall be declared to be eligible for the award of the B.Arch. degree if he/she has Registered and successfully completed all the courses and Thesis, Professional Training as per the curriculum.

a) Successfully acquired the minimum required credits as specified in the curriculum.
b) No disciplinary action pending against him/her.
c) **Two Compulsory Educational Tours apart from the site / field visit.**

22. QUESTION PAPER PATTERN

1. The questions in the End Semester Examinations of Theory and Theory cum Studio courses will cover the following three aspects
   - Remembrance
   - Understanding
   - Application / Design/ Analysis/ Evaluation/ Creativity/ Case Study (whichever is suitable to the subject.)
2. The percentage and way in which these aspects should be incorporated will be broadly based on the nature of each subject and its unique content.
3. The distribution of questions will be broadly based on weightage of each unit/ number of periods in a unit.
4. There will be no subdivisions in a Part A question.
5. There will be a maximum of two subdivisions in a Part B question.
6. In order to cover content as per weightage of units as well as not to leave a unit in choice, a Part B question (especially in the case of Theory cum Studio where the number of questions is not equal to the number of units), if required, can integrate knowledge across units or have subdivisions with questions from related units.
7. Care should be taken to give choices between questions of broadly similar nature (in terms of remembrance/ understanding/ application/ design/ analysis/ evaluation/

creativity/ case study) in Part B.

TABLE 1- SEMESTER I

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0100	Mathematics	3 hrs	**10** questions X **2** marks = **20**	**5** questions X **16** Marks = **80**
U23TH0101	Introduction to Architecture	3 hrs	1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern

B. THEORY CUM STUDIO COURSES

Code	Subject	Duration	Part A	Part B
U23TS0102	Communication English	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**4** questions X **20** Marks=**80** 1. Essay type questions covering first four units depending on the weightage of the units, whereas fifth unit is practical based. 2. Questions in Either/Or pattern

C. STUDIO COURSES

Code	Subject	Duration	
U23ST0103	Fundamental Art Studio	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.
U23ST0104	Introduction to Graphics	3 hrs	
U23ST0105	Fundamental Design Studio	2 days	

TABLE 2- SEMESTER II

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0206	Structural Mechanics	3 hrs	**10** questions X **2** Marks=**20**	**5** questions X **16** Marks=**80**
U23TH0207	History of Architecture - Civilizations	3 hrs	1. Objective type questions covering all units depending on the weightage of theunits 2. All questions compulsory	1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern

B. STUDIO COURSES

Code	Subject	Duration	
U23ST0208	Building Elements and Finishes	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.
U23ST0209	Perspective and Measure Drawings	2 days	
U23ST0210	Architectural Model Making	2 days	
U23ST0211	Foundational Space Design Studio	2 days	

TABLE 3- SEMESTER III

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0312	Structural Analysis of Beams and Columns	3 hrs	**10** questions X **2** Marks=**20**	**5** questions X **16** Marks=**80**
U23TH0313	History of Indian and Islamic Architecture	3 hrs	1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern

B. THEORY CUM STUDIO COURSES

Code	Subject	Duration	Part A	Part B
U23TS0314	Surveying and Site Analysis	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**4** questions X **20** Marks=**80** 1.Essay type questions covering first four units depending on the weightage of the units, whereas fifth unit is practical based. 2.Questions in Either/Or pattern.
U23TS0315	Climate responsive Architecture	3 hrs		

C. STUDIO COURSES

Code	Subject	Duration	
U23ST0316	Building Materials in Construction	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.
U23ST0317	Rural Architectural Design Studio	2 days	

TABLE 4- SEMESTER IV

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0418	Structural Steel Design	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**5** questions X **16** Marks=**80** 1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern
U23TH0419	History of Early Christian to Baroque Architecture	3 hrs		

B.THEORY CUM STUDIO COURSES

Code	Subject	Duration	Part A	Part B
U23TS0420	Services on Water Supply and Waste Management	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**4** questions X **20** Marks=**80** 1. Essay type questions covering first four units depending on the weightage of the units, whereas fifth unit is practical based. 2. Questions in Either/Or pattern

C. STUDIO COURSES

Code	Subject	Duration	
U23ST0421	Metals in Building Construction	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.
U23ST0422	Computer Aided Design	2 days	
U23ST0423	Campus Design Studio	2 days	

TABLE 5- SEMESTER V

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0524	Design of Structural Members	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**5** questions X **16** Marks=**80** 1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern
U23TH0525	History of Modern, Post Modern and Contemporary Architecture	3 hrs		
	Professional Elective - I	3 hrs		

B. THEORY CUM STUDIO COURSES

Code	Subject	Duration	Part A	Part B
U23TS0526	Services on Electricity and Acoustics	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**4** questions X **20** Marks=**80** 1. Essay type questions covering first four units depending on the weightage of the units, whereas fifth unit is practical based. 2. Questions in Either/Or pattern

C. STUDIO COURSES

Code	Subject	Duration	
U23ST0527	Concrete in Building Construction	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.
U23ST0528	Urban Mixed Use Design Studio	2 days	

TABLE 6- SEMESTER VI

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0629	Building Automation and Control Systems	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**5** questions X **16** Marks=**80** 1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern
U23TH0630	Specification and Estimation	3 hrs		
	Professional Elective II	3 hrs		
	Professional Elective III	3 hrs		

B.STUDIO COURSES

Code	Subject	Duration	
U23ST0631	Architectural Design Detailing	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.
U23ST0632	Multi - Level Complex Design Studio	2 days	

TABLE 7- SEMESTER VII

A. THEORY COURSES

Code	Subject	Duration	Part A	Part B
U23TH0733	Professional Practice and Ethics	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**5** questions X **16** Marks=**80** 1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern
U23TH0734	Landscape and Ecology	3 hrs		
	Professional Elective - IV	3 hrs		
	Professional Elective -V	3 hrs		

B. THEORY CUM STUDIO COURSES

Code	Subject	Duration	Part A	Part B
U23TS0735	Services on AC, Fire Safety and Mechanical Transportation	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**4** questions X **20** Marks=**80** 1. Essay type questions covering first four units depending on the weightage of the units, whereas fifth unit is practical based. 2. Questions in Either/Or pattern

C.STUDIO COURSES

Code	Subject	Duration	
U23ST0736	High Rise Commercial and Residential Design Studio	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.

TABLE 8 – SEMESTER VIII

A. PRACTICAL TRAINING

Code	Course Title	Duration	
U23PT0837	Professional Training	2 days	Portfolio examined through a Viva Voce Examination by one External Examiner (who shall be a Practicing Architect) unique for each batch of 40 and appointed by COE.

TABLE 9- SEMESTER IX

A. THEORYCOURSES

Code	Subject	Duration	Part A	Part B
U23TH0938	Human Settlement and Planning	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**5** questions X **16** Marks=**80** 1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern
U23TH0939	Urban Design	3 hrs		
U23TH0940	Urban Housing	3 hrs		
	Professional Elective IV	3 hrs		

B. STUDIO COURSES

Code	Subject	Duration	
U23ST0941	Urban Design Studio	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.

TABLE 10 – SEMESTER X

A. THEORY COURSES

Code	Course Title	Duration	Part A	Part B
U23TH1042	Disaster Management Architecture	3 hrs	**10** questions X **2** Marks=**20** 1. Objective type questions covering all units depending on the weightage of the units 2. All questions compulsory	**5** questions X **16** Marks=**80** 1. Essay type questions covering all units depending on the weightage of the units 2. Questions in Either/Or pattern

B. THESIS

Code	Course Title	Duration	
U23ST1043	Architectural Thesis	2 days	Portfolio examined through a Viva Voce Examination by two External Examiners (of which one shall be a Practicing Architect) unique for each batch of 40 students and appointed by COE.

23. CHANGE OF REGULATIONS

The School of Architecture may from time to time revise, amend or change the regulation, curriculum and syllabus as and when found necessary.

SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
(An Autonomous Institution)

Puducherry

Curriculum R-2023
for
B.Arch. Degree Programme
(With effect from academic year 2023-24)

I SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0100	Mathematics	BS	3	0	0	3	50	50	100
2	U23TH0101	Introduction to Architecture	PC	3	0	0	3	50	50	100
THEORY CUM STUDIO										
3	U23TS0102	Communication English	HS	2	0	2	3	50	50	100
STUDIO										
4	U23ST0103	Fundamental Art Studio	HS	0	0	6	3	50	50	100
5	U23ST0104	Introduction to Graphics	ES	0	0	5	3	50	50	100
6	U23ST0105	Fundamental Design Studio	PC	0	0	12	9	50	50	100
		TOTAL		**8**	**0**	**25**	**24**	**300**	**300**	**600**

II SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0206	Structural Mechanics	ES	3	0	0	3	50	50	100
2	U23TH0207	History of Architecture - Civilizations	HS	3	0	0	3	50	50	100
STUDIO										
3	U23ST0208	Building Elements and Finishes	PC	0	0	5	3	50	50	100
4	U23ST0209	Perspective and Measured Drawing	ES	0	0	5	3	50	50	100
5	U23ST0210	Architectural Model Making	PC	0	0	6	3	50	50	100
6	U23ST0211	Foundational Space Design Studio	PC	0	0	12	9	50	50	100
		TOTAL		**6**	**0**	**28**	**24**	**300**	**300**	**600**

III SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0312	Structural Analysis of Beams and Columns	ES	3	0	0	3	50	50	100
2	U23TH0313	History of Indian and Islamic Architecture	HS	3	0	0	3	50	50	100
THEORY CUM STUDIO										
3	U23TS0314	Surveying and Site Analysis	PC	2	0	2	3	50	50	100
4	U23TS0315	Climate responsive Architecture	BS	2	0	2	3	50	50	100
STUDIO										
5	U23ST0316	Building Materials and Construction	PC	0	0	5	3	50	50	100
6	U23ST0317	Rural Architectural Design Studio	PC	0	0	14	9	50	50	100
		TOTAL		**10**	**2**	**23**	**24**	**300**	**300**	**600**

IV SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0418	Structural Steel Design	ES	3	0	0	3	50	50	100
2	U23TH0419	History of Early Christian to Baroque Architecture	BS	3	0	0	3	50	50	100
THEORY CUM STUDIO										
3	U23TS0420	Services on Water Supply and Waste Management	ES	2	0	2	3	50	50	100
STUDIO										
4	U23ST0421	Metals in Building Construction	PC	0	0	5	3	50	50	100
5	U23ST0422	Computer Aided Design	PAEC	0	0	5	3	50	50	100
6	U23ST0423	Campus Design Studio	PC	0	0	14	9	50	50	100
		TOTAL		**8**	**0**	**26**	**24**	**300**	**300**	**600**

V SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0524	Design of Structural Members	ES	3	0	0	3	50	50	100
2	U23TH0525	History of Modern, Post Modern and Contemporary Architecture	HS	3	0	0	3	50	50	100
ELECTIVE										
3		Professional Elective - I	PE	3	0	0	3	50	50	100
THEORY CUM STUDIO										
4	U23TS0526	Services on Electricity and Acoustics	ES	2	0	2	3	50	50	100
STUDIO										
5	U23ST0527	Concrete in Building Construction	PC	0	0	5	3	50	50	100
6	U23ST0528	Urban Mixed use Design Studio	PC	0	0	16	10	50	50	100
		TOTAL		**12**	**0**	**23**	**25**	**300**	**300**	**600**

VI SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0629	Building Automation and Control Systems	PC	3	0	0	3	50	50	100
2	U23TH0630	Specification and Estimation	PC	3	0	0	3	50	50	100
ELECTIVE										
3		Professional Elective - II	PE	3	0	0	3	50	50	100
4		Professional Elective - III	PE	3	0	0	3	50	50	100
STUDIO										
5	U23ST0631	Architectural Design Detailing	PC	0	0	5	3	50	50	100
6	U23ST0632	Multi-Level Complex Design Studio	PC	0	0	16	10	50	50	100
		TOTAL		**12**	**0**	**21**	**25**	**300**	**300**	**600**

VII SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0733	Professional Practice and Ethics	PC	3	0	0	3	50	50	100
2	U23TH0734	Landscape and Ecology	PC	3	0	0	3	50	50	100
ELECTIVE										
3		Professional Elective - IV	PE	3	0	0	3	50	50	100
4		Professional Elective -V	PE	3	0	0	3	50	50	100
THEORY CUM STUDIO										
5	U23TS0735	Services on AC, Fire Safety and Mechanical Transportation	ES	2	0	2	3	50	50	100
STUDIO										
6	U23ST06	High Rise Commercial and Residential Design Studio	PC	0	0	16	11	50	50	100
		TOTAL		**14**	**0**	**18**	**26**	**300**	**300**	**600**

VIII SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
STUDIO										
1	U23PT0837	Professional Training	PAEC	0	0	0	26	50	50	100
		TOTAL		**0**	**0**	**0**	**26**	**50**	**50**	**100**

IX SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH0938	Human Settlement and Planning	HS	3	0	0	3	50	50	100
2	U23TH0939	Urban Design	PC	3	0	0	3	50	50	100
3	U23TH0940	Urban Housing	HS	3	0	0	3	50	50	100
ELECTIVE										
4		Professional Elective - VI	PE	3	0	0	3	50	50	100
STUDIO										
5	U23ST0941	Urban Design Studio	PC	0	0	16	14	50	50	100
		TOTAL		**12**	**0**	**16**	**26**	**250**	**250**	**500**

X SEMESTER

S.NO	CODE	COURSE TITLE	CATEGORY	L	T	P/S	C	Marks		
								IA	ESE	TM
THEORY										
1	U23TH1042	Disaster Management Architecture	PC	3	0	0	3	50	50	100
STUDIO										
2	U23ST1043	Architectural Thesis	PC	0	0	36	23	50	50	100
		TOTAL		**3**	**0**	**36**	**26**	**100**	**100**	**200**

Total no.of credits : 250.

CATEGORY OF COURSES AND ITS CREDITS

HUMANITIES AND SOCIAL SCIECNES (HS)

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
1	U23TH0207	History of Architecture- Civilizations	3	0	0	3	50	50	100
2	U23TS0102	Communication English	2	0	2	3	50	50	100
3	U23ST0103	Fundamental Art Studio	0	0	6	3	50	50	100
4	U23TH0313	History of Indian and Islamic Architecture.	3	0	0	3	50	50	100
5	U23TH0419	History of Early Christian to Baroque Architecture.	3	0	0	3	50	50	100
6	U23TH0525	History of Modern, Post Modern and Contemporary Architecture.	3	0	0	3	50	50	100
7	U23TH0938	Human Settlements Planning	3	0	0	3	50	50	100
8	U23TH0940	Urban Housing	3	0	0	3	50	50	100

BASIC SCIENCES (BS)

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
1	U23TH0100	Mathematics	3	0	0	3	50	50	100
2	U23TS0315	Climate Responsive Architecture	2	0	2	3	50	50	100

ENGINEEIRNG SCIENCES (ES)

Sl. No.	Course Code	Course title	C/ P	L	T	P/S	C	Marks		
								IA	ESE	TM
1	U23ST0104	Introduction to Graphics	5	1	0	4	3	50	50	100
2	U23TH0206	Structural Mechanics	4	2	2	0	3	50	50	100
3	U23TH0312	Structural Analysis of Beams and Columns	4	2	2	0	3	50	50	100
4	U23ST0209	Perspective and Measure Drawing	5	1	0	4	3	50	50	100
5	U23TS0420	Services on Water Supply and Waste Management	4	2	0	2	3	50	50	100
6	U23TH0418	Structural Steel Design	4	2	2	0	3	50	50	100
7	U23TS0526	Services on Electricity and Acoustics	4	2	0	2	3	50	50	100
8	U23TH0524	Design of Structural Members	4	2	2	0	3	50	50	100
9	U23TS0735	Services on AC, Fire Safety and Mechanical Transportation	4	2	0	2	3	50	50	100

PROFESSIONAL CORE (PC)

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
1	U23ST0105	Fundamental Design Studio	0	0	12	9	50	50	100
2	U23ST0208	Building Elements and Finishes	0	0	5	3	50	50	100
3	U23ST0210	Architectural Model Making	0	0	6	3	50	50	100
4	U23TH0101	Introduction to Architecture	3	0	0	3	50	50	100
5	U23ST0211	Foundational Space Design Studio	0	0	12	9	50	50	100
	U23TS0314	Surveying and Site Analysis	3	0	0	3	50	50	100
6	U23ST0316	Building Materials in Construction	0	0	5	3	50	50	100
7	U23ST0317	Rural Architectural Design Studio	0	0	14	9	50	50	100
8	U23ST0421	Metals in Building Construction	0	0	5	3	50	50	100
9	U23ST0423	Campus Design Studio	0	0	14	9	50	50	100
10	U23ST0527	Concrete in Building Construction	0	0	5	3	50	50	100
11	U23ST0528	Urban Mixed use Design Studio	0	0	16	10	50	50	100
12	U23TH0630	Specification Estimation and Valuation	3	0	0	3	50	50	100
13	U23TH0629	Building Automation and Control Systems	3	0	0	3	50	50	100
14	U23ST0631	Architectural Design Detailing	0	0	5	3	50	50	100
	U23ST0632	Multi-Level Complex Design Studio	0	0	16	10	50	50	100
15	U23TH0733	Professional Practice and Ethics	3	0	0	3	50	50	100
16	U23TH0939	Urban Design	3	0	0	3	50	50	100
17	U23ST0736	High Rise Commercial and Residential Design Studio	0	0	16	11	50	50	100
18	U23TH0734	Landscape and Ecology	3	0	0	3	50	50	100
19	U23ST0941	Urban Design Studio	0	0	16	14	50	50	100
20	U23TH1042	Disaster Management	3	0	0	3	50	50	100

PROFESSIONAL ELECTIVES - I

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
1	U23EL0500	Theory of Design	3	0	0	3	50	50	100
2	U23EL0501	Vernacular Architecture	3	0	0	3	50	50	100
3	U23EL0502	Art Appreciation	3	0	0	3	50	50	100
4	U23EL0503	uman Behavior and Built Environment	3	0	0	3	50	50	100

PROFESSIONAL ELECTIVES -II

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
5	U23EL0604	Interior Design	3	0	0	3	50	50	100
6	U23EL0605	Structure and Architecture	3	0	0	3	50	50	100
7	U23EL0606	Evolution of Human Settlements	3	0	0	3	50	50	100
8	U23EL0607	Technological Fabrication in Architecture	3	0	0	3	50	50	100

PROFESSIONAL ELECTIVES -III

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
9	U23EL0608	Contemporary Building Materials	3	0	0	3	50	50	100
10	U23EL0609	Glass Architecture and Design	2	2	0	3	50	50	100
11	U23EL0610	Steel Architecture and Design	3	0	0	3	50	50	100
12	U23EL0611	Concept of Green Cities	3	0	0	3	50	50	100

PROFESSIONAL ELECTIVES - IV

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
13	U23EL0712	Contemporary Process in Architectural Design	3	0	0	3	50	50	100
14	U23EL0713	Energy Efficient Architecture	3	0	0	3	50	50	100
15	U23EL0714	Architectural Conservation	3	0	0	3	50	50	100
16	U23EL0715	Artificial Intelligence in Architecture	3	0	0	3	50	50	100

PROFESSIONAL ELECTIVES - V

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
17	U23EL0716	Advanced Structures	3	0	0	3	50	50	100
18	U23EL0717	Sustainable Architecture and Planning	3	0	0	3	50	50	100
19	U23EL0718	Dissertation	0	0	6	3	50	50	100
20	**U23EL0719**	**Road Safety and Civic Sense**	**3**	**0**	**0**	**3**	**50**	**50**	**100**

PROFESSIONAL ELECTIVES - VI

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
21	U23EL0920	Architectural Photography and Journalism	3	0	0	3	50	50	100
22	U23EL0921	Construction and Project Management	3	0	0	3	50	50	100
23	U23EL0922	Earthquake Resistant Architecture	3	0	0	3	50	50	100
24	**U23EL0923**	**Human Rights**	**3**	**0**	**0**	**3**	**50**	**50**	**100**

PROFESSIONAL ABILITY ENHANCEMENT COURSES (PAEC)

Sl. No.	Course Code	Course title	L	T	P/S	C	Marks		
							IA	ESE	TM
1	U23ST0102	Computer Aided Design	0	0	5	3	50	50	100
2	U23PT0837	Professional Training	0	0	0	26	50	50	100
3	U23ST1043	Architectural Thesis	0	0	36	23	50	50	100

SUMMARY

Sl. No.	Subject Area	Credits per Semester										Credits Total
		I	II	III	IV	V	VI	VII	VIII	IX	X	
1	HS	6	3	3		3	3	3		6		**27**
2	BS	3		3	3							**9**
3	ES	3	6	3	6	6		3				**27**
4	PC	12	15	15	12	13	13	14		17	3	**114**
5	PE					3	6	6		3		**18**
6	PAEC				3		3		26		23	**55**
Total		**24**	**24**	**24**	**24**	**25**	**25**	**26**	**26**	**26**	**26**	**250**
Non-credit / Mandatory		NCC / NSS /YRC Rotaract		Rural Study Tour		All India Tour						

SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
(An Autonomous Institution)

Puducherry

Syllabus R-2023

for

B.Arch. Degree Programme

(With effect from academic year 2023-24)

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**I**	Course Category : **BS**				End Semester Exam Type: **TH**		
Course Code	**U23TH0100**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Mathematics**	**3**	**0**	**0**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	The aim of the course is to develop the skills of the students in architectural drawing	**K2**
	CO2	The students will be trained on the basis of the topics of Mathematics necessary for effective understanding of architecture subjects.	**K2**
	CO3	Understanding the Concept of Trigonometric functions, Maxima and Minima	**K2**
	CO4	Understanding the Concept of Homogeneous Equation and Euler's Theorem	**K2**
	CO5	At the end of the course, the students would have an understanding of the appropriate role of the mathematical concepts learnt	**K2**

UNIT - I	**Trigonometry and Mensuration**	**Periods: 9**
- Trigonometric (sine, cosine and tan functions) and exponential functions - De-Moiver's theorem. - Volume and Surface Area of Solids of Revolution.		**CO1**
UNIT - II	**Three-Dimensional Analytical Geometry**	**Periods: 9**
- Direction cosines and ratio's - Angle between two lines - Equations of a plane - Equations of a straight line – Coplanar lines – Shortest distance between skew lines.		**CO2**
UNIT - III	**Integration And Functions of Two Variables**	**Periods: 9**
- Integration of rational, trigonometric and irrational functions - Taylor's Theorem - Maxima and Minima (Simple Problems)		**CO3**
UNIT - IV	**Ordinary Differential Equations**	**Periods: 9**
- Linear equations of second order with constant coefficients - Methods of Variation of Parameter.		**CO4**
UNIT - V	**Basic Statistics and Probability**	**Periods: 9**
- The arithmetic mean, median, mode, standard deviation and variance - Elementary probability - Laws of addition and multiplication of probabilities.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition,2011.

Reference Books

1. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.) 7th Edition, New Delhi, 2009.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co.Ltd., New Delhi, 11th Reprint, 2010.
3. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, 2nd Edition, New Delhi, 5th Reprint, 2009.
4. Gupta S.C and Kapoor V.K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, 9th Edition, New Delhi, 1996.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**I**	Course Category: **PC**				End Semester Exam Type: **TH**		
Course Code	**U23TH0101**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Introduction to Architecture**	**3**	**0**	**0**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Introduction and Components of architecture.	**K1 K2**
	CO2 A thorough understanding on elements of architectures of form and space.	**K2**
	CO3 Understanding and exploring the basic principles of design .	**K2**
	CO4 Understanding the sensory Architecture.	**K2**
	CO5 Understanding and exploring the components of building circulation.	**K2**

UNIT - I	**Introduction to Architecture**	**Periods: 8**
- Definitions of architecture. - Components of architecture: use, means, site, shelter, relation to nature, structure, skin, materials, services, circulation, typology, aesthetics, expression, character, symbolism, experience, etc - Types of design in history- unself-conscious/ self-conscious design, pragmatic/ iconic/ canonic/ analogic design.		**CO1**

UNIT - II	**Elements of Design**	**Periods: 7**
- Geometric elements such as point, line, plane, volume, form etc. - Form as manifesting attributes such as pattern, light, colour, surface, texture etc. - Characteristics of geometric forms/space such as sphere, cube, pyramid, cylinder, cone and their derivatives.		**CO2**

UNIT - III	**Principles of Design**	**Periods: 12**
Characteristics acting as principles to generate architectural design such as proportion, scale, balance, symmetry, asymmetry, rhythm, axis, hierarchy, datum, unity, harmony, dominance, climax, focus with architectural examples.		**CO3**

UNIT - IV	**Human senses and built Environment**	**Periods: 8**
- Human body and sensory Architecture - Vision,Tactile, Haptic, auditory, olfactory senses, with architectural case study. - Space in architecture - Enclosure - spatial organisation and its types ,organisation of spaces.		**CO4**

UNIT - V	**Circulation elements**	**Periods: 10**
- Circulation elements - Approach,Entrance,Configuration of path ,Form of Circulation . - Design analysis of the buildings: Falling water house, & Guggenheim museum by F. L. Wright -Villa Savoye & Chapel of Notredame DuHaut by Le corbusier.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1.Francis D.K. Ching, “Architecture-Form, Space and Order”, Van Nostrand Reinhold Company, New York, 2007.

2.Simon Unwin, “Analysing Architecture”, Rouledge, London, 2003.

3.Pramar V.S., “Design Fundamentals in Architecture”, Somaiya Publications Private Ltd., NewDelhi, 1973.

4.YatinPandya,” Elements of Space making”, Mapin 2007.

5.Juhani Pallasma : The Eyes of the skin: Architecture & the senses: Wiley 3rd edition:2012

Reference Books

1. Leland M.Roth, “Understanding Architecture: Its Experience History and Meaning”,Craftsmanhouse, 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. NeilsPrak, “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. SimonUnwin, Analysing Architecture , Rouledge ,London , 2003..

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**I**	Course Category: **HS**				End Semester Exam Type: **TH**		
Course Code	**U23TS0102**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Communication English**	**2**	**0**	**2**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies	**K2**
	CO2	Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation	**K2**
	CO3	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings	**K2**
	CO4	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing	**K2**
	CO5	An Understanding to how to Handle the Client independently with a Project Proposal	**K2**

UNIT - I	**Introduction**	**Periods: 9**	
- TED Talk: Meaning, Importance (Listen TED Talk Videos on Architecture) - Mind Map: Definition, Importance, Note taking using Mind Maps - Techniques of Reading: Skimming, Scanning, SQ3R technique, Active Reading, Detailed Reading - Reading Comprehension: Architecture Texts, Manuals, and Journals.			**CO1**
UNIT - II	**Speaking, Reading and Writing**	**Periods: 9**	
- Descriptive Essay Writing - E mail Writing, Report Writing, Letter Writing, Resume' and Job Application Letter - Note Making and Summarizing			**CO2**
UNIT - III	**Descriptive Presentation**	**Periods: 9**	
- Verbal and Non-verbal Communication - Etiquette: Meaning, Types: Social, Meeting, Telephone - Negotiation: Meaning, Types, Strategies, Tactics: BATNA.			**CO3**
UNIT - IV	**Analytical Presentation**	**Periods: 9**	
- Tenses - Voice - Degrees of Comparison - Cohesive Devices - Subject-Verb Agreement - Adjectives of Comparison - Architecture Vocabulary for sentence construction: Parts of Building - Abbreviations & Acronyms related to Architecture.			**CO4**
UNIT - V	**Project Proposal Presentation**	**Periods: 9**	
- Conversation practice between/among clients, suppliers, business partners, colleagues - Presentation: Individual & Group, Presenting Case Studies, Literature Reviews, Analysis and Inference - Group Discussion - Just a Minute (JAM) - Interview			**CO5**

Lecture Periods:	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

1. English for Architects and civil Engineers - Sharon Hendenreich Springer, 2014 ISBN 978-3-658-030-63- (e-book).
2. www.cambridgescholars.com
3. www.robertdwatkins.com/Englishworkbook.pdf
4. arkenglish

Reference Books

1. Chris Mounsey: Essays and Dissertation (Oxford University Press) February 2005.
2. Sidney Green baum: The Oxford English Grammar (Oxford University Press)March 2005.
3. Krishna Mohan and Meera Banerji: Developing Communication Skills (Mac Millan india Ltd)[2000].
4. Krishna Mohan and Meenakshi Raman: Effective English Communication (Tata Mc-Graw Hill)[2000].

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-
2	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-
3	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-
4	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-
5	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**I**	Course Category: **PC**				End Semester Exam Type: **TE**		
Course Code	**U23ST0103**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Fundamental Art Studio**	**0**	**0**	**6**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 The students are exposed to various mediums, techniques and tools	**K2**
	CO2 The students gain mastery in sketching, visualizing and expression through manual drawing.	**K2**
	CO3 Sensitized to culture, craft and context	**K2**
	CO4 Skill Development in Handling Materials and in Making Products	**K3**
	CO5 Skill Development in Craft and Technology by using Wood, Metal, Clay and Printing	**K3**

UNIT - I **Basics of Drawing** **Periods: 9**

- Introduction to Drawing through various period of History
- Seeing (Observation / Proposition / Scale /Texture through study of still life and natural objects)
- Visualizing (Memory Drawing / Exploratory Drawing)
- Expressing (Qualities of Lines / Drawing tools and Quality of Expressions - Pen – Pencil – Charcoal - Marker)
- Abstraction and communication (Sketching and Free hand perspective Drawing)

CO1

UNIT - II **Drawing From Observation** **Periods: 9**

The processes of seeing, Imagining and Representing

- Observations on Line and Shape
- Observation on Tone and Texture
- Observations on Form and Structure
- Observations on Space and Depth
- Sketching Exercises related to the contents specified above.

CO2

UNIT - III **Graphic Design** **Periods: 9**

- Introduction to history of Graphic Design
- Visual perception theory (Gestalts) – Principle of Compositions
- Color Theory
- Type Design and Typography (Layouts / Format / Calligraphy)
- Environmental Graphics (Signage / Logo / enhancing the built environment)
- Exercises in environmental graphic design, color and composition

CO3

UNIT - IV **Painting** **Periods: 9**

- Introduction to Art / Artists.
- Mediums, Techniques and Tools (Water colors / Posters /Acrylic / Inks / Brushes / Knives / Mixed Media)
- Exercises using various techniques and mediums.

CO4

UNIT - V **Culture - Craft - Technology** **Periods: 9**

- Understanding Craft and Technology
- Material exploration (Wood/ Metal / Clay / Printing)
- Print Making / Wood Carving / Clay Sculpting / Casting / Sheet Metal etc.,

CO5

Lecture Periods:	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 90**

Text Books

1. Webb, Frank, “The Artist guide to Composition”, David & Charles, U.K., 1994.
2. Ching Francis, “Drawing a Creative Process”, Van Nostrand Reinhold, New York, 1990.
3. Alan Swann, “Graphic Design School”, Harper Collins, 1991.
4. Envisioning Architecture – an analysis of drawing , Iain Fraser & Rod Henmi, 1991

Reference Books

1. Moivahuntly, “The artist drawing book”, David & Charles, U.K., 1994.
2. Arundell (Jan) Exploring sculpture, Mills and Boon, London/Charles,T. Brand Ford Company, U.S.A.
3. The art of drawing trees, heads, colours, mixing, drawing, landscape and painting, water colour, oilcolour, etc. – The Grumbacher Library Books, New York, 1996.
4. Caldwell peter, “Pen and Ink Sketching”, B.T. Bats ford Ltd., London, 1995.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**I**	Course Category: **PC**				End Semester Exam Type: **ST**		
Course Code	**U23ST0104**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Introduction To Graphics**	**0**	**0**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	An understanding on the concepts of architectural drawing as well as representation skills are imparted.	**K2**
	CO2	An understanding on the building representation in 2D Planar surface and Multi View Projection Drawings of Solids	**K3**
	CO3	An understanding on Architect's Sketches translated as Drawing systems through Pictorial Systems	**K3**
	CO4	An understanding on Isometric and Axonometric Detailed Drawings	**K3**
	CO5	An understanding on Measuring Drawings of Furniture's and Building Components	**K3**

UNIT - I	**Geometrical Drawing: Introduction to Drafting**	**Periods: 9**	
- Introduction to fundamentals of drawing/ drafting - Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, etc. - Use of scales - Construction - Triangles - Circles - Tangents - Curves -Conic sections.			**CO1**
UNIT - II	**Plane Geometry and Solid Geometry**	**Periods: 9**	
Construction and development of planar surface - Square - Rectangle - Polygon Introduction of multi- view projection - Projection of points, lines and planes. Multi- view projection of solids - Cube - Prism - Pyramids - Cones - Cylinders. - Sections of solids.			**CO2**
UNIT - III	**Architectural Drawing Systems**	**Periods: 9**	
- Communicating Architectural Design Ideas from Concept to Construction - Case studies of Architect's Sketches translated as Drawing systems - Types of Projection systems. - Types of Pictorial systems such as Multi view, Para line and Perspective drawings.			**CO3**
UNIT - IV	**Multiview And Parallel line Drawings**	**Periods: 9**	
- Principles of Orthographic views – Reading multi view drawings - Representing materials in Architectural Design and Construction drawings - Drafting of Building Components in Plans – Elevations – Sections through Case studies of Architects' drawings - Construction of Paraline drawings – Isometric and Axonometric			**CO4**
UNIT - V	**Measured Drawing**	**Periods: 9**	
Fundamentals of measured drawing - Format for presentation methods - Techniques of measuring buildings and their details Measured drawing of simple objects - Furniture and building components.			**CO5**

Lecture Periods:	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 90**

Text Books

1. Morris IH., "Geometrical Drawing for Art Students", Orient Longman, Madras, 2004.
2. Francis D. K. Ching, "Architectural Graphics", John Wiley and Sons, 2009.
3. Fraser Reekie, Reekie's, "Architectural Drawing", Edward Arnold, 1995

Reference Books

1. Francis D.K.Ching with Steven P.Juroszek, "Design Drawing" John Wiley & Sons, Inc. Second edition, reprint 2012.
2. Fraser Reekie, Reekie's, "Architectural Drawing", Edward Arnold, 1995.
3. Scidler & Korte; Hand drawings for Designers - Communications ideas through area graphics; Four child books NY; 2012

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**I**	Course Category: **PC**				End Semester Exam Type: **ST**		
Course Code	**U23ST0105**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Fundamental Design Studio**	**0**	**0**	**12**	**9**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	An understanding of the qualities of different elements as well as their composite fusions	**K3**
	CO2	An ability to engage and combine the elements of design in spontaneous as well as intentional ways in order to create desired qualities and effects	**K3**
	CO3	Development of required skills – observation / analysis / abstractions / interpretation / representations / expressions through models and drawings	**K6**
	CO4	An ability to design and study evolution of craft through iconic designs like Eames Chair, Rietvelt Chair	**K6**
	CO5	An Analytical appraisal of building form in terms of visual character, form and function, play of light and shade, solids and voids, colors and texture	**K6**

Contents

Introduction to Spatial Design, Form and Structures through Basic Design **Elements of Design:** Properties, qualities and characteristics of point, line, direction shape, form, color and texture **Principles of Design:** Scale, Proportion, Balance, Harmony, Rhythm and Contrast. Concepts of Visual perception – Material and processes. **The course shall be conducted by giving a number of exercises in the form of Design studios, Seminars and Creative workshops that are aimed at teaching the following:** - Elements and Principles of Visual Composition and Pattern making. - Exploring Color theories and their application in a Visual composition. - Study of texture and schemes of texture both applied and stimulated and their application. - Material and Form / Structures – Nature based enquiry into form both Linear and Planar, fluid and plastic forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol, clay, plaster of Paris etc. - Study of Solids and voids to evolve sculptural forms and spaces using specific process - oriented methods like casting, moldings etc., - Analytical appraisal of an iconic Design like a rietvelt chair, Eames chair etc., for form, - function, visual characteristics, ergonomics etc. /evolution of a craft. - Analytical appraisal of building form in terms of visual character, form and function, play - of light and shade, solids and voids, colors and texture.	**CO1**

Lecture Periods:	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 90**

Text Books

1. Owen Cappleman & Michael Jack Jordon, Foundations in Architecture: An Amotated Anthologyof Beginning Design Project, Van Nostrand Reinhold New York, 1993.
2. Charles Wallschlacgerm & Cynthia Busic-Snyder, Basic Visual Concepts and Principles for Artists, Architects and Designers, McGraw Hill, New York 1992.

Reference Books

1. Pramar V.S., Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi,1973.
2. Francis D.K.Ching, “Architecture: Form, Space and Order, Van Nostrand Reinhold Co., (Canaa),1979.
3. Elda Fezei, Henny Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
4. Lawrence Bunchy C.Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y.10001, 1972.
5. Exner V., Pressel D., “Basics Spatial Design”, Birkhanser, 2009.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**II**	Course Category: **PC**				End Semester Exam Type: **TH**		
Course Code	**U23TH0206**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Structural Mechanics**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.	**K1 K2**
	CO2 An understanding about the Plane Trusses	**K1 K2**
	CO3 Students are taught basic geometric properties and the behavior of materials under effect of forces.	**K1 K2 K3**
	CO4 Understand the Elastic properties of solids	**K1 K2 K3**
	CO5 Applying and understanding the relationship between the Constants	**K1 K2 K3**

UNIT - I	**Forces and structural systems**	**Periods: 16**
- **Principles of statics** - Forces and their effects - **Types of force systems** - Resultant of concurrent and parallel forces - **Theorms** - Lami's theorem- principle of moments -Varignon's theorem -principle of equilibrium - Types of supports and loadings - Determination of reactions for simply supported beams - simple problems.		**CO1**
UNIT - II	**Analysis of plane trusses**	**Periods: 12**
- Analysis of plane trusses - Introduction to Determinate and Indeterminate plane trusses. - Analysis of simply supported and cantilevered trusses by method of joints and method of sections.		**CO2**
UNIT - III	**Properties of section**	**Periods: 12**
- Properties of section - Centroid- Moment of Inertia - Section modulus - Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis - simple problems.		**CO3**
UNIT - IV	**Elastic properties of solids**	**Periods: 10**
Elastic properties of solids - Concept of stress and strain - Deformation of axially loaded simple bars **Types of stresses** - Concept of axial and volumetric stresses and strains (excluding composite bar).		**CO4**
UNIT - V	**Elastic constants**	**Periods: 10**
- Elastic constants - Elastic Modulus - Shear Modulus - Bulk Modulus - Poisson's ratio - Relation between elastic constants - Application to problems.		**CO5**

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

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

Reference Books

1. P.C.Punmia, Strength of Materials and Theory of Structures; Vol. I, Lakshmi Publications, Delhi 1994.
2. S. Ramamrutham, Strength of Materials – Dhanpatrai& Sons, Delhi, 1990.
3. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989.
4. R.K. Rajput – Strength of Materials, S. Chand & Company Ltd. New Delhi 1996.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	School of Architecture	Programme: **B.Arch.**						
Semester	II	Course Category: **PC**				End Semester Exam Type: **TH**		
Course Code	U23TH0207	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**History of Architecture - Civilizations**	3	-	-	3	50	50	100

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 An understanding about the culture and civilization of primitive architecture	**K1 K2**
	CO2 An Understanding about the tomb architecture as a response to culture and context of ancient Egypt	**K1 K2**
	CO3 An understanding about the spatial and stylistic qualities associated with architecture in Mesopotamian civilization	**K1 K2**
	CO4 An understanding about Architecture and culture of Greece & Rome	**K1 K2**
	CO5 An understanding about the Indus valley civilization and Buddhist architecture	**K1 K2**

UNIT - I **Pre-historic / primitive architecture** **Periods: 7**

- Introducing concepts of culture and civilization – Paleolithic and Neolithic Culture – art forms and evolution of shelter – megaliths – agricultural revolution and its impact on culture and civilization.
- Case studies: Oval huts near Nice, Dolmen tomb, Gallery grave, Passage grave, Tumulus, Houses at Catal Huyuk, Stonehenge etc.

CO1

UNIT - II **Nile valley civilization** **Periods: 10**

- **Landscape and culture of Ancient Egypt**
- History – religious and funerary beliefs and practices – monumentality – tomb architecture: evolution of the pyramid from the mastaba – Great Pyramid of Cheops, Gizeh.
- **Temple architecture:** mortuary temples and cult temples - Temple of Ammon Ra, Karnak – Temple of Abu Simbel (Rock Cut)

CO2

UNIT - III **Ancient river valley civilizations: Mesopotamia** **Periods: 10**

- **Landscape and culture of Greece**
- Hellenic and Hellenistic cultures
- Character and lifestyle
- Polis and democracy
- Orders
- Greek city planning: Acropolis
- Parthenon temple
- Optical illusion
- Public buildings: Agora and theatre
- **Rome** – Roman Republic empire – character and lifestyle– Orders – Forum Temple of Pantheon, Colosseum, Circus Maximus

CO3

UNIT - IV **Classical period: Greece & Rome** **Periods: 8**

- **Landscape and culture of Greece**– Hellenic and Hellenistic cultures – character and lifestyle – polis and democracy– orders
- Greek city planning: Acropolis – Parthenon temple– optical illusion – Public buildings: Agora and theatre
- **Rome** – Roman Republic empire – character and lifestyle– Orders – Forum
- Temple of Pantheon, Colosseum, Circus Maximus

CO4

UNIT - V **Ancient Indian civilization** **Periods: 10**

- **Indus Valley Civilization:** culture and pattern of settlement -Aryan civilization- origins of early Hinduism - Vedic culture - Vedic village and rudimentary forms of bamboo and wooden construction
- **Origins of Buddhism and Jainism:** evolution of building typologies - symbolism of the stupa - the Sanchi Stupa, vihara and the chaitya hall - architectural production during Ashoka's rule Ashokan Pillar, Sarnath - rock cut architecture in Ajanta and Ellora.

CO5

Lecture Periods: 45	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 45**

Text Books

1. Sir Banister Fletcher, A History of Architecture, CBS Publications (Indian Edition),20th Edition 2002.
2. Spiro Kostof – A History of Architecture – Setting and Rituals, Oxford University Press, London, 1986.

Francis D.K. Ching et al; A global history of Architecture; John Wiley's sons, 2ndedition 2010.

Reference Books

1. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Westview press, 3rd revised edition; 2014.
2. S. Lloyd and H.W. Muller, Ancient Architecture: History of World Architecture – Series, Phaidon Press, London, 2004.
3. Gosta, E. Samdstrom, Man the Builder, McGraw Hill Book Company, New York,1970.
4. Bussagh; Marco; Understanding Architecture; I.B.Tauris& co. Ltd; 2005.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	-	-	-	-
2	1	-	-	-	-	-	-	-	-	-	-
3	1	-	-	-	-	-	-	-	-	-	-
4	1	-	-	-	-	-	-	-	-	-	-
5	1	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**II**	Course Category :PC			End Semester Exam Type: **ST**			
Course Code	**U23ST0208**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Building Elements and Finishes**	**0**	**0**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Learn construction details using naturally occurring building materials such as stone, bamboo, mud and lime through drawing as well as doing a literature or live case study.	**K1 K2**
	CO2	Understanding the details of foundations suitable for construction with stone, bamboo, lime and Mud.	**K1 K2 K3**
	CO3	Students are to submit drawing plates comprising of technical plan, elevation and section along with sketches and details showing method of construction	**K1 K2 K3**
	CO4	An understanding of the details of Openings and Fenestration suitable for all types of Construction.	**K2 K3**
	CO5	An understanding of the materials for surface finishing and materials available in market for Paints, Plastering materials, Glazes and Varnishes.	**K2 K3**

UNIT - I **Building materials** **Periods: 10**

- Introduction to Building materials
- Naturally occurring building materials such as Stone, Bamboo, Lime and Mud
- Characteristics and Applications.
- The above-mentioned Theory topics will be given as assignment and submitted to the External Viva.

UNIT - II **Building components – 01– Foundations** **Periods: 20**

- Introduction to Building Components
- Foundations
- Foundations suitable for construction with stone, bamboo, lime and mud
- Exercises on Foundations in History and Today's context.

UNIT III **Building components – 02 - Walls** **Periods: 20**

- Introduction to Building Components – Walls – Walls suitable for construction with stone, bamboo, lime and mud
- Exercises on Walls in History and Today's context.

UNIT IV **Building components – 03 – Openings/fenestrations** **Periods: 15**

- Design and preparation of detailed drawings of joinery including doors, windows and ventilators.
- Design and preparation of layouts of service intensive rooms like kitchens and toilets.
- Design and detailing out of floor, wall and ceiling finishes/ construction/ laying.

UNIT V **Finishes** **Periods: 10**

- Introduction to Finishes – Paints, Plastering, Putty, Glazes and Varnishes – Exercises on different finishes in History and Today's context for building components with stone, bamboo, lime and mud
- Market survey of Paints, Plastering materials, Glazes and Varnishes.
- The above-mentioned Theory topics will be given as assignment and submitted to the External Viva.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 75**	**Total Periods: 75**

Text Books

1. Arora S.P. and Bindra S.P., "Text book of Building Construction", Dhanpat Rai & Sons, New Delhi,2012.
2. Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany,2000.
3. National Building Code Of India 2005- Part 6 Structural Design- Section 3 Timber andBamboo.
4. Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons2000.

References

1. Ghanshyam Pandya, M.P. Ranjan, Nilam Iyer Bamboo and Cane Crafts of Northeast India; National Institute of Design(2004).
2. Don A. Watson Construction Materials and Processes McGraw Hill1972.
3. WB Mckay Building construction, Vol 1,2, Longman UK1981.
4. Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2	Attendance		
Marks	25		25	5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**II**	Course Category :PC			End Semester Exam Type: **ST**			
Course Code	**U23ST0209**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Perspective and Measured Drawing**	**0**	**0**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Ability to construct a 3 dimensional simple geometrical shapes.	**K2 K3**
	CO2 Ability to construct the 3d views and perspective drawings of the buildings.	**K2 K3**
	CO3 Ability to understand building exterior sociography and shadows of building components	**K2 K3**
	CO4 Ability to document the Historic Building through pen and ink rendering.	**K2 K3**
	CO5 Understanding of advanced documentation and measured drawing techniques.	**K2 K3**

UNIT - I **Perspective methods** **Periods: 15**

- Introduction to the concept of perspective drawing.
- One point and two-point perspective of simple geometrical shapes like cube, prism, combination of shapes using picture plane method and measuring point method.
- Introduction to three-point perspective.

UNIT - II **Perspective: building interior** **Periods: 10**

- Construction of one, two and three-point perspective grids
- Construction of one- and two-point perspective of building interiors.
- Adding of human figures, planters, furniture etc. in an interior perspective scene.
- Basic applications of shade and shadows and rendering techniques.

UNIT III **Perspective: building exterior** **Periods: 15**

Sciography

- Construction of sciography on building shadows of architectural elements.

Short cut perspective method.

Construction of one, two- and three-point perspective of building exterior.

- Adding of human figures, trees etc.,
- Application of light and shadow and rendering techniques of building materials

UNIT IV **Measured drawing: historic document study** **Periods: 20**

- Documentation and drawing of a simple historic building along with the relevant study of the building based on its history, morphology and context.
- Measured drawing using pen and ink rendering technique.

UNIT V **Measured drawing: building documentation** **Periods: 15**

- Complete documentation of a building of special interest in terms of building construction, architectural excellence or technology using photographs, tapes etc.
- Measured drawing of plans, elevations, sections, isometric projections of building details etc. using pen and ink rendering technique.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 75**	**Total Periods: 75**

Text Books

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

References

1. John Montague; Basic Perspective Drawing - A Visual Approach; John Wiley & Sons; 5th edition 2010.
2. Mo Zell; The Architecture Drawing Course - Understand the principles & master the practices; Thames & Hudson; 2014

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2	Attendance		
Marks	25		25	5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**II**	Course Category :PC			End Semester Exam Type: **ST**			
Course Code	**U23ST0210**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Architectural Model Making**	**0**	**0**	**6**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Exploration of conventional and less conventional techniques of representation in an attempt to creative visualization and to understand drawings as vehicles of thinking.	**K1 K2 K3**
	CO2 An understanding and applying a skill for making a conceptual sketch.	**K2 K3**
	CO3 An understanding and applying the Model making techniques in various materials.	**K2 K3**
	CO4 An understanding and Exploration in varying scales of models through instruction in Presentation techniques.	**K2 K3**
	CO5 Versatility in making models ranging from study to presentation and in varying scales and materials	**K2 K3**

UNIT - I **Line, render and mixed media** **Periods: 16**

- Free hand sketching in architectural representation- pen, charcoal, ink, water color, paints, mixed media, collages, lino cutting, print making as tools.

UNIT - II **Diagramming** **Periods: 18**

- Conceptual sketches - Plan, section, elevation, perspectives, isometric / oblique projections, axonometric /parallel projection.
- Unit I & II can be explored by way of assignments that require study, analysis, documentation with weightage given to representational expression and techniques.

UNIT III **Design processes and model making techniques** **Periods: 18**

- Generative / geometry, fractals, parametric / material explorations (both in traditional materials like mount, foam, thermacoel, clay, plaster of Paris, paper Mache, wood and new age materials like polystyrene, Aerocon blocks, plastics, meshes, and processes like carpentry, casting, molding, welding, laser cutting etc.
- Unit III can be explored with exercises that involve research through a process for example nature to structure and the evolution of a structural system that can be fabricated to scale.

UNIT IV **Presentation Models** **Periods: 18**

- Exploration in varying scales of models through instruction in techniques- Residential to urban - Historic / Contemporary buildings
- Exercises involving topography, textures, landscapes, human elements etc.

UNIT V **Study models as a tool in architectural design process** **Periods: 20**

- Exploration of the physical model as a tool through all phases of architectural design process, ranging from conceptual to specific design solutions.
- This Unit will integrate with the Architectural Design course in this semester.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 90**	**Total Periods: 90**

Text Books

1. Mo Zell – The Architectural Design course, Understand the Principles and Master The 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

References

1. Marco Frascari - Eleven Exercises in the art of Architectural Drawing, Routledge, 2011
2. Natascha Meuser, Construction and manual Architectural Drawings, DOM Publisher,2012
3. Rendow Yee, Architectural Drawing A Visual Compendium of Types and Methods, Wiley,2013
4. David Dernie, Architectural Drawing, Laurence King,2010.
5. Lorraine Farrelly, Representational Techniques, AVA, 2011.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2	Attendance		
Marks	25		25	5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**II**	Course Category: **PC**				End Semester Exam Type: **ST**		
Course Code	**U23ST0211**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Foundational Space Design Studio**	**-**	**-**	**12**	**9**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	The students shall understand the basic functional aspect of designing simple building type and its relevant spatial organization.	**K1 K6**
	CO2	The students shall be learning to reciprocate and sensitize the design/concept to the environment and the design skill of the project.	**K1 K6**
	CO3	The students shall be learning Scale and Complexity in Architectural Form.	**K1 K6**
	CO4	An understanding of Psychological and aesthetic experience of form and space in terms of scale, color, light, texture, etc.	**K1 K6**
	CO5	An understanding of space requirement, anthropometrics, space standards, circulation.	**K1 K6**

CONTENT	**Periods: 180**
• Scale and Complexity: projects involving small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale; passive energy. • **Areas of focus/ concern:** • Architectural form and space. • Aesthetic and psychological experience of form and space in terms of scale, color, light, texture, etc. • Function and need: user requirements, anthropometrics, space standards, circulation. • Image and symbolism. • Typology/ project: bedroom, bathroom, kitchen, shop, exhibition pavilion, children's environment, snack bar, residence, petrol bunk, fire station.	**CO1**

Lecture Periods:	**Tutorial Periods: -**	**Practical Periods: 180**	**Total Periods: 180**

Text Books

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 Hill2011.
3. Ernst Neuferts Architects Data, Blackwell2012.
4. Ramsey et al, Architectural Graphic Standards, Wiley2008.

Reference Books

1. Will Jones; Architects Sketch books; Thames & Hudson;2011.
2. Sam F.Miller, Design Process: A Primer for Architectural and Interior Design,VNR; 1995.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**								**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	1	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	**Weight age**	**Split up of marks**		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**III**	Course Category : **ES**				End Semester Exam Type: **TH**		
Course Code	**U23TH0312**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Structural Analysis of Beams and Columns**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Ability to apply the concepts/techniques of finding stresses.	**K2**
	CO2 Ability to use simple bending theory to find deflection in beams.	**K1 K4**
	CO3 Ability to analyze and solve different types of columns.	**K1 K5**
	CO4 Ability to analyze the different types of indeterminate beams.	**K2**
	CO5 Ability to analyze the cantilever Beams.	**K1**

UNIT - I	**Shear Force and Bending Moment**	**Periods: 12**	
- Basic concepts - Shear force and bending moment diagrams for cantilever and simply supported beams subjected to different types of loadings Point loads, uniformly distributed loads - Point of contra flexure.			**CO1**
UNIT - II	**Stresses in Beams**	**Periods: 12**	
- Theory of simple bending. Bending stress distribution. - Strength of sections. - Shearing stress. - Distribution in beam sections.			**CO2**
UNIT - III	**Stresses in Beams**	**Periods: 12**	
- Slope and deflection at a point - Macaulay's method for simply supported and cantilever beams.			**CO3**
UNIT - IV	**Columns**	**Periods: 12**	
- Short and long columns - Concept of elastic stability - Euler's theory - Assumptions and load carrying capacity of columns with different end conditions - Concept of effective length - Slenderness ratio - Limitations of Euler's theory - Rankine's formula.			**CO4**
UNIT - V	**Statically Indeterminate Beams**	**Periods: 12**	
- Introduction. Determination of degree of statistical indeterminacy for beams - Analysis of propped cantilever using Moment Area method - Central point load, uniformly distributed loads.			**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

2. R.K. Bansal, 'A Text Book on Strength of Materials', Laxmi Publications, New Delhi, 2006.
3. B.C. Punmia et al, 'SMTS-I, Strength of Materials', Laxmi Publications, 2015.

Reference Books

7. .M. Ratwani & V.N. Vazirani, 'Analysis of Structures, Vol. 1', Khanna Publishers, Delhi,2012.
8. Timoshenko, S.P. and D.H. Young, 'Elements of Strength of Materials', 5th edition, East West Press, 2011.
9. A.R. Jain and B.K.Jain, 'Theory and analysis of structures', Vol. 1, Nemchand and Bros, Roorkee, 1987.
10. R.K. Rajput, 'Strength of Materials', S.Chand, 2006.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

<table>
<tr><td rowspan="2">Assessment</td><td colspan="4">Continuous Assessment Marks (CAM)</td><td>End Semester Examination (ESE) Marks</td><td>Total Marks</td></tr>
<tr><td>CAT 1</td><td>CAT 2</td><td>Model Exam</td><td>Attendance</td><td rowspan="2">50</td><td rowspan="2">100</td></tr>
<tr><td>Marks</td><td colspan="3">45
(Best of 2 from 3 Test,200 marks reduced to 45 marks)</td><td>5</td></tr>
</table>

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**III**	Course Category : **HS**				End Semester Exam Type:**TH**		
Course Code	**U23TH0313**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**History of Indian and Islamic Architecture**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 An understanding of the evolution of temple architecture in India	**K1 K2**
	CO2 An Understanding of Dravidian architecture characteristics and temple towns of Southern India	**K1 K2**
	CO3 An Understanding of Nagara style temple characteristics and elements	**K1 K2**
	CO4 An understanding of Islamic architecture of the India	**K1 K2**
	CO5 An understanding of Spread of Islam into other regions of India and their architectural Expressions	**K1 K2**

UNIT - I	**Early India and its Cultural Productions**	**Periods: 8**

Evolution of Hinduism
Hindu forms of worship.Evolution of temple form - meaning, symbolism, ritual and social importance of temple - categories of temple - elements of temple architecture.Early shrines of the Gupta and Chalukyan periods Tigawa temple, Ladh Khan and Durga temple, Aihole - Papanatha, Virupaksha temples, Pattadakal - Kailasanatha temple, Ellora. **CO1**

UNIT - II	**Architecture of Southern India**	**Periods: 11**

- Outline history of South India with particular emphasis on Bhakthi movement
- Evolution of temple town- Madurai, Srirangam.
- Pallavas - Rathas and Shore temple, Mamallapuram,
- Cholas - Brihadishwara temple,
- Pandyas - Madurai meenakshi amman temple.
- Vijayanagara kingdom - Vittala temple , Vijayanagara.
- Hoysala architecture - Chennakesava temple, Belur.

CO2

UNIT - III	**Architecture of Northern India**	**Periods: 8**

- Architecture of Orissa, Rajasthan, Madhyapradesh and Gujarat.
- Lingaraja Temple, Bhubaneswar - Sun temple, Konark.
- Architecture of step wells in Northern India and their socio-cultural importance
- Surya Kund Modhera - Adalaj step Well.

CO3

UNIT - IV	**Introduction to Islamic architecture and Early Islamic Architecture in India**	**Periods: 8**

Islamic architecture of the world as rising from Islam as a socio-cultural and political phenomenon.
Principles and characteristics of Islamic architecture - building types - to include aspects of religion, geometry, structure, materials, decoration, light. Evolution of Islamic architecture under the Delhi Sultanate - Establishment of the Delhi Sultanate- Slave, Khalji, Tughlaq, Sayyid and Lodhi Dynasties. **CO4**

UNIT - V	**Regional Islamic Architecture, Mughal Architecture**	**Periods: 10**

Spread of Islam into other regions of India and their architectural expressions
Development of Provincial style
Bengal- Adina masjid,
Ahmedabad - Tin darwaza,
Bijapur – Gol Gumbaz.

Mughal architecture : Humayun - Humayun tomb, Akbar - Fathepur Sikri , Shahjahan - Taj Mahal ,Agra.
Development of the Mughal gardens. **CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Percy Brown, 'Indian Architecture (Buddhist and Hindu Period)', Taraporevala and Sons, Bombay, 2014.
2. Percy Brown, 'Indian Architecture (Islamic Period)', Taraporevala and Sons, Bombay, 2014.
3. Christopher Tadgell, 'The History of Architecture in India - From the Dawn of Civilization to the End of the Raj', Phaidon, 2002.
4. Robert Hillenbrand, 'Islamic Architecture - Form, Function and Meaning', Columbia UniversityPress, 2004
5. Romila Thapar, 'The Penguin History of Early India', Penguin, 2015.
6. Burton Stein, A History of India, John Wiley & Sons, 2010.
7. K.A. Nilakanta Sastri, 'A History of South India: From the Prehistoric Times to the Fall of Vijayanagar', Oxford University Press, 2007.

Reference Books

1. George Michell, 'The Hindu Temple', University of Chicago Press, 1988.
2. Stella Kramrisch, 'The Hindu Temple', Motilal Banarsidass, Vol I 2002,Vol II1996.
3. Satish Grover, 'Buddhist and Hindu Architecture in India', CBS, 2008.

4. Satish Grover, 'Islamic Architecture in India', CBS, 2012.
5. Catherine Asher, 'Architecture of Mughal India', Cambridge University Press, 2001.
6. Ananda K. Coomaraswamy, 'The Dance of Siva: Essays on Indian Art and Culture', Rupa Publications, 2013.
7. A.L.Basham, 'The Wonder that was India', Picador, 2004.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**III**	Course Category : **PC**				End Semester Exam Type:**TS**		
Course Code	**U23TS0314**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Surveying and Site analysis**	**2**	**-**	**2**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 Sensitivity towards aspects of site at macro and micro contexts	**K1 K3**
	CO2 Ability to exploit potential of site to design the built environment	**K2 K3**
	CO3 Ability to measure, draw, analyses and plan a particular site for a specific purpose	**K2 K3**
	CO4 An understanding of site layout and development	**K2 K3**
	CO5 An understanding of detailed site analysis, schematic site layout and development	**K2 K3**

UNIT - I	**Introduction to Site and Site surveying**	**Periods: 12**

Definitions
- Plot, site, land and region.
- Units of measurements.

Introduction to survey and need for surveying.
- Methods of surveying and context of use.
- Chain survey and Triangulation – instruments used, method of survey and plotting into survey drawing. Plain table, Compass and theodolite surveys - method, instruments used and application.
- Modern surveying Instruments such as EDMs and Total Stations and their application.

Understanding of administrative maps and site drawings, including FMB.

Introduction to measuring a site
- Drawing out a site plan from measurements and computing area by geometrical figures and other methods.
- Introduction to marking plans, layout plans and centerline plans. Importance and procedure for making these drawings and dimensioning.
- Procedure and precautions of setting out a plan on site.
- Understanding the above through site visits to real projects.

CO1

UNIT- I	**Site Analysis**	**Periods: 12**

Site as offering potential/ limitations to architectural design.
- Importance of site analysis.
- Onsite and off-site factors.
- Analysis of natural, cultural and aesthetic factors.

Factors
- Topography, hydrology, soils, vegetation, climate and microclimate, surface drainage, accessibility, size and shape,

Infrastructure, sources of water supply and means of disposal system, visual aspects, context of built environment.

Detailed analysis
- Contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations.

-Maps of matrix analysis & composite analysis methods.

Understanding the above through real projects/ case studies.

CO2

UNIT - III	**Site context and Regulations**	**Periods:10**

- Detailed understanding of context of the site.
- Introduction to master plans, land use for cities, development control rules.
- Site selection criteria for different building typologies.
- Impact of building developments on the surroundings including aspects such as traffic, noise, pollution, microclimate, etc., especially in the context of large-scale projects.
- Understanding the above through real projects/ case studies.

CO3

UNIT - IV	**Principles of Site Layout and Development**	**Periods: 12**

- Organization of pedestrian and vehicular circulation.
- Geometric calculation for movement. Types of roads, hierarchy of roads, networks, road widths and parking regulations.
- Principles of positive drainage and grading for drainage. Location and design of sewage treatment plants.
- Methods to control soil erosion.
- Location of utility lines to simplify maintenance.
- Planning for rain water harvesting.
- Incorporation of services such as drinking water pipelines, fire hydrants, communication and networking facilities at site.
- Vegetation, landforms and water as modifiers of microclimate.
- Understanding the above through real projects/ case studies.

CO4

UNIT - V	**Exercise in Site Surveying and Planning**	**Periods: 14**

- Application of all the knowledge gained in previous units through a real/ hypothetical project involving a real site. The process would involve choosing site for a building typology or vice versa, field exercise in measuring and drawing the site, detailed site analysis, schematic site layout and development. - The project will be explored through analysis/ models/ sketches/ drawings.	**CO5**

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

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.

Reference Books

1. Joseph De.Chiarra and Lee Coppleman, 'Urban Planning and Design Criteria', Van Nostrand Reinhold Co., 1982.
2. Strom Steven, 'Site Engineering for Landscape Architects', John Wiley & Sons, 2013.
3. P.B.Shahani, 'Text of Surveying Vol.I', Oxford and IBH Publishing Co, 1980
4. 'Development Control Rules', CMDA 2008.
5. Genevieve S. Baudoin, 'Interpreting Site: Studies in Perception, Representation, and Design', Four child books NY; 2012.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2*	Attendance	50	100
Marks	20		25	5		

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**III**	Course Category : **BS**				End Semester Exam Type: **TS**		
Course Code	**U23TS0315**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Climate Responsive Architecture**	**2**	**-**	**2**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 An understanding of heat balance in human beings	**K2**
	CO2 An understanding of the effect of sun and wind on buildings	**K2**
	CO3 An understanding of material effects in buildings	**K2 K3**
	CO4 Ability to design buildings with respect to climate	**K3**
	CO5 An understanding of design strategies for various climates.	**K2**

UNIT - I	**Climate and Human Comfort**	**Periods: 10**

- Climate and Civilization
- Factors that determine climate of a place
- Components of climate.
- Classification of climate for building designers in tropics
- Characteristics of climate
- Human body heat balance and heat loss.
- Effects of climatic factors on human body heat loss
- Effective temperature, human thermal comfort.

CO1

UNIT - II	**Design of Solar Shading Devices**	**Periods: 14**

- Movement of sun. Locating the position of sun.
- Sun path diagram
- Overheated period
- Solar shading
- Shadow angles.
- Exercise in the design of shading devices through models/ calculations/ drawings/ software.

CO2

UNIT - III	**Heat flow through Building Envelope- Concepts**	**Periods: 10**

- The transfer of heat through solids.
- Definitions -Conductivity, Resistivity, Specific heat, Conductance, Resistance and Thermal capacity.
- Surface resistance and air cavities. Air to air transmittance (U value).
- Time lag and decrement. Material qualities of envelopes.
- Exercise involving calculation/ software for design analysis.

CO3

UNIT - IV	**Air Movement due to Natural and Built Forms**	**Periods: 12**

- Wind and the effects of topography on wind patterns.
- Air currents around building.
- Air movement through buildings. The use of fans.

Thermally induced air currents – Stack effect, Venturi effect, use of courtyard. Exercise exploring air movement in architecture with physical models/ simulation through software.

CO4

UNIT - V	**Climate and Design of Buildings**	**Periods: 14**

- Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates.
- Climate responsive design exercise for different contexts through sketches/ drawings/ analysis/ detailing/ calculation.

CO5

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

1. O.H. Koenigsberger and Others, 'Manual of Tropical Housing and Building- Climatic Design',Orient Longman, India, 2010.
2. Bureau of Indian Standards IS 3792, 'Hand book on Functional Requirements of Buildings other than Industrial Buildings- Part I – IV', New Delhi,1987.

Reference Books

1. Martin Evans, 'Housing Climate and Comfort', Architectural Press, London, 1980.
2. B. Givoni, Man, 'Climate and Architecture', Architectural Sciences Series, Applied Science Publishers Ltd., London, 1981.
3. B. Givoni, 'Passive and Low Energy Cooling of building', Van Nostrand Reinhold, New York,1994.
4. Galloe Salam and Sayigh A.M.M, 'Architecture, Comfort and Energy', Elsevier Science Ltd., Oxford,1998.
5. Arvind Krishnan, Szokolay et.al, 'Climate Responsive Architecture- A Design Handbook for Energy Efficient Buildings', Tata McGraw Hill, 2010.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2*	Attendance	50	100
Marks	20		25	5		

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**III**	Course Category : **PC**				End Semester Exam Type: **ST**		
Course Code	**U23ST0316**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Building Materials and Construction**	**-**	**-**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Knowledge of properties and construction methods of brick, clay products and timber products	**K1 K2**
	CO2	Ability to design and detail structural and non-structural components of simple buildings using the above materials.	**K1 K6**
	CO3	Ability to integrate knowledge of properties and construction methods of basic building materials in the design of simple projects.	**K1 K6**
	CO4	Ability to integrate knowledge of properties and construction methods of Timber and its Products.	**K1 K2**
	CO5	Ability to integrate knowledge and design exercise involving use of brick, clay and timber Products.	**K1 K2 K6**

UNIT - I	**Introduction to Brick and Clay Products**	**Periods: 10**

- Brick and clay as basic building materials and their use through examples
- Types of brick and clay products
- Outline of their manufacture, characteristics and applications in building construction. Products to include different types of bricks for masonry.
- Roofing products - Pot/pan tiles and Mangalore tiles, flooring tiles such as clay, ceramic and vitrified tiles, Hourdi tiles, current innovations
- Understanding of product literature. Site visits with documentation in the form of sketches/ drawings/photos
- The above mentioned Theory topics will be given as assignment and submitted to the External Viva.

CO1

UNIT - II	**Brick and Clay in Building Construction**	**Periods: 20**

Brick Bonding

- Basic principles of brick bonding and its types. Mortar, plastering, pointing, finishes for brick
- Construction principles and procedures for building components using brick and clay products.

Building Components

- Foundation, load bearing walls, partition walls, compound walls, parapet walls, roofs, arches, lintels, coping, steps, flooring, paving of different types

Principles for innovative and composite construction using brick and clay products

- Products to include prefabricated brick panels, precast curved brick arch panels, reinforced brick/ reinforced brick concrete slabs, prefabricated floor/ roof using structural clay units, Hourdi block roofing, current innovations - Drawings/ models of the principles

Understanding of detailed drawings/ published work. Site visits with documentation in the form of sketches/ photos

CO2

UNIT - III	**Introduction to Timber and Timber Products**	**Periods: 10**

- Timber as basic building material and brief history of its use with examples. Timber sources, classification, characteristics, defects, conversion, seasoning, storage, uses, preservation, finishes (including paint, varnish, enamel, special paints and coatings). Market forms of timber.
- Types of industrial timber products. Outline of their manufacture, characteristics and applications in building construction.
- Products to include plywood, particle board, block board, fiber board, cement bonded particle board, sustainable products, current innovations
- Understanding of product literature. Site visits with documentation in the form of sketches/ drawings/photos.
- The above-mentioned Theory topics will be given as assignment and submitted to the External Viva.

CO3

UNIT - IV	**Timber in Building Construction**	**Periods: 20**

- Joints in timber. Construction principles and procedures for timber wall, floor, roof trusses (to include lean to, couple, collar, king post, queen post and roof covering material), staircase.
- Construction principles and procedures for different types of timber doors, windows and ventilators.
- The types, whichever is applicable for each, will include materials (paneled, flush, glazed), swing, mechanisms of operation (fixed, openable, sliding, folding, sliding and folding, pivoted, revolving, top hung, bottom hung, louvred), nature - (French, corner, bay).
- Construction principles and procedures using timber/industrial timber/ gypsum products for partitions (fixed, sliding, sliding and folding), paneling, false ceiling, flooring. Hardware and fixing for all the above as applicable.
- Drawings/ models of the principles. Understanding of detailed drawings/ published work. Site visits with documentation in the form of sketches/ drawings/ photos.
- The above-mentioned Theory topics will be given as assignment and submitted to the External Viva.

CO4

UNIT - V	**design using brick, clay, timber and timber products**	**Periods: 15**

- A design exercise involving use of brick, clay and timber products in appropriate structural and nonstructural components in a simple, small project of any basic typology.

CO5

Lecture Periods:	**Tutorial Periods:-**	**Practical Periods: 75**	**Total Periods: 75**

Text Books

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 sons1983.
7. S. C. Rangwala, 'Engineering Materials', Charotar Publishing House India,2015.
8. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge,2010.

Reference Books

1. American Institute of Timber Construction (AITC), 'Timber Construction Manual', Wiley Publishers,2004.
2. Francis D.K Ching, 'Building Construction Illustrated', John Willey & Sons,2008.
3. Willis H Wagner & Howard Bud Smith, 'Modern Carpentry',GoodHeart–Wilcox.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**III**	Course Category : **PC**				End Semester Exam Type: **ST**		
Course Code	**U23ST0317**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Rural Architectural Design Studio**	**-**	**-**	**14**	**9**	**50**	**50**	**100**

Course Outcomes		**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1	Ability to collect, assimilate and integrate knowledge in a holistic manner.	**K1 K6**
	CO2	Sensitivity towards the nature and values of unselfconscious and collective design as well as the interconnectedness of human society and environment.	**K1 K6**
	CO3	Ability to observe and analyze changes in the above.	**K1 K6**
	CO4	Ability to project future transformations and give possible/ appropriate ways to address issues, if any.	**K1 K6**
	CO5	Sensitivity in design approach in community-oriented projects with respect to context, collective values and needs.	**K1 K6**

CONTENT

- Rural settlements offer an opportunity to understand basic aspects of human built environment and what goes into its making/ influences it. The interrelationship between built form and society will be studied, understood and established, starting from either end as required. Study of specific modes of rural/vernacular/traditional architecture including their morphology, local materials and construction techniques, details, meaning, etc., will be done to give an insight into the particulars and universals of architecture.
- Appropriate tools and processes can be used to aid the understanding. These include different methods of historical and socio-cultural study, oral history, discussions, information collection, surveys, maps, perceptual sketches, documentation through drawings, demographic study, assimilation and analysis.
- Transformations across time need to be traced to understand constants and dynamics in human society. They will also be critically evaluated through discussions with experts. Rising from this, future changes can be projected/ envisaged and if found required, policy and physical interventions can be suggested/ explored. The physical interventions found necessary will be taken up as design situations. This could range from individual to community level and involve any aspect of the physical environment (including building projects) as the situation/view point warrants.
- If the context does not warrant a building need, a small community-oriented building design will be given as a separate project in addition to the rural project. For building projects, the scale and complexity of planning and construction usually involved will be simple small or medium span, ground plus two storied maximum, simple horizontal and vertical movement, simple/ local materials and construction, passive energy.

Lecture Periods:	**Tutorial Periods:-**	**Practical Periods: 210**	**Total Periods: 210**

Text Books

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 Professional2001
5. R.J. S. Spence and D.J. Cook, 'Building Materials in Developing Countries', John Wiley and sons1983.
6. S. C. Rangwala, 'Engineering Materials', Charotar Publishing House India,2015.
7. Roy Chudley, Roger Greeno, 'Building Construction Handbook', Routledge,2010.

Reference Books

1. Ramachandran H, 'Village Clusters and Rural Development', Concept Publications,1980.
2. Thorbeck D, 'Rural Design', Routledge,2002.
3. Hassan Fathy, 'Architecture for the Poor', University of Chicago press,1973.
4. R. C. Arora, 'Integrated Rural Development', S. Chand,1979.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	1	2	-	1	-	-	3	-	-	-	-	-	-	-
2	2	1	2	-	1	-	-	3	-	-	-	-	-	-	-
3	3	1	2	-	1	-	-	3	-	-	-	-	-	-	-
4	4	1	2	-	1	-	-	3	-	-	-	-	-	-	-
5	5	1	2	-	1	-	-	3	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	**Weight age**	**Split up of marks**		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**IV**	Course Category : **ES**				End Semester Exam Type:**TH**		
Course Code	**U23TH0418**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Structural Steel Design**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Ability to design timber beams and columns by applying the code provisions	**K1 K2 K3**
	CO2	Ability to design steel joints for maximum efficiency and strength	**K5 K6**
	CO3	Ability to design tension and compression members for different conditions by applying the code provisions	**K3 K4**
	CO4	Ability to design different types of laterally unsupported & supported beams for different conditions	**K3 K4**
	CO5	Ability to design different types of steel structures and its executions	**K5 K6**

UNIT - I	**Steel Structures - Bolted Joints**	**Periods: 12**
- Assumptions. Failure of bolted joints. - Strength and efficiency of bolted joints. - Types. Design of bolted joints for axially loaded members (excluding eccentric connections).		**CO1**
UNIT - II	**Steel Structures - Welded Joints**	**Periods: 12**
- Types of welded joints. - Advantages and disadvantages. - Design of fillet welds (excluding eccentric connections).		**CO2**
UNIT - III	**Steel Tension Members**	**Periods: 12**
- Introduction. - Net sectional area. - Permissible stresses. - Design of axially loaded tension member. - Lug angle, tension splice.		**CO3**
UNIT - IV	**Steel Compression Members**	**Periods: 12**
- Introduction. - Different sections. - Built up section. - Design of columns (excluding lacing, battening and other connections).		**CO4**
UNIT - V	**Steel Beams**	**Periods: 12**
- Introduction. - Laterally supported and unsupported beams. - Design of laterally supported beams		**CO5**

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

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.

Reference Books

1. S.K. Duggal, 'Limit State Design of Steel Structures', McGraw Hill Education, Private Limited,2010.
2. Dr. V. L. Shah & Prof. Veena Gore, 'Limit State Design of Steel Structures', Structures Publications, Pune, 2012.
3. S.S. Bhavikatti, 'Design of Steel Structures by Limit State Method as per IS800-2007', I.K.International Publishing House Pvt, Ltd,2012.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

<table>
<tr><td rowspan="2">Assessment</td><td colspan="4">Continuous Assessment Marks (CAM)</td><td>End Semester Examination (ESE) Marks</td><td>Total Marks</td></tr>
<tr><td>CAT 1</td><td>CAT 2</td><td>Model Exam</td><td>Attendance</td><td rowspan="2">50</td><td rowspan="2">100</td></tr>
<tr><td>Marks</td><td colspan="3">45
(Best of 2 from 3 Test,200 marks reduced to 45 marks)</td><td>5</td></tr>
</table>

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**IV**	Course Category : **HS**				End Semester Exam Type: **TH**		
Course Code	**U23TH0419**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**History of Early Christian to Baroque Architecture**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 An understanding of Birth and spread of Christianity and Church planning	**K1 K2**
	CO2 An understanding of the early medieval cathedrals and its style	**K1 K2**
	CO3 An understanding of the Late medieval cathedrals and its style	**K1 K2**
	CO4 An understanding of Renaissance architects and their works	**K1 K2**
	CO5 An understanding of Roman Baroque churches and Rococo style	**K1 K2**

UNIT - I	**Early Christian**	**Periods: 8**
- Birth and spread of Christianity. - Transformation of the Roman Empire - Early Christian worship and burial,Church planning. - Basilica concept: St. Peters Rome - Centralized plan concept: S. Hagia Sophia, Constantinople; St. Marks, Venice.		**CO1**
UNIT - II	**Early Medieval Period**	**Periods: 11**
- The Carolingian Renaissance. - Feudalism and rural manorial life. - Monasticism. - Craft and merchant guilds. Medieval domestic architecture. - Romanesque churches. - Development of vaulting. - Pisa Group of cathedrals. - Durham cathedral.		**CO2**
UNIT - III	**Late Medieval Period**	**Periods: 8**
- Development of Gothic architecture Church plan. - Structural developments in France and England Case studies. - Notre Dame, Paris; Salisbury Cathedral, Westminster Abbey - Wooden roofed churches - Domestic architecture		**CO3**
UNIT - IV	**Renaissance Architecture**	**Periods: 8**
- Idea of rebirth and revival - the Renaissance patron - Urbanism Renaissance architecture: Brunelleschi and rationally ordered space - Merchant Prince palaces: Palazzo Ricardi Andrea Palladio - Mannerist architecture: The Renaissance in transition. - Michelangelo : Library at S. Lorenzo, Florence		**CO4**
UNIT - V	**Baroque Architecture**	**Periods: 10**
- Roman Baroque churches: The central plan modified-St. Peters, Rome - English baroque : Sir Christopher wren; St. Paul's London - French Baroque: Versailles - Rococo Architecture – Interiors – hotels.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Sir Banister Fletcher, "A History of Architecture", CBS Publishers, 1996.
2. Spiro Kostof,"A History of Architecture - Setting and Rituals", Oxford University Press, London, 1995.

Reference Books

1. Pier Luigi Nervi, General Editor, "History of World Architecture" - Series, Harry N.Abrams, Inc.Pub., New York, 1972.
2. S.Lloyd and H.W.Muller, "History of World Architecture" - Series, Faber and Faber Ltd., London, 1986.
3. Leland M Roth; "Understanding Architecture": Its elements, history and meaning; Craftsman House, 1994.
4. White J.F, White S.J., "Church Architecture: Building and Renovating for Christian worship", OSL Publications, 2008

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**		Programme: **B. Arch.**					
Semester	**IV**		Course Category : **ES**			End Semester Exam Type: **ST**		
Course Code	**U23TS0420**		Periods/Week			Credit	Maximum Marks	
			L	T	P	C	CAM	ESE	TM
Course Name	**Services on Water Supply and Waste Management**		**2**	**-**	**2**	**3**	**50**	**50**	**100**
Course Outcomes	**On completion of the course, the students will be able to**							BT Mapping (Highest Level)
	CO1	Understanding of water supply, sewage, drainage and waste systems in buildings						**K1 K2**
	CO2	Ability to conceptually plan/ design the above for a given simple context						**K4 K6**
	CO3	Understanding of storm water drainage and its applications						**K1 K2**
	CO4	Understanding of solid waste management and its applications						**K1 K2**
	CO5	Design in the form of choice, details of system and layout/ drawings						**K4 K6**

UNIT - I	**Water Quality, Treatment and Distribution**	**Periods: 14**	
Sources of water supply. Water Quality. Water requirements for all type of residential, commercial, industrial buildings and for town. Water treatment methods - Screening, aeration, sedimentation, filtration, disinfection, softening. Distribution of water. - Water piping systems in all type of buildings. - Choice of pipe materials. - Types of fixtures and fittings. Water consumption calculations for various contexts. - Water meters. - Design and calculations of OHTs, UG Sumps and fire \fighting storage. - Related mechanical equipment. - Automation systems. - Water heating systems, solar water heaters. - Energy efficient systems. Green and sustainable concepts in the above where relevant. - Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos.			**CO1**
UNIT - II	**Sewerage**	**Periods: 12**	
- Sewage and sullage. Sewerage systems. - Different types/stages of sewage treatment at city level. - Sewer line, gradients, manholes, inspection chambers. - One pipe/ two pipe plumbing systems. - Sewage treatment at small Campus / building level -sewage treatment plants, septic tank, leach pits. - Sustainable practices and systems. - Site visits with documentation in the form of sketches/ drawings/ photos.			**CO2**
UNIT - III	**Drainage and Waste Management**	**Periods: 10**	
- Storm water drains at city level. - Types of pipe. - Storm water gutter. - Drainage systems in small building/campus. Roof drainage. - Rain water harvesting and storage sumps. - Sustainable practices and systems. - Solid waste- types, segregation and refuse collection. Disposal - Incinerator, composting, vermicomposting, sanitary land filling, bio gas system, modern renewable energy system. - Site visits with documentation in the form of sketches/ drawings/ photos.			**CO3**
UNIT - IV	**Plumbing Systems in Buildings**	**Periods: 10**	
- Basic principles of plumbing. - Plumbing, sanitary fittings and their requirements for a small building - wash basins, water closets, urinals, bidets, sinks, gate valve, float valve, flap valve, ball valve, flush valve, etc, - Different types of taps, faucets, stop cocks, bib cocks, 'P', 'Q', 'S', floor/bottle traps. - Understanding of products, product catalogue, service drawings. - Site visits with documentation in the form of sketches/ drawings/ photos.			**CO4**
UNIT - V	**Design of Services**	**Periods: 12**	
- Schematic design of water supply, sewage, drainage and solid waste services in the context of a small building/ campus/ neighborhood. - The project will integrate knowledge from all the previous units. - Design in the form of choice, details of system and layout/ drawings. -			**CO5**

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

1. 'Manual of Water Supply and Treatment', second edition, CPHEEO, Ministry of works and housing, New Delhi, 1977.
2. AFE Wise, JA Swaffied Water, 'Sanitary & Waste Services in buildings', V Edition, Mitchell Publishing, Co. Ltd., 2002.
3. Punmia B.C., 'Waste Water Engineering', Laxmi Publications, 2009.
4. Arceivala S.J., 'Waste Water Treatment for Pollution Control', Tata McGraw Hill,2008.
5. National Building Code - Bureau of Indian Standards.
6. Indian Standard Code of Practice for Water Supply in Buildings, IS :2065 – 1983'.

Reference Books

1. G.M. Fair, J.C. Geyer and D.Okin, 'Water and Waste water engineering Volume II', John Wiley & Sons, Inc. New York, 1968.
2. S.C.Rangwala, 'Water Supply and Sanitary Engineering', Charotar publishing house,
3. 'Renewable Energy, Basics and Technology, Supplement Volume on Integrated energysystems', Solar Agni systems, Sri Aurobindo Ashram, Pondicherry 605002.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Viva Voce (ESE) Marks	Total Marks
	Concept	Design Development	Presentation	Attendance	50	100
Marks	10	20	15	5		

Department	**School of Architecture**	Programme: **B. Arch.**		
Semester	**IV**	Course Category : **PC**		End Semester Exam Type**:ST**
Course Code	**U23ST0421**	Periods/Week	Credit	Maximum Marks

		L	T	P	C	CAM	ESE	TM
Course Name	**Metals in Building Construction**	**-**	**-**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Knowledge of properties of ferrous and nonferrous metals as materials for buildings	**K1 K2**
	CO2 An understanding of possibilities of steel as an important building construction material	**K1 K2**
	CO3 Ability to design and detail structural and nonstructural components of simple buildings using metals.	**K3 K4**
	CO4 Ability to use metal innovatively in building projects	**K1 K2**
	CO5 Ability to Design and construction details in the form of sketches, drawings, models	**K4 K5**

UNIT - I	**Ferrous Metals in Building Construction**	**Periods: 10**

- Types of iron and their uses in building.
- Their properties, types, uses, protection and finishes.
- Corrosion of ferrous metals and its prevention.
- Fire protection of steel.
- Steel sections and products for structural and non-structural use including current innovations.
- Joints in steel- welding, riveting, bolting.
- Stainless steel.
- Understanding of product literature. Site visits.

CO1

UNIT - II	**Steel in Non-Structural Building Components**	**Periods: 18**

- Construction principles and procedures for nonstructural building components using steel.
- Components to include doors, windows, ventilators, rolling shutters of different types as applicable - openable, sliding, pivoted, fixed, louvered.
- Glazing, hardware and fixing for components.
- Sketching/ drawing/ models of the principles.
- Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/ drawings/ photos.

CO2

UNIT - III	**Steel in Structural Building Components**	**Periods: 20**

- Construction principles and procedures for structural building components using steel.
- Components to include foundations, columns, beams, staircases, roofs (different types of trusses, space frames, etc), total structures such as geodesic dome.
- Connections between the different components and fixing.
- Materials for glazing, cladding, roof covering, etc., as required for particular components, and their fixing.
- Prefabrication in steel.
- Drawings/ models of the principles.
- Understanding of product literature/ shop drawings.
- Site visits with documentation in the form of sketches/ drawings/ photos

CO3

UNIT - IV	**Non Ferrous Metals in Building Construction**	**Periods: 12**

- Aluminum and aluminum alloys in building construction.
- Properties, durability, finishes and uses.
- Aluminum products such as extrusions, foils, castings, sheets, current innovations.
- Construction principles and procedures for nonstructural building components using aluminum.
- Components to include door, window, ventilator of different types - openable, sliding, pivoted, fixed, louvered, etc., as applicable.
- Aluminum for interior components such as paneling, partitions and false ceiling.
- Glazing, hardware and fixing for components. Introduction to Aluminum curtain wall glazing.
- Sketching/ drawing/ models of the principles. Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/drawings/photos.
- Introduction to other non-ferrous metals such as copper, lead, zinc. Their manufacture, properties, uses and finishes.

CO4

UNIT - V	**Design and Detailing using Metals**	**Periods: 15**

- A design and detailing exercise involving metals, predominantly steel, as primary construction material in an appropriate typology involving a simple scale project.
- The project will integrate knowledge from all the previous units.
- Design and construction details in the form of sketches, drawings, models.

CO5

Lecture Periods: -	**Tutorial Periods:-**	**Practical Periods:75**	**Total Periods: 75**

Text Books

1. P.C Vargheese, '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.

Reference Books

1. Gorenc, Tinyou, Syam, 'Steel Designer's Handbook', CBS Publishers and Distributors, New Delhi, Bangalore,2005

2. Alan Blanc, 'Architecture and Construction in Steel', E&FN Spon, London,1993
3. Allan Brookes, 'Cladding of Buildings', E&FN Spon, London,1998.
4. Mark Lawson, Peter Trebilcock, 'Architectural Design in Steel', Taylor and Francis,2004.
5. Terri Meyer Boake, 'Understanding Steel Design', Birkhauser,2011.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Viva Voce (ESE) Marks	Total Marks
	Concept	Design Development	Presentation	Attendance		
Marks	10	20	15	5	50	100

Course Code	U23ST0422	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Computer Aided Design**	**-**	**-**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	Ability to express using digital tools in the realm of visual composition, drafting, 3D visualization and rendering	**K5 K6**
	CO2	Ability to do 2D Drafting exercise of a simple building	**K5 K6**
	CO3	Ability to understand the viewing of the Model	**K1 K2**
	CO4	Ability to do 3D-modelling technique and construction planes, drawing objects, 3D surfaces	**K5 K6**
	CO5	Ability to do 3D Rending and settings	**K5 K6**

UNIT - I	**INTRODUCTION TO COMPUTER AND IMAGE EDITING**	**Periods: 12**
- Computer as a drafting tool: Productivity tools in CAD, organization of layers for working drawings, use of blocks and symbols hatch patterns. - Dimensioning systems extracting of areas from drawings, concept of paper space plotting the drawings.		**CO1**
UNIT - II	**THE BASICS OF BUILDING MODELLING**	**Periods: 15**
- Computer as a design tool: Repetition of forms mirroring, coping, and array etc. - Calculation of areas, volumes. Creating and using templates, blocks, and symbols and using them in architectural drawings. - Managements of large drawing files. - Working in a network environment-Security systems-converting drawing files into Internet compatible files. - Transparent overlays, hatching utilities, line type, line weight and color. Multiline, polyline, etc. Styles, blocks and symbol library.		**CO2**
UNIT - III	**2D PRESENTATION TOOL**	**Periods: 9**
- Photoshop: Creating and saving images, basic image editing, Photoshop tool box and tools, using layers, special effects. - Creating presentation of plans using InDesign/Photoshop.		**CO3**
UNIT - IV	**3D MODELLING**	**Periods: 9**
- Introduction to 3D Modelling and integrating Architectural design with 3D model and generating 2D drawings using SKETCHUP.Concepts. - Principal tools for drawing, modification, construction, camera, walkthrough, sandbox etc – breaking edges, Google toolbar. Model setting and managers – colors and materials – entities – making input & output – technical information – common tasks – applications.		**CO4**
UNIT - V	**3D RENDERING AND SETTING**	**Periods: 9**
- RENDERING Lumion /Enscape /Vray . - Architectural visualization tool. - Creation of 3D models. - CAD drawing into videos, images and 360 panoramas, applying materials, effects, lighting and reflections.		**CO5**

Lecture Periods: -	**Tutorial Periods:-**	**Practical Periods:45**	**Total Periods: 45**

Text Books

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', Spon process, 2012.
3. Mohammed Saleh Uddin, 'Digital Architecture – 3D Computer Graphics from 50 top designers', 1999.

Reference Books

1. Scott Onstott, 'AutoCAD 2015 and AutoCAD LT 2015 Essentials', AutoDesk Official press, 2014.
2. Fiorello. J. A., 'CAD for Interiors beyond the basics', Wiley publications, 2011.
3. Ryan Duell and Tobias Hathorn, 'AutoDesk Revit Architecture 2015: No Experience Required', AutoDesk Official Press, 2014.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Viva Voce (ESE) Marks	Total Marks
	Concept	Design Development	Presentation	Attendance	50	100
Marks	10	20	15	5		

Department	**School of Architecture**	Programme: **B. Arch.**		
Semester	**IV**	Course Category : **PC**		End Semester Exam Type: **TE**
Course Code	**U23ST0423**	Periods/Week	Credit	Maximum Marks

		L	T	P	C	CAM	ESE	TM
Course Name	**Campus Design Studio**	**-**	**-**	**14**	**9**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Ability to perceive, understand and represent fundamental attributes of form- space with respect to human experience and use.	**K1 K2**
	CO2	Ability to ideate, innovate and create meaningful built environment in basic human situations.	**K5 K6**
	CO3	Ability to design projects are small buildings or small campuses involving civic/ cultural use.	**K5 K6**
	CO4	Ability to do cognitive maps, sketches, manual drawings, physical models with simple materials.	**K5 K6**
	CO5	Ability to Study and designing projects of small scale.	**K5 K6**

CONTENT

- Designing a built environment requires the development of individual capacity for thought with respect to subjective and objective aspects.
- Studying and designing projects of small scale that involve a more immediate and basic experience is important in this context.
- The study and project exploration will involve the following aspects from first principles as well as through live studies and theory – human behavior, activities and needs for various purposes, role of specific form/space in creating particular experiences and effects, built form-open space relationships, spatial organization, environment behavior aspects (especially those relating to children), site as a positive tool in all scales, potential of materials and construction. Through this, both the qualitative and quantitative attributes of design can be understood and engaged. This would give training in the ingenious use of architecture to fulfil goals towards a responsive and stimulating environment.
- The techniques used for study and presentation can align themselves towards the above, such as cognitive maps, sketches, manual drawings, physical models with simple materials.
- The scale and complexity of projects will be commensurate with this - small to medium size projects involving buildings/ small campuses with simple circulation, passive energy, multiples of single unit space, single use buildings.
- Some suggestive projects are small buildings or small campuses involving civic/ cultural use, uses related to children such as schools, facilities for people with special requirements. The number of projects is left to the discretion of the faculty based on scale and complexity.

Text Books

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.

Reference Books

1. Julius Panero, Martin Zelnik, 'Human Dimension and Interior Space', Whitney Library of Design, 1975.
2. Richard P. Dober, 'Campus Planning', Reinhold Book Corporation, 1963.
3. Sam F.Miller, 'Design Process: A Primer for Architectural and Interior Design', Van Nostrand Reinhold, 1995.
4. Dudek M, 'Schools and Kindergartens', Birkhauser 2007.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Viva Voce (ESE) Marks	Total Marks
	Concept	Design Development	Presentation	Attendance	50	100
Marks	10	20	15	5		

Department	**School of Architecture**	Programme: **B.Arch.**		
Semester	**V**	Course Category :ES		End Semester Exam Type: **TH**
Course Code	**U23TH0524**	Periods/Week	Credit	Maximum Marks

		L	T	P	C	CAM	ESE	TM
Course Name	**Design of Structural Members**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

			BT Mapping (Highest Level)
Course Outcomes	**On completion of the course, the students will be able to**		
	CO1	To understand the different concepts of WSM and LSD methods using the code provisions.	**K1 K2**
	CO2	To design RCC beams and slabs by applying the above concepts.	**K1 K2**
	CO3	To Understand the design of short columns subjected to axial load.	**K1 K2**
	CO4	To understand the different concepts in designing footing using LSD methods	**K1 K2**
	CO5	To design RCC dog legged staircase using LSD method.	**K1 K2 K3**

UNIT - I	**Limit state design of concrete beams**	**Periods: 14**	
- Concept of elastic method, Ultimate load method and limit state method. - Advantages of limit state method over other methods. - Analysis and design of singly and doubly reinforced rectangular beam for bending.			**CO1**
UNIT - II	**Limit state design of concrete slabs**	**Periods: 12**	
- Analysis and design of one way and two-way rectangular slab subjected to uniformly distributed load for various boundary conditions and corner effects.			**CO2**
UNIT - III	**Limit state design of concrete column**	**Periods: 12**	
- Types of Column - Design of short columns subjected for axial load.			**CO3**
UNIT - IV	**Limit state design of concrete footing**	**Periods: 12**	
- Types of Footing - Design of Axially loaded square and rectangular footings.			**CO4**
UNIT - V	**Design of concrete staircase by limit state method**	**Periods: 10**	
- Types of staircases - Design of dog legged staircase.			**CO5**

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

1. S.N. Sinha, “Reinforced Concrete Design”, Tata McGraw Hill, 2002.
2. Shah H.J, , 'Reinforced Concrete', Charotar, Vol. 1 2016, Vol.2 2014.

References

1. P.Dayaratnam, 'Design of Reinforced Concrete Structures', Oxford and IBH PublishingCo.,1983.
2. C. Sinha and S.K. Roy, 'Fundamentals of Reinforced Concrete', S.Chand & Co., NewDelhi,1983.
3. Dr. B.C. Punmia, 'Reinforced Concrete Structures' Vol, 1 & 2', Laxmi publication, Delhi, 2004.
4. IS 456 'Indian Standard, Plain and Reinforced Concrete, Code of Practice', Bureau of Indian Standards, 2000.
5. S.Unnikrishnan Pillai and Devados Menon, 'Reinforced Concrete Design', Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1999.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**		
Semester	**V**	Course Category :HS		End Semester Exam Type: **TH**
Course Code	**U23TH0525**	Periods/Week	Credit	Maximum Marks

		L	T	P	C	CAM	ESE	TM
Course Name	**History of modern, Post Modern and Contemporary Architecture**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

			BT Mapping (Highest Level)
Course Outcomes	**On completion of the course, the students will be able to**		
	CO1	An understanding of the Industrialization and its impact	**K1 K2**
	CO2	An understanding of modernism and International styles	**K1 K2**
	CO3	An understanding of brutalism and conditions of post modernity	**K1 K2**
	CO4	An understanding of postmodern architecture and critical regionalism	**K1 K2**
	CO5	An understanding of pre and post independent architecture in India.	**K1 K2**

UNIT - I	**Leading to a new architecture and industrialization**	**Periods: 8**

- Beginnings of modernity
- Origin and development of Neo Classicism
- Industrialization and its impact
- Growing need for mass housing: Development of Industrial material and construction technologies - concrete, glass and steel, structural engineering, standardization-Industrial exhibitions
- Chicago School and skyscraper development.
- Roots of Art Noveau as protest movement against classical architecture, organic influences; works of Antonio Gaudi, Victor Horta, Vienna Secession.

Arts and Crafts in Europe and America.

- Works of Morris and Webb.

CO1

UNIT - II	**Modern architecture**	**Periods: 11**

Early modernism in Europe and America.

- Critique of ornamentation and Raumplan of Adolf Loos.
- Peter Behrens and Werkbund.

Modern art and architecture

- Expressionism, Futurism, Constructivism, Cubism, Suprematism and De–Stijl. Art Deco, Functionalism, Bauhaus, CIAM, International Style.

CO2

UNIT – III	**Critiquing modernism**	**Periods: 10**

TEAM X

- Brutalism, projects of Smithsons and Aldo Van Eyck
- Ideas, works and evolution- Philip Johnson, Louis Kahn, Eero Saarinen,I.M.Pei
- Writings of Jane Jacobs, Robert Venturi, Aldo Rossi and Christopher Alexander.

Conditions of Post Modernity

- various postmodern directions in architecture
- canonization of Post Modernism– works of Graves, Venturi
- postmodern classicism
- ideas and works of urbanism: Soleri, Archigram and Metabolism
- High Tech architecture: Works of Rogers and Piano

CO3

UNIT - IV	**After modernism**	**Periods: 8**

Deconstructivism theory and practice

- Eisenmann, Hadid, Gehry, Libeskind,

Critical Regionalism as a category of architecture.

- Ideas and works of Fathy, Ando, Bawa,

Outline of contextual approaches in Indian architecture after the 60s.

- Works of Doshi, Correa, Raj Rewal.
- Philosophy and works of Nari Gandhi, Laurie Baker

CO4

UNIT - V	**Pre and post independent architecture in india**	**Periods: 8**

Colonialism and its impact

- early colonial architecture: forts, bungalows, cantonments
- Stylistic transformations: Indo Saracenic (Delhi and Chennai), PWD and institutionalization of architecture

Architectural debates associated with nation formation

- early modernist architecture- post independence city planning: Chandigarh and Bhubaneswar

Influences on post-independence architects

- Architecture of Doshi, Correa, Raj Rewal

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Kenneth Frampton, “Modern Architecture: A Critical History”, Thames & Hudson, London, 1994.
2. Diane Ghirardo , “Architecture after Modernism”, Thames & Hudson, London, 1990.
3. Miki Desai et. al., “Architecture and independence”, Oxford University Press, 2000
4. Christopher Alexander, “Pattern Language”, Oxford University Press, Oxford, 1977
5. Robert Venturi , “Complexity and Contradiction in Architecture”, 1977.
6. Leonardo Benevolo, History of Modern Architecture, 2 Vols.,Routledge & Keganpaul, London, 1971

References

1. Thomas Metcalf, An imperial Vision, Faber & Faber/ Electa, 1980.
2. Christian Norburg Schulz., Meaning in Western Architecture, Studio Vista
3. Michael Hays ed., “Architecture Theory” since 1968, CBA, 1999
4. Jane Jacobs, “Deaths and Life of Great American Cities”, Vintage, 2003
5. James Steele, “Hassan Fathy”, Academy Editions, 1985

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	2	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	2	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	2	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	2	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	2	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**	
Semester	**V**	Course Category :ES	End Semester Exam Type: **TS**

Course Code	U23TS0526	Periods/Week			Credit	Maximum Marks		
		L	T	P/S	C	CAM	ESE	TM
Course Name	**Services on Electricity and Acoustics**	**2**	**-**	**2**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 To gain knowledge of basic electrical, lighting and acoustic systems in buildings.	**K1 K2**
	CO2 To design buildings satisfying electrical, lighting and acoustic principles.	**K1 K2 K3**
	CO3 To design basic electrical, lighting and acoustic systems for buildings.	**K5 K6**
	CO4 To understand acoustic properties of materials/products through study.	**K1 K2**
	CO5 To understand of drawings/details related to real acoustic design projects.	**K1 K2**

UNIT - I	**Generation of electricity and distribution in buildings**	**Periods: 12**

Basics of electricity
- Ohms and Kirchoffs Laws.
- Units: watt, volt, amps.
- Generation of electricity.

Distribution from grid to facilities.
- Two phase and three phase systems.
- Substation, transformers, generators. Wires and conduits, types and applications.
- Lightning conductors and earthing.
- Distribution boards, meters, switch boards, earthing.

Energy efficient systems and renewable energy resources.

Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos. Design of electrical layout for buildings of small scale through drawings. **CO1**

UNIT - II	**Introduction to lighting**	**Periods: 12**

Basics of lighting
- Electromagnetic spectrum.
- Sources of light.
- Laws and terminologies of lighting.

Daylight
- Considerations for designing with daylight - typology, room dimensions, openings. Daylight Factor.

Artificial lighting
- Light from artificial sources, quantity and quality.
- Types of lamps and luminaires.
- Applications and choice of luminaires.

Energy efficient systems.

Understanding of product literature/ service drawings. Site visits with documentation in the form of sketches/ drawings/ photos. **CO2**

UNIT - III	**Lighting design for buildings**	**Periods: 12**

- Lighting level for different uses in outdoor and indoor environment.
- Lighting calculations.
- Design exercise involving lighting design for appropriate projects of simple scale through choice, calculations, layout, drawings, simulations, physical models.

Sketching/ drawing/ models of the principles. Understanding of product literature/ published work. Site visits with documentation in the form of sketches/ photos. **CO3**

UNIT - IV	**Fundamentals of acoustics**	**Periods: 9**

Fundamentals- Sound waves, frequency, intensity, wave length, measure of sound, decibel scale, speech and music frequencies.
- NC curves.
- Permissible noise limits.

Material property
- Absorption, reflection, scattering, diffusion, transmission.
- Absorption co-efficient, NRC, Sound Transmission Class (STC), Impact Insulation Class (IIC).

Understanding acoustic properties of materials/ products through study of product literature/ site visits. **CO4**

UNIT - V	**Environmental acoustics**	**Periods: 17**

- Environmental noise and its control.
- Structure borne and air borne noise control.
- Site selection.

Sound in enclosed space: Reverberation time, optimum reverberation time, echo, early decay time. **CO5**

Architectural acoustics

- Importance of shape volume, treatment for interior surfaces, etc.
- Basic principles in designing classroom, lecture and conference hall, offices, open air theatre, auditorium, concert hall, theatre, cinema, recording studio.

Calculations

Simple problems based on reverberation time and absorption coefficients. Understanding of drawings/ details related to real acoustic design projects. Site visits with Documentation in the form of sketches/ drawings/ photos. Acoustic design for simple and small projects including planning, constructional measures and sound reinforcement systems through calculations, conceptual sketches, drawings, models.

Lecture Periods: 60	Tutorial Periods:-	Practical Periods:-	Total Periods: 60

Text Books

1. Phillips, 'Lighting in Architectural Design', McGraw Hill. New York, 1964.
2. David Egan, Victor Olgyay 'Architectural Lighting', McGraw-Hill, 2001.
3. Gary Gordon, 'Interior Lighting for Designers', 5th Edition, John Wiley & Sons Inc., New York, 2015.
4. David Egan, 'Architectural Acoustics', J.Ross Publishing, 2007.
5. David Lee Smith, 'Environmental Issues for Architecture', Wiley, 2011.
6. National Building Code - Bureau of Indian Standards.

References

1. 'The Lighting Handbook', IES, 2011.
2. National Lighting Code 2010.
3. Descottes, Herve and Cecilia E. Ramos, 'Architectural Lighting: Designing with Light and Space', Princeton Architectural Press, Princeton, 2011.
4. A.K.Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation Manual', CBS, 2009

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2*	Attendance	50	100
Marks	20		25	5		

Department	**School of Architecture**	Programme: **B.Arch.**		
Semester	**V**	Course Category :PC	End Semester Exam Type: **ST**	
Course Code	**U23ST0527**	Periods / Week	Credit	Maximum Marks

		L	T	P	C	CAM	ESE	TM
Course Name	**Concrete in Building Construction**	**0**	**0**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 To use concrete as a versatile material in different methods.	**K1 K2 K3**
	CO2 To understand the concepts of concrete as a building construction material.	**K1 K2**
	CO3 To design and detail specific components in concrete where there is scope for architectural design.	**K2 K3 K4**
	CO4 To understand the basic principles for seismic design in concrete.	**K1 K2**
	CO5 To create ability to use concrete innovatively in simple projects.	**K1 K2 K3**

UNIT - I **Introduction to cement and concrete** **Periods: 12**

Cement
- Composition, properties, types and uses of cement.
- Tests for cement.

Cement mortar and plastering

Concrete
- Composition.
- Mix design.
- Nature of aggregates for mix including classification, sources, shape, size, grading, sampling and analysis.
- Proportioning, water-cement ratio, workability.

Stages in concrete construction
- Formwork, mixing, placing, curing.
- Cement and concrete finishes including roughcast, dry dash, textured, stucco.

Water proofing and damp proofing of concrete.

Understanding of product literature. Site visits with documentation in the form of sketches/ photos

UNIT - II **Cast in-situ cement concrete in building construction** **Periods: 21**

- Construction principles and procedures for building components using cast in situ cement concrete (plain and reinforced).
- Components to include different types of foundations, columns, beams, slabs, walls, lintels and sun shades, staircases, sump, water tank, flooring.

Drawings/ models of the principles.

Understanding of detailed drawings/ published work. Site visits with documentation in the form of sketches/ photos.

UNIT III **Precast concrete products in building construction** **Periods: 15**

- Types and characteristics of simple precast concrete products.
- Construction principles and procedures for structural and non-structural building components using precast concrete.
- Components to include different types of blocks/ tiles for walls, floors and roof, jali, parapet, paving.
- Laying/constructing and finishing.

Sketching/ drawing/ models of the principles. Understanding of product literature/ published work. Site visits with documentation in the form of sketches/ photos.

UNIT IV **Special concretes and innovations in concrete** **Periods: 12**

Types of special concretes
- Lightweight concrete - Aerated Concrete No-fines concrete - Polymer concrete
- pre-stressed concrete - Fiber-reinforced concrete - Ready-mixed concrete
- Ferrocement.

Building materials and components developed by research organizations
- CBRI, SERC, NBO, and BMTPC.
- Techniques for renovation and retrofitting.

Basic principles for seismic design in concrete.

Understanding of product literature/ published work. Site visits with documentation in the form of sketches/ photos.

UNIT V **Design and detailing using concrete** **Periods: 15**

- Design and detailing exercise involving concrete as primary construction material in an appropriate typology involving a simple scale project.
- The project will integrate knowledge from all the previous units.

Design and construction details in the form of drawings, sketches and models.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 75**	**Total Periods: 75**

Text Books

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.

References

1. Arthur Lyons, 'Materials for Architects and Builders - An Introduction', Arnold, London, 1997.
2. Don A.Watson, 'Construction Materials and Processes', McGraw Hill Co., 1986.
3. S.N Sinha, 'Reinforced Concrete Design', Tata-McGraw Hill, New Delhi, 2002
4. Howard Kent Preston, 'Prestressed Concrete for Architects and Engineers', McGraw Hill, NewYork, 1964.
5. Alan Blanc, 'Stairs, Steps and Ramps', Butterworth, Heinemann Ltd., 1999
6. R. Chudley et al**,** 'Construction Technology', Heinemann, 2011.
7. 'Standards and Specifications for Cost Effective Innovative Building Materials and Techniques'', BMPTC Publication, New Delhi.
8. Pamphlet and Manuals of SERC, BMPTC, HUDCO and other research organizations.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V**	Course Category :PC			End Semester Exam Type: **ST**			
Course Code	**U23ST0528**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM

Course Name	**Urban Mixed use Design Studio**	**0**	**0**	**16**	**10**	**50**	**50**	**100**

Course Outcomes		**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1	To create ability to understand nature, needs and ways of contemporary urban society as well as relate the existing built environment as a reflection of this.	**K2**
	CO2	To create ability to draw from this understanding and identify issues involving in contemporary urban life and the built environment.	**K2**
	CO3	To create ability to draw from this understanding and identify challenges involving in contemporary urban life and the built environment.	**K2, K3, K4**
	CO4	To address specific situations/scenarios characteristics of urban life and context.	**K2**
	CO5	To create ability to give appropriate/innovative design solutions in the above context.	**K2**

Content

- Urban environment is synonymous with heterogeneity of populace and their diverse needs and lifestyles. Private and public spaces for varied programmes such as living, working and socio-cultural needs bring individuals and groups in intersection or proximity to each other. Further, current transformations in urban society have led to many changes in buildings. The challenge within the discipline of architecture is not only to create conducive spaces for contemporary ways of life within particular contexts, but also to identify issues and programmes and address them in innovative ways.
- These would include urban living, urban working, socio-cultural life, urban recreation, etc.,

1. Achieving comfort without sacrificing on density would also be a concern, along with exposure to building byelaws and barrier free environment. The approach and projects will be directed towards one or more of these aspects.
2. The tools and techniques engaged for study and design can be those which are best suited to study the above, including mapping of urban patterns/ways of life and needs, demographics, socio-cultural aspects, densities, land use, etc.,
3. Projects will address specific situations/scenarios characteristic of urban life and context, either single or mixed use. They will be of medium to large scale, involving repetitive or unique spaces, low or mid- rise buildings with passive/active energy.
4. The number of projects is left to the discretion of the faculty based on scale and complexity.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 210**	**Total Periods: 210**

Text Books

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.

References

1. Rem Koolhaas et al, 'Project on the City II: The Harvard Guide to Shopping', Taschen, 2001.
2. Peter Coleman, 'Shopping Environments: Evolution, Planning and Design', Routledge, 2006.
3. LMVRDV, 'FARMAX- Excursions on Density', 010 Publishers, 2006.
4. Jos Boys, 'Disability, Space, Architecture: A Reader', Routledge, 2017.
5. Emily Talen, 'Design for Diversity', Routledge, 2012.
6. luis Alexandre Casanovas Blanco (Ed), 'After Belonging: Objects, Spaces, and Territories of the Ways We Stay in Transit', Lars Muller Publishers, 2016.
7. Manuel Gausa, 'Housing: New Alternatives, New Systems', Birkhäuser Basel 1999
8. Mark Hutter, 'Experiencing Cities (The Metropolis and Modern Life)', Routledge, 2015.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	1	-	2	-	-	-	1	-	-	-	-	-	-	-
2	1	1	-	2	-	-	-	1	-	-	-	-	-	-	-
3	1	1	-	2	-	-	-	1	-	-	-	-	-	-	-
4	1	1	-	2	-	-	-	1	-	-	-	-	-	-	-
5	1	1	-	2	-	-	-	1	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment tool	**Weight age**	**Split up of marks**

Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VI**	Course Category :PC				End Semester Exam Type: **TH**		
Course Code	**U23TH0629**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM

Course Name	**Building Automation and Control Systems**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 An understanding of the building automation system and human machine interface.	**K2**
	CO2 Knowledge about safety systems and components.	**K1**
	CO3 An understanding of security and surveillance installation and design.	**K2**
	CO4 To gain knowledge on Energy conservation and its strategies in BAS.	**K2**
	CO5 An understanding of current trend and innovation in Building Automation Systems.	**K2**

UNIT - I	**Introduction to building automation and control systems**	**Periods: 9**

- Introduction to and History of Building Automation Systems (BAS).
- Building Types and Key Requirements. Different systems in BAS which includes HVAC, security and surveillance, communication, fire, lighting systems, climate control, etc. Ideas of intelligent buildings, Human Machine Interface (HMI), facilities management and life cycle costs. Control Theory.
- Technology like (sensors, control elements), direct digital control, control applications, communication systems, and Building Automation Protocols. Role of different stakeholders (Architect, contractor, consultant, application engineer and engineer) in BAS system design.

CO1

UNIT - II	**Fire safety systems**	**Periods: 9**

- Statutory Standards and codes for fire safety. Objective and essential components and working of a Fire Alarm System.
- Type of detection technology in the Fire alarm system.
- Basic knowledge on working, design and installation of Fire alarm system.
- Fire suppression systems. Components, working and installation. various types of technologies currently in use.

CO2

UNIT - III	**Security, surveillence and communcation systems**	**Periods: 6**

- Introduction to Access Control, Intruder Alarm, Essential Components of each System, and Various types of Technologies employed in the system.
- Introduction to CCTV, Perimeter protection system, Essential Components of each System, and Various types of Technologies employed in the system. Public Address System and other communication systems and their requirements.
- Basic knowledge as how the above all works, designed and installed.

CO3

UNIT - IV	**Hvac, lighting, climate control**	**Periods: 12**

- Building Automation and Control Systems for HVAC, Lighting and Climate Control.
- Energy Conservation Control Strategies.

CO4

UNIT - V	**Integrated building management system**	**Periods: 8**

- Overview of various components, technology, sensors, etc., that are common to more than one system. Integrated Building Management System IBMS.
- Integrated approach in design, maintenance and management system.
- Current trend and innovation in building automation systems. Impact of Information Technology.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Building Automation Systems – A Practical Guide to Selection and Implementation, Maurice Eyke
2. National Building Code of India.

References

1. George Clifford , Modern Heating Ventilating and Air Conditioning
2. Vaughn Bradshaw , Building control Systems
3. Roger W. Haines, HVAC Systems Design Handbook, Fifth Edition by 5.
4. James E. Brumbaugh, HVAC Fundamentals
5. Herman Kruegle, CCTV Surveillance,
6. John L. Bryan, Fire Suppression Detection System
7. Vivian Capel, Security Systems and Intruder Alarm System,
8. Mike Constant & Peter Turnbull, The Principles and Practice of Closed Circuit Television.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**

1	2	-	-	1	-	2	-	-	-	-	-	-	-	-	-
2	2	-	-	1	-	2	-	-	-	-	-	-	-	-	-
3	2	-	-	1	-	2	-	-	-	-	-	-	-	-	-
4	2	-	-	1	-	2	-	-	-	-	-	-	-	-	-
5	2	-	-	1	-	2	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	**Continuous Assessment Marks (CAM)**				**End Semester Examination (ESE) Marks**	**Total Marks**
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**					
Semester	**VI**	Course Category :PC			End Semester Exam Type: **TH**		
Course Code	**U23TH0630**	Periods/Week			Credit	Maximum Marks	
		L	T	P	C	CAM	ESE	TM

Course Name	**Specification and Estimation**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 To understand the art of building construction through specification writing.	**K2**
	CO2 To create ability to work out the approximate estimate for small scale building projects and low cost housing.	**K2 K3**
	CO3 To create ability to work out the detailed estimate for small scale building projects and low cost housing.	**K2 K3 K5**
	CO4 To understand the valuation.	**K2**
	CO5 To understand the budgeting.	**K1 K2**

UNIT - I	**Specification and specification writing**	**Periods: 9**

- 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.
- Brief Specification for1st 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, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace.

CO1

UNIT - II	**Estimation**	**Periods: 9**

- Types & purpose. Approximate estimate of buildings.
- Bill of quality, factors to be considered. Principles of measurement and billing.
- Contingencies.
- Measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work.
- Abstract of an estimate.
- Costs associated with constructed facilities.
- Approaches to cost estimation.
- Type of construction cost estimates. Cost Indices.
- Applications of cost indices to estimating.
- Estimate based on engineer's list of quantities. Estimation of operating costs.

CO2

UNIT - III	**Detailed estimate**	**Periods: 11**

- Deriving detailed quantity estimates for various items of work for a single storied building.
- To include earthwork excavation, brick work, plain cement concrete, reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course.

CO3

UNIT - IV	**Valuation**	**Periods: 8**

- Valuation. Explanation of terms.
- Types of values. Sinking fund.
- Years of purchase. Depreciation.
- Types of depreciation.
- Valuation of real properties.
- Types, methods and purpose of valuation.

CO4

UNIT - V	**Budgeting**	**Periods: 8**

- Elements of cash flow.
- Time value of money.
- Capital investment decision.
- Types of business firms.
- Budget and Budgetary Control.
- Types of Budgets.
- Preparation of financial budget.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

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 andDistributors,2000.
4. S.Sanga Reddi and P.L.Meiyappan, 'Construction Management', Kumaran Publication, Coimbatore.
5. Gurcharan Singh and Jagdish Singh, 'Estimating Costing and Valuation', Standard Publishers Distributors,2012.

References

1. 'I.S.1200-1968 Methods of Measurements of Buildings and Civil Engineering works'.
2. Latest schedule of rates of P.W.D.
3. Latest Data book of P.W.D.
4. PWD Standard Specifications. Govt Publication.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	3	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VI**	Course Category :PC			End Semester Exam Type: **ST**			
Course Code	**U23ST0631**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM

Course Name	**Architectural Design Detailing**	**0**	**0**	**5**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 To understand all the aspects that go into the making of a building through study of drawings related to construction.	**K1 K2**
	CO2 To evolve a conceptual design projects into schematic design, balancing technical consideration.	**K1 K2**
	CO3 To prepare architectural working drawings for the resolved schematic design.	**K2 K3**
	CO4 To create ability to resolve spatial concerns with technical aspects of a building.	**K2**
	CO5 To create ability to design and detail components within a building.	**K2**

UNIT - I **Understanding architecture through building drawings** **Periods: 16**

- Understanding architecture as a physical, workable product through study of comprehensive set of drawings for any live building project, interpreting them and presenting their characteristics through seminars/ assignments.
- The drawings to be studied should include architectural working drawings from macro to micro scale- site plan, building plans, staircase details, kitchen and toilet detail of joinery, etc.,
- Service drawings to include electrical, plumbing.

UNIT - II **Schematic design integrating architectural design with structural and service considerations** **Periods: 18**

- Evolving a conceptual design project into schematic design, balancing different technical considerations.
- Considerations to include appropriate structural, plumbing, electrical, mechanical and HVAC systems.
- Working out schemes to decide and finalize on the best possible design that integrates everything together.
- Scale of the project could be small to medium and include any typology, involving a newly created, quick, simple design or an older design from previous academic years.

UNIT III **Architectural working drawings** **Periods: 18**

- Preparation of architectural working drawings for the resolved schematic design.
- Drawings to include site plan, center line drawings, building drawings, detailed drawings of specific areas like staircases and wall sections, dimensions explaining the various components, joinery schedule.

UNIT IV **Detailed drawings of rooms and architectural components** **Periods: 15**

- Design and preparation of detailed drawings of joinery including doors, windows and ventilators.
- Design and preparation of layouts of service intensive rooms like kitchens and toilets.
- Design and detailing out of floor, wall and ceiling finishes/ construction/ laying.

UNIT V **Detailed drawings of built in components** **Periods: 8**

- Design and preparation of detailed drawings of built in furniture and components based on the room/ typology to include counters, cabinets, wardrobes, storage, fittings and fixtures, display units, workstation

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 75**	**Total Periods: 75**

Text Books

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.

References

1. Susan Dawson, 'Architect's Working Details -Volume 1-10', E- Map Construct, 2004.
2. Nelson L Burbank, 'House Carpentry Simplified', McGraw Hill, 1985.
3. David Sauter, 'Landscape Construction', Delmar Publishers, 2010.
4. Grant W. Reid ,'Landscape Graphics', Whitney Library of Design, 1987.
5. Francis. D. K. Ching, 'Building Construction Illustrated', John Wiley & Sons, 2011.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**	**Program Specific Outcomes (PSOs)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
2	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
3	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
4	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
5	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment tool	**Weight age**	**Split up of marks**		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**		
Semester	**VI**	Course Category :PC	End Semester Exam Type: **ST**	
Course Code	**U23ST0632**	Periods / Week	Credit	Maximum Marks

			L	T	P	C	CAM	ESE	TM
Course Name	**Multi - Level Complex Design Studio**		**0**	**0**	**16**	**10**	**50**	**50**	**100**
Course Outcomes	**On completion of the course, the students will be able to**							BT Mapping (Highest Level)	
	CO1	To create ability to critically understand and address issue of resources.						**K1 K2**	
	CO2	To create ability to balance diverse aspects/concerns of buildings by making informed choices and innovative design in the context of buildings with intense or complex programmes.						**K1 K2**	
	CO3	To create ability to apply knowledge intensively in realms such as sustainable built environment, services.						**K1 K2**	
	CO4	To address specific situations/scenarios characteristics of urban life and context.						**K2 K3**	
	CO5	To create ability to give appropriate/innovative design solutions in the above context.						**K5 K6**	

Content

- Architecture is a man-made addition to the world and is resource intensive. The questions in this regard are how to simplify needs and means. Further, architecture today is also required to integrate several physical concerns in a building as human needs in built environment have become more complex with respect to intensity, distribution and interdependency of activities/ programs.
- Here the challenge is to address complex needs in an efficient manner so as to conserve/ optimize resources without compromising on quality of life.
- The approach and projects will be directed towards one or more of these concerns.
- Appropriate tools and techniques related to the above can be used in study and design, especially in terms of technical aspects.

The nature of projects can be either or both of these

1) simple scale, ordinary or special use projects examining design through resources of different types
2) Large, complex projects (multi storied buildings, office complexes, buildings for healthcare, performing art center, etc.,) that need technical resolution and/or balance of various aspects. Aspects to be addressed can be urban land as resource, planning integration and detailing, sustainable building practices, green issues, alternative energy, intelligent building techniques and service integration, advanced building practices, appropriate materials and construction, sensitive and optimal use of resources.
The numbers of projects are left to the discretion of the faculty based on scale and complexity.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 210**	**Total Periods: 210**

Text Books

1. Daniel Williams, 'Sustainable Design, Ecology, Architecture & Planning', John Wiley & Sons Inc,NJ, 2007.
2. Mili Mazumdar, 'Energy Efficient Buildings in India', TERI, New Delhi, 2012.
3. 'Sustainable Building Design Manuals I & II', TERI, 2004.
4. Derek Clements-Croome, 'Intelligent Buildings: An Introduction', Routledge, 2013.
5. Stephen A. Kliment, Editor 'Building Type Basics' Series, Wiley.

References

1. Lara Menzel, 'Office - Architecture + Design', Braua Publishers, 2009.
2. Sheri Koones, 'Prefabulous+Sustainable, Building and Customizing an Affordable, Energy fficient Home', ABRAMS, 2010.
3. Edward Ng, 'Designing High-density Cities for Social and Environmental Sustainability, Routledge, 2009.
4. Robin Guenther, Gail Vittori, 'Sustainable Healthcare Architecture', 2nd Edition, Wiley 2013.
5. Marian Keeler, Bill Burke, 'Fundamentals of Integrated Design for Sustainable Building', Wiley, John Wiley & Sons, 2009.
6. Mark Hutter, 'Experiencing Cities (The Metropolis and Modern Life)', Routledge, 2015.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-
2	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-
3	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-
4	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-
5	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

		L	T	P	C	CAM	ESE	TM
Course Name	**Professional Practice and Ethics**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Knowledge of the role of professional and statutory bodies	**K1**
	CO2 An understanding of the provisions in Architects Act 1972.	**K2**
	CO3 An understanding of code of conduct.	**K2**
	CO4 Understand the operator of semiconductor diode and its applications.	**K2**
	CO5 Familiarity with the process and role of an architect in project execution.	**K2**
	CO6 Understanding the Government rules and regulations for successful practicing.	**K2**

UNIT - I	**Introduction to architectural profession code of conduct and ethics.**	**Periods: 9**

- Architectural profession and role of architects in society.
- Registration of architects. Role of the Indian Institute of Architects.
- Architects Act 1972- intent, objectives, provisions with regard to architectural practice.
- Council of Architecture- role and functions.
- Importance of ethics in professional practice.
- Code of conduct for architects.
- Punitive action for professional misconduct of an architect.
- Architecture as a professional service towards clients.
- Architect's office and its management - organizational structure, infrastructure requirement, and skills required, elementary accounts, tax liabilities. Setting up architectural practice.

CO1

UNIT - II	**Architect's services, scale of fees & competitions**	**Periods: 9**

- Mode of engaging an architect.
- Comprehensive services, partial services and specialized services.
- Scope of work of an architect, Schedule of services.
- Scale of fees - Council of Architecture norms, Mode of payment.
- Terms and conditions of engagement, Letter of appointment.
- Importance of Architectural competitions.
- Types of competitions - open, limited, ideas competition, single and two stage competitions.
- Council of Architecture guidelines for conducting architectural competitions.
- National and international Competitions. Case studies.

CO2

UNIT - III	**Project management - tender & contract**	**Periods: 12**

- Tender - Definition. Types of Tenders - open and closed tenders. Conditions of tender.
- Tender notice. Tender documents.
- Concept of EMD. Submission of tender. Tender scrutiny.
- Tender analysis. Recommendations. Work order. E-tendering - advantages, procedure, conditions.
- Contract – definition. Contract agreement and its necessity.
- Contents - articles of agreement, terms and conditions, bills of quantities and specifications, appendix.
- Certification of contractors.
- Bills at different stages.
- New trends in project formulation and different types of execution - BOT, DBOT, BOLT, BOO, etc.,
- Role of architect in project execution stage.

CO3

UNIT - IV	**Legal aspects**	**Periods: 6**

- Arbitration - definition and advantages.
- Sole and joint arbitrators.
- Role of umpires, award.
- Arbitration clause in contract agreement -role of architect, excepted matters.
- Easement – meaning, types of easements.
- Copy rights and patenting – provisions of copy right acts in India, copy right in architectural profession.
- Consumer Protection Act - intent, architect's responsibility towards his clients.

CO4

UNIT - V	**Important legislation's and current trends**	**Periods: 9**

- Planning parameters at various scales. - DTCP rules. - Second Master Plan CMDA as case study. - Chennai Corporation Building Rules 1972. - Panchayat Rules. - Building rules in National Building Code. - H –Z Factories Act. Persons with Disabilities Act. - Barrier Free Environment. Coastal Regulation Zone. - Heritage Act. - Globalization and its impact on architectural profession. - Preparedness for international practice. - Entry of foreign architects in India. - Information technology and its impact on architectural practice. - Emerging specializations in the field of architecture -architect as construction/ project manager, architectural journalism, architectural photography.	**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Architects Act1972.
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.

Reference Books

1. J.J.Scott, 'Architect's Practice', Butterworth, London1985.
2. Development Regulations of Second Master Plan for Chennai Metropolitan Area-2026.Chennai City Corporation Building Rules1972.
3. T.N.D.M. Buildings rules,1972.
4. Consumer Protection Act, 1986.
5. Arbitration Act,1996.
6. Factories Act,1948.
7. Persons with Disabilities Act,1995.
8. Tamil Nadu Cinematography Act. DTCP Act

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	-	-	-	3	-	3	2	-	-	-
2	1	-	-	-	3	-	3	2	-	-	-
3	1	-	-	-	3	-	3	2	-	-	-
4	1	-	-	-	3	-	3	2	-	-	-
5	1	-	-	-	3	-	3	2	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**	

Semester	VII	Course Category : PC				End Semester Exam Type: TH		
Course Code	U23TH0734	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	Landscape and Ecology	3	-	-	3	50	50	100

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	Awareness of the role of landscape design with respect to macro scale of sustainability and Ecology as well as in the micro scale of shaping of outdoor environments	K1
	CO2	Knowledge about the elements of landscape design and their scope.	K1
	CO3	Sensitivity towards evolution of different garden and landscape design across time and context conduct	K2
	CO4	An understanding of landscape design with respect to site planning and different functional typologies of spaces.	K2
	CO5	An understanding of landscape design with respect to site planning and different functional typologies of spaces.	K2

UNIT-I	Introduction	Periods: 7	
Introduction to landscape architecture. - Basic concepts of ecology and the impact of human activities on them. - Bio, Geo, chemical cycles including water cycle, carrying capacity of an ecosystem. - Environmental impact assessment. - Reclamation and restoration of derelict lands.			CO1
UNIT - II	**Elements in landscape design**	**Periods: 10**	
- Introduction to hard and soft landscape elements. - Different types of hard landscape elements. - Plant materials, water and landform - classification, characteristics, use and application in landscape design.			CO2
UNIT - III	**Garden design in history**	**Periods: 10**	
- Japanese, Italian Renaissance, Mughal and English gardens. - Outline of landscape and garden design in Indian history. - Gardens depicted in Sanskrit literature, Nandavanams and residential gardens of - South India. Moghul gardens. - Public parks and residential gardens of the colonial period.Contemporary public landscape projects.			CO3
UNIT - IV	**Site planning**	**Periods: 10**	
- Organization of spaces in the outdoor environment. - Role of circulation and built form in shaping the environment. - Role of landscape design in design of neighborhood parks, children's play area and campus development.			CO4
UNIT - V	**Landscaping of functional areas**	**Periods: 8**	
- Urban open spaces and principle of urban landscape. - Street landscaping, landscape design for waterfront areas and functional areas in urban centers. - Green infrastructure including green roofs and walls.Building rules in National Building Code.			CO5

Lecture Periods: 45	Tutorial Periods:-	Practical Periods:-	Total Periods: 45

Text Books

1. Motloch, J.L., 'An Introduction to Landscape Design', US: John Wiley and Sons, 2001.
2. Michael Laurie, 'Introduction to Landscape Architecture', Elsevier, 1986.
3. Sauter D; 'Landscape Construction', Delmar Publishers; 2000.
4. Geoffrey And Susan Jellico, 'The Landscape of Man', Thames And Hudson, 1987.

Reference Books

1. 'Time Saver Standards for Landscape Architecture', McGraw Hill, Inc, 1995.
2. Grant W Reid, 'From Concept to Form in Landscape Design', Van Nostrand Reinhold Company, 1993.
3. Albert J. Rutledge, 'Anatomy of a Park', McGraw-Hill Book Company, 1971.
4. Richard P. Dober, 'Campus Landscape', John Wiley and Sons; 2000.
5. Strom Steven, 'Site Engineering for Landscape Architects', John Wiley and Sons Inc., 2004.
6. Brian Hacket, 'Planting Design', Mc Graw Hill Inc, 1976.
7. T.K. Bose and Chowdhury, 'Tropical Garden Plants in Colour', Horticulture And Allied Publishers, Calcutta, 1991.
8. Rahoul B Singh, 'Gardens of Delight- Indian Gardens through the Ages', Lustre Press, Roli Books, 2008.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Semester	VII	Course Category : ES				End Semester Exam Type: TS		
Course Code	U23TH0735	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	Services on AC, Fire Safety and Mechanical Transportation	2	-	2	3	50	50	100

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Familiarity with different air conditioning systems, their context of use and basics of planning involved	K1
	CO2 An understanding of fire safety, firefighting, fire prevention and installations in buildings.	K1
	CO3 An understanding of fire safety, firefighting, fire prevention and installations in buildings.	K2
	CO4 Ability to integrate services in buildings	K2
	CO5 Integrating all the building services in design	K2

UNIT- I	Design aspects of air conditioning systems	Periods: 14

- Thermodynamics.
- Transfer of heat.
- Refrigeration cycle components.
- Vapor compression cycle.
- Refrigerant, Compressor, condenser, evaporator, refrigerant control devices, electric motors, air handling units, cooling towers.
- Air conditioning systems for buildings of different scales and their requirements
- Window type, split system, package unit, direct expansion system, chilled water system, fan coil unit, district cooling systems.
- Energy efficient systems, environmental aspects and latest innovations.Understanding all the above through product literature/ field visits.

CO1

UNIT - II	Design aspects of air conditioning systems	Periods: 10

- Design criteria for selection of air conditioning.
- Configuring/ sizing of mechanical equipment, equipment and spaces for them. Horizontal and vertical distribution of services for large buildings.
- Exercise on the above through choice, calculations, layout and drawings.

CO2

UNIT - III	Fire and safety	Periods: 12

- Causes of fire in buildings - Stages of fire and how it spreads - Fire drill.
- Heat/ fire/ smoke detection.
- Alarm and extinguisher systems.
- Fire safety standards.
- General guidelines for egress design for multistory buildings.
- Understanding all the above through product literature/ field visits. Exercise on design of fire safety systems for different building types through choice, calculations, layout and drawings

CO3

UNIT - IV	Mechanical transportation systems in buildings	Periods: 12

Lifts and escalators

- Types and applications.
- Round trip time for lifts.
- Design of lift lobby and vertical transportation core.
- Conveyors, travellators, dumb waiters. Standards for all.
- Latest technologies in vertical transport systems.
- Integration of lifts and escalators with building automation systems.
- Understanding all the above through product literature/ field visits. Design exercise on the above through choice, calculations, layout and drawings.

CO4

UNIT - V	Integration of services into architectural design	Periods: 12

- Principles of grouping and integrating of horizontal and vertical distribution of all services in a multi- storeyed building/ large building.
- Services to include vertical transportation, electrical, communication, air conditioning and fire safety.
- Integrating service requirements into architectural design in an appropriate typology involving a simple scale project through sketches/ drawings.

CO5

Lecture Periods: 60	Tutorial Periods:-	Practical Periods:-	Total Periods: 60

Text Books

1. William H. Severns and Julian R Fellows, 'Air conditioning and Refrigeration', John Wiley and Sons, London, 1988.
2. National Building Code - Bureau of Indian Standards.
3. 'ISHRAE Handbook for Refrigeration', 2015.
4. George R. Strakosch (Editor), Robert S. Caporale, 'The Vertical Transportation Handbook' 4th

Edition, Wiley and Sons, 2010.

Reference Books

1. A.F.C. Sherratt, 'Air Conditioning and Energy Conservation', The Architectural Press, London,1980.
2. Andrew H Buchanan; 'Structural Design for Fire Safety', Wiley, 2001.
3. Swenson S. Don, 'Heating, Ventilating and Air Conditioning', American Technical Publishers 1995.
4. ISHRAE, 'All about AHUs- Air Handling Units'.
5. CIBSE Guide D, 'Transportation Systems in Buildings', 2010.
6. A.K.Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation Manual', CBS, 2009.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	-	-	-	-	-
2	1	-	-	2	-	-	-	-	-	-	-
3	1	-	-	2	-	-	-	-	-	-	-
4	1	-	-	2	-	-	-	-	-	-	-
5	1	-	-	2	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	Model Exam	CAT 2*	Attendance		
Marks	20		25	5	50	100

Semester	VII	Course Category : **PC**				End Semester Exam Type: **ST**		
Course Code	**U23TH0736**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**High Rise Commercial and Residential Design Studio**	**-**	**-**	**16**	**11**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Ability to understand the wider implication of design decisions and their inter dependency with larger processes of society	**K3**
	CO2 Ability to take creative, critical and informed decisions in the context of significant projects that could shape society in positive ways	**K3**
	CO3 Ability to understand and handle a wide campus design	**K4**
	CO4 An understanding of new trends and technology in building designing	**K5**
	CO5 Exposure of advance building material and usage in the field of Architecture	**K5**

Content

- Architecture as a discipline balances many concerns in the creation of buildings. However, it also represents ideas and production reacting to/ reinforcing/ anticipating/ transforming specific aspects of the existing world towards a more desirable future. This could spring from individual perspectives as well as through concerted efforts which then become movements. Architecture can thus seek to understand, reflect, strengthen, question, change status . The process of design can thus offer a possible, intended future.

- Projects/ design situations will be given in this regard which address issues/ programme of current society with a larger impact in terms of scale or importance. Different realms/ aspects of contemporary life can be explored. Some possible projects/ area of inquiry are institutional campuses of significance, mixed use projects involving diverse user groups, culturally and socially important buildings, urban life, technological developments, culture, globalization, place, meaning, identity, appropriate architecture, etc.,

- Suitable processes can be engaged for critical and creative thinking which could include wide and interdisciplinary reading to take critical positions, contemporary processes such as mapping and diagramming, methods related to social, technical or empirical aspects, etc.,
- The particular line of thought will be taken through to completion through the processes. It is preferable to have one major project with small exercises under it if required.

Lecture Periods:-	**Tutorial Periods:-**	**Practical Periods:-240**	**Total Periods: 240**

Text Books

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.

Reference Books

1. Mitchell WJ, 'Imagining MIT: Designing a campus for the 21st century', MIT Press, 2007.
2. Himanshu Burte, 'Space for Engagement', Seagull Books, 2008.
3. Mark Garcia, 'The Diagrams of Architecture', Wiley 2010.
4. Bjarke Ingels, 'Yes is more', Taschen, 2009.
5. Steven Holl, Juhani Pallasmaa, Alberto Pérez Gómez, 'Questions of perception: Phenomenology of Architecture', William Stout, 2006.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-
2	1	1	-	2	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-
4	1	1	-	-	-	-	-	-	-	-	-
5	1	1	-	1	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment tool	**Weight age**	**Split up of marks**		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VIII**	Course Category : **PC**				End Semester Exam Type: **ST**		
Course Code	**U23PT0837**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Professional Training**	**-**	**-**	**-**	**26**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 An overall idea of the nuances of architectural practice.	**K3**
	CO2 An understanding about the total process that goes into the making of a building.	**K3**
	CO3 Maturity in using the experience gained from internship in the thesis project.	**K3**
	CO4 Ability to understand the live project and execution in the site.	**K4**
	CO5 An understanding on preparing an estimation and Cost cutting in live project.	**K6**

Content

- Practical Training will be done in offices/ firms in India, empaneled by the institution, in which the principal architect is registered with the Council of Architecture.
- The student will attempt to learn as much of aspects outlined in the objectives, either first hand or indirectly.
- The progress of practical training will be assessed periodically internally through submission of log books along with work done by the students in terms of drawings, reports, etc., along with the regular progress report from the employers.
- The students will be evaluated based on the criteria related to their contribution in the office some of which are given below.
- Understanding and involvement in the process of architectural practice as mentioned in the Objectives within the scope of the specific office in which training is undertaken.
- Adherence to time schedule, overall responsibility and professional conduct.
- Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings and skill in this regard.
- Ability to work as part of a team in an office and contribute to related activities.
- Ability to participate in client meetings and discussions.
- Involvement in supervision at project site.
- Involvement/ initiative/ participation in any other aspects during the course of the training.
- At the end of the Practical Training, a portfolio of work done during the period of internship along with certification from the office should be submitted for evaluation through a viva voce Examination.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**								**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	-	2	-	3	3	-	-	-
2	1	2	-	-	2	-	3	3	-	-	-
3	1	2	-	-	2	-	3	3	-	-	-
4	1	2	-	-	2	-	3	3	-	-	-
5	1	2	-	-	2	-	3	3	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment Tool	**Weightage**	**Split up of Marks**	
		Internal	**External Viva-voce**
Total in-semester Assessment	100%	45 + 5 for attendance (100 reduced to 45)	50 (100 reduced to 50)

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**IX**	Course Category: **HS**				End Semester Exam Type: **TH**		
Course Code	**U23TH0938**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Human Settlement and Planning**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	To understand the morphology of settlements and their generating forces and characteristics	**K1**
	CO2	An understanding of the role of planning processes in making positive changes to settlements.	**K1 K2**
	CO3	An understanding of rural and regional development in India**.**	**K1**
	CO4	Ability to understand the Urban Planning and Urban development**.**	**K1**
	CO5	Awareness of planning interventions with respect to the current world.	**K1 K2**

UNIT - I	**Introduction to Human Settlements**	**Periods: 9**	
- Introduction to planning as a discipline and brief evolution of the profession. - Elements of human settlements - Human beings and settlements - Nature, shells and networks-their functions and linkages. Anatomy and classification of human settlements - locational, resource based, population size and occupational structure.			**CO1**
UNIT - II	**Forms of Human Settlements**	**Periods: 9**	
- Linear, non- linear and circular, combinations. - Reasons for development - Advantages and disadvantages. Case studies - Factors influencing the growth and decay of human settlements.			**CO2**
UNIT - III	**Rural and Regional Development in India**	**Periods: 9**	
- Rural development plans, programme and policies from case studies - Regional Plan - Area delineation, land utilization plan, hierarchical system of settlements, their sizes and functions.			**CO3**
UNIT - IV	**Urban Planning and Urban Renewal**	**Periods: 9**	
- Introduction to urban planning in India - Scope, content and limitations of masterplan - Structure plan, DDP/ZDP, planned unit development - Development control rules. Urban renewal, redevelopment, rehabilitation and conservation. Urban development projects – case studies.			**CO4**
UNIT - V	**Aspects in Contemporary Urban Planning in India**	**Periods: 9**	
- Globalization and its impact on cities - Sustainable planning concepts - New forms of developments, to include self-sustained communities, SEZ, transit oriented development (TOD), integrated townships, and smart cities. Case studies.			**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. C.L.Doxiadis, Ekistics, 'An Introduction to the Science of Human Settlements', Hutchinson, London,1968.
2. Thooyavan K R, 'Human Settlements- A Planning guide to Beginners', M.A. Publications,2005.
3. Ministry of Urban affairs and Employment, Government of India, New Delhi, 'Urban Development Plans: Formulation and Implementation-Guidelines',1996.
4. Andrew D Thomas, 'Housing and Urban Renewal', Harper Collins,1986.

Reference Books

1. S. B. Golahit, 'Rural Development Programmes In India', Neha Publishers & Distributors,2010.
2. 'CMDA Second Master Plan for Chennai Metropolitan Area 2026: Vision, Strategies andAction Plans (Vol.I, II &III)', Chennai, India,2008.
3. V. Nath, 'Regional Development And Planning In India', Neha Publishers & Distributors,2009.
4. Government of India, 'Report of the National Commission on Urbanisation',1988.
5. Hansen N., 'Regional Policy and Regional Integration', Edward Elgar, UK,1996.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-
2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	1	-	1	1	-	-	-	-	-	-	-	-	-	-
5	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**IX**	Course Category: **PC**				End Semester Exam Type: **TH**		
Course Code	**U23TH0939**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Urban Design**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Awareness of the evolution and characteristics of urban forms, their components and Inter- dependencies.	**K1**
	CO2	Understanding of Modern urbanism.	**K1**
	CO3	Understanding of urbanism through theories, aspects, issues and solutions.	**K1 K2**
	CO4	Understanding contemporary urbanism and Urban interventions.	**K1**
	CO5	Knowledge of ways to look at and interpret urbanism today.	**K1 K2**

UNIT - I	**Urbanism in History**	**Periods: 10**

- Outline of forces shaping urbanism
- Urbanism of river valley civilizations
- Morphology of pre-industrial European cities to include Greek and Roman cities, medieval European towns, Renaissance urbanism and ideal cities
- Outline of historic cities of India
- Temple town urbanism of Tamil Nadu
- Mughal city form
- Medieval cities of India
- Colonial urbanism in India.

CO1

UNIT - II	**Modern Urbanism**	**Periods: 10**

- Industrialization and impact on urbanism
- American grid iron planning
- Theories, ideas and practice of good urban planning/cities/urbanism in early 20thcentury.Outline of modernist cities and urbanism across the world. **Morphology of Indian modernist cities**
- Chandigarh, Bhuvaneshwar and Gandhi Nagar. **Components of modern urbanism**
- Blocks, density, neighborhood, streets etc., and the inter dependencies- Evolution of urban design as a discipline, its scope and objectives.

CO2

UNIT - III	**Cities and Urbanism through Texts and Theories**	**Periods: 10**

Introduction to and discussion of key texts and theories of cities and urbanism

- Imageability and Lynch, Townscape and Cullen, Genius Loci and Schulz, historic city and Rossi
- Social aspects of urbanism and the works of Jane Jacobs, William Whyte and Jan Gehl, Collage City and Colin Rowe, current theories and texts.

CO3

UNIT - IV	**Contemporary Urbanism and Urban Interventions**	**Periods: 7**

- Understanding aspects, issues and solutions related to urbanism today through study of literature and best practices/case studies in urban design
- Topics to include urban decay, change and renewal, place making, heritage, conservation, identity, suburban sprawl, gated communities, generic form, privatization of public realm, role of real estate, transportation, zoning, globalization, technology, digital age, sustainability, community
- Participation, gender, class, power.

CO4

UNIT - V	**Urban Studies**	**Periods: 8**

- Introduction to study and interpretation of cities (especially Indian) through understanding published studies/ analysis
- The focus will be on components/aspects as well as tools/ methods. Tools and methods to include different types of maps/mapping, drawings, sketches, photo documentations, reading, data collection, analysis
- Aspects to include topography, geology, hydrology, micro climate, vegetation, urban density, growth, city limits/boundaries, history, urban architecture, typologies, infra- structure, land parcels, public space, demographics, patterns of usage, land use.
-

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

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 UrbanDesign', Routledge,2014

Reference Books

1. Jonathan Barnett, 'An Introduction to Urban Design', Harper Row,1982.
2. Lawrence Halprin, 'Cities', Reinhold Publishing Corporation, New York,1964.
3. Gosling and Maitland, 'Concepts of Urban Design', St. Martin's Press,1984.
4. Malcolm Moor, 'Urban Design Futures', Routledge,2006.
5. Geoffrey Broadbent, 'Emerging Concepts in Urban Space Design', Taylor & Francis,2003.
6. AnuradhaMathu, 'Deccan Traverses', Rupa, 2006.
7. Strom Steven, 'Site Engineering for Landscape Architects',John Wiley and Sons Inc.,2004.
8. T.K. Bose and Chowdhury, 'Tropical Garden Plants in Colour', Horticulture and Allied Publishers, Calcutta,1991.
9. Rahoul B Singh, 'Gardens of Delight- Indian Gardens through the Ages', LustrePress, Roli Books,2008.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**IX**	Course Category: **HS**				End Semester Exam Type: **TH**		
Course Code	**U23TH0940**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Urban Housing**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Knowledge of professional code of conduct and ethics.	**K1 K2**
	CO2	Knowledge of various issues concerning housing & housing development in Indian & Global context covering a cross section of income groups.	**K1 K2**
	CO3	Ability to appreciate socio-economic aspects in housing.	**K1 K2**
	CO4	An understanding of housing standards, site planning principles, housing concepts and types.	**K1**
	CO5	An understanding of key issues in housing today.	**K1**

UNIT - I	**Introduction to Architectural Profession Code of Conduct and Ethics**	**Periods: 11**

- Housing and its importance in architecture, its relationship with neighborhood and city planning.
- Housing demand and supply
- National Housing Policy
- Housing agencies and their role in housing development
- Impact of life style. Rural Housing
- Public and private sector housing.

CO1

UNIT - II	**Socio-Economic Aspects**	**Periods: 9**

- Economics of housing.
- Social economic factors influencing housing affordability.
- Formal and informal sector.
- Equity in housing development.
- Sites and services.
- Slum housing, upgradation and redevelopment.
- Low Cost Housing.
- Health principles in housing.
- Legislation for housing development.
- Cost-effective materials and technologies for housing. Case studies in India and developing countries.

CO2

UNIT - III	**Housing Standards**	**Periods: 9**

- UDPFI guide lines, standard and regulations
- DCR
- Performance standards for housing.

CO3

UNIT - IV	**Site Planning and Housing Design**	**Periods: 9**

Site Planning for housing

- Selection of site for housing, consideration of physical characteristics of site, location factors, orientation, climate, topography, landscaping. Integration of services and parking.

Housing design relating to Indian situations

- Traditional housing, row housing, cluster housing, apartments, high-rise housing. Case studies in India of the various types.

CO4

UNIT - V	**Current Aspects and Issues in Housing**	**Periods: 7**

- Green building and sustainable practices
- Disaster resistance and mitigation.
- Prefabrication Community participation.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Christopher Alexander, 'A Pattern Language', Oxford University press, New York1977.
2. Leuris S, 'Front to back: A Design Agenda for Urban Housing', Architectural Press,2006.
3. S.K.Sharma, 'Mane A New Initiative in Public Housing', Housing & Urban Development Corporation,1991.
4.

Reference Books

1. Richard Kintermann and Robert Small, 'Site Planning for Cluster Housing', Van Nostrand Reinhold Company, London/New York,1977.
2. Joseph de Chiara et al, 'Time Saver Standards for Housing and Residential Development', McGraw Hill Co, New York,1995.
3. Forbes Davidson and Geoff Payne, 'Urban Projects Manual', Liverpool University Press, Liverpool1983.
4. HUDCO Publications, 'Housing for Low Income, Sector Model'.
5. 'Sustainable Building Design Manual: Vol 1 and 2',The Energy Research Institute,2004.
6. A.K.Lal, 'Handbook of Low Cost Housing', New Age International Private Limited,1995.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**IX**	Course Category : **PC**			End Semester Exam Type:**ST**			
Course Code	**U23TH0941**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Urban Design Studio**	**0**	**0**	**16**	**14**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Ability to observe and analyses the urban environment.	**K3**
	CO2	Ability to include the transportation nodes, heritage areas, adaptive reuse, suburban sprawl, place making.	**K3 K4**
	CO3	Understanding of this aspect of architecture will be achieved by architectural projects involving interdependencies between architecture and the city.	**K3 K4**
	CO4	Describe characteristics of semiconductor diode and utilize it for different applications	**K3 K4**
	CO5	Ability to bring inclusivity into the architectural design process**.**	**K3 K4**

Content

1. Urbanism is a dynamic phenomenon involving many aspects - urban growth, land use distribution and change, urban form, demographics including gender and class, cultural aspects such as place and heritage physical infrastructure such as roads and transportation nodes, public spaces etc.,
2. Architecture is an integral and large part of urbanism, shaping and being shaped by it. It can serve to include/ gather society and enrich the urban environment in a seamless manner. Understanding of this aspect of architecture will be achieved by architectural projects involving interdependencies between architecture and the city.
3. Some of the issues and areas that could be addressed are- transportation nodes, heritage areas, adaptive reuse, suburban sprawl, place making, identity, collective memory, mixed use programming, large scale urban interventions, revitalization and renewal of urban fragments, urban waterfront development, urban nodes, multiuse urban complexes.
4. The tools and techniques can include contemporary ways/ tools of perceiving, gathering and analyzing data, inclusive, collaborative and participatory approaches, etc., It is preferable to have one major project with small exercises under it if required.

PRE-THESIS WORK

Students should choose a topic of their choice in terms of design potential and/ or idea exploration to be taken up for completion. The topic could be project based with specific areas of study/ approach or study/ approach based leading to a project. If the latter, care should be taken to choose topics that can lead to sufficient architectural design component.

Students should submit the topic for approval with a rough outline of the nature of the project, area of interest, study and design scope, challenges, possible case studies, methodology and outcome. The areas of study/research/design can include any of the broad areas of the discipline - contemporary needs of society, history, theory, sustainability, structural or service oriented design, projects that involve complex planning and integration of several aspects, appropriate architecture, urban design, contemporary processes, social housing, urban oriented architectural design, conservation oriented architectural design, etc.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 240**	**Total Periods: 240**

Text Books

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', Routledge2015.
4. Jan Gehl, 'Life between Buildings- Using Public Space', ArkitektensForleg1987.
5. 'Time Savers Standard for Urban Design', Donald Watson, McGraw Hill,2005.
6. Malcolm Moore & Jon Rowland Eds, 'Urban Design Futures', Routledge,2006.

References

1. Michelle Provoost et al., 'Dutchtown', NAI Publishers, Rotterdam,1999.
2. Lawrence Halprin, 'Cities', Reinhold Publishing Corporation, New York,1964.
3. Gosling and Maitland, 'Urban Design', St. Martin's Press,1984.
4. Kevin Lynch, 'Site Planning', MIT Press, Cambridge1967.
5. Jeremy Till et al, 'Spatial Agency: Other Ways of Doing Architecture', Routledge,2011.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	3	-	1	-	-	-	-	-	-	-	-	-
2	1	2	-	3	-	1	-	-	-	-	-	-	-	-	-
3	1	2	-	3	-	1	-	-	-	-	-	-	-	-	-
4	1	2	-	3	-	1	-	-	-	-	-	-	-	-	-
5	1	2	-	3	-	1	-	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment tool	Weight age	Split up of marks		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**					
Semester	**X**	Course Category: **PC**				End Semester Exam Type: **TH**	
Course Code	**U23TH1042**	Periods/Week			Credit	Maximum Marks	
		L	T	P	C	CAM	ESE	TM
Course Name	**Disaster Management Architecture**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1	The students will be able to differentiate the types of disasters, causes and their impact on environment and society.	**K1 K2**
	CO2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.	**K1 K2**
	CO3	Understanding of inter-relationship between disasters and development.	**K1 K2**
	CO4	Understanding of disaster risk –management in India.	**K1**
	CO5	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.	**K2 K3**

UNIT - I	**INTRODUCTION TO DISASTERS**	**Periods: 9**

- Definition: Disaster, Hazard, Vulnerability, Resilience, Risks
- Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc– Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial,etc.
- Differential impacts- in terms of caste, class, gender, age, location, disability
- Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Do's and Don'ts during various types of Disasters.

CO1

UNIT - II	**APPROACHES TO DISASTER RISK REDUCTION (DRR)**	**Periods: 9**

- Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural-nonstructural measures
- Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Institutional Processes sand Framework at State and Central Level
- State Disaster Management Authority (SDMA)
- Early Warning System – Advisories from Appropriate Agencies.

CO2

UNIT - III	**INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT**	**Periods: 9**

- Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc
- Climate Change Adaptation
- IPCC Scenario and Scenarios in the context of India.
- Relevance of indigenous knowledge, appropriate technology and local resources.

CO3

UNIT - IV	**DISASTER RISK MANAGEMENT IN INDIA**	**Periods: 9**

- Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmers and legislation.
- Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

CO4

UNIT - V	**DISASTER MANAGEMENT: APPLICATIONS AND CASESTUDIESAND FIELD WORK**	**Periods: 9**

- Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Singhal J.P. “Disaster Management”, Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN- 13:978-9380386423
2. Tushar Bhattacharya, “Disaster Science and Management”, McGraw Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367,ISBN-13:978-1259007361]
3. Gupta Anil K, SreejaS. Nair. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi,2011
4. KapurAnu Vulnerable India: A Geographical Study of Disasters, IIAS and Sage Publishers, New Delhi,2010.

Reference Books

1. Govt. of India: Disaster Management Act, Government of India, New Delhi,2005
2. Government of India, National Disaster ManagementPolicy,2009.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**X**	Course Category : **PAEC**			End Semester Exam Type: **ST**			
Course Code	**U23ST1043**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Architectural Thesis**	**0**	**0**	**36**	**23**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Skill, knowledge and expertise in the domain of architectural design.	**K2 K3**
	CO2	Ability to study/research/design can include any of the broad areas.	**K3**
	CO3	Ability to present the thought process an ideas using the software's tools	**K3 K4**
	CO4	Ability to design a complex project like social housing, urban oriented design.	**K3 K4**
	CO5	Ability to handle a major architectural project independently through all stages	**K4 K5**

Content

1. Students should choose a topic of their choice in terms of design potential and/ or idea exploration to be taken up for completion. The topic could be project based with specific areas of study/ approach or study/ approach based leading to a project. If the latter, care should be taken to choose topics that can lead to sufficient architectural design component.
2. Students should submit the topic for approval with a rough outline of the nature of the project, area of interest, study and design scope, challenges, possible case studies, methodology and outcome.
3. The areas of study/research/design can include any of the broad areas of the discipline – contemporary needs of society, history, theory, sustainability, structural or service oriented design, projects that involve complex planning and integration of several aspects, appropriate architecture, urban design, contemporary processes, social housing, urban oriented architectural design, conservation oriented architectural design,etc.
4. The progress of work will be reviewed periodically throughout the semester. At the end of the semester, students should submit the final thesis project for the viva voce exam. The final submission will comprise of study sheets, optional study models, design approach sheets, optional design process models, design presentation sheets, final model, detailed drawings of an important part of the project, project report summarizing the entire thesis work and soft copy of all the work.

Lecture Periods: -	**Tutorial Periods: -**	**Practical Periods: 540**	**Total Periods: 540**

Text Books

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

References

1. Stephen A. Kliment, Editor 'Building Type Basics' Series,Wiley.
2. Igor Marjanović, KaterinaRüediRay,LesleyNaaNorleLokko, 'The Portfolio - An Architecture Student's Handbook', Routledge,2003.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
2	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
3	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
4	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-
5	1	2	-	3	-	-	1	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

<table>
<tr><th>Assessment tool</th><th>Weightage</th><th colspan="3">Remarks</th></tr>
<tr><td>Review 1</td><td>5 marks</td><td colspan="3"></td></tr>
<tr><td>Review 2</td><td>10 marks</td><td colspan="3"></td></tr>
<tr><td>Review 3</td><td>10 marks</td><td colspan="3"></td></tr>
<tr><td>Review 4</td><td>10 marks</td><td colspan="3"></td></tr>
<tr><td>Internal Review</td><td>10 marks</td><td colspan="3"></td></tr>
<tr><td>Total in-semester assessment</td><td>45%(100 reduced to 45)</td><td colspan="3">45% + 5% for attendance</td></tr>
<tr><td rowspan="3">End semester viva-voce</td><td rowspan="3">50% (100 reduced to 50)</td><td colspan="3">Split up of marks</td></tr>
<tr><td>Concept</td><td>Design Development</td><td>Presentation</td></tr>
<tr><td>15</td><td>20</td><td>15</td></tr>
</table>

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V**	Course Category: **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0500**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Theory of Design /Professional Elective - I**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Ability to think about architecture as one of the many fields under the broader ambit of design as a fundamental human activity	**K1 K2**
	CO2 Self-awareness with respect to the creative process	**K1 K2**
	CO3 Ability to engage different processes to give creative output	**K1 K2**
	CO4 An understanding of architectural concepts - programmatic, analogic, metaphor, essence, etc	**K1 K2**
	CO5 An Detailed Understanding of Process in Designing	**K1 K2 K3**

UNIT - I	**Introduction to Design**	**Periods: 7**
- Definition and understanding of design. - History of design process from earliest times through Renaissance, Beaux Arts, Bauhaus. Different classifications of design according to scale, process, mode of production, etc., - self- conscious/ unselfconscious, design through drawing/ design through craft, pragmatic/ iconic/ analogic/ canonic or syntactic, handmade/ machine made, product design to city design, functional/ aesthetic, nature vernacular/technological.		**CO1**
UNIT - II	**Design Methodology Movement**	**Periods: 10**
- Context for the rise of the design methodology movement from the 1950s with the critique of modernism. - Theories of the first generation and the second-generation design methodologists. - Design as wicked problem. - Escalation and regression in Design. - Summary by Johnson of various models of the design process - parametric or analysis/ synthesis/ evaluation, conjecture-refutation, paradigmatic, hermeneutical.		**CO2**
UNIT - III	**Creative Thinking**	**Periods: 10**
- Understanding the term creativity. - Theories on thinking - left brain/ right brain, convergent/ divergent thinking, lateral/vertical thinking. - Broadbent's idea of the design spectrum - from the logical to chance. - Blocks in creative thinking. - Techniques to generate creativity as put forth by Broadbent, Bono.		**CO3**
UNIT - IV	**Architectural Creativity**	**Periods: 8**
- Types of architectural concepts - programmatic, analogic, metaphor, essence,etc., - Channels to creativity in architecture as put forth by Antoniades. - Personal philosophies and strategies of individual designers.		**CO4**
UNIT - V	**Process and Design**	**Periods: 10**
- People and design process- concept of pattern language by Christopher Alexander, participatory approach to design, design as process involving time and people. - Introduction to contemporary processes in design including diagramming, mapping, parametric exploration,etc.,		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Geoffrey Broadbent, 'Design in Architecture - Architecture and the Human Sciences', John Wiley & Sons, New York,1981.
2. Bryan Lawson, 'How Designers Think', Architectural Press,2005.
3. Anthony Antoniades, 'Poetics of Architecture- Theory of Design',VNR,1992.
4. Edward De Bono, 'Lateral Thinking- Textbook of Creativity', Penguin Books,1990.
5. Christopher Alexander, 'A Pattern Language', Oxford University Press,1977.
6. James C. Snyder, Anthony J. Catanese, Timothy L. McGinty, 'Introduction to
7. Architecture', McGraw Hill,1979.
8. Mark Garcia, 'The Diagrams of Architecture', Wiley2010.
9. C. Thomas Mitchell, 'Redefining Designing: From Form to Experience', Van Nostrand Reinhold, 1992.

Reference Books

1. Victor Papanek, 'Design for the Real world, Human Ecology and Social Change', Chicago Review Press,2005.
2. Paul Alan Johnson, 'Theory of Architecture- Concepts, Themes, Practices', VNR;1994.
3. Christopher Jones, 'Design Methods', John Wiley and Sons;1980.
4. Tom Heath, 'Method in Architecture', John Wiley & Sons, New York,1984.
5. Nigel Cross, 'Developments in Design Methodology', John Wiley & Sons,1984.
6. James L. Adams, 'Conceptual Blockbusting', Basic Books,2001.

Jeremy Till et al, 'Spatial Agency: Other Ways of Doing Architecture', Routledge,2011.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V**	Course Category: **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0501**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Vernacular Architecture /Professional Elective - I**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 An understanding of Indian vernacular architecture as a process and to also provide an overview of various approaches and concepts towards its study	**K1 K2**
	CO2 Knowledge of vernacular architectural forms in different regions	**K1 K2**
	CO3 An understanding of the impact of colonial rule on vernacular architecture in India	**K1 K2**
	CO4 An understanding of vernacular architecture of south India	**K1 K2**
	CO5 An understanding of western influences on vernacular architecture of India	**K1 K2**

UNIT - I	**Introduction**	**Periods: 7**
- Definition and classification of vernacular architecture. Vernacular architecture as a process. - Methodology for survey and study of vernacular architecture. Overview of cultural and contextual responsiveness of vernacular architecture.		**CO1**
UNIT - II	**Approaches and Concepts**	**Periods: 9**
- Overview of different approaches and concepts to the study of vernacular architecture. - Aesthetic, architectural and anthropological studies in detail.		**CO2**
UNIT - III	**Vernacular Architecture of Western and Northern**	**Periods: 11**
- Forms,spatialplanning,culturalaspects,symbolism,colour,art,materialsofconstruction and construction technique of the vernacular architecture of the deserts of Kutch and Rajasthan (including havelis of Rajasthan), rural and urban Gujarat (including wooden mansions/ havelis in general and that of the Bohra Muslims) and geographical regions of Kashmir (including houseboats).		**CO3**
UNIT - IV	**Vernacular Architecture of South India**	**Periods:8**
- Forms, spatial planning,culturalaspects,symbolism,art,colour,materialsofconstruction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of Kerala (including houses of the Nair & Namboothri community, Koothambalamand Padmanabhapuram palace) and Tamil Nadu (including houses and palaces of the Chettinad region,agraharams)		**CO4**
UNIT - V	**Western Influences on Vernacular Architecture in India**	**Periods: 10**
- Colonial influences on the traditional Goan house. - Evolution of the bungalow from the traditional bangla, Victorian villas. Planning principles and materials and methods of construction of the bungalow. - Settlement pattern and house typologies of Pondicherry and Cochin.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Paul Oliver, 'Encyclopedia of Vernacular Architecture of the World', Cambridge University Press,1997.
2. Amos Rapoport, 'House, Form & Culture', Prentice Hall Inc.1969.

R W Brunskill, 'Illustrated Handbook on Vernacular Architecture', Faber & Faber;1970

Reference Books

1. V.S. Pramar, 'Haveli – Wooden Houses and Mansions of Gujarat', Mapin,1989.
2. Kulbushanshan Jain and Minakshi Jain, 'Mud Architecture of the Indian Desert', Aadi Centre, Ahmadabad,1992.
3. G.H.R.Tillotson,'TheTraditionofIndianArchitecture:Continuity,Controversy,Change since 1850', Oxford University Press, Delhi,1989.
4. Carmen Kagal, 'Vistara- The Architecture of India', The Festival of India,1986.
5. S. Muthiah et al, 'The Chettiar Heritage', Chettiar Heritage2000.
6. Weber.W&Yannas.S, 'Lessons from Vernacular Architecture', Routledge,2014.

Bernard Rudofsky, 'Architecture without Architects', MoMA,1964.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V**	Course Category: **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0502**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Art Appreciation /Professional Elective - I**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 An understanding and appreciation of art as basic and varied human creation related to cognition and experience	**K1 K2**
	CO2 Awareness of important art productions in the West and	**K1 K2**
	CO3 Sensitivity towards collective and individual cultural productions as unique expressions of historical and geographic context	**K1 K2**
	CO4 An understanding of context for the major changes in art from late 19th century and the birth of modern art	**K1 K2**
	CO5 An understanding of Modern Art	**K1 K2**

UNIT - I	**Introduction to Art**	**Periods: 7**
	- Definition of art, need for art, role of art. Art, reality, perception, representation. - Categoriesofartintermsofmediaandtechnique.Howtoappreciateartintermsofform, content and context.	**CO1**
UNIT - II	**Vocabulary Art**	**Periods: 8**
	- Introduction to the vocabulary of art constituted by elements (line, shape, form, space, color, light, value, texture) and principles (unity, variety, harmony, rhythm, balance, proportion, emphasis, contrast, movement). - Appreciation of art with respect to all the above through examples.	**CO2**
UNIT - III	**Beginnings of Western Art to Modern Art**	**Periods: 10**
	- Outline of art in the West from the beginnings to the birth of modern art. - Important works from the following art traditions will be understood and appreciated in terms of their form, content and context: Prehistoric Art, Egyptian and Mesopotamian art, Greek and Roman art, Medieval art, Renaissance and Baroque art, Neoclassicism, Romanticism, Realism.	**CO3**
UNIT - IV	**Modern Art and After**	**Periods: 11**
	- Outline of the context for the major changes in art from late 19th century and the birth of modern art. - Important works from the following movements will be understood and appreciated in terms of their form, content and context: Impressionism, Post Impressionism, Fauvism, Expressionism, Modern art, Abstract/ Non-Objective art, Cubism, Dadaism, Surrealism, Futurism, Constructivism, Suprematism, DeStijl, - Abstract Expressionism, Pop art, Op art. Outline of new forms and media in art from mid 20thcentury.	**CO4**
UNIT - V	**Indian Art**	**Periods: 9**
	- Outline of art in India over history. Important works from the following art traditions and movements will be understood and appreciated in terms of their form,content and context: - Indus Valley art, Hindu, Buddhist and Jain art, Mughal and Rajput miniature art, art during the colonial period, modern Indian art, contemporary directions	**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Fred, S. Kleiner, 'Gardener's Art through Ages', Wadsworth Publishing,2012.
2. Bernard S. Myers, 'Understanding the Arts', Holt Rinehart and Winston Inc,1964.
3. H.H. Arnason, 'History of Modern Art', Thames and Hudson,1977.
4. ParthaMitter, 'Indian Art', Oxford University Press,2001.
5. Edith Tomory, 'A History of Fine Arts in India and the West', Orient Blackswan,1989.

Reference Books

1. Peter and Linda Murray, 'The Penguin Dictionary of Art and Artists', Penguin,1989.
2. E.H. Gombrich, 'The Story of Art', Phaidon,2002.
3. E.H. Gombrich, 'Art and Illusion', Phaidon,2002.

4. 'Indian Art since the early 1940s- A Search for Identity', Artists Handicrafts Association of Cholamandal Artists Village,Madras,1974.
A.K.Coomaraswamy, Fundamentals of Indian Art, Historical Research Documentation Programme, Jaipur,1985.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V**	Course Category: **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0503**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Human Behavior and Built Environment /Professional Elective - I**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 An understanding of the relationship between human behaviour and built environment.	**K1 K2**
	CO2 Knowledge about various terms and aspects related to human behaviour.	**K1 K2**
	CO3 An ability to study physical situations with respect to human behavior	**K1 K2**
	CO4 Sensitivity to apply knowledge of human behaviour in design situations	**K1 K2**
	CO5 An understanding human behaviour with assessment of spaces.	**K1 K2**

UNIT - I	**Introduction to Environmental Psycology**	**Periods: 8**	
- Introduction to the term environmental psychology as relation between human behaviors and natural and built environment. Interdisciplinary and multidisciplinary aspect of environmental psychology. Outline of history of study of human behaviors with respect to context.			**CO1**
UNIT - II	**Environmental Perception and Cognition**	**Periods:9**	
- Theories of environmental perception. Gestalt Theory. Perception and cognition of natural and built environment. Cognitive maps and way finding in larger built environment.			**CO2**
UNIT - III	**Environment and Behavior**	**Periods: 10**	
- Proxemics, Personal space. Defensible space. Territoriality. Privacy. Ambient Environment. Stress. Density. Crowding. Behaviour Setting. Patterns and activities. Archetypical spaces. Place identity and place attachment. Human behaviour in different contexts with- nature, residential, work, urban public space, city, etc., Human behaviour and geometry of spaces/ buildings. Exercise for the above.			**CO3**
UNIT - IV	**Environment Behavior Studies and Design**	**Periods: 10**	
- Environment behaviour studies. Methods of study such as physical traces, observation, interviews, self-reporting, experimental methods, mock up, post occupancy evaluation. Methods and case studies to apply environment-behaviour studies in design.			**CO4**
UNIT - V	**Built Environmental Studies**	**Periods: 8**	
- Bakers ecological psychology approach. Environment and behavior studies related to noise, Weather, Climate, Territoriality, Disasters, Crowding. Issues related to built environment like design of residential, work, learning and leisure environment. Exercise for the above.			**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Francis Andrew, 'Environmental Psychology', Wadsworth, 1993.
2. John Zeisel 'Enquiry by Design: Tools for Environment-Behaviour Research', Cambridge University Press, 1984.
3. Robert Bechtel, 'Enclosing Behaviour', John Wiley, 1977.
4. Clovis Heimsath, 'Behavioural Architecture', McGraw Hill, 1977.
5. Gwen Bell, Edwina Randall, 'Urban Environment and Human Behaviour'- An Annotated Bibliography', Dowden Hutchinson Ross, 1973

Reference Books

1. Robert Gifford, 'Environmental Psychology: Principles and Practice', Optimal Books, 2007.
2. RikardKuller, 'Architectural Psychology', McGraw Hill, 1978.
3. Robert Sommer, 'The Behavioural Basis of Design', Englewood Cliffs, 1969. 4. Christopher Alexander, 'A Pattern Language', Oxford University Press, 1977

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
2	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
3	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
4	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
5	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

<table>
<tr><td rowspan="2">Assessment</td><td colspan="4">Continuous Assessment Marks (CAM)</td><td>End Semester Examination (ESE) Marks</td><td>Total Marks</td></tr>
<tr><td>CAT 1</td><td>CAT 2</td><td>Model Exam</td><td>Attendance</td><td rowspan="2">50</td><td rowspan="2">100</td></tr>
<tr><td>Marks</td><td colspan="3">45
(Best of 2 from 3 Test,200 marks reduced to 45 marks)</td><td>5</td></tr>
</table>

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**VI**	Course Category : **EL-2**				End Semester Exam Type:**TH**		
Course Code	**U23EL0604**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Interior Design / Professional Elective - II**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	An understanding of interior design as an integral part of architecture and as an Interdisciplinary and allied field related to architecture	**K1 K2**
	CO2	An overall exposure to the ways in which interior spaces can be enriched through the design of specific interior components	**K1 K2**
	CO3	An understanding of interior treatment and finishes in the experience of interior spaces	**K1 K2**
	CO4	An understating of interior elements and spaces	**K1 K2**
	CO5	Ability to design interior spaces	**K1 K6**

UNIT - I	**Interior Spaces and Furniture Across History**	**Periods: 11**
- 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.		**CO1**
UNIT - II	**Introduction to Interior Design**	**Periods: 7**
- 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, color, light, pattern, texture) and principles (balance, proportion, scale, rhythm, hierarchy unity, contrast, harmony, emphasis, movement) with specific reference to examples from interior design.		**CO2**
UNIT - III	**Components of Interior Space–I**	**Periods: 9**
- 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, color, texture. - Study of representative examples.		**CO3**
UNIT - IV	**Components of Interior Space–II**	**Periods: 9**
- 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 artifacts. - Their physical properties and effects on spaces. Study of representative examples		**CO4**
UNIT - V	**Components of Interior Space–III**	**Periods: 9**
- 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. Study of representative examples.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Francis D.K.Ching, 'Interior Design Illustrated', John Wiley & Sons,2012.
2. Joseph DeChiara, Julius Panero, Martin Zelnik, 'Time Saver's Standards forInterior 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.
7. John F.Pile, Judith Gura, 'A History of Interior Design', Wiley,2013.

Reference Books

1. Helen Marie Evans, 'An Invitation to Design', Macmillan Pub Co,1982.
2. Julius Penero and Martin Zelnik, 'Human Dimensions and Interior Space', Whitney Library of Design,1979.
3. Kathryn B. Hiesinger and George H. Marcus, 'Landmarks of Twentieth Century Design; Abbey Ville Press,1995.
4. Susanne Slesin and Stafford Cliff, 'Indian Style', Thames andHudson,1990.
5. RosemaryKilmer,W.OtieKilmer,'ConstructionDrawingsandDetailsforInteriors: Basic Skills', John Wiley & Sons,2009.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B. Arch.**						
Semester	**VI**	Course Category : **EL-2**				End Semester Exam Type:**TH**		
Course Code	**U23EL0605**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Structure and Architecture / Professional Elective - II**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Familiarity with concepts of structural design and its influence on the functional and aesthetic domains of architectural design relating to historic and contemporary periods.	**K1 K2**
	CO2	Understanding of architectural expression and its relation to form, structure and changing technology	**K1 K2**
	CO3	Understanding on Contemporary examples with respect to parametric/ digital processes and innovative new materials	**K1 K2**
	CO4	Understanding of contemporary structural Expression through case studies	**K1 K2**
	CO5	Understanding of a study of architectural form and structural expression	**K1 K2**

UNIT - I	**Structural Design in the Pre-Industrial Era**	**Periods: 8**	
- Development of monolithic and rock cut structures. - Trabeated construction, arcuate construction, vaults and flying buttresses. - Tents and masted structures.			**CO1**
UNIT - II	**Structural Design in the Post-Industrial Period**	**Periods: 9**	
- Post Industrial modular construction of large span and suspension structures in steel and concrete - Projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen. Structure in DE constructivism - Structure and aesthetics. - Parametric/ digital processes and structure.			**CO2**
UNIT - III	**Contemporary Structural Expression through Case Studies-I**	**Periods: 10**	
- The select case studies would include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park, Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Norman Foster and Standsted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw.			**CO3**
UNIT - IV	**Contemporary Structural Expression through case Studies-II**	**Periods: 10**	
- The select case studies would include Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Renzo Piano Building Workshop. - Contemporary examples with respect to parametric/ digital processes and innovative new materials			**CO4**
UNIT - V	**Seminar**	**Periods: 9**	
- Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence			**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

4. Shigeru Ban, McQuaid, Matilda, 'Engineering and Architecture: Building the Japan Pavilion', Phaidon Press Ltd, UK, 2008.
5. 'Cox Architects'(The Millennium Series), Images Publishing Group, 2001. James B Harris, Kevin Li,
6. 'Masted Structures in Architecture', Routledge,20125. Aronson J,

Reference Books

1. PatrizioBertelli et al, 'Herzog & De Meuron: Prada Aoyama Tokyo', Fondazione Prada, 2004 Christopher Beorkrem,
2. 'Material Strategies in Digital Fabrication', Routledge, 2012 Angus J. Macdonald, Structure and Architecture, Architectural Press, 2001.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Semester	VI	Course Category : PE				End Semester Exam Type: TH		
Course Code	U23EL0606	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	Evolution of Human Settlements / Professional Elective - II	3	-	-	3	50	50	100

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Awareness of the nature and characteristics of human settlements	K1 K2
	CO2 An understanding of the evolution of human settlements and their shaping forces	K1 K2
	CO3 Familiarity with current aspects of settlements	K1 K2
	CO4 An understanding of modern and post modernism cities	K1 K2
	CO5 An understanding human settlements in a changing world	K1 K2

UNIT - I	ORIGIN OF HUMAN SETTLEMENTS AND EARLY SETTLEMENTS	Periods: 9

- Origins of civilizations.
- Elements and determinants of human settlements.
- Human settlements in the pre-historic period. Ancient river valley civilizations of Indus valley, Mesopotamia, Egypt and China with emphasis on the layout and patterns of the settlements and the influence of resources on them.

CO1

UNIT - II	PRE-INDUSTRIAL CITIES	Periods: 9

- Greek and Roman civilizations and their settlements-role of defense, politics, trade and other factorsinthedevelopmentofsettlementplanning.MedievalandRenaissancecitiesinEurope.
- City plans of Vienna, Amsterdam, Paris.
- Cities as expression of political power- Washington DC, Pretoria. Industrial revolution and its influence on cities.

CO2

UNIT - III	CITIES IN INDIA	Periods: 9

- Ancient town planning principles of India.
- Medieval Indian cities and factors that led to their development. Islamic and Mughal cities.
- Colonial urbanism including presidency towns, hill towns and cantonments.
- New Delhi as imperial power.

CO3

UNIT - IV	MODERN AND POSTMODERN CITIES	Periods: 9

- Contributions of Ebenezer Howard, Lewis Mumford, Patrick Geddes, C.A. Doxiadis. Visionary/ Utopian city concepts by Le Corbusier, Frank Lloyd Wright.
- ModerntownplanningprinciplesandexamplesincludingManhattanandNewTownmovement in Britain. Planning of the capital cities of Brasilia and Chandigarh.
- Postmodern Utopian vision of Archigram, Metabolism and Paolo Soleri.

CO4

UNIT - V	HUMAN SETTLEMENTS IN A CHANGING WORLD	Periods: 9

- Changing nature of human settlements today through case studies.
- Topics to include impact of global economy, trade, information and communication technology, sustainability.

CO5

Lecture Periods: 45	Tutorial Periods:-	Practical Periods:-	Total Periods: 45

Text Books

1. Mumford L, 'The City in History', Harcourt BraceInternational, 1968.
2. Morris AEJ, 'History of Urban form beforetheIndustrialRevolution', Rout ledge, 1994.
3. Spiro Kostof, 'The City Shaped: Urban Patterns and Meaning through History', Thames and Hudson, 1999.
4. Dutt B.B, 'Town Planning in Ancient India', Thacker Spink & Co., Calcutta, 1995.
5. 'Cities in a Globalizing World: Global Report on Human Settlements', United Nations Center for Human Settlements.

Reference Books

1. Spiro Kostof, 'The City Assembled: Elements of Urban form through History', Thames, and Hudson, 2005.
2. Simon Eisner, Arthur Gallion, Stanley Eisner, 'Urban Pattern', John Wiley & Son, 1999.
3. Comhaire J, 'How Cities Grew', Florham Park Press,1971.
4. Kosambi D.D, 'The Culture and Civilization of Ancient India in Historical Outline', Vikas, 1997.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Semester	VI		Course Category : **PE**			End Semester Exam Type:**TH**		
Course Code	**U23EL0607**		Periods/Week			Credit	Maximum Marks	
			L	T	P	C	CAM	ESE	TM
Course Name	**Technological Fabrication in Architecture / Professional Elective - II**		**3**	**-**	**-**	**3**	**50**	**50**	**100**
Course Outcomes	**On completion of the course, the students will be able to**							BT Mapping (Highest Level)	
	CO1	An understanding the evolution of digital fabrication						**K1**	
	CO2	Application of different methods of fabrication and the workability with materials						**K1**	
	CO3	Knowing the subtractive fabrication method in different scales						**K2**	
	CO4	An understanding of transformative fabrication and Digital Prototype						**K2**	
	CO5	An understanding of file to factory process						**K2**	

UNIT - I	**INTRODUCTION TO DIGITAL FABRICATION**	**Periods: 9**
- Introduction to Digital Fabrication - Advantages of Digital Fabrication - Evolution of digital fabrication in architecture - overview of the impact the technology - new realm of possibilities for architectural expression, Etc.		**CO1**
UNIT - II	**ADDITIVE FABRICATION**	**Periods: 9**
- 3d Printing - Process of 3d printing, its Possible Materials Etc. - Case studies of Application of 3d printing in practice at different scales.		**CO2**
UNIT - III	**SUBTRACTIVE FABRICATION**	**Periods: 9**
- Laser Cut - CNC Milling - Water Jet Cutting, Etc., it's Possible Materials Etc. - Case studies of Application of Subtractive Fabrication in practice at different scales.		**CO3**
UNIT - IV	**TRANSFORMATIVE FABRICATION**	**Periods: 9**
- Robotic Fabrication - Mechanically Transformative Process, Etc., it's Possible Materials Etc. - Case studies of Application of Transformative Fabrication in practice at different scales		**CO4**
UNIT - V	**FILE TO FACTORY PROCESS**	**Periods: 9**
- Preparation of File to Factory Process - Optimization of meshes/files, STL Formats, Etc.,		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Branko Kolarevic and Kevin Klinger, Manufacturing Material Effects: Rethinking Design and Making in Architecture, 2014
2. Digital Fabrication, Paul Andersen, David Salomon, Sanford Kwinter, David Carson, Architecture of Patterns, W. W. Norton & Co, 2010
3. Heino Engel, Structure Systems, 1997
4. Lisa Iwamoto, Digital Fabrications: Architectural and Material Techniques, Princeton: Princeton Architectural Press, 2009
5. Branko Kolarevic, Architecture in the Digital Age: Design and Manufacturing, London: Taylor & Francis 2005.

Reference Books

1. Bob Shiel, Ruairi Glynn, Fabricate: Making Digital Architecture, Toronto: Riverside Architectural Press, 2011.
2. Emergent Design Group, Morphogenetic Design Strategies AD, 2004 8. Farshid Moussavi, Daniel Lopez, Garrick Ambrose, Ben Fortunato, Ryan R. Ludwig and Ahmadreza Schricker, The Function of Form
3. Rivka Oxman and Robert Oxman, The New Structuralism: Design, Engineering and Architectural Technologies
4. Michael Weinstock, Michael Hensel, Achim Menges (eds.), Emergence: Morphogenetic Design Strategies, AD, Vol 74, No. 3, May/June 2004.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
2	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
4	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
5	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Semester	VI	Course Category :PE				End Semester Exam Type: **TH**		
Course Code	**U23EL0608**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Contemporary Building Materials / Professional Elective - III**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	To give Exposure to the need and use of various contemporary materials in creating innovation.	**K1 K2**
	CO2	To understand the characteristics and performance of the newer materials in terms of detailing and application to the context.	**K1 K2**
	CO3	To understand the types, terminology and classification of composite materials based on particle, reinforced, fiber reinforced, structural and composite benefit in Building construction.	**K1 K2**
	CO4	To understand definition, manufacture, properties, performance and applications of Nano Materials.	**K1 K2**
	CO5	To have knowledge about digital and tensile materials.	**K1 K2**

UNIT - I **Introduction** **Periods: 7**

- Introduction and need for ultra-performance materials in building design as a substitute to conventional materials.
- Newer application for special performance, thermal/ sound/ moisture protection, fitting, equipment and furnishing.
- Properties of contemporary materials – multidimensional, repurposed, recombinant, intelligent, interfacial, transformant,etc.

CO1

UNIT - II **Advanced concrete and composite reinforcement** **Periods: 10**

- Types of advanced concrete and its applications.
- Workability and mechanical properties, durability and reliability of advanced concrete materials.
- Manufacturing and application in buildings.
- Bendable concrete, light transmitting concrete, translucent concrete, pervious concrete, eco- cement,etc.,
- Introduction to manufacture, types, properties and performance of new reinforcement materials in concrete - Aramid fibers, bio-steel, carbon (Graphite) Fibers and fiber glass etc.

CO2

UNIT - III **Composite materials** **Periods: 10**

- Types, terminology and classification of composite materials based on particle reinforced fiber reinforced, structural and composite benefit in building construction.
- Composite materials manufacturing process.
- Use of composite materials namely Polymer Matrix Composites (PMCs) and Fiber- Reinforced Polymers (FRPs) along with cement, steel, aluminum, wood, glass, etc., for thermal insulation, fire protection, coating, painting and structural monitoring etc.

CO3

UNIT - IV **Nano-materials and nano-composites** **Periods: 9**

- Definition, manufacture and types of nanomaterials. Properties, performance of nanomaterials in building construction, types and application of nano-materials like carbon, nano tubes etc.,
- Nano composite used with cement, steel, aluminium, wood, glass for thermal insulation, fire protection, coating and painting and structural monitoring etc..Nano technologies in building and construction.
- Contemporary examples with respect to parametric/ digital processes and innovative new materials

CO4

UNIT - V **Digital and tensile materials** **Periods: 9**

- Types of materials and its constitution, manufacturing and construction technology requirement for 3D printed buildings structure and Extraterrestrial printed structures.
- Tensile fabric structure by digital printing. Translucent fabric, thin-film photovoltaics, texlon foil, PVC (poly vinyl chloride) coated polyester cloth and PTFE (poly tetra fluroethlene)(teflon) coated glass cloth.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Christiane Sauer, 'Made of...New Materials Sourcebook for Architecture and Design', Prestel Pub,2010.
2. Mel Schwart, 'Encyclopaedia of Smart Materials -Vol 1,2', Wiley-Interscience, 2001.
3. SenemÖzgönülŞensan, 'Smart Materials and Sustainability: Application of Smart Materials in Sustainable Architecture', LAP Lambert Academic Publishing,2010.
4. Axel Ritter, 'Smart Materials in Architecture, Interior Architecture and Design',Birkhäuser Architecture,2002.

References

1. Michelle Addington, & Daniel LSchodek, 'Smart Materials and New Technologies: for the Architecture and Design Professions, Architectural Press,2005.
2. Michael. F. Ashby, Paulo Ferreira, Daniel L. Schodek, 'Nanomaterials, Nanotechnologies and Design: An Introduction for Engineers and Architects', Butterworth- Heinemann,2009.
3. Blaine Brownell, 'Transmaterial 2', Princeton Architectural Press,2008.
4. John Fernandez, 'Material Architecture: Emergent Materials for Innovative Buildings and Ecological Construction', Taylor & Francis, 2006.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	1	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	1	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	1	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	1	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	1	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Semester	VI	Course Category :PE				End Semester Exam Type: **TH**		
Course Code	**U23EL0609**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Glass Architecture and Design / Professional Elective - III**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 To understand of glass and its potential in contemporary usage	**K1 K2**
	CO2 To create awareness in need for green buildings and energy efficient buildings.	**K1 K2**
	CO3 To create importance of case study of green buildings designed predominantly with energy efficient materials.	**K1 K2**
	CO4 To Understand tools currently in practice with respect to the use of glass in buildings.	**K1 K2**
	CO5 To Understand software currently in practice with respect to the use of glass in buildings.	**K1 K2**

UNIT - I	**Glass as Building Material**	**Periods: 10**

- Applications of glass in buildings (façade/ interior applications). Understanding the production & properties of glass.
- Value additions including coating technology (importance & necessity) and processing (tempering, heat strengthening, DGU, laminated, ceramic fritting). Types of Glass- mirror, lacquered, fire resistant. Modern glass with different applications.
- Glass for hospitals, green homes, airports, offices, other buildings.
- Glass and human safety compliances. Role of glass in fire safety considerations - Class E, EI &EW.
- Role of glass in acoustics. International standards & codal provisions.

CO1

UNIT - II	**Glass and Green Architecture**	**Periods: 10**

- Types of advanced concrete and its applications.
- Workability and mechanical properties, durability and reliability of advanced concrete materials.
- Manufacturing and application in buildings.
- Bendable concrete, light transmitting concrete, translucent concrete, pervious concrete, eco- cement,etc.,
- Introduction to manufacture, types, properties and performance of new reinforcement materials in concrete - Aramid fibers, bio-steel, carbon (Graphite) Fibers and fiber glass etc.

CO2

UNIT III	**Case study**	**Periods: 10**

- Types, terminology and classification of composite materials based on particle reinforced fiber reinforced, structural and composite benefit in building construction.
- Composite materials manufacturing process.
- Use of composite materials namely Polymer Matrix Composites (PMCs) and Fiber- Reinforced Polymers (FRPs) along with cement, steel, aluminum, wood, glass, etc., for thermal insulation, fire protection, coating, painting and structural monitoring etc.

CO3

UNIT - IV	**Design workshops I**	**Periods: 15**

- Definition, manufacture and types of nanomaterials. Properties, performance of nanomaterials in building construction, types and application of nano-materials like carbon, nano tubes etc.,
- Nano composite used with cement, steel, aluminum, wood, glass for thermal insulation, fire protection, coating and painting and structural monitoring etc..Nano technologies in building and construction.
- Contemporary examples with respect to parametric/ digital processes and innovative new materials

CO4

UNIT - V	**Design workshops II**	**Periods: 15**

- Types of materials and its constitution, manufacturing and construction technology requirement for 3D printed buildings structure and Extraterrestrial printed structures.
- Tensile fabric structure by digital printing. Translucent fabric, thin-film photovoltaics, texlon foil, PVC (poly vinyl chloride) coated polyester cloth and PTFE (poly tetra fluroethlene) (teflon) coated glass cloth.

CO5

Lecture Periods: 60	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 60**

Text Books

1. Christian Schittich, 'Glass Construction Manual', Birkhauser Basel,2007.
2. 'Architectural Glass Guide', Federation of Safety Glass,2013.

References

1. 'LEED 2011 For India - Green Building Rating System', Indian Green Building Council,2011
2. 'Energy Conservation Building Code. User Guide', Bureau of Energy Efficiency,2009.
3. 'IS 875 (Part -3) Reaffirmed 1997. Code of Practice for Design loads', Bureau of Indian Standards,1998.
4. 'IS 7883. Code of Practice for the Use of Glass in Buildings', Bureau of Indian Standards,2013.
5. Training Manuals & E- Learning, Glass Academy

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VI**	Course Category :PE				End Semester Exam Type: **TH**		
Course Code	**U23EL0610**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Steel Architecture and Design / Professional Elective - III**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 To Understand of steel as a structural material in design and construction practice.	**K1 K2**
	CO2 To Understand of steel as a functional material in design and construction practice.	**K1 K2**
	CO3 To Understand of steel as an aesthetic material in design and construction practice.	**K1 K2**
	CO4 To Understand of steel as sustainable material in design and construction practice.	**K1 K2**
	CO5 To study on transformation of architectural design into fabricated materials.	**K1 K2**

UNIT - I	**Introduction to steel as Building Material**	**Periods: 8**
- Materiality of steel, structural properties of steel, advantages of steel in construction. - History of metal in construction–Iron to Steel. Steel and tension. Industrialization and mass fabrication of steel. - Casting of steel in historic and contemporary examples. - Invention of hollow structural sections. Hot rolled steel shapes, various hollow structural sections.		**CO1**
UNIT - II	**Steel in High Tech Movement, Contemporary Architecture**	**Periods: 10**
- Introduction to High Tech movement. - Understanding of various typologies of high-tech movement – Extruded, Grid/Bay, Diagrids, arched/ curved structures tensile. - Advantages of diagrids over standard frames. - Curved steel – creating curves in steel buildings, limitations in curving steel. - Evolution of AESS (architecturally exposed structural steel) through HighTech movement.		**CO2**
UNIT III	**Structural Expression of Steel**	**Periods: 10**
- Introduction to AESS (architecturally exposed structural steel), standard structural steel versus AESS. Factors that define AESS. - Characteristics and categories of AESS. - Connection types for AESS – bolted, welded and cast connections. Member types for AESS – Tubular and standard sections. - Various steel frame design, basic connection strategies, basic understanding of steel floor systems, truss systems and braced systems		**CO3**
UNIT - IV	**Sustainability, steel and other materials**	**Periods: 9**
- Introduction to steel as a sustainable material. - Recycled, reuse and adaptive reuse of steel. Steel and glazing systems, support systems for glazing. - Technical aspects of combining steel with glass. Various steel and glass envelope systems - Curtain wall system, wind braced support systems, cable net walls, spider steel connections with structural glass, simple and complex cable systems. - Handling curves and lattice shell construction. Advanced framing system - Steel and Timber. Low carbon design strategies.		**CO4**
UNIT - V	**Fabrications, erection and implications on design**	**Periods: 8**
- Study on transformation of architectural design into fabricated elements. - Study of process profile through case studies. Role of physical and digital models in fabrication. Steel in temporary/ exhibit buildings. - Need for corrosion and fire protection. Various finishes and coating systems of steel. - Detailed study on corrosion protection and fire protection systems. - Transportation, site issues and erection onsite. - Erection of beams and columns. - Effects of climate and weather on erections. Other issues relating to practical implication of design onsite.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. TerrimeyerBuake, 'Architectural Design in Steel', SPON,2004.
2. Peter Silver et al, 'Structural Engineering for Architects', Laurence King,2013.

References

1. Victoria Ballard Bell & Patrick J Rand; 'Materials for Architectural Design', Lawrence King,2006.
2. Ettinger J. Van et all(Editors), 'Modern Steel Construction in Europe',Elsevier,1963.
3. Leonardo Benevolo, 'History of Modern Architecture Vol 1 &2', Reprint, MIT Press, 1977.
4. 'Handbook of Steel Construction', Canadian Institute of Steel Construction,2010.
5. John Leckie, 'Steel and Other Materials', Canadian Institute of Steel Construction, 2007.
6. INSDAG Publications and Brochures.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	School of Architecture	Programme: **B.Arch.**						
Semester	**VI**	Course Category :PE				End Semester Exam Type: **TH**		
Course Code	**U23EL0611**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Concept of Smart Cities / Professional Elective - III**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Familiarity with the concepts of smart cities.	**K1**
	CO2 An understanding of Urban Infrastructure in smart cities.	**K1**
	CO3 Exposure to smart city practices in Urban and historic cores.	**K2**
	CO4 An understanding of Sustainable aspects in smart cities.	**K2**
	CO5 Knowledge about different domains/ areas in which smart cities can be realized.	**K2**

UNIT - I	**Introduction to smart cities**	**Periods: 8**
- Origin of the term smart cities. Different interpretations of smart cities. Evolution of the term till today. - Overview of smart cities as integrating physical planning effectively with other parameters - economy, infrastructure of various types, energy, climate change, urban governance, social aspects, mobility, quality of life, etc., ICT, GIS and remote sensing as tools to enable smart cities.		**CO1**
UNIT - II	**Urban physical infrastructure and smart cities**	**Periods: 8**
- Different types of urban infrastructure. - sewage, water, electricity and lighting, mobility of people and goods, parking. Case studies for each as well as for integrated approach.		**CO2**
UNIT - III	**Economic, social and cultural aspects**	**Periods: 10**
- Smart city concepts and city economy. Urban governance and smart city. - Smart city concepts in slum area development. - Historic core regeneration/ preservation and smart city. Case studies for each.		**CO3**
UNIT - IV	**Ecology, energy and smart city**	**Periods: 8**
- Geography of the city. Ecological aspects. Climate change. Flooding patterns. - Energy and Sustainability in cities. - Incorporating smart concepts to enhance and mitigate positive and negative effects with respect to these areas. Case studies.		**CO4**
UNIT - V	**Smart cities mission India**	**Periods: 9**
- Study on transformation of architectural design into fabricated elements. - Study of process profile through case studies. Role of physical and digital models in fabrication. Steel in temporary/ exhibit buildings. - Need for corrosion and fire protection. Various finishes and coating systems of steel. - Detailed study on corrosion protection and fire protection systems. - Transportation, site issues and erection onsite. - Erection of beams and columns. - Effects of climate and weather on erections. Other issues relating to practical implication of design onsite.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Rajeswari Ray, GIS for Smart Cities, Ane Books 2017
2. Binti Singh and Manoj Parmar, Smart City in India, Routledge 2020
3. Mike Barlow and Cornelia Levy-Bencheton, Smart Cities Smart Future, Wiley 2019
4. Charanjit Singh Shah, Redefining Indian Smart and Sustainable Cities, I K International Publishing House 2017 5. Antoine Picon, Smart Cities: A Spatialised Intelligence, Wiley 2015

References

1. Mohammad S. Obaidat and Petros Nicopolitidis, Smart Cities and Homes, Morgan Kaufmann 2016.
2. Poonm Sharma, Swati Rajput, Sustainable Smart Cities in India, Springer 2019
3. Ricardo Armentano, Parag Chatterjee et al, The Internet of Things, CRC Press, Taylor and Francis 2018

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
2	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
3	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
4	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
5	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0712**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Contemporary Process in Architectural design / Professional Elective - IV**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 An understanding the works of Architect in contemporary process.	**K1**
	CO2 An Ability to implement in digital architecture.	**K1**
	CO3 Creating the diagram and schematic plans in design.	**K1**
	CO4 An understanding different style in architecture.	**K2**
	CO5 An Understanding of contemporary materials and implementing in design.	**K2**

UNIT- I	**Introduction**	**Periods: 7**
- Investigation of contemporary theories of media and their influence on the perception of space and architecture. - Technology and art. - Technology and architecture. - Digital technology and architecture.		**CO1**
UNIT - II	**Aspect of digital architecture**	**Periods: 8**
- Aspects of digital architecture. Design and computation. - Difference between digital process and non- digital process. - Architecture and cyberspace. Qualities of the new space. - Issues of aesthetics and authorship of design. Increased Automatism and its influence..		**CO2**
UNIT - III	**Contemporary process**	**Periods: 10**
- Emerging phenomena such as increasing formal and functional abstractions. - Diagrams, diagrammatic reasoning, diagrams and design process. - Animation and design. Digital hybrid.		**CO3**
UNIT - IV	**Geometries and surfaces**	**Periods: 9**
- Fractal geometry. - Shape grammar. - Hyper surface. - Liquid Architecture. - Responsive architecture		**CO4**
UNIT - V	**Contemporary process and architectural works**	**Periods: 11**
- 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.Study to be undertaken in the form of assignments/discussions/seminars/presentations.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Walter Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', in Illuminations, Schocken Books, New York,1969
2. Ignaci de Sola Morales,'Differences: Topographies of Contemporary Architecture', MIT Press,1997.
3. William J Mitchell, 'the Logic of Architecture: Design, Computation and Cognition',MIT Press,1995.
4. Ali Rahim, 'Contemporary Process in Architecture', John Wiley & Sons,2000.
5. Ali Rahim (Ed), 'Contemporary Techniques in Architecture', Halsted Press,2002.
6. Peter Eisenmann; Diagram Diaries, Universe,1999. Grey Lynn, 'The Folded, The Pliant and The Supple, Animate form', Princeton Arch. Press,1999.

Reference Books

1. Gillian Hunt, 'Architecture in the Cyberspace II', John Wiley & Sons,2001.
2. L. Convey et al, 'Virtual Architecture', Batsford,1995.
3. Rob Shields (ed.), 'Cultures of the internet: Virtual Spaces, Real Histories, Living bodies', Sage, London,1996.
4. John Beckman, 'The Virtual Dimension, Architecture, Representation and Crash Culture', Princeton Architecture

Press,1998.
5. William J Mitchell, City of Bits: Space, Place and the Infobahn',MIT Press, Cambridge,1995.
6. Marcos Novak, 'Invisible Architecture: An Installation for the Greek Pavilion', Venice Biennale,2000.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	2	-	1	3	-	3	-	-	-	-
2	1	2	-	1	3	-	3	-	-	-	-
3	1	2	-	1	3	-	3	-	-	-	-
4	1	2	-	1	3	-	3	-	-	-	-
5	1	2	-	1	3	-	3	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0713**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Energy Efficient Architecture / Professional Elective - IV**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Knowledge of alternative sources of energy and passive design considerations..	**K1**
	CO2 An understanding of day lighting and natural ventilation in design.	**K1**
	CO3 Familiarity with future trends in creating sustainable built environment .	**K2**
	CO4 An understanding of Day lighting and Ventilation.	**K2**
	CO5 An understanding of new trends in technology.	**K2**

UNIT - I	**Passive design**	**Periods: 10**

- Significance of energy efficiency in the contemporary context.
- Simple passive design considerations involving site conditions, building orientation, plan form and building envelope.
- Heat transfer and thermal performance of walls and roofs.

CO1

UNIT - II	**Passive heating**	**Periods: 10**

- Direct gain.
- Thermal storage of wall and roof.
- Roof radiation trap.
- Solarium.
- Isolated gain.

CO2

UNIT - III	**Passive cooling**	**Periods: 8**

- Evaporative cooling.
- Nocturnal radiation cooling.
- Passive desiccant cooling.
- Induced ventilation.
- Earth sheltering.
- Wind tower.
- Earth air tunnels.

CO3

UNIT - IV	**Day lighting and natural ventilation**	**Periods: 7**

- Daylight factor.
- Daylight analysis.
- Daylight and shading devices.
- Types of ventilation.
- Ventilation and building design.

CO4

UNIT - V	**Contemporary and future trends**	**Periods: 10**

Areas for innovation in improving energy efficiency such as photo voltaiccells, battery technology, thermal energy storage, recycled and reusable building materials, nanotechnology, smart materials, energy conservation building code.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. 'Manual on Solar Passive Architecture', IIT Mumbai and Mines New Delhi,1999.
2. Arvind Krishnan et al, 'Climate Responsive Architecture a Design Handbook for Energy Efficient Buildings', Tata McGraw Hill Publishing Company Limited, New Delhi,2001.
3. MajumdarM, 'Energy-efficient Building in India', TERI Press,2000.
4. Givoni .B, 'Passive and Low Energy Cooling of Buildings', Van Nostrand Reinhold, New York,1994.

Reference Books

1. Fuller Moore, 'Environmental Control Systems', McGraw Hill Inc, New Delhi,1993.
2. Sophia and Stefan Behling, 'SolpowerThe Evolution of Solar Architecture', Prestel, New York,1996.
3. Patrick Waterfield, 'The Energy Efficient Home: A Complete Guide', CrowoodpressLtd,2011.
4. Dean Hawkes, 'Energy Efficient Buildings: Architecture, Engineering andEnvironment',
5. W.W. Norton & Company, 2002.
6. David Johnson and Scott Gibson, 'Green from the Ground Up: Sustainable, Healthy and Energy Efficient Home Construction', Taunton Press,2008.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	2	-	2	-	-	-	-	-	-	-
2	1	2	-	2	-	-	-	-	-	-	-
3	1	2	-	2	-	-	-	-	-	-	-
4	1	2	-	2	-	-	-	-	-	-	-
5	1	2	-	2	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0714**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Architectural Conservation / Professional Elective - IV**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes		On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	An understanding of the importance of heritage, issues and practices of conservation Through case studies.	**K1**
	CO2	Familiarity with historic materials and their properties, different technologies for investigating masonry, foundation and also traditional and modern repair methods	**K1**
	CO3	An understanding on analysis of traditional and modern methods. .	**K1 K2**
	CO4	An understanding and data collection of heritage building.	**K2**
	CO5	An ability to analyze and documenting the historical building.	**K2**

UNIT - I	**Introduction to conservation**	**Periods: 12**

- Understanding heritage.
- Defining conservation, preservation and adaptive reuse.
- Heritage conservation- need, debate and purpose.
- History of conservation movement.
- International agencies like ICCROM,ICOMOS,UNESCO and their role in conservation.
- Charters. Principles and ethics of conservation.

CO1

UNIT - II	**Conservation in India**	**Periods: 7**

- Museum conservation.
- Monument conservation and the role of ASI, SDA,INTACH.
- Central and state government policies and legislation's.
- Inventories and projects.

Selected case studies of sites such as Hampi, Golconda,Mahabalipuram.

CO2

UNIT - III	**Conservation methods and materials**	**Periods: 10**

- Investigation techniques and tools.
- Behavior of historic materials and structures.
- Problems with masonry, foundation.
- Repair methods, traditional and modern methods.

Seismic retrofit, services additions and disabled access to historic buildings. Moisture and pollution problems.

CO3

UNIT - IV	**ONSERVATION PRACTICE**	**Periods: 7**

- Listing of monuments.
- Documentation of historic structures.
- Assessing architectural character.
- Historic structure report.
- Guidelines for preservation, rehabilitation and adaptive re-use of historic structures.

Case studies of palaces in Rajasthan, dwellings in Chettinad and Swamimalai. Heritage site management.

CO4

UNIT - V	**URBAN CONSERVATION AND CONSERVATION PLANNING**	**Periods: 11**

- Understanding the character and issues of historic towns.
- Selected case studies. Historic districts and heritage precincts.
- Conservation as a planning tool.
- Financial incentives and planning tools such as TDR.
- Urban conservation and heritage tourism.

Case studies of sites like Cochin, Pondicherry French town. Conservation project management.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

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', UniversitatKarlsruhe,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.

Reference Books

1. James M. Fitch, Historic Preservation: Curatorial Management of the Built World by University Press of Virginia; ReprintEdition,1990.
2. Robert E. Stipe, 'ARicher Heritage: Historic Preservation in the Twenty-First Century, University of North Carolina Press, 2003.
3. B.P. Singh, 'India's Culture- The State, The Arts and Beyond', Oxford University Press,2000
4. John H. Stubbs and Emily G Makas; Architectural Conservation in Europe and the Americas, John Wiley & Sons,2011.
5. A.G. K. Menon (Ed), 'Conservation of Immovable Sites', INTACH Publication, N.Delhi.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0714**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Artificial Intelligence in Architecture / Professional Elective - IV**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 To gain Knowledge about artificial intelligence as a domain..	**K1**
	CO2 Exposure to various intelligence processes and new trans-disciplinary design methodologies.	**K1**
	CO3 Familiarity with future trends in design intelligence system. .	**K2**
	CO4 An understanding of artificial intelligence in design process and construction.	**K2**
	CO5 An understanding of application of AI in architectural projects.	**K2**

UNIT - I	**Introduction to conservation**	**Periods:8**	
-	Introduction to Artificial Intelligence; Introduction to Internet of Things (IoT), Big Data, Machine Learning (MI), Block Chain, Etc.		**CO1**
UNIT - II	**Conservation in India**	**Periods: 8**	
-	Definition of Cybernetics; Cybernetic architecture; Cyberspace; Virtual-Reality; The Architectural Relevance of Cybernetics.		**CO2**
UNIT - III	**Conservation methods and materials**	**Periods: 10**	
-	Algorithm in Architecture; Data driven/informed process; Multi-Agent Design System; Automation in Design; Swarm Intelligence, Neural Networks, Morphogenetic, Self-Organising, Behavioural; Evolutionary and cognitive aspects.		**CO3**
UNIT - IV	**Conservation practice**	**Periods: 8**	
-	Robotic construction, 4d Printer, Real-time Fabrication, Virtual/Augmented Reality, Flying Robots; Human-free construction process		**CO4**
UNIT - V	**Urban conservation and conservation planning**	**Periods: 9**	
-	Application of AI in Architectural Projects/by Architects: Zaha Hadid Architects (ZHA), Foster + Partners, Buro Happold, Arup Group, Matias Del Campo, Sidewalk Labs/Delve, Regen Villages, Phil Bernstein, Etc.,		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Architecture in the Age of Artificial Intelligence: An Introduction to AI for Architects, Neil Leach, Bloomsbury Visual Arts.
2. The Routledge Companion to Artificial Intelligence in Architecture, Imdat As, Prithwish Basu, Routledge;
3. Artificial Intelligence and Architecture, From Research to Practice, Stanislas Chaillou, Birkhäuser.

Reference Books

1. Johnston, John, 'Cybernetics and the New Complexity of Machines', pp.27-62 in The Allure of the Machinic Life: Cybernetics, Artificial Life, and the New A.I, The MIT Press, 2008.
2. Nicholas Negroponte, 'Soft Architecture Machines', MIT Press 1975. Pp.6-49.
3. Michael Speaks, 'Design Intelligence', in Latent Utopias: Experiments within Contemporary Architecture (Graz, 2002), pp.73-76.
4. Frazer J.H., 'The Cybernetics of Architecture: A Tribute to the Contribution of Gordon Pask', Kybernetes, Vol.20, No.5/6 2001, pp 641-651.
5. Frazer J.H., 'The Architectural Relevance of Cybernetics', Systems Research, Vol 10, No.3, 1993, pp.43-48.
6. Johnston, John, 'The New AI: Behaviour-based Robotics, Autonomous Agents, and Artificial Evolution, pp.27-64 in The Allure of the Machinic Life: Cybernetics, Artificial Life, and the New A.I., The MIT Press, 2008.
7. Andrew Pickering, 'Grey Walter' in the Cybernetic Brain: Sketches in Another Future, The University of Chicago Press, 2010.
8. McCarthy, John., Minsky, L, Marvin., Rochester, Nathaniel., Shannon, E, Claude., A proposal for the dartmouth summer research project on artificial intelligence, august 31,1955., AI magazine, 27,(2006), 4, pp. 12-13.
9. Carta, Silvio., Big data, code and the discrete city: shaping public realms, Routledge, London, UK, 2019.
10. Bini, Stefano, A., Artificial intelligence, machine learning, deep learning, and cognitive computing: what do these terms mean and how will they impact health care, The Journal of arthroplasty, 33, (2018), 8, pp. 2358-2361.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)								Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
1	1	-	-	1	-	2	1	-	-	-	-
2	1	-	-	1	-	2	1	-	-	-	-
3	1	-	-	1	-	2	1	-	-	-	-
4	1	-	-	1	-	2	1	-	-	-	-
5	1	-	-	1	-	2	1	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category: **EL-5**				End Semester Exam Type: **TH**		
Course Code	**U23EL0716**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Advanced Structures / Professional Elective - V**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Understand the concepts and applications of pre-stressed concrete	**K1 & K2**
	CO2 Understanding the concepts and application of industrial structures.	**K1 & K2**
	CO3 Understanding the concepts and systems used in skyscraper.	**K1 & K2**
	CO4 Familiarity with the theory and applications of tensile structures.	**K2& K3**
	CO5 An understanding of shells, Domes and folded plates.	**K1 & K2**

UNIT - I	**PRESTRESSEDCONCRETE**	**Periods: 10**
- Losses of Prestress - Design requirements. - Design of determinate beams.		**CO1**

UNIT - II	**INDUSTRIALSTRUCTURES**	**Periods: 8**
- Classification, planning and layout requirements, functional requirements. - Types of industrial structures- power plants, bunkers and silos, cooling towers, containment structures, chimneys. Merits.		**CO2**

UNIT - III	**HIGH–RISE BUILDINGS**	**Periods: 7**
- Introduction. - Load action in high rise buildings - Various structural systems. Waffle slab. - Approximate analysis of frames for gravity and horizontal loadings		**CO3**

UNIT - IV	**TENSILE STRUCTURES**	**Periods: 10**
- Concept, development, laws of formation, merits and demerits of pneumatic structures. - Basic principles, forms, merits and demerits of cable structures.		**CO4**

UNIT - V	**SHELLS, DOMES ANDFOLDEDPLATES**	**Periods: 10**
- Shells of translation. - Shells of revolution - Classification of shells and different forms - Domes. - Types of folded plates - Spaceframes.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. B.C.Punmia,'ReinforcedConcreteStructures,Vol.1&2',LaxmiPublications,NewDelhi, 1994.
2. N. Subramanian, 'Principles of Space Structures', Wheeler,1998.
3. Thandavamoorthy T.S, 'Advanced Structures of Architecture', Eswar Press,2008.
4. Council on Tall Buildings and Urban Habitat, 'Structural System for Tall Buildings', McGraw Hill,1995.
5. Milo.S.Ketchum and Mark.A. Ketchum, 'Types and Forms of Shell Structures,1997.

Reference Books

1. P. Dayaratnam, P.Sarah, 'Prestressed Concrete Structures', Medtech,2017.
2. Wolfgang Schueller, 'High Rise Building Structures', John Wiley &Sons,1976.
3. Frei Otto, 'Tensile Structures Volume 1 & 2' TheMIT Press,1973.
4. Bryan Stafford Smith, Alex Coull, 'Tall Building Structures - Analysis & Design', John Wiley,1991.
5. Thomas Herzog, 'Pneumatic Structures', Crosby Lockwood Staples, London,1977.
6. Bandyopadhyay J.N, 'Thin Shell Structures: Classical and Modern Analysis', New Age International,2007.
7. Ramaswamy G.S, 'Design and Construction of Concrete Shell Roofs', CBS,2005.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	2	-	-	1	-	-	-	-	-	-	-	-
2	1	2	-	2	-	-	1	-	-	-	-	-	-	-	-
3	1	2	-	2	-	-	1	-	-	-	-	-	-	-	-
4	1	2	-	2	-	-	1	-	-	-	-	-	-	-	-
5	1	2	-	2	-	-	1	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category: **EL-5**				End Semester Exam Type: **TH**		
Course Code	**U23EL0717**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Sustainable Architecture and Planning / Professional Elective - V**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 An understanding of the concepts of ecosystem, carrying capacity, ecological footprint, sustainability and sustainable development.	**K1**
	CO2 Awareness of emerging vulnerabilities of global warming and climate change and an understanding of the contribution of building industry towards the same.	**K1 & K2**
	CO3 Familiarity with approaches to achieving sustainable buildings and communities	**K1 & K2**
	CO4 Knowledge of incentives and evaluation systems for green buildings.	**K2**
	CO5 Awareness of sustainable cities	**K1 & K2**

UNIT - I	**INTRODUCTION TO SUSTAINABILITY**	**Periods: 7**
- Concept of sustainability - Carrying capacity, sustainable development. - Bruntland report - Ethics and visions of sustainability. - Circles of sustainability - Sustainable economy and use. - Eco systems, food chain and natural cycles or cradle to cradle concept.		**CO1**
UNIT - II	**CLIMATE CHANGE AND SUSTAINABILITY**	**Periods: 10**
- Overview of climate change and its impact on a global and regional scale - Principles of energy systems - Energy crisis and global environment - Study on vernacular techniques and technological advancements in climate control in different climatic zones		**CO2**
UNIT - III	**SITE AND SUSTAINABILITY**	**Periods: 8**
- Sustainable site selection and development. - Introduction to Green building concepts. - TERI, LEED, GIRHA and BREEAM. Ecology and sustainability - Different sources of energy, recyclable products and embodied energy.		**CO3**
UNIT - IV	**SUSTAINABLE MATERIALS**	**Periods: 10**
- Selection of materials Eco building materials and construction. - Low impact construction - Bio mimicry, zero energy buildings, nanotechnology and smart materials		**CO4**
UNIT - V	**SUSTAINABLE CITIES**	**Periods: 10**
- Dimensions of sustainable community - Social, cultural and economic factors. - Urban ecology, urban heat island effects, smog etc. - Case studies of eco city or communities.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Dominique Gauzin–Muller,'Sustainable Architecture and Urbanism: Concepts, Technologies and Examples', Birkhauser,2002.
2. Catherine Slessor, 'Eco-Tech: Sustainable Architecture and High Technology',
3. Thames and Hudson 1997.
4. Ken Yeang, 'Ecodesign- A Manual for Ecological Design', Wiley Academy,2006.

Reference Books

1. Arian Mostaedi, 'Sustainable Architecture: Low Tech Houses', CarlesBroto,2002.
2. Sandra F. Mendler& William Odell, 'HOK Guidebook to Sustainable Design', John Wiley and Sons,2000.
3. Richard Hyder, 'Environmental Brief: Pathways for Green Design', Taylor and Francis,2007.
4. Brenda Vale and Robert Vale, 'Green Architecture: Design for a Sustainable Future', Thames and Hudson,1996.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

<table>
<tr><td rowspan="2">Assessment</td><td colspan="4">Continuous Assessment Marks (CAM)</td><td rowspan="2">End Semester Examination (ESE) Marks</td><td rowspan="2">Total Marks</td></tr>
<tr><td>CAT 1</td><td>CAT 2</td><td>Model Exam</td><td>Attendance</td></tr>
<tr><td>Marks</td><td colspan="3">45
(Best of 2 from 3 Test,200 marks reduced to 45 marks)</td><td>5</td><td>50</td><td>100</td></tr>
</table>

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category : **EL-5**			End Semester Exam Type: **ST**			
Course Code	**U23EL0718**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Dissertation / Professional Elective - V**	**3**	**0**	**0**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	A dissertation report which is based on accepted norms of technical writing	**K1 K2**
	CO2	Ability to research deeply into a subject and develop a coherent line of thought based on point of view, observation, analysis and study.	**K3 K4**
	CO3	Ability to look at architecture, history and design through ideas, texts and intent behind works.	**K2 K3**
	CO4	Ability to involve research based on primary sources and secondary sources.	**K4 K5**
	CO5	Ability to look at architecture from an informed, analyzed and well thought out critical perspective which would help strengthen the thesis process.	**K3 K4**

Content

1. Design studio emphasizes on explaining and understanding architecture primarily through the mode of making. However, architecture as a field itself is driven by explicitly stated or implicitly understood ideas/ points of view of particular society and individuals. Dissertation offers an opportunity to look at architecture, history and design through ideas, texts and intent behind works.
2. It involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest.
3. Topics may range from analyzing the works of an architect, history, typological changes, writing, design process and many more. They could involve research based on primary sources in terms of doing actual field studies and/or secondary sources through reading.
4. The dissertation proposal in about 1500 words stating the topic, issues to be explored and the scope must be submitted for approval. Work on the approved topic should start from the beginning of the semester and would be periodically reviewed. At the end of the semester, a well written report of a minimum 10,000 words should be submitted in the prescribed format, if any, provided by the University.
5. The suggested structure for the report can be - outline/ background of the area of study, statement of objectives or research questions within the area of study, outline of methodology/ way to achieve the objectives or answer the questions of research, core section with necessary content such as documentation, analysis, arguments, etc., final conclusion. The report will be presented in the viva- voce exam and defended.

Lecture Periods: 90	**Tutorial Periods: -**	**Practical Periods:**	**Total Periods: 90**

Text Books

1. Iain Borden and KaaterinaRuedi; 'The Dissertation: An Architecture Student's Handbook',
2. Architectural Press,2000.
3. Linda Grant and David Wang, 'Architectural Research Methods', John Wiley Sons,2001

References

1. Wayne C Booth, Joseph M Williams, Gregory G. Colomb, 'The Craft of Research', 2nd Edition,
2. University of Chicago Press,2008.
3. Ranjith Kumar, 'Research Methodology- A Step by Step Guide for Beginners', Sage Publications,2005.
4. John W Creswell, 'Research Design: Qualitative, Quantitative and Mixed Methods Approaches', Sage Publications, 2002.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	3	-	-	-	-	-	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Methods

Assessment tool	**Weight age**	**Split up of marks**		
Continuous Assessment	45 Marks (100 reduced to 45)	Concept	Design Development	Presentation
		10	20	15
Total in-semester assessment	45% + 5% for attendance			
End semester viva/voce	50% (100 reduced to 50)	Concept	Design Development	Presentation
		15	20	15

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**VII**	Course Category: **EL-5**				End Semester Exam Type: **TH**		
Course Code	**U23EL0719**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Road Safety and Civic Sense / Professional Elective - V**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Understanding the Road Safety and Types of Roads	**K1 K2**
	CO2 Understanding the Types of Intersections, Pedestrian Circulations	**K1 K2**
	CO3 Understanding the Traffic Signs and Signals with Traffic Control Aids	**K1 K2**
	CO4 Understanding the Cause of Road Accident and Prevention Safety measures to Road Accidents	**K2**
	CO5 Understanding the Traffic Regulations, Laws and Legislations	**K1 K2**

UNIT - I	**Introduction to Road Safety and Typology of Roads**	**Periods: 7**

- Road as an active space, Types of Users, User Behavior, Sensory Factors like Vision and Hearing in User Behavior.
- Vehicle Characteristics: Dimensions, Weight, Turning Radii, Braking Distance, Lighting System, Tyres, etc. Type of Hazards: Conflicts and Accidents.
- Road Classification: National Highways, State Highways, District Roads (MDR and ODR), Village Roads Urban Road Classification: Expressways, Arterial, Sub-Arterial, Collector, Local, Service Roads, One-Way, Two-Way etc. Mountainous Roads. Speed Limits of the Road types.
- Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Cycling Track, Green Strip, Curbs, Camber, etc. Spatial Standards for the Cross-Section Design. Relationship between Road Design and Road Safety.

CO1

UNIT - II	**Intersection, Pedestrian Circulation and Barrier Free Design**	**Periods: 10**

- Types of Road Intersections: Basic Forms of at-grade Junctions (T, Y, Staggered, Skewed, Cross, Scissors, Rotary, etc. Grade Separated Junctions (with or without interchange): Three-Leg, Four-Leg, Multi-Leg, etc.
- Design of Intersections: Design and Spatial Standards for Traffic Islands, Turns, Turning Radii, Directional Lanes, Pedestrian Crossings. Median Openings, Traffic Calming Components like Speed Breakers and Table-Top Crossings etc.
- Design Considerations for Diverging, Merging, and Weaving Traffic. Location and Design for Traffic Signals.
- Requirement of Pedestrian Infrastructure: Sidewalks and Footpaths, Recommended Sidewalk Widths, Pedestrian Crossings, Pedestrian Bridges, Subways, Cycle Tracks, etc.
- Barrier Free Design: Location and Design Standards for Ramps for Wheel Chair Access, Other Provisions like Tactile for Visually Challenged etc.
- Safety Provisions: Pedestrian Railings, Anti-skid Flooring, Pedestrian Signal, Walk Button, etc.

CO2

UNIT - III	**Traffic Signs and Road Marking with Traffic Signal, Traffic Control Aids and Street Lighting**	**Periods: 8**

- Type for Traffic Signs: Principles and Types of Traffic Signs, Danger Signs, Prohibitory Signs, Mandatory Signs, informatory Signs, Indication Signs, Direction Signs, Place Identification Signs, Route Marker Signs, etc. Reflective Signs, LED Signs. Static and Dynamic Signs.
- Standards for Traffic Signs: Location, Height and Maintenance of Traffic Signs
- Types of Road Markings: Centre Lines, Traffic Lane Lin.es, Pavement Edge Lines, No Overtaking Zone Markings, Speed Markings, Hazard Markings, Stop Lines, Pedestrian Crossings, Cydist Crossings, Route Direction Arrows, Word Messages, Marking at Intersections, etc.
- Material, Color and Typography of the Markings.
- Traffic Signals: Introduction, Advantages, and Disadvantages - Signal Indications: Vehicular, Pedestrian and Location of the Signals.
- Traffic Control Aids: Roadway Delineators (Curved and Straight Sections), Hazard Markers, Object Markers, Speed Breakers, Table Top Crossings, Rumble Strips, Guard Rails, Crash Barriers etc.
- Street Lighting: Need for Street Lighting, Type of Lighting, Illumination Standard, Location and Intermediate Distance.

CO3

UNIT - IV	**Sustainable Road Accident, Road Safety and Civic Sense Materials**	**Periods: 10**

- Nature and Types of Road Accidents (Grievously Injured, Slightly Injured, Minor Injury, Non-Injury, etc.) The situation of Road Accidents in India (Yearly), Fatality Rates, etc. - Factors (and Violations) that cause accidents, Prevention and First Aid to Victims Collision Diagrams and Condition Diagrams exercises. - Traffic Management Measures and their influence in Accident Prevention. - Need for Road Safety, Category of Road Users and Road Safety Suggestions. - Precautions for Driving in Difficult Conditions (Night, Rain, Fog, Skidding Conditions, Non-Functional Traffic Lights, etc.) - Types of Breakdowns and Mechanical Failures. Accident Sign (Warning Light, Warning Triangle, etc.) - Introduction to Concept of Civic Sense and its relationship to Road Safety: Importance of Civic Sense, Road Etiquettes and Road User Behavior, Rules of Road, Right of the Way. Providing Assistance to Accident Victim. Sensitization against Road Rage.election of materials Eco building materials and construction. –Low impact construction – bio mimicry, zero energy buildings, nanotechnology and smart materials.	**CO4**

UNIT - V	**Traffic Regulations, Laws and Legislations**	**Periods: 8**

- Indian Motor Vehicles Act (Chapter VIII: Control of Traffic to be discussed in detail) - Regulations Concerning Tra1fic: Cycles, Motor Cycles and Scooters, Rules for Pedestrian Traffic, Keep to the Left Rule, Overtaking Rules, Turning Rules, Priority Rules, Hand Signals, etc. - Speed and Hazard Management. Penal Provisions. - National Road Safety Policy, Central Motor Vehicle Rules, State Motor Vehicle Rules Introduction to Good Practices.	**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Introduction to Traffic Engineering, R Srinivasa Kumar
2. Traffic Engineering and Transport Planning, LR Kadiyali
3. Book on Road Safety Signage and Signs, Ministry of Road Transport and Highways, Government of India

Reference Books

1. MORT&H Pocketbook for Highway Engineers, 2019 (Third Revision)
2. S. Publications by UTTIPEC namely, Street Design Guidelines, UTTIPEC Guideline for Road Markings, UTTIPEC Guideline and Specification for Crash Barriers, Pedestrian Railing and dividers, UTTIPEC Standard Typical Crossing Design.
3. Publications by Indian Road Congress.
4. Street Design Standards as provided in Times Savers, Neuferts etc.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance		
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5	50	100

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V / IX**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0920**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Architectural Photography and Journalism / Professional Elective - VI**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 An ability to critically think and analyze about the effects of architecture on society as well as the tools to enable recording of the same	**K2**
	CO2 An understanding of Equipment's like Camera and lenses.	**K2**
	CO3 An understanding of Journalism skills: research, reporting, writing, editing, criticism	**K2**
	CO4 An Discussions on topics needed in an architectural journal and current issues	**K2**
	CO5 An Exercise on integrating photography in architectural journalism	**K3**

UNIT - I	**Introduction to Architectural Photography**	**Periods: 9**	
- General introduction to the art of photography; concept of color; concepts of lighting, distance, visual angle, frames media. - Technical definitions, types of lighting fixtures, types of flashes, controlling lighting levels with flash photography. - Color rendering in photographic medium, color rendering in photographs under different lighting condition, lighting colors and its effect on a photograph, color filters in a camera. - Exercise in lighting photography with artificial light and black and white photos.			**CO1**
UNIT - II	**Photographic Techniques and Compositions**	**Periods: 9**	
- Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale– photo- finishing and editing digital images. - Perspectives: Single Point, Two- Point, Three- Point and methods of correcting distortions – Lighting: External and Interior			**CO2**
UNIT - III	**Journalism**	**Periods: 9**	
- Introduction to journalism, key concepts and objectives of Journalism. - Specialized journalism: with emphasis on architectural journalism. Journalism skills: research, reporting, writing, editing criticism.			**CO3**
UNIT - IV	**Discussion and Issues**	**Periods: 9**	
- Regional, national and international discussion forums. - Changes in contemporary and historical design practices. - Discussions on topics needed in an architectural journal and current issues. - Types of journals. - Works of key architectural journalists. - Public discourse on the internet. - Mass media and public opinion. - Critique on selected pieces of journalism.			**CO4**
UNIT - V	**Field Program**	**Periods: 9**	
Exercise on integrating photography in architectural journalism.			**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Julian Calder and john Garrett, The 35mm Photographer's Handbook, Pan Books, London1999
2. Julie Adair King, Digital Photography for Dummies, COMDEX, New Delhi 1998 3. Professional photography – photographing buildings, David Wilson,Rotovision
4. Point view- The art of architectural photography, E.Manny A Ballan,VNR
5. Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries. UNESCO/Thomson Foundation/ Common wealth BroadcastingAssociation, 2005.
6. Ward, S. J. A. "Philosophical Foundations of Global Journalism Ethics." Journal of Mass Media Ethics., Vol. 20, No. 1, 3-21,2005.

Reference Books

11. 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.
12. S. J. A.Ward, 'Philosophical Foundations of Global Journalism Ethics', Journal ofMass Media Ethics, Vol. 20, No. 1, 3-21,2005.
13. M. Heinrich, 'Basics Architectural Photography', BikhauserVerlagAG,2008.
14. Gerry Kopelow, 'Architectural Photography: The Professional Way', Princeton Architectural Press,2007.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V / IX**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0921**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Construction and Project Management / Professional Elective - VI**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to		BT Mapping (Highest Level)
	CO1	Ability to understand a project from concept to commissioning, feasibility study & facility programme, design, construction to commissioning	**K2**
	CO2	Ability to apply project management techniques in achieving objectives of a project like client **needs** quality, time & cost.	**K3**
	CO3	An understanding of principles of management, construction scheduling, scope definition and team roles.	**K2**
	CO4	An Understanding of Computerized Project Management in Field of Practicing	**K2**
	CO5	An Understanding of Real estate & regulatory strategies.	**K2**

UNIT - I	**Introduction to Project Management**	**Periods: 7**

- Project management concepts.
- Objectives, planning, scheduling.
- Controlling and role of decision.
- In project management.
- Traditional management system.
- Gantt's approach.
- Load chart. Progress chart. Development of bar chart, merits and demerits. CPM networks, merits and demerits. PERT network.
- Introduction to the theory of probability and statistics.

CO1

UNIT - II	**Project Programming and Critical Path Method**	**Periods: 11**

- Project network, Event activity, Dummy, Network rules, Graphical guidelines for Network.
- Numbering the events Cycles.
- Development of network-planning for network construction.
- Models of network construction.
- Steps in development of network.
- Work break down structure Hierarchies.
- Critical path method-process activity time estimate, earliest event time ,latest allowable occurrence time, start and finish time of activity, float, critical activity and critical path problems.

CO2

UNIT - III	**Resource Planning**	**Periods: 7**

- Cost model- project cost, direct cost, indirect cost, slope curve, total project cost.
- Optimum duration contracting the network for cost optimization.
- Steps in cost optimization, updating, resource allocation, resource smoothing, resource leveling

CO3

UNIT - IV	**Computerized Project Management**	**Periods: 11**

- Creating a new project, building task.
- Creating resources and assessing costs, refining project.
- Project tracking, recording actual.
- Reporting on progress.
- Analyzing financial progress.
- Introduction to BIM

CO4

UNIT - V	**Concept to Commissioning**	**Periods: 9**

- Project feasibility study.
- Real estate & regulatory strategies.
- Facility programming and planning.
- Design management.
- EPC. Testing &commissioning.

CO5

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. Dr. B.C. Punmiaand K.K. Khandelwal, 'Project Planning and Control with PERT and CPM', Laxmi Publications,2018.
2. Elaine Marmel, 'Microsoft Project 2010 Bible', Wiley,2010.
3. Sam Kubba, 'Green Construction Project Management and Cost Oversight', Elsevier,2010

Reference Books

1. Jerome D. Wiest and Ferdinand K. Levy, 'A Management Guide to PERT/CPM', Prentice Hall of India,1982.
2. Bert Bielefeld, 'Basics Project Management Architecture', Birkhauser,2013.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	45 (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V / IX**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0922**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Earthquake Resistant Architecture / Professional Elective - VI**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Ability to understand the formation and causes of earthquakes	**K2**
	CO2 An understanding of the factors to be considered in the design of buildings and services to resist earthquakes	**K2**
	CO3 Seismic design and detailing of masonry structures, wood structures, earthen structures Seismic design and detailing of RC and steel buildings	**K3**
	CO4 An Understanding of Seismic design and detailing of Construction techniques	**K2**
	CO5 An Understanding of design for earthquake resistance involving institutional masonry building with horizontal spread and height restriction	**K2**

UNIT - I	**Fundamentals of Earthquake**	**Periods: 7**
- 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.		**CO1**
UNIT - II	**Site Planning, Performance of Ground and Building**	**Periods: 10**
- Historical experience, site selection and development. - Earthquake effects on ground, soil rupture, liquefaction, land slides. - Behavior of different types of building structures, equipment's, lifelines, collapse patterns. - Behavior of non-structural elements like services, fixtures in earthquake-prone zones		**CO2**
UNIT - III	**Seismic Design Codes and Building Configuration**	**Periods: 10**
- Seismic design code provisions. - Introduction to Indian codes. - Building configuration - scale of building, size, horizontal and vertical plane, building proportions, symmetry of building - torsion, re- entrant corners, irregularities in buildings like short storeys, short columns,etc.		**CO3**
UNIT - IV	**Different Types of Construction Details**	**Periods: 11**
- Seismic design and detailing of masonry structures, wood structures, earthen structures. Seismic design and detailing of RC and steel buildings. - Design of non-structural elements - architectural elements, water supply, drainage, electrical and mechanical components.		**CO4**
UNIT - V	**Urban Planning and Architectural Design**	**Periods: 7**
- Vulnerability of existing buildings, facilities planning, fires after earthquake, socio-economic impact after earthquakes. - Conceptual design for earthquake resistance involving institutional masonry building with horizontal spread and height restriction, multistoried RC framed apartment/commercial building.		**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. 'Guidelines for earthquake resistant non-engineered construction', National Information centre of earthquake engineering (NICEE, IIT Kanpur, India),2004.
2. C.V.R Murthy, Andrew Charlson, 'Earthquake Design Concepts', NICEE, IIT Kanpur,2006.
3. Agarwal.P, 'Earthquake Resistant Design', Prentice Hall of India,2006.

Reference Books

1. Ian Davis, 'Safe Shelter within Unsafe Cities: Disaster Vulnerability and Rapid Urbanization', Open House International, UK,1987
2. 'Socio-economic developmental record'- Vol.12, No.1,2005.
3. Mary C. Comerio, LuigiaBinda, 'Learning from Practice- A Review of Architectural Design and Construction Experience after Recent Earthquakes', Joint USA-Italy workshop, Oct.18-23, 1992, Orvieto,Italy.

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)				End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Attendance	50	100
Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)			5		

Department	**School of Architecture**	Programme: **B.Arch.**						
Semester	**V / IX**	Course Category : **PE**				End Semester Exam Type: **TH**		
Course Code	**U23EL0923**	Periods/Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**Human Rights / Professional Elective - VI**	**3**	**-**	**-**	**3**	**50**	**50**	**100**

Course Outcomes	On completion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1 Ability to understand the basics about Human Rights.	**K2**
	CO2 An understanding of the history of Human Rights.	**K2**
	CO3 Ability to understand the Theories of Human Rights.	**K2**
	CO4 An Understanding of Human Rights Scenario in India.	**K2**
	CO5 An Understanding of various Human Right Laws in Specific manner.	**K2**

UNIT - I	**Introduction to Human Rights**	**Periods: 9**	
- Human Rights – Meaning, Origin and Development. Notion and Classification of Rights – Natural, Moral and Legal Rights. Civil and Political Rights, Economic, Social and Cultural Rights; Collective / Solidarity Rights.			**CO1**
UNIT - II	**Site Planning, Performance of Ground and Building**	**Periods: 9**	
- Evolution of the Concept of Human Rights Magana Carta – Geneva Convention of 1864, Universal Declaration of Human Rights, 1948. Theories of Human Rights.			**CO2**
UNIT - III	**Seismic Design Codes and Building Configuration**	**Periods: 9**	
- Theories and Perspectives of UN Laws – UN Agencies to monitor and Compliance.			**CO3**
UNIT - IV	**Different Types of Construction Details**	**Periods: 9**	
- Human Rights in India – Constitutional Provisions / Guarantees			**CO4**
UNIT - V	**Urban Planning and Architectural Design**	**Periods: 9**	
- Human Rights of Disadvantaged People – Women, Children, Displaced persons and Disabled persons, including aged and HIV Infected People. Implementation of Human Rights – National and State Human Rights Commission – Judiciary – Role of NGO's, Media, Educational Institutions, Social Movements.			**CO5**

Lecture Periods: 45	**Tutorial Periods:-**	**Practical Periods:-**	**Total Periods: 45**

Text Books

1. "Universal Declaration of Human Rights" (Draft Committee, Paris),1948.
2. Human Rights and their Limits,Wiktor Osiatynski – 2009.

Reference Books

1. Kapoor S.K., "Human Rights under International law and Indian Laws", Central Law Agency, Allahabad, 2014.
2. Chandra U., "Human Rights", Allahabad Law Agency, Allahabad,2014.
3. Upendra Baxi, The Future of Human Rights, Oxford University Press, New.

COs/POs/PSOs Mapping

COs	**Program Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Correlation Level: 1 – Low, 2 – Medium, 3 – High

Evaluation Methods

Assessment	**Continuous Assessment Marks (CAM)**				**End Semester Examination (ESE) Marks**	**Total Marks**
	CAT 1	CAT 2	Model Exam	Attendance	50	100

Marks	**45** (Best of 2 from 3 Test,200 marks reduced to 45 marks)	5		