



UNIVERSITY OF CALICUT

**Abstract**

General and Academic - Faculty of Engineering - B.Arch programme - Revised syllabus w.e.f 2017 Admn.. - Seventh to Tenth semester - Implemented subject to ratification by the Academic Council - Orders issued.

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**G & A - IV - E**

U.O.No. 2039/2020/Admn

Dated, Calicut University.P.O, 15.02.2020

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- Read:-*1.U.O.No.11016/2017/Admn dated 31.08.2017.  
2.U.O.No. 8825/2018/Admn dated 24.07.2018.  
3.Item No.1 of Minutes of the meeting of the Board of Studies in Architecture held on 19.08.2019.  
4.Item No. 1 of Minutes of the meeting of the Faculty of Engineering held on 05.12.2019.

ORDER

The revised Regulations and the Syllabus for combined First and Second semester B.Arch Programme was implemented with effect from 2017 admission vide paper read as (1) and the revised Syllabus of Third to Sixth semester of B.Arch Programme was implemented with effect from 2017 admission vide paper read as (2) above.

The Board of Studies in Architecture at its meeting held on 19.08.2019 scrutinized and discussed the syllabus of B.Arch from seventh to tenth semesters and approved the same with modifications vide paper read as (3) and the resolution of the Board of Studies was approved by the Faculty of Engineering vide paper read as (4).

Considering the urgency, the Vice Chancellor has accorded sanction to implement the Syllabus of Seventh to Tenth semester of B.Arch Programme w.e.f 2017 Admn. subject to ratification by Academic Council.

The Revised Syllabus of B.Arch Programme w.e.f 2017 Admn. (Seventh to Tenth semester) is therefore implemented with effect from 2017 admission.

(B.Arch Degree Programme Scheme - 2017 Admn., Regulations and Syllabus of B.Arch Programme (2017 Admn) -First and Second Semester, Syllabus of B.Arch Programme (2017 Admn) - Third to Sixth Semester, Syllabus of B.Arch Programme (2017 Admn)-Seventh to Tenth Semester appended)

Biju George K

Assistant Registrar

To

- 1.Principals of affiliated B.Arch Colleges.
2. The Controller of Examinations.

Copy to:PA to VC/PA to Registrar/PA to CE/DR, B.Tech/EX & EG sections/ GA I F/SF/DF/FC

Forwarded / By Order

Section Officer

**UNIVERSITY OF CALICUT – B. ARCH. DEGREE COURSE SCHEME – 2017 ADMISSION**

<b>COMBINED FIRST AND SECOND SEMESTER</b>										
<b>Course Code</b>	<b>Subject</b>	<b>Credits</b>	<b>Hours per Week</b>			<b>Duration of Exam</b>	<b>Marks</b>			
			<b>L</b>	<b>T</b>	<b>P/D</b>		<b>W</b>	<b>J</b>	<b>S</b>	<b>TOTAL</b>
AR 17-11	Basic Design *	10	0	0	8	0		200	300	500
AR 17-12	Theory of Design I	4	2	0	0	3	100		50	150
AR 17-13	Building Materials and Construction I	5	1	0	2	3	100		100	200
AR 17-14	Theory of Structures I	4	2	1	0	3	100		50	150
AR 17-15	History of Architecture I	3	2	0	0	3	100		50	150
AR 17-16	Architectural Drawing and Graphics	6	0	0	5	3	100		100	200
AR 17-17	Visual Arts & Presentation	4	1	0	2	3	100		100	200
AR 17-18	Model-making Workshop	2	0	0	2	0			100	100
AR 17-19	Communication Skills	2	0	0	2	0			50	50
<b>TOTAL</b>		<b>40</b>	<b>8</b>	<b>1</b>	<b>21</b>		<b>600</b>	<b>200</b>	<b>900</b>	<b>1700</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

<b>THIRD SEMESTER</b>										
<b>Course Code</b>	<b>Subject</b>	<b>Credits</b>	<b>Hours per Week</b>			<b>Duration of Exam</b>	<b>Marks</b>			
			<b>L</b>	<b>T</b>	<b>P/D</b>		<b>W</b>	<b>J</b>	<b>S</b>	<b>TOTAL</b>
AR 17-31	Architectural Design I*	10	0	0	10	0		200	300	500
AR 17-32	Theory of Design II	3	2	0	0	3	100		50	150
AR 17-33	Building Materials and Construction II	3	1	0	3	3	100		100	200
AR 17-34	Building Climatology	3	3	0	0	3	100		50	150
AR 17-35	Building Science Lab	3	0	0	3	0			100	100
AR 17-36	Theory of Structures II	3	2	1	0	3	100		50	150
AR 17-37	History of Architecture II	3	3	0	0	3	100		50	150
AR 17-38	Computer-aided Visualization I	2	0	0	2	0			100	100
<b>TOTAL</b>		<b>30</b>	<b>11</b>	<b>1</b>	<b>18</b>		<b>500</b>	<b>200</b>	<b>800</b>	<b>1500</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

<b>FOURTH SEMESTER</b>										
<b>Course Code</b>	<b>Subject</b>	<b>Credits</b>	<b>Hours per Week</b>			<b>Duration of Exam</b>	<b>Marks</b>			
			<b>L</b>	<b>T</b>	<b>P/D</b>		<b>W</b>	<b>J</b>	<b>S</b>	<b>TOTAL</b>
AR 17-41	Architectural Design II*	10	0	0	10	0		200	300	500
AR 17-42	Site Surveying & Analysis	3	2	0	1	3	100		50	150
AR 17-43	Building Materials and Construction III	3	1	0	3	3	100		100	200
AR 17-44	Building Services - I (Water Supply & Sanitation)	3	3	0	0	3	100		50	150

AR 17-45	Theory of Structures III	3	2	1	0	3	100		50	150
AR 17-46	History of Architecture III	3	3	0	0	3	100		50	150
AR 17-47	Environmental Studies	3	2	0	0	3	100		50	150
AR 17-48	Computer-aided Visualization II	2	0	0	2	0			100	100
<b>TOTAL</b>		<b>30</b>	<b>13</b>	<b>1</b>	<b>16</b>		<b>600</b>	<b>200</b>	<b>750</b>	<b>1550</b>

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<b>FIFTH SEMESTER</b>										
Course Code	Subject	Credits	Hours per Week			Duration of Exam	Marks			
			L	T	P/D		W	J	S	TOTAL
AR 17-51	Architectural Design III*	10	0	0	10	0		200	300	500
AR 17-52	Landscape Design	3	3	1	0	3	100		50	150
AR 17-53	Building Materials & Construction IV	3	1	0	3	3	100		100	200
AR 17-54	Building Services - II (Lighting & Electrical Services)	3	3	0	0	3	100		50	150
AR 17-55	Design of Structures I	3	2	1	0	3	100		50	150
AR 17-56	History of Architecture IV	3	3	0	0	3	100		50	150
AR 17-57	Specification, Estimation & Costing	3	2	1	0	3	100		50	150
<b>TOTAL</b>		<b>28</b>	<b>14</b>	<b>3</b>	<b>13</b>		<b>600</b>	<b>200</b>	<b>650</b>	<b>1450</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

<b>SIXTH SEMESTER</b>										
Course Code	Subject	Credits	Hours per Week			Duration of Exam	Marks			
			L	T	P/D		W	J	S	TOTAL
AR 17-61	Architectural Design IV*	10	0	0	10	0		200	300	500
AR 17-62	Interior Design	3	1	0	3	3	100		100	200
AR 17-63	Building Materials & Construction V	3	1	0	3	3	100		100	200
AR 17-64	Building Services - III (HVAC & Mechanical Services)	3	3	0	0	3	100		50	150
AR 17-65	Design of Structures II	3	2	1	0	3	100		50	150
AR 17-66	History of Architecture V	3	3	0	0	3	100		50	150
AR 17-67	Town Planning	3	3	0	0	3	100		50	150
<b>TOTAL</b>		<b>28</b>	<b>13</b>	<b>1</b>	<b>16</b>		<b>600</b>	<b>200</b>	<b>700</b>	<b>1500</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

**SEVENTH SEMESTER**

Course Code	Subject	Credits	Hours per Week**			Duration of Exam	Marks			
			L	T	P/D		W	J	S	TOTAL
AR 17-71	Architectural Design V*	12	0	0	12	0		200	300	500
AR 17-72	Urban Design	3	3	0	0	3	100		50	150
AR 17-73	Architectural Detailing & Working Drawing	3	0	0	4	0			100	100
AR 17-74	Building Services - IV (Acoustics & Fire-fighting Services)	3	3	0	0	3	100		50	150
AR 17-75	Building Economics and Sociology	3	3	0	0	3	100		50	150
AR 17-76	Elective - I	3	3	0	0	3	100		50	150
<b>TOTAL</b>		<b>27</b>	<b>12</b>	<b>0</b>	<b>16</b>		<b>400</b>	<b>200</b>	<b>600</b>	<b>1200</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

\*\* 2 Hours per week allotted for Library

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

**Course**

AR 17-76-1

AR 17-76-2

AR 17-76-3

AR 17-76-4

**Elective - I**

Sustainable Architecture and Planning

Cost-efficient Construction Techniques

Barrier-free Environment Design

Vernacular Architecture

**EIGHTH SEMESTER**

Course Code	Subject	Credits	Hours per Week			Duration of Exam	Marks			
			L	T	P/D		W	J	S	TOTAL
AR 17-81	Practical Training*	15	0	0	0	0		300	300	600
<b>TOTAL</b>		<b>15</b>						<b>300</b>	<b>300</b>	<b>600</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

**NINTH SEMESTER**

Course Code	Subject	Credits	Hours per Week**			Duration of Exam	Marks			
			L	T	P/D		W	J	S	TOTAL
AR 17-91	Architectural Design VI*	12	0	0	12	0		200	300	500
AR 17-92	Earthquake-resistant Structures	3	3	0	0	3	100		50	150
AR 17-93	Dissertation	3	0	3	0	0		100	100	200
AR 17-94	Construction and Project Management	3	3	0	0	3	100		50	150
AR 17-95	Professional Practice	3	3	0	0	3	100		50	150

AR 17-96	Elective - II	3	3	0	0	3	100		50	150
<b>TOTAL</b>		<b>27</b>	<b>12</b>	<b>3</b>	<b>12</b>		<b>400</b>	<b>300</b>	<b>600</b>	<b>1300</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

\*\* 3 Hours per week allotted for Library

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

<b>Course</b>	<b>Elective - II</b>
AR 17-96-1	Architectural Conservation
AR 17-96-2	Services in High-rise Buildings
AR 17-96-3	Architectural Journalism
AR 17-96-4	Urban Housing

<b>TENTH SEMESTER</b>										
<b>Course Code</b>	<b>Subject</b>	<b>Credits</b>	<b>Hours per Week</b>			<b>Duration of Exam</b>	<b>Marks</b>			
			<b>L</b>	<b>T</b>	<b>P/D</b>		<b>W</b>	<b>J</b>	<b>S</b>	<b>TOTAL</b>
AR 17-101	Architectural Thesis*	25	0	0	30	0	0	300	400	700
<b>TOTAL</b>		<b>25</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>300</b>	<b>400</b>	<b>700</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L - Lecture, T - Tutorial, P/S - Practical/Studio, W - Written University Examination, J - Jury, S - Sessional Marks

**TOTAL CREDITS: 250**  
**MARKS: 11500**

**AGGREGATE**



**UNIVERSITY OF CALICUT**

**Abstract**

Faculty of Engineering-B.Arch programme-Revised regulation and syllabus with effect from 2017 admissions-implemented-Orders issued.

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U.O.No. 11016/2017/Admn

**G & A - IV - E**

Dated, Calicut University.P.O, 31.08.2017

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*Read:-*1.Item No.1 of the Minutes of the meeting of the Board of Studies in Architecture held on 05.06.2017.  
2.Item No.1.10 of the Minutes of the meeting of the Academic council held on 17.07.2017.

**ORDER**

As per paper read as (1), the Board of Studies in Architecture discussed and scrutinised the B.Arch course Regulation 2017 in detail and approved the same with modifications. The Board also approved the Curriculum and Syllabus for Combined First and Second semester B.Arch Programme.

According to paper read as (2), the Academic council in its meeting held on 17.07.2017 resolved to approve Item No.1 of the Minutes of the meeting of the Board of Studies in Architecture held on 05.06.2017.

The Vice Chancellor has accorded sanction to implement the above resolution of the Academic Council.

The following orders are therefore issued;

1.The Revised Regulations and the Syllabus for Combined First and Second semester B.Arch Programme is implemented with effect from 2017 admission.

(Regulation and syllabus appended)

Ajitha P.P

Joint Registrar

To

1.The Controller of Examinations  
2.Principals of affiliated B.Arch Colleges  
Copy to:PS to VC/PA to PVC/PA to Registrar/PA to CE/DR,B.Tech/EX & EG sections/SF/DF/FC

Forwarded / By Order

Section Officer

**University of Calicut**

**Course Regulations**

**of**

**B.Arch. Degree Course**

**(With effect from 2017 admissions)**

## **Preamble**

Architectural education in India is regulated by the Council of Architecture (hereafter, the COA, unless otherwise specified) which was constituted under the Architect's Act 1972. Council has prescribed mandatory 'minimum standards of Architectural Education regulations'. It prescribes the structure of the B. Arch. Course, eligibility for admission of students, periods of study, standards of syllabus, examinations, faculty, infrastructure, equipment, maximum permissible intake for each batch, etc. The course regulations of B. Arch. Degree course (2017 Scheme) of the University has been formulated based on the COA regulations.

### **1. Conditions for Admission**

Candidates for admission to the B.Arch. Degree course shall be required to have passed the Higher Secondary (Plus Two) Examination of State Board of Kerala or examination recognized equivalent by the University of Calicut (hereafter, the University, unless otherwise specified), with Mathematics as a subject, with minimum 50% in aggregate marks.

All Admissions to B.Arch. degree course shall be subject to passing of National Aptitude Test in Architecture (NATA) conducted by the COA (as per the guidelines of COA, India) or any specially designed aptitude test in architecture conducted by the competent authority of the Central / State Governments as approved by the COA. There is no provision for lateral admission to the second year or at any stage for the 5 year degree course in Architecture.

#### **1.1 Admission to Diploma Holders**

A candidate who has a diploma in architecture / engineering awarded by the State Board of Technical Examination or an examination recognized equivalent by the State Board of Technical Education after undergoing regular course of 3 years in an approved institute, securing at least 50% aggregate marks, shall be eligible to be admitted to the first year B.Arch. programme of the University. Candidates with International Baccalaureate Diploma, after 10 years of schooling, with not less than 50% marks in aggregate and with Mathematics as a compulsory subject of examination are also eligible.

Diploma holders from other states should produce an Equivalence certificate from the Controller of Technical Exams, Kerala/State Board of Technical Examinations for admission to B. Arch. Course.

#### **Note:**

A relaxation of 5% marks in the qualifying examination will be allowed to those candidates who belong to the communities listed under the Socially and Educationally Backward Classes (SEBC) and whose annual family income is up to the specified limit. SC/ST candidates need only a pass in the qualifying examination. The amendments in qualifications for admission as notified by the COA from time to time will also be applicable for the admission to B. Arch Degree Course.

Criteria for selection and method of admission to merit/management seats for B. Arch. Degree course conducted by Government/Aided/Self-financing colleges



affiliated to the University shall be governed by the rules/regulations framed by the Commissioner of Entrance Examinations or other competent authority appointed by the Government of Kerala, in consultation with the University and without contravening with the stipulation of the University Grants Commission (UGC) and the COA. The students admitted by affiliated colleges violating the above regulations will not be eligible for registration to University Examinations and contravention of the regulations shall lead to withdrawal/suspension of affiliation. They shall also satisfy the conditions regarding age and physical fitness as prescribed by the University.

## 2. **Structure of the Course**

The B.Arch. Degree Course will have a curriculum in conformity with the minimum standards of Architectural Education prescribed by the COA, constituted under the Architect's Act 1972, with syllabi consisting of theory, theory cum studio and studio subjects that shall be categorized as follows:

- i. Design Skills subjects include Architectural Design, Basic Design, Architectural Thesis, etc.
- ii. Technology and Construction Skills subjects include Building Materials and Construction, Architectural Detailing and Working Drawing, etc.
- iii. Arts and Humanities subjects include History of Architecture, Sociology & Economics Theory of Human Settlements, Urban Housing, etc.
- iv. Professional and Auxiliary Skills subjects include Architectural Drawing and Graphics, Visual Arts, Computer-aided visualization, etc.
- v. Electives include elective courses like Vernacular Architecture, Architectural Journalism and Photography, Entrepreneurship skills for Architects, etc.

All students shall choose three elective subjects; one each in the sixth, seventh and ninth semesters from a set of elective subjects prescribed in the syllabus and offered by the institution. There should be at least 25% students of the class/batch for an elective subject to be offered.

New electives may be introduced according to the needs of emerging fields in architecture. The name of the elective and its syllabus should be approved by the University before the subject is offered as an elective.

The subjects of study, both theory and practical, shall be in accordance with the prescribed scheme and syllabi.

The medium of instruction, examination, and evaluation is English for all courses, design studios, seminar presentations and project/thesis reports.

## 3. **Duration of the Course**

The course for the B. Arch. Degree shall extend over a period of five academic years comprising of ten semesters including one semester of Practical Training after the completion of the 7th semester B. Arch. Examination and one semester Architectural Thesis Project work after the completion of the 9th semester B. Arch. examination. The maximum duration permissible for taking the B. Arch. Degree course is fixed as 10 years.

Admission to the first year shall be completed by 31st August. The first and second semesters shall be combined and the S1 & S2 B. Arch. Examination will be conducted at the end of the first academic year.

The minimum number of working days in combined first and second semesters shall be 150 days. In the 3rd to 10th semesters, there shall be a minimum of 75 working days. Working periods can be of 50-60 min. duration. A Working week shall consist of 30 - 40 periods.

#### 4. **Course Calendar**

The course calendar, published by the University in advance, should be strictly followed for ensuring timely conduct of examinations and publication of results. The course calendar should be prepared by convening a meeting of Principals / Heads of all affiliated architecture institutions.

Faculty members from affiliated architecture colleges who are assigned duty by the University for Centralized Valuation Camp should strictly attend the valuation at the specified centre; Head of each institution should ensure this, failing which disciplinary action will be initiated against defaulting colleges, including withholding of valuation of answer papers of candidates appeared for the concerned examination from such institutions. Duty leave shall be granted to such faculty members who are assigned valuation duties.

Faculty members appointed for Centralized Valuation Camp should necessarily have minimum two years teaching experience or as prescribed by the University from time to time.

At the end of every semester, the Head of each Institution should forward the list of faculty members working in the college along with their qualification, years of teaching experience, and subjects taught in various semesters to the University. This is a mandatory requirement which should be strictly followed by the Head of each Institution. The head of each Institution shall ensure the availability of sufficient number of regular faculty members having experience and qualifications (as prescribed by the COA in the Regulations for Architecture Education) in the institution.

#### 5. **Assessment of Students**

Assessment of students for each subject will be done by internal continuous assessment and end semester examinations. The individual maximum marks allotted for continuous assessment and End-semester University examinations for each subject is as prescribed by the scheme of study.

Every teacher is required to maintain an 'ATTENDANCE AND ASSESSMENT RECORD' for every semester which consists of attendance marked in each theory / theory cum studio /studio class, the assessment marks and the record of class work (topics covered), separately for each course handled by the teacher. This should be submitted to the Head of the Department periodically (at least three times in a semester) for checking the syllabus coverage and the records of assessment marks and attendance. The Head of the Department will affix his/her signature and date after due verification. At the end of the semester, the record should be verified by the Head of the Department who shall keep this document in safe custody (for ten years

from the date of admission of that batch of students). The records of attendance and assessment of both current and previous semesters should be available for inspection.

a) **Continuous Assessment**

Internal assessment shall be conducted throughout the semester. It shall be based on internal examinations, assignments (such as home assignment, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.) as decided by the faculty handling the course with the approval of the head of the institution, and regularity in the class.

Internal assessment marks of all theory and practical subjects should have a class average limited to 80%. If the class average of internal assessment marks of any theory subject is greater than 80%, it should be normalized to limit it to 80%. If the class average is not greater than 80%, absolute marks should be given.

For practical subjects, end-semester examination marks of the candidates who have secured 40% or more marks should have a class average limited to 80%. If the class average of end-semester examination marks of practical subjects is greater than 80%, it should be normalized to limit the class average to 80%. If it is not greater than 80%, absolute marks should be given.

All the students in the nominal roll of the class on the closing day of semester should be considered for normalization of internal marks.

Normalized internal assessment marks of theory and practical subjects, should be published in the college 10 days before sending it to the University so as to enable the students to report any corrections.

All subjects of the B.Arch. Degree Course excluding Dissertation, Practical Training, Thesis and Viva Voce are grouped into two. Continuous assessment marks shall be awarded as per the following norms for each group.

**GROUP I**

Basic Design, Architectural Design I, II, III, IV, V, and VI, Building Materials and Construction – I, II, III, IV, V and VI, Architectural Drawing and Graphics, Visual Arts, Model-making Workshop, Communication Skills, Building Science Lab, Computer-aided Visualization I and II, and Architectural Detailing and Working Drawing.

Assignments/other measures as specified above	– 70%,
Test(s)	– 20%
Regularity	– 10%

**GROUP II**

All subjects other than mentioned in Group I.

Assignments/other measures as specified above	– 30%,
Test(s)	– 60%
Regularity	– 10%

- i. The C. A. marks allotted for regularity for all subjects shall be awarded full only if the candidates have secured at least 90% attendance in the subject. Proportionate reduction will be made in the case of subjects in which he/she gets below 90% of the attendance for the subject.
- ii. The Practical Training, the Dissertation, Thesis and Viva Voce, Jury for Basic Design, Architectural Design I to VI, Study Tour, and Documentation Camp shall be conducted as per the guidelines given in Section 21.

### **(b) End-semester Examinations**

- i. There shall be University Examinations at the end of combined first and second semester and at the end of every semester from 3rd semester onwards in subjects as prescribed under the respective scheme of examinations for B.Arch. Degree course except practical training.
- ii. Examinations for all subjects (Theory, Drawing, Architectural Design Jury, Practical Training Jury, and Thesis Viva Voce) will be conducted by the University.
- iii. Examinations will be held twice in a year – April/May session (for even semesters) and October/November session (for odd semesters); failed or improvement candidates will have to appear for the End-Semester examinations along with regular students. The combined 1st and 2nd semester is reckoned as equivalent to an even semester for the purpose of conduct of examination and the University examination will be held during April/May. However, 9th and 10th Semester examinations will be conducted in both the sessions.

### **6. Pattern of Questions for End-Semester Examinations of Theory Subjects**

The question papers of end-semester examinations of theory subjects shall be prepared by experts having at least 2 years of experience of teaching the concerned subject for B.Arch. courses in the concerned subject.

The question papers shall conform to the following guidelines:

- (a) Even distribution of questions from all modules of the course syllabus as per the question paper pattern given in the syllabus of each subject.
- (b) Unambiguous and free from any defects/errors.
- (c) Contains adequate data/other information on the problems assigned
- (e) Have clear and complete instructions to the candidates like the structural and other codes allowed to be taken inside the examination hall, and special stationery items to be supplied to students if any.

The pattern of questions for all subjects shall be specified along with the syllabus of the particular subject.

The question papers shall be scrutinized by an expert on the subject to check the conformity to the guidelines.

Model question paper shall be prepared for each subject after the syllabus preparation. This same model question paper along with the syllabus must be sent to the question-paper setter every time for framing the questions. All question paper setters should provide the scheme and key for the evaluation. The model question paper shall be made available to students.

7. **Credit System**

Each subject shall have a certain number of credits assigned to it depending upon the academic load and the nature and importance of the subject. The credit associated with each subject will be shown in the prescribed scheme and syllabi. Each course shall have an integer number of credits, which reflects its weightage.

8. **Grading**

The university shall award the letter grade to students based on the marks secured by them in both internal assessment and end-semester examinations taken together in the subjects registered. Each letter grade indicates a qualitative assessment of the student's performance and is associated with a specified number of grade points. The grading system along with the grade points for each grade, applicable to passed candidates is shown below. All passed candidate will be allotted a grade S, A, B, C, D, or E according to the total marks scored by him/her. Absolute Marks secured by the candidates will also be included in the Mark list.

If a candidate does not pass a subject as per the conditions given in Section 10, he/she will be assigned an Unsatisfactory grade 'U' irrespective of his/her total marks. If a student does not pass a subject in two attempts, the maximum grade he/she can get is 'C' when he/she passes the subject in any subsequent examination, whatever be the marks scored by him/her.

A student is considered to have completed a subject successfully and earned the credits if he/she secures a letter grade other than 'U' in that course. Letter grade 'U' has zero grade point and the candidate has to write the examination again to improve the grade. A student's performance is measured by the number of credits that he/she has earned and by the cumulative grade point average (CGPA) maintained by him/her.

Percentage of marks (rounded off to the nearest integer) scored by the passed candidates	Corresponding Grade allotted	Grade Points
91- 100	S	10
81-90	A	9
71-80	B	8

61-70	C	7
51-60	D	6
40-50	E	5

For converting CGPA to percentage of marks, the following formula can be used.  
Percentage marks = (CGPA - 0.5) x 10.

9. **Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)**

- a. A Semester Grade Point Average (SGPA) shall be computed for all the students for each semester, as follows:

$$SGPA = \sum_{i=1}^n \frac{C_i G_i}{C_i}$$

where, n is the number of subjects registered during the semester, Ci is the number of credits allotted to the subject as per the scheme, and Gi is the grade points corresponding to the grade awarded to the student for the subject.

- b. A Cumulative Grade Point Average (CGPA) shall be computed for all the students at the end of each semester by taking into consideration their performance in the present and the past semesters as follows:

$$CGPA = \sum_{i=1}^m \frac{C_i G_i}{C_i}$$

where, m is the number of courses registered up to that semester, Ci is the number of credits allotted to the subject as per the scheme, and Gi is the grade points corresponding to the grade awarded to the student for the subject.

An up-to-date assessment of overall performance of a student is obtained by calculating CGPA. CGPA is weighted average of the grade points obtained in all the subjects registered by the students since he entered the B. Arch. course.

- c. Both the SGPA and CGPA shall be rounded off to the second place of decimal and recorded as such for ease of presentation. Whenever the CGPAs are to be used for the purpose of determining the merit ranking in a group of students, only the rounded off values shall be made use of.

10. **Minimum for Pass**

- (a) A candidate who secures not less than 40% marks in a subject at the end-semester examinations and not less than 50% of the total marks assigned to the subject, shall be declared to have passed the examination in that subject.

**OR**

- (b) A candidate who secures in end-semester examination itself, 40% of the total marks assigned to a subject (60 % of the university exam marks) shall also be declared to have passed the examination in that subject.

The total marks assigned to a subject in the above calculations are the sum of maximum marks assigned to the end-semester examination and maximum internal assessment marks of that subject. Candidates will be assigned grades according to the marks scored.

- Candidates shall secure 40% of marks in the external jury and 50% aggregate in (C.A.+ External Jury) for a pass in Basic Design and Architectural Design I to VI.
- For Dissertation and other such subjects which do not have University examination, the minimum marks for pass shall be 50% of the aggregate marks.
- For the Practical Training undertaken after the seventh semester, the minimum marks for pass shall be 50% of the aggregate marks.
- Candidates shall secure 40% of marks in the external jury and 50% aggregate (C.A. + External Jury) for passing the Thesis and Viva voce.

If a student fails to secure a pass in examinations of tutorial and studio courses, including subjects which have only internal marks, the student shall be given a make-up chance. He/she shall resubmit an improved Portfolio with works done under the supervision of a faculty member assigned by the Head of the department for the subsequent viva voce examination. The internal marks secured shall be suitably revised. Maximum period for submission of improved works shall not exceed one month from the date of announcement of the results of the concerned students in the Jury examination, by the Head of the teaching institution, excluding intervening University examinations, if any. Maximum marks also will be limited to 50% or the class average for the subject whichever is lower, for internal as well as external marks. Only those students, who have appeared for the original chance, shall be eligible for make-up chance.

In case, a student fails to secure a pass in this make-up chance, the student shall have to take a break and repeat the particular subject/s when it is offered next i.e. as a repeater student in the subsequent batch without affecting the sanctioned intake of that batch, fulfill the requirements for attendance, secure fresh internal assessment and submit the design/assignments as in the case of a regular student.

## 11. **Improvement**

Candidates shall be allowed to improve the grade of any two subjects of Group II (as mentioned in Section 5-a) in each semester. If the candidate gets more marks in the improvement chance, marks scored in the improvement chance will be considered for grading in the subject; otherwise marks scored in the first attempt will be retained.

No candidate shall be permitted to improve the marks scored in subjects of Group I (as mentioned in Section 5-a) and Continuous Assessment unless otherwise described in these regulations.

## 12. **Attendance**

A candidate shall be permitted to appear for the end-semester examinations only if he/she satisfies the following requirements:

- a. He/she must secure not less than 75% attendance in the total number of working hours in each semester.
- b. He/she must earn a progress certificate from the head of the institution stating that he/she has satisfactorily completed the course of study prescribed in the semester as required by these regulations.
- c. His/her conduct must be satisfactory.

It shall be open to the Vice Chancellor to grant condonation of shortage of attendance on the recommendation of the head of the institution in accordance with the following norms.

- The shortage shall not be more than 10%.
- Shortage up to 20% shall be condoned once during the entire course provided such shortage is caused by continuous absence on genuine medical grounds.
- Shortage shall not be condoned more than twice during the entire course.

A candidate who is not eligible for condonation of shortage of attendance shall repeat the semester.

Students are eligible for duty leave if they perform certain kinds of duties like representing the college/University in sports and games, etc. on recommendation from faculty members concerned, Head of Institution shall sanction duty leave for the period of absence. The maximum limit of duty leave that can be granted to a student during a semester is 10% of the total number of instructional hours engaged in that semester.

Application for duty leave should be submitted to the Head of Institution preferably before the duty is performed or within ten working days after returning from duty. If duty leave is sanctioned, the student shall meet the faculty members handling classes for him/her in that semester (within 2 weeks after returning from duty), and request them to mark duty leave granted in the record of attendance.

## 13. **Registration for each Semester**

Every candidate should register for all subjects of the end-semester examinations of each semester. A candidate who does not register will not be



permitted to attend the end semester examinations; he/she shall not be permitted to attend the next semester.

A candidate shall be eligible to register for any higher semester i.e. 3rd semester onwards if he/she has satisfactorily completed the course of study and registered for the examination of the combined first and second semesters. A candidate shall be eligible to register for the fourth to tenth semesters if he/she has satisfactorily completed the course of study and registered for the examination of the immediate previous semester. He/she should register for the semester at the start of the semester before the stipulated date. University will notify the starting and closing dates for each semester.

A pass in all subjects of combined first and second semesters is required for a student to become eligible for entry into the seventh semester. A pass in all subjects of third and fourth semester would be mandatory for entry into ninth semester for all students. He/she can be permitted to register with the subsequent batch as and when he/she satisfies the eligibility condition as repeater without affecting the sanctioned intake of that batch.

As this rule for promotion is an academic prerequisite, no exemption should be granted for any reason whatsoever. The Head of the Institution should take necessary measures to implement this rule strictly.

A student can be transferred from one institution to another institution only in the beginning of 3rd semester of the course, after the completion of admission process.

A Student who has temporarily discontinued his/her studies shall be permitted to rejoin the course with permission from the University, on the recommendations of the Head of the Institution, if he/she has to discontinue the course based on medical grounds and he/she should produce the medical certificate issued by a Govt. medical officer specialized in the respective field while rejoining the course. There will be provision for maternity leave to female students as per the norms of the University in vogue.

#### 14. **Additional Requirements for the degree**

In addition to the requirements prescribed for the award of B. Arch. Degree, each student must complete compulsory social service for a specified duration during 3rd to 9th semesters of the course. A record is to be kept showing the details of social service activities undertaken and it should be approved and certified by the Head of Institution before permitting the student to register for the tenth semester.

Social work shall have social / architectural significance .This can be a project related to INTACH, Rural/urban housing, Urban/rural social/physical surveys, Environmental issues and any such project the Head of the Institution approves. The report is to be made available in the college library for reference to concerned persons in a suitable format.

Students are required to compulsorily undertake educational tours to visit places of architectural interest and other study trips as per the requirements of the

Architectural Design Studio in the relevant semesters, taking not more than 5 working days in a semester. It can be combined with vacations/holidays.

For students who are granted exemption from attending any tour, measures shall be taken to record their attendance in the college and provide alternate tasks.

Students are also required to participate in a Documentation camp before the end of the Seventh semester.

15. **Examination Monitoring Cell**

Head of each Institution should formulate an Examination Monitoring Cell at the institution for supervising all examinations, especially the internal examinations. This cell, with a senior staff member as Convener, shall consist of minimum three members (one shall be a lady). A clerical staff having computer skills shall also be assigned for the examination monitoring cell.

The collective responsibilities of the examination monitoring cell are to:

- (a) Schedule all end-semester practical examinations as per the course calendar and inform the University two weeks in advance
- (b) Inform the University expert team (two weeks in advance) the schedule of all end-semester practical examinations.
- (c) Officiate as the examination squad to keep a vigil on all end-semester examinations. If any malpractices are found / reported by invigilators, inform these to the Head of Institution along with a report about the incident. Head of Institution shall forward all such complaints to the University.
- (d) Prepare and forward the list of examiners for all end-semester practical examinations to the Head of Institution for enabling him to issue appointment letters. Inform the University the list of examiners for practical examinations.
- (e) After closing the end-semester examinations conducted at institution level of each semester, fill-up and return the check-list given by the University.
- (f) Schedule all examinations conducted as part of internal assessment of students.
- (g) To receive any complaint from students regarding issues like out-of-syllabus questions, printing mistakes, etc. of end-semester examinations of theory and practical subjects. The cell shall investigate these complaints and if necessary forward it to the University with specific comments.
- (h) To receive any complaints from students regarding internal examinations, inquire into such incidents, and give a report to the Head of the Institution for necessary action.
- (i) In general, to function as an extended wing of the office of the Controller of Examinations of the University, at Institution level.

To conduct all the theory examinations, a Chief Superintendent and an Assistant Chief Superintendent should be appointed internally by the Head of the Institution. At least one external Additional Chief Superintendent should be appointed by the University as Observer for conducting theory examinations in all affiliated Architecture Colleges, who shall be not below the rank of an Assistant Professor in a Government/Aided College or Assistant Registrar in the University.

16. **Class Committee**

The Head of the Institution shall take necessary steps to form a class committee for each class at the start of classes of each semester. This class committee shall be in existence for the semester concerned. The class committee shall consist of the Head of Department, Staff Advisor of the class, a senior faculty member of the department, and three student representatives (one of them should be a girl). There should be at least two meetings of the class committee every semester; it shall be the responsibility of the Head of Department to convene these meetings. The decisions of the Class Committee shall be recorded in a register for further reference. Each class committee will communicate its recommendations to the Head of Institution.

The responsibilities of the class committee are:

- (a) to review periodically the progress and conduct of students in the class.
- (b) to discuss any problems concerning any subjects in the semester concerned.
- (c) to identify weaker students of the class and suggest remedial measures.
- (d) to review teaching effectiveness and coverage of syllabus.
- (e) discuss any other issue related to the students of the class.

17. **Eligibility for the Degree**

a) No candidate shall be eligible for the B. Arch. Degree unless he/she has undergone the prescribed course of study for a period of not less than five academic years (including Practical Training and Architectural Thesis Project) in an institution maintained by or affiliated to the University and has passed all the examinations as per the prescribed B. Arch. Degree curriculum.

b) The University shall issue the mark lists of students who pass the examinations in supplementary chances, through the head of the institution in which the student attended the course work.

18. **Classification of Successful Candidates**

- a) A candidate who qualifies for the degree, passing all the subjects of the ten semesters within 6 academic years after the commencement of his course of study and secures not less than a CGPA of 8.00 of all the semesters shall be declared to have passed the B. Arch. Degree examination in First Class with Distinction.
- b) A candidate who qualifies for the degree, passing all the subjects of the ten semesters within 6 academic years after the commencement of his course of study and secures less than 8.0 CGPA but not less than a CGPA of 6.50 of all the semesters shall be declared to have passed the B. Arch. Degree examination in First Class.
- c) All other candidates who qualify for the degree passing all the subjects of the ten semesters and not covered as per Section 18 (a) and 18 (b) shall be declared to have passed the B. Arch. Degree examination in Second class.

Name of the college where the candidate studied for the B. Arch. program shall be printed in each grade-card issued to the student. It may be indicated in each mark-list that the internal assessment marks of all subjects have been normalized.

19. **Grievance Redressal Cell**

Each college should set up a Grievance Redressal Cell constituted as per the norms prescribed by MHRD, UGC, COA, State Government, Honourable Courts etc. to look into grievances of the students, pertaining to SC & ST welfare, women, examinations etc.

20. **Anti-Ragging Cell**

The Head of Institution shall take necessary steps to constitute anti-ragging committee and squad at the commencement of each academic year. The committee and the squad shall take effective steps as specified by the Honorable Supreme Court of India, to prevent ragging.

21. **B. Arch. Degree Course Manual**

More details about the conduct and evaluation of Basic Design and Architectural Design I to VI, Practical Training, Thesis and Viva Voce, Study Tour and Documentation Camp for Architectural Design, and Dissertation are discussed in this course manual.

## **1. BASIC DESIGN AND ARCHITECTURAL DESIGN I TO VI**

a) The Evaluation of Basic Design and Architectural Design I to VI is based on continuous Evaluation and End-Semester Examination conducted by a panel of Jury members.

The marks for the Continuous Assessment will be awarded by the staff member in charge. The University shall appoint the jury panel for the jury examinations. The Valuation panel will consist of an external examiner and an internal examiner who are to be appointed by the university on the recommendations of the Chairman of the B.Arch. program. Improvement jury, whenever required will be conducted by the same panel, as far as possible or alternate arrangement shall be done by the Chairman of the B.Arch. program. The staff member in charge of the subject shall also be included in the panel of Jury members, as far as possible.

The External Examiner shall be from among the faculty members of other teaching Institutions or an Architect registered with the COA, incorporated under Architect's Act 1972, having experience of not less than 5 years.

b) Students shall submit the portfolio consisting of the assignments / projects for the subject during the course period, with the approval of the staff-in-charge of the subject. The staff-in-charge of the subject shall submit a report consisting of the details of assignments / projects given, their objectives, and weightage given to each work, to the Chairman through the Department.

The jury members (internal and external examiners together) will evaluate the portfolio on the basis of the report. Students shall be present and explain their work to the Jury members at the time of evaluating their portfolio.

c) The pass mark for Basic Design and Architecture Design I to VI is 50 % of aggregate marks (C.A. marks + Jury marks). For external Jury, minimum for a pass shall be 40%.

d) The Jury members shall submit the consolidated marks countersigned by the Chairman and the Head of the concerned Institution to the University.

e) The result of the students who fail to secure a minimum of 40% marks in the external jury and/or a minimum of 50% of aggregate marks (C.A. marks + Jury marks) will be published by the Head of the Institution within three working days from the last day of the Jury exam, in order to facilitate them to appear for the make-up chance. Only those students, who have appeared for the original chance, shall be eligible for make-up chance.

## **2. PRACTICAL TRAINING**

### **a) Introduction**

As per the B. Arch. Curriculum, students shall undergo one semester of practical training immediately after the completion of the 7th semester B.Arch. examinations. Only those who have passed all studio oriented subjects (Jury evaluated subjects) up to sixth semester shall be eligible to undergo practical training. In such a case where results have not been declared the candidate shall be given a provisional enrollment in Practical Training.

The training shall be under an architect registered with the COA, possessing an experience of minimum five years and approved by the Dept. of Architecture of the teaching institution.

The duration of practical training is one semester (Min. 100 working days / as per COA norms).

### **b) Selection of Firm for Practical Training.**

The candidate shall select the architect / firm for practical training with the approval of the Dept. of Architecture of the teaching institution, in advance before the commencement of the 7th semester University examination.

He/she should not be a faculty of the Dept. of Architecture of the teaching Institution or their immediate relatives or an architect employed in the Public sector.

Students can also select internationally recognized Architects practicing outside India, with the approval of the Dept. of Architecture of the teaching Institution.

### **c) Type of works to be carried out during the training period**

The students are expected to gain exposure in the following aspects:

- Site visit and Site Supervision

- Preparation of drawings for getting building permissions, working drawings, service drawings, etc.
- Preparation of estimates, specifications, contract documents, and tender documents
- Discussion with clients and other consultants

**d) Monthly work report**

The students are required to send copies of the monthly report of the work done to the Dept. of Architecture of the teaching institution, within one week after the completion of each month. The report shall be duly signed by the principal architect or by the concerned architect supervising the work.

**e) Documents to be submitted after the completion of training**

The students are required to submit to the Department of Architecture of the teaching institution a report including the details of their work illustrated with sketches, prints and other documents connected with the projects on which he/she has worked both in office and at site, a work diary, originals of monthly reports, and a certificate regarding their conduct and performance of work done during the training period. This report shall be certified by the registered architect under whom the candidate had undergone practical training.

**f) Evaluation of practical training**

Continuous assessment for Practical Training shall be done by the institution in a systematic procedure. For the Practical Training, a viva-voce examination shall be conducted at the end of the eighth semester by a jury consisting of an internal and an external examiner appointed by the University.

Makeup chance will be given to those who fail in the jury of practical training as per the norms applicable for other Jury examinations. In case, a student fails to secure a pass in this makeup chance, the student shall have to take a break and repeat the practical training when it is offered next i.e. as a repeater student in the subsequent batch without affecting the sanctioned intake of that batch.

Variation in the opportunities for training available in various architects firms shall not adversely affect the students' marks. Their efforts to gain experience and regularity in conforming to the prescribed norms shall be taken into account.

**3. THESIS AND VIVA VOCE**

**a) Selecting the Thesis topic**

Students of the B.Arch. Degree course are required to complete an Architectural Design Thesis during the last six months of the B.Arch. Degree program.

Students admitted to the tenth semester shall submit choices of their thesis project within a week after the commencement of the tenth semester classes.

The Head of the department of the teaching institution shall allot a guide for each student considering the nature of the work and specialization of the faculty member. Students shall obtain approval for the project of Thesis from the Department of the

teaching Institution. The duration of the thesis will be 18 weeks from the date of commencement of the tenth semester of B.Arch. Degree Course.

The project selected may be either a live architectural project or a hypothetical one so that the student gets training in tackling projects similar to what he/she is likely to face in his/her professional career. The project and its programming shall be worked out by the student in consultation with the guide.

The work should include an intensive study of the topography, climate and problems concerned with design of spaces and structures. The solution of the problem shall incorporate the integrated approach of the architect, engineer, urban designer, planner and landscape architect and this shall be reflected in the preparation of drawings and written report. Students are required to maintain a work diary of the thesis work. All students are required to schedule their thesis work and get it approved by the guide at the beginning of the thesis work. A copy of the schedule shall be submitted to the thesis coordinator nominated by the Head of the Department.

#### **b) Internal Evaluation**

Internal evaluation of each student will be done by a three member jury constituted by the Department. Guide shall be one member of the jury. The other jury members are to be constituted either from the faculty of Architecture of the Teaching College and/or from among the Architects registered with the Council of Architecture, incorporated under the architect's act 1972, with not less than five years experience. The progress will be assessed by the jury periodically through a minimum of four stages of reviews, the dates of which will be published by the department before the commencement of the tenth semester. Each review shall assess the student's systematic design process and solutions expressed by graphical (including models) and oral presentation.

300 marks to be awarded as marks for internal assessment and shall be awarded through the four reviews. The split up of the same shall be normally as follows.

Review 1 - Introduction of the Thesis Topic, Feasibility studies, Basic data, Case studies/ Primary surveys, Analysis, Arriving at Inferences and Design Program, Site analysis and Conceptual development, Introduction of Special Topic.

90 marks

Review 2 – Review of Previous stage, arriving at lay out plan, Sketch design for various building blocks including Floor Plans, Sections, Elevations, Views, Block Models etc., Conformity to Relevant Standards, Bye laws etc. and Achievement of Basic Objectives of Architectural Design, Further studies on Special Topic.

90 marks

Review 3 - Review of Previous stages, Final Layout, Final Design for various building blocks through relevant Plans, Sections, Elevations, Views etc., Details of Building and Site Services, Site Planning and Landscape schemes, Preparation of

relevant Detailed Drawings, Application of Special Topic in the design scheme, Preparation of Draft Report.

90 marks

Review 4 - Preview of Final stage of all finalized drawings and schemes, Structural Details, Working Details etc., Review of Final Draft of the Report.

30 marks

A candidate who fails to secure minimum 40% marks in each review will have to appear for a supplementary review on the date announced by the department of Architecture. There shall be only one supplementary review for each stage.

Students have to obtain a total of 40% marks combining the four stages of reviews to become eligible for the external jury, failing which he/she has to repeat with the next immediate batch.

Such students will have to take a token registration from the university to continue their Thesis along with the next regular batch. These students will be considered as supplementary candidates without affecting the regular strength of the class.

### **c) External evaluation**

The University shall appoint the jury panel for the jury examinations. The jury panel will consist of one/two external examiner(s) and internal examiners who are to be appointed by the University on the recommendations of the Chairman of the B.Arch. program.

Students shall secure 40% of marks in the external jury and 50% aggregate (Internal + External Jury) for successfully completing the Thesis and Viva voce.

The jury appointed by the University shall evaluate the thesis documents and conduct viva voce. Marks shall be jointly awarded by the jury out of the maximum of 300 and the tabulated marks list along with the original shall be forwarded to the controller of examinations through the chairperson.

### **d) Suggested Areas for Special Topic**

- Building construction techniques and the details of the use of new materials
- Equipment and design of any one building service like air conditioning, Electrification and illumination, sanitation and water supply or acoustics
- Furnishings, fittings and finishes
- Climatic research and its applications
- Or any other suitable topic approved by the teaching institution

### **e) Documents to be submitted for the Jury**

Two copies of the Data Collection in the preliminary design stage (up to the design and including the case studies) shall be compiled and presented in A3 size format along with the final submission. Two copies of the Final Report shall be submitted on the date and time announced by the Dept. of Architecture of the Teaching Institution. The total number of design sheets for final submission shall not exceed 30 (thirty) A1 size sheets. Models are to be submitted at the time of Viva voce examination.



The format and other instructions regarding the schedule of reviews, preparation of the bound volumes of Data Collection, Final Report, Final Sheets, Model, etc. will be announced by the Dept. of Architecture of the Teaching Institution.

The Head of the Department shall have the freedom to send the thesis documents after the final Jury evaluation for participating in competitions organized by the Council of Architecture etc., with the consent of the concerned candidate. Anything which is not explicitly covered in these regulations shall be decided by the thesis monitoring committee.

#### **4. STUDY TOUR AND DOCUMENTATION CAMP FOR ARCHITECTURAL DESIGN**

##### **a) Study Tour**

The study tours for visiting important places of Architectural interest shall be conducted as part of Architectural Design and shall officially be accompanied by the faculty members. The maximum duration of one study tour shall be limited to 15 days combined with vacation, out of which working days shall not exceed 5 in a semester. Each student shall submit a detailed bound report of the educational tour to the Head of the Department within two weeks after the programme. These bound reports signed by the staff advisor or faculty in charge of tours / visits and by the Head of the department, shall also be considered for evaluations as part of the Architectural Design Jury.

##### **b) Documentation Camp**

The documentation camp shall be of maximum 7 days duration and conducted as part of the Architectural Design course before the end of the seventh semester. The faculty members handling the subject shall also be present in the camp. The documentation camp consists of preparation of measured drawings of selected buildings / historic places inside and around the state of Kerala.

The originals of materials produced as part of the study tour and camp shall be submitted to the Department of the college and such materials submitted shall be the property of the Department. These drawings / reports shall be signed by the staff advisor or faculty in charge of the Architectural Design Studio and by the Head of department. They shall also be considered for evaluation as part of the Architectural Design Jury.

#### **5. DISSERTATION**

Students of the B.Arch. Degree course are required to submit a Dissertation as part of the ninth semester. Students admitted to the ninth semester shall submit choices of their dissertation within a week after the commencement of the ninth semester classes.

The Head of the department of the teaching institution shall allot a Dissertation Supervisor (Faculty member of the Dept. of Architecture of the teaching institution) for each student considering the nature of the topic and specialization of the faculty member. Students shall obtain approval for the topic of the Dissertation from the Department of the teaching Institution.

Continuous assessment for Dissertation shall be done for a weightage of 50% of the total marks by the Dissertation supervisor who will award marks for three assessments as per the academic schedule of the University. For Dissertation, a Viva Voce Examination shall be conducted at the end of the semester. The head of Dept. of the teaching institution shall constitute a jury for evaluating the final presentation of the dissertation work. The jury panel shall be constituted from among the faculty of the Dept. of Architecture of the Teaching institution and/or from among the Architects registered with the council of Architecture, incorporated under the architect's act 1972, with not less than 5 years experience.

***Notwithstanding all that has been stated above, the University has the right to modify any of the above regulations from time to time as per the University rules and the COA regulations.***

**UNIVERSITY OF CALICUT – B. ARCH. DEGREE COURSE SCHEME – 2017  
ADMISSION**

<b>COMBINED FIRST AND SECOND SEMESTER</b>										
<b>Course Code</b>	<b>Subject</b>	<b>Credits</b>	<b>Hours per Week</b>			<b>Duration of Exam</b>	<b>Marks</b>			
			<b>L</b>	<b>T</b>	<b>P/S</b>		<b>W</b>	<b>J</b>	<b>S</b>	<b>TOTAL</b>
AR 17-11	Basic Design *	10	0	0	8	0		200	300	500
AR17-12	Theory of Design - I	4	2	0	0	3	100		50	150
AR 17-13	Building Materials and Construction - I	5	1	0	2	3	100		100	200
AR 17-14	Theory of Structures- I	4	2	1	0	3	100		50	150
AR 17-15	History of Architecture - I	3	2	0	0	3	100		50	150
AR 17-16	Architectural Drawing and Graphics	6	0	0	5	3	100		100	200
AR 17-17	Visual Arts & Presentation	4	1	0	2	3	100		100	200
AR 17-18	Model-making Workshop	2	0	0	2	0			100	100
AR 17-19	Communication Skills	2	0	0	2	0			50	50
<b>TOTAL</b>		<b>40</b>	<b>8</b>	<b>1</b>	<b>21</b>		<b>600</b>	<b>200</b>	<b>900</b>	<b>1700</b>

\* Evaluation by the Jury as per the B. Arch. Degree Manual

L – Lecture, T – Tutorial, P/S – Practical/Studio, W – Written University Examination, J – Jury, S – Sessional Marks



<b>SEMESTER I Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-11</b>	<b>BASIC DESIGN</b>	<b>0-0-8</b>	<b>10</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Basic Design for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Introduce the various elements and principles of design for two and three dimensional compositions.</li> <li>• Through a series of exercises enable the student to explore graphically the various stages of representations, communication and speculations in drawing and design.</li> <li>• Help to develop the ability to translate abstract principles of design into Architectural solutions for simple problems.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An understanding of the elements and principles of design.</li> <li>• Comprehension of the diverse ways in which the various design elements could be composed to create a unified whole.</li> </ul>				
<p><b>Text books</b></p> <ul style="list-style-type: none"> <li>• Charles Wallschlaeger &amp; Synthia Basic Snyder, Basic Visual Concepts &amp; Principles for artists, architects &amp; designers, McGraw hill, USA, 1992.</li> <li>• Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997</li> <li>• Francis D.K.Ching - Architecture - Form Space and Order, Van Nostrand Reinhold Co., (Canada),1979.</li> <li>• Francis D.K.Ching – Drawing – A creative Process, Van Nostrand Reinhold Co., (Canada),1979.</li> <li>• Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2001.</li> <li>• Julius Panero, Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design, 1975</li> <li>• Maitland Graves, The Art of Colour and Design, McGraw Hill Book Company Inc.,1951</li> <li>• Mark Karhen, Space planning basics, John Wiley &amp; son - 2004</li> <li>• Neuferts' Architect's Data, Orbid Publishing Ltd., Know how the complete course in Dit and Home Improvements NO.22, Bed Fordbury, London, W.C.2, 1981.</li> <li>• Owen Cappleman &amp; Michael Jack Kordan, Foundations in Architecture: An Annotated Anthology of beginning design projects, Van Nostrand Reinhold, New York.</li> <li>• Paul Laseau, Graphic Thinking For Architects and Designers, John Wiley &amp; Sons, New York, 2001.</li> </ul>				

- Paul Zelanski & Mary Pat Fisher, Design Principles & Problems , 2nd Ed, Thomson & Wadsworth, USA,1996
- Robert Gill, Rendering with Pen and Ink
- Simon Unwin, 'Analizing Architecture', Routledge, 2003
- V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt.Ltd., New Delhi,1973.
- Wong Wucius, Principles of color composition, Van Nostrand Rein Hold – 1976
- Wang Wucius, , Principles of three dimensional design, Van Nostrand Rein Hold – 1976
- Wang Wucius, Principles of Two dimensional design, Van nostrand Rein hold -1972

## **MODULE I**

### **FUNDAMENTALS IN DESIGN (48 Hours)**

Elements in composition: Point, Line, Plane, Volume, Colour, Texture. Analyzing paintings, compositions, murals, sculptures, building and nature.

Principles of design – Dominance, unity, balance, symmetry, hierarchy, rhythm, contrast, harmony, focus etc. .

Introduction to fundamentals in drawing, composition and understanding graphic medium:  
Basic exercises in drawing skill building, composition and design vocabulary

## **MODULE II**

### **CREATIVITY (24 Hours)**

Compositional and modeling exercises in 2 D and 3 D using concepts like abstraction, transformation, Illusion, symbolism. Exercises on observation and visual perception on the principles of Gestalt Theory

Forms: Generation of 3 D volumes from 2 D planes. Various organizations of forms and principles involved in articulating forms using architectural examples. Study of Solids and voids.

Study of linear and planar forms using materials like Mount Board, metal foil, box boards, wire string, thermocol etc.

## **MODULE III**

### **FORMS (32 Hours)**

Colour and texture: Study of colour and colour schemes, texture and texture scheme. Perception of colour and texture in light from natural and artificial sources. Study of openings for light, shadow, shades and sciography and their effect on spaces'

Study of fluid and plastic forms using appropriate materials like clay, plaster of paris etc. and explore the play of light and shade.

Scale and proportion: Study of scale and proportioning systems – Classical orders, Golden Section etc. Anthropometrics – Study of space standards and anthropometrics to include physically handicapped and elderly

## **MODULE IV**

### **DEVELOPMENT OF DESIGN PROCESS (56 Hours)**

Major: Design of a fundamental furniture lay-out , circulation, Lighting and ventilation for space such as Living, Dining Bedroom Architect's Office , Doctor's clinics or exterior space like out-door Dining, Gathering space etc.

Minor: Detailing and designing a Furniture used in the Design

Stress should be on concept generation and development of rich design process.

**TOTAL HOURS: 160**

<b>SEMESTER I Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-12</b>	<b>THEORY OF DESIGN - I</b>	<b>2-0-0</b>	<b>4</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Theory of Design for students of architecture would,</p> <ul style="list-style-type: none"> <li>• To introduce various facets of Architecture and its influencing factors with respect to form and space.</li> <li>• To introduce the basic elements/principles of form and space as one of the ways to experience the built environment.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An exposure to the principles of architecture and applications of the same in buildings and spaces.</li> <li>• Awareness about various ideologies and philosophies of architecture.</li> <li>• An exposure to analysis of architecture through case studies of projects by various architects.</li> </ul>				
<p><b>Text books</b></p> <ul style="list-style-type: none"> <li>• Francis D. K. Ching, Architecture - Form, Space and Order, Van Nostrand Reinhold Company ,1979</li> <li>• Roger H. Clark, Michael Pause, Precedents In Architecture, Van Nostrand Reinhold Company ,1996</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• K.W.Smithies, Principles of Design in Architecture, Van Nostrand Reinhold Company , 1981</li> <li>• 2. Sam F. Miller, Design Process - A Primer For Architectural &amp; Interior Design, Van Nostrand Reinhold Company , 1995</li> <li>• Ernest Burden, Elements of Architectural Design – A Visual Resource, Van Nostrand Reinhold Company , 1994</li> <li>• V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications, New Delhi, 1973.</li> <li>• Paul Alan Johnson - The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co. NewYork,1994.</li> <li>• Helm Marie Evans and Caria David Dunneshil, An initiation to design, Macmillan Publishing Co.Inc.,NewYork,1982.</li> </ul>				



## **MODULE I**

### **INTRODUCTION TO ARCHITECTURE (15 Hours)**

Understanding the relevant terms – Architecture, Art, Architectural design –Aesthetics in art and architecture.

ELEMENTS OF DESIGN – Understanding the basic elements of design: point, line, plane, volume.

FORMS – Properties of forms - Understanding perceptual effects of geometric forms, cube, sphere, pyramid, cylinder and cone and its section as well as their derivatives with respect to the evolution of architectural form and space – Transformation of forms –Articulation of forms.

SPACE – Understanding perceptual effects of specific configuration of architectural spaces – Elements defining spaces –Spatial relationships - Spatial organisation – centralised, linear, radial, clustered, grid –built form and open space relationships.

## **MODULE II (10 Hours)**

PRINCIPLES OF DESIGN –Understanding the fundamental principles of Architectural compositions: axis, symmetry/asymmetry, balance, hierarchy, rhythm, datum, transformation, unity, harmony, dominance, climax.

PROPORTION AND SCALE IN ARCHITECTURE- Different types of proportioning systems

## **MODULE III (5 Hours)**

CIRCULATION -Movement with reference to the architectural form and space – detailed study of relationship between architectural form and circulation – Types of circulation – Building approach and entrance - Configuration of path- Path space relationship, orientation.

## **MODULE IV (10 Hours)**

DESIGN AND ANALYSIS - Introduction to modes of understanding architecture in totality in terms of the various aspects studied in previous modules– understanding how case studies have used representational, analytic and interpretational tools.

WORKS OF ARCHITECTS - Role of individual architects in the generation of architectural form, through study of exemplary works, architectural inspirations, philosophies, ideologies and theories of architects. (E.g. F L Wright, Le Corbusier, Charles Correa).

**TOTAL HOURS: 40**

## **UNIVERSITY EXAMINATION PATTERN**

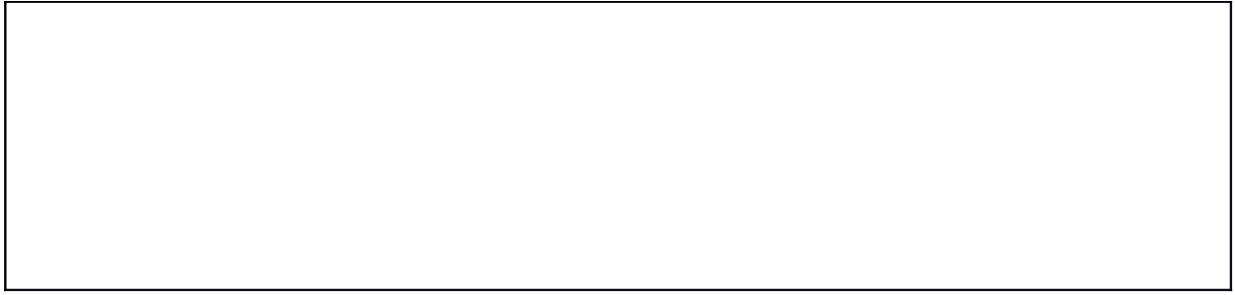
Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



<b>SEMESTER I Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-13</b>	<b>BUILDING MATERIALS AND CONSTRUCTI ON - I</b>	<b>1-0-2</b>	<b>5</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Building materials and construction course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Introduce to the student different components of buildings and various materials, their properties and uses.</li> <li>• Provide an exposure to the principles of masonry construction, arches, lintels/ beams, corbelling, cantilever etc.</li> <li>• Help them to understand the details of construction using stone and soil as well as products derived from them.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An understanding of the properties of various building materials and their applications.</li> <li>• Exposure to the common construction techniques used for constructing various components of a building.</li> <li>• Development of architectural drafting skills in the representation of construction details.</li> </ul>				
<p><b>Text books</b></p> <ul style="list-style-type: none"> <li>• Arora S.P. and Bindra S.P., “Text book of Building Construction”, Dhanpat Rai &amp; Sons, New Delhi, 2012.</li> <li>• Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany, 2000.</li> <li>• National Building Code Of India 2005- Part 6 Structural Design- Section 3 Timber and Bamboo.</li> <li>• Francis D.K. Ching, Building Construction Illustrated John Wiley &amp; Sons 2000.</li> <li>• Balagopal T.S. Prabhu, “Civil Engineering Drawing Hand book”</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Ghanshyam Pandya, M.P. Ranjan, Nilam Iyer Bamboo and Cane Crafts of Northeast India; National Institute of Design (2004).</li> <li>• Don A. Watson Construction Materials and Processes McGraw Hill 1972.</li> <li>• WB Mckay Building construction, Vol 1,2, Longman UK 1981.</li> <li>• Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.</li> </ul>				

**MODULE I****INTRODUCTION (15 hrs)**

Drafting Exercises on Representation of different types of building materials in plan and sections. Symbols used to denote different types of joinery, plumbing fittings and accessories in plan, sections and elevations.

Components of Building – Sub structure and Super structure. Drafting Exercises on Simple, cross section of walls showing various building components in plan and section.

Introduction to Building Materials – Sand, Stone, Brick, Timber, Clay & Ceramic products – their sources, classification, properties, and applications.

**MODULE II****FOUNDATIONS (12 hrs.)**

Introduction to Foundations – Definition, function, types – selection criteria – bearing capacity of soil – methods of testing – settlement of foundations

Drafting exercises on various types of foundations – Wall Footing, Isolated Footing, Combined Footing

**MODULE III****MASONRY (30 hrs.)**

Brick Masonry - Types of bricks, principles of brick masonry construction - joints, pointing and finishing, types of brick masonry - brick masonry work using different bonds, rat trap bond, Junctions – T- Junction (1 and 11/2 bricks), L – Junction (1 and 11/2 bricks), Cross junction (2 bricks), Piers – 1, 11/2, 2 bricks, Brick paving, Reinforced Brick Masonry, Cavity wall, Composite Masonry and arches, types of mortar & mortar mix for brick construction-Plastering - Brick masonry for foundation plinth and wall, arches and lintels in brick, coping, steps.

Principles of stone masonry construction - types of stone masonry random rubble masonry/ Ashlar Masonry - stone finishes- jointing types of mortar for stone construction - Stone masonry for foundation, plinth and wall, retaining wall, arches and lintels in stone, coping, steps, flooring, cladding.

**MODULE IV****MUD CONSTRUCTION, CLAY PRODUCTS AND RURAL MATERIALS (15 hrs.)**

Cob, Rammed earth, Wattle and daub construction- Principles of Masonry construction using Adobe, Compressed Stabilized Earthen Blocks; Foundation and plinth for mud structures, Design of openings (arches, corbelled arches), Mud plaster, mud mortar, Damp and weather proofing of mud structures, Mud flooring, Construction of thatched roof.

Drafting Exercises on Hollow clay blocks – walls, roofs, partitions - Applications of various natural materials (Mud, Bamboo, Casuarinas, Palm, Coconut, Hay, Grass husk) in various parts of the building.

**TOTAL HOURS: 72****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTE	Course Name	L-T-P/S	Credits	Year of introduction
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<b>RI Course No.</b>				
<b>AR 17-14</b>	<b>THEORY OF STRUCTURES-I</b>	<b>2-1-0</b>	<b>4</b>	<b>2017</b>

### Course Objectives

The Mechanics of Structures course for students of architecture would,

- Help to acquaint the students with the general methods of analyzing engineering problems.
- Assist in illustrating the applications of the methods to solve practical engineering problems.

### Course Outcome

- Understanding of the concepts of mechanics of structures.
- Appreciation of the principles involved in various types of trusses and beams and their loading patterns.

### Text books

- Rajasekharan S. and Sankarasubramanian G., Engineering Mechanics-Statics and Dynamics, Vikas Publications, New Delhi
- R.K. Bansal., Engineering Mechanics, Lakshmi Publications Pvt.Ltd., New Delhi
- S.B. Junnarkar & H.J. Shah, Mechanics of Structures Vol I, Charotar publishing House, Anand
- R.K. Bansal., Strength of Materials, Lakshmi Publications Pvt.Ltd., New Delhi

### Reference Books

- Shames I.H., Engineering Mechanics-Statics and Dynamics, Prentice Hall of India, New Delhi
- Hibbeler R.C., Engineering Mechanics- Statics, Pearson Education, New Delhi
- Timoshenko, Strength of Materials Vol. I & Vol. II, CBS Publishers & Distributors, New Delhi
- James M Gere & Stephen P Timoshenko, Mechanics of Materials, CBS Publishers & Distributors, New Delhi

### MODULE I (16 hours)

Introduction to Engineering Mechanics: Principles of statics- Free body diagram - Composition and resolution of forces- Resultant of concurrent force system - Lami's theorem-Parallelogram law of forces - Method of moments - Theorem of Varignon - Parallel force system - Couple - Resultant and equilibrium for a general system of coplanar forces.

### MODULE II (16 hours)

Friction: Laws of friction - Equilibrium of a body on a rough inclined plane - Ladder friction  
 Properties of surfaces: Centre of Gravity - Centroid - Centroid of composite plane figures  
 Moment of inertia - Parallel and perpendicular axis theorem- Moment of inertia of composite sections and rigid bodies (cylinder, circular rod, sphere) Product of Inertia-Principal axes and principal moment of inertia (Concept only)

**MODULE III (14 hours)**

Plane trusses: Types of trusses-Analysis of cantilever and simply supported trusses using Method of joints, Method of sections and Graphical method.

Beams: Types of beams- Supports- Loads-Support reactions of simply supported, cantilever and overhanging beams. Principle of virtual work (concept only).

**MODULE IV (14 hours)**

Bending Moment & Shear force: Shear force and bending moment diagrams for cantilever, simply supported and overhanging beams for different types of loading. Relationship connecting intensity of loading, shear force and bending moment

**TOTAL HOURS: 60****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER I Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17 – 15	HISTORY OF ARCHITECTURE – I	2-0-0	3	2017

### Course Objectives

The History of Architecture - I course for students of architecture would,

- Provide an insight to the architecture of the prehistoric period, ancient civilizations across the world, and Buddhist and Hindu architecture in India.
- Introduce them to the cultural and contextual determinants that influenced the built form and settlement patterns.
- Help them to understand the development of architecture with reference to character, style, materials, technology, climate, geography, religion, and culture.

### Course Outcome

- An understanding about the spatial and stylistic qualities associated with architecture of various civilizations.
- Placing architecture within the realm of various social, political and economic upheavals, and as a response to cultural and contextual pressures.
- Enable students to appreciate chronological developments along the timeline and across various civilizations and geographies.

### Reference Books

- Banister Fletcher, ‘ Dan Cruickshank Sir Banister Fletcher’s a history of architecture: A History of Architecture’, Architectural Press, 1996
- Percy Brown, ‘ Indian Architecture: Buddhist and Hindu Periods”, D. B. Taraporevala, 1965
- Satish Grover, ‘The Architecture of India: Buddhist and Hindu’, Vikas, 1980
- G.K.Hiraskar, ‘The Great Ages of World Architecture’
- Christopher Tadgell, ‘The History of Architecture in India’, Phaidon, 1994
- Satish Chandra, ‘History of Architecture and Ancient Building Materials in India’, Tech Books Internationals, 2003
- James C. Harle, ‘The Art and Architecture of the Indian Subcontinent’: Second Edition, Yale Univ. Press, 1994
- Henri Stierlin - Hindu India - From Khajuraho to the Temple city of Madurai – Taschen, 2002
- Carmen Kagal, Vistara: the Architecture of India, published by Festival of India, 1998
- Ilay Cooper, ‘Barry Dawson, Traditional Buildings of India’, Thames and Hudson, 1998

### MODULE I (16 Hours)

Study of the world civilizations to understand how people lived, their thoughts, beliefs, religions, social customs, cultural practices and related architectural growth.

A brief introduction to World Architecture.

Prehistoric: Factors influencing Architecture, General characteristics.

History, evolution and factors influencing architectural characteristics of the following Civilizations:

Ancient Mesopotamia: Ziggurat of Ur.

Ancient Egypt: Tombs & Temples - Great Pyramid at Giza, Great Temple of Karnak, Ammon, Sphinx.

Ancient Greece: Classical Orders - Optical corrections - Acropolis of Athens, The Parthenon, The Erechtheion, Agora.

Ancient Rome: Tuscan and composite orders - Roman materials and construction techniques - lintels, arches & vaults, aqueducts. Building typologies examples - Pantheon, Colosseum, Basilica of Constantine, Thermae of Caracalla, and Forum.

### **MODULE II (10 Hours)**

Indus Valley Civilization: Culture and pattern of settlement - City planning, domestic architecture, building materials and construction techniques - Mohenjo Daro, Harappa.

Vedic Period: Vedic Village - City Planning in later Vedic period - Building materials and construction techniques.

Buddhist Architecture: Introduction to Buddhist art - Hinayana and Mahayana Buddhism - Architectural Productions during Ashoka's rule - Ashokan Pillar, Sarnath. Development of Chaitya arch. Major building typologies - The Great Stupa at Sanchi, Chaitya Hall, Karli, Main caves of Ajantha and Ellora, Rani Gumpha - Udaigiri

### **MODULE III (10 Hours)**

Early temples: Evolution and major influences on development of form and other architectural elements. Gupta and Early Chalukyan styles - Gupta temple at Tigawa, Main caves at Badami, Ladkhan and Durga temples, Aihole.

Hindu temple architecture: Principles of Design and Construction.

Dravidian style: Contributions of various dynasties

Pallava: Rock cut and structural temples - Rathas and Mandapas at Mahabalipuram, Shore Temple at Mahabalipuram, Kailasanatha Temple at Kanchipuram.

Chola: Brihadeswara temple, Thanjavur.

Pandya: Evolution of Gopurams

Later Chalukya or Hoysala: Hoysaleswara temple, Halebid.

Vijayanagara: Hampi, Vittalaswami temple at Hampi.

### **MODULE IV (10 Hours)**

The late Pandya or Nayak style: Complexity in Temple plan of Srirangam temple, Meenakshi temple at Madurai, Rameshwaram temple.

Indo Aryan Style: Salient features of Indo Aryan Temples

Orissan: Parasurameswara, Lingaraja temples at Bhubaneswar. Sun temple at Konark.

Khajuraho: Kandariya Mahadeva Temple at Khajuraho.

Gujarat: Sun temple at Modhera.

**TOTAL HOURS: 46**

### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.



Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER I Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR17- 16	<b>ARCHITECTURAL DRAWING AND GRAPHICS</b>	0-0-5	6	2017

### Course Objectives

The Architectural Drawing and Graphics course for students of architecture would,

- Introduce students to the fundamental techniques of architectural drawing and develop appropriate manual skills for visualization and technical representation of built forms in different types of drawings. The course also acts as a bridge to understanding basics of computer aided drafting and architectural graphics.

### Course Outcome

- An understanding of the concepts of architectural drawing techniques.
- Assisting the students to develop a graphical language of architecture both in 2D and 3D.

### Reference Books

- N. D. Bhatt, 'Elementary Engineering'.
- Cari Lara Svensan and Wiliam Ezara Street, 'Engineering Graphics'.
- K. Venugopal, 'Engineering Drawing and Graphics'.
- S. Rajaraman, ' Practical Solid Geometry'.
- Francis D. K. Ching, ' Drawing, Space, Form, Expression'.
- Shankar Mulik, 'Perspectives and Sciography', Allied Publishers, India, 1999

### MODULE I (15 Hours)

#### INTRODUCTION

Introduction to Architectural drawings: types of drawings- Freehand sketches and mechanical drawing for architectural applications and presentation drawings. Different mediums used such as pencil, ink, types of papers, reproduction methods. Demonstration of drawing instruments and their use. Essential kit for making architectural drawings. Single-view and multi-view drawings, Differentiating Paraline and Perspective projections- Sheet layout, title block construction, different types of lines, line thickness, dimensioning lines and dimensioning styles

1. **CONIC SECTIONS**- Ellipse, hyperbola, parabola.

#### 2. SCALES

Use of scale in drawings, Representation fraction (R.F.), Classification of scales- Construction detail of Plain scale, Diagonal scale and Vernier scale.

### MODULE II (30 Hours)

#### BASIC ARCHITECTURAL DRAWING

Introduction to Architectural drafting, symbols, lettering, dimensioning, values in drawn lines, tone, texture and color. Architectural representation of materials on drawings, terminology and abbreviations used in architectural drawings.

Basic Geometric Construction- circles, tangents, drawing polygons.

Spirals, helices and involutes.

Reduction and enlarging of given drawings. Measured drawing to scale of furniture pieces, rooms, doors, windows etc. Representation of wall thickness and openings in walls in geometrical plan shapes.

### **ORTHOGRAPHIC PROJECTION**

Introduction to Orthographic Projection, Differentiating First angle and third angle projection. First Angle Projection- Illustrative examples-points and lines.

First Angle

1. **ORTHOGRAPHIC PROJECTION-PLANES**-Projection of planes: projection of planes/laminae of regular geometric shapes parallel to one plane and inclined to other plane, planes/laminae inclined to both reference planes.
2. **ORTHOGRAPHIC PROJECTION-SOLIDS**- First Angle Projection of solids—rectangular parallelepiped, cube, prism, pyramid, cylinder, cone, sphere.
3. **DEVELOPMENT OF SURFACE OF SOLIDS**- Geometrical solids such as prism of 4 and 5 sides, cylinder, pyramid of base sides 4 and 5, cone – Truncated solids such as cone, pyramid – Transition pieces such as rectangular reducing to circle, circle to square.

*(Minimum 4 Drawing Exercises Suggested)*

### **MODULE III (20 hrs)**

#### **ISOMETRIC PROJECTION & CONVERSION**

Pictorial Projections- Introduction to Isometric, Axonometric and Oblique projections.

1. **ISOMETRY**- difference between Isometric projection and isometric view - Isometric scale isometric Projection/views of solids like prisms, cylinders, cones pyramids, and spheres. Isometric projection of sectioned and composite solids.
2. **CONVERSION OF PICTORIAL VIEWS INTO ORTHOGRAPHIC VIEWS**- Preparing scaled multi-view drawing from isometric views.

*(Minimum 4 Drawing Exercises Suggested)*

### **MODULE IV (20 Hours)**

#### **PERSPECTIVE PROJECTION & SCIOGRAPHY**

1. **PERSPECTIVE PROJECTIONS**: Definition of perspective elements, classification of perspectives- Visual ray and Vanishing point Methods. Constructing one point and two point perspective views of simple solids and furniture pieces.
2. **INTRODUCTION TO SCIOGRAPHY**- principles of shades and shadows, Drawing shadows of simple objects in plan, elevation and perspective.

*(Minimum 4 Drawing Exercises Suggested)*

#### **Note:**

Number of drawing exercises suggested above is for class work. Additional exercises wherever necessary may be given as home assignments.

**TOTAL HOURS: 85**

### **UNIVERSITY EXAMINATION PATTERN**

Q I - 2 Questions of 25 marks from module I with choice to answer anyone.

Q II - 2 Questions of 25 marks from module II with choice to answer anyone.

Q III - 2 Questions of 25 marks from module III with choice to answer anyone.

Q IV - 2 Questions of 25 marks from module IV with choice to answer anyone.

<b>SEMESTER I Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17 -17</b>	<b>VISUAL ARTS &amp; PRESENTATION</b>	<b>1-0-2</b>	<b>4</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Visual Arts &amp; Presentation course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Provide requisite knowledge of visual language involving various media. The primary focus is on developing basic drawing and painting skills, as applied to architecture.</li> <li>• Help students acquire basic knowledge about the characteristic of colours (water/ poster/ crayon etc.) and develop skills in using various media as effective and versatile presentation tools.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An understanding of the techniques of usage of various media and their applications.</li> <li>• Development of architectural presentation skills using different media.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• J.H. Bustano, 'Principles of Colour and Colour Mixing'.</li> <li>• Francis D.K. Ching, 'Architectural Graphics,' John Wiley, 2002.</li> <li>• Francis D.K. Ching, 'Drawing, Space, Form, Expression'.</li> <li>• Victor Perard, 'Anatomy and Drawing'.</li> <li>• Luis Slobodkin, 'Sculpture-Principle and Practice'.</li> <li>• Suzanne Huntington, 'Art of Ancient India'.</li> <li>• Roy C. Craven, 'Indian Art'.</li> <li>• J.C. Harle, 'Art &amp; Architecture of the Indian Sub-continent'.</li> </ul>				
<p><b>MODULE I (15 Hours)</b> <b>FUNDAMENTALS OF VISUAL ARTS</b></p> <p>a. Introduction to Art object, definition and Interpretation. Introduction to History of Art, Artistic Tradition and Theories.</p> <p>b. Graphic representations – Visual composition and Abstraction- Exercises involving Logo design, collage and calligraphy.</p> <p>c. Drawing: Types, Characteristics &amp; functions of lines and its visual impacts.</p> <p><b>MODULE II (18 Hours)</b></p> <p>a. Primary pencil sketching, tonal value and variation, shading techniques and texture technique.</p> <p>b. Primary ink drawing techniques using nib pens, Radiograph, Rotring pens, tonal value and variation, shading techniques and texture technique.</p> <p>c. Study of Objects having varied shapes (cuboids, prismatic, spherical, globular etc.) in different media- charcoal, pencils, pastels and ink. Sketching of simple natural / manmade forms in combination with trees , human figures etc</p>				

- d. Outdoor Study; study of monuments. Buildings in pencils, ink, charcoal, pastels etc. study should focus on Architectural details, wherever relevant.
- e. Rendering of perspective with sciography of Architectural Design problems.
- f. Sciography - Use, Definition, Direction of Light, Location of object, Method of finding shadows of a sphere, Right circular cone, shade of double curve surface of revolution. Shadows of lines and circles. Shadows of architectural elements. Shadows of circular solids. Shadows on buildings.

### **Module III (15 HRS)**

- a. Elements of Painting: Pictorial & Spatial organizations, Form and texture in Painting, Theory of Colour- Chromatic Values, Colour wheel, colour chart, Two-dimensional/ Three dimensional aspects of Painting.
- b. Basic psychological aspects of lines, forms and colours, Unity of forms: Gestalt theory.
- c. Techniques of Rendering in water, poster, oil, mixed media and New Media.
- d. Architectural photography:
- Photography for documentation work.
  - Use of Photography for making audio-visual Presentation projects.
  - Use of Photography for simulating, overlaying or just positioning of building in different background /environments.
  - Special skills and equipment required for photography of buildings-Effects of using various lenses / filters in Photography of buildings.
  - Effects of outdoor light on buildings for photography, study of shadow in architectural photography.
  - Scale relationships in photography of buildings.-Photographing interiors-special skills and equipment required. Comparative values / effects black and white effects / colour photography in architecture.

### **MODULE IV (18 Hours)**

- a. Introduction to Indian aesthetics/ Canonical principles of Indian Art, Sculpture & Painting.
- b. Mural Tradition in Kerala- Study of Style, Form and Technique.
- c. Languages, Methods & Techniques of Sculpture: Form, Texture, Mass and Volume. Sculpture in relief, Shallow relief, Sculpture in round. Free standing sculpture in relation to Architectural space.
- d. Techniques: Molding & casting in Plaster, Mud, Cement and Fiber glass.

**TOTAL HOURS: 66**

### **UNIVERSITY EXAMINATION PATTERN**

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 30 marks from module I and module II with choice to answer anyone.
- Q III - 2 Questions of 30 marks from module III and module IV with choice to answer anyone.



<b>SEMESTER I Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-18</b>	<b>MODEL-MAKING WORKSHOP</b>	<b>0-0-2</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Model-making Workshop course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Equip students with the basic skills necessary to represent their ideas three-dimensionally using simple materials.</li> <li>• Enable students to get acquainted with various tools essential for creating architectural models.</li> <li>• Help students to comprehend the exercises of the Basic Design and Architectural Graphics Studio in a better manner, as the subject is to be taught in coordination with them.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• This course will assist the students to enhance their project presentation skills by the use of simple as well as detailed architectural models.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Criss. B. M., “Designing with models: A Studio guide to Architectural Process Models”, John Wiley &amp; Sons, Hoboken, 2011.</li> <li>• Werner, M., “Model Making”, Princeton Architectural Press, New York , 2011.</li> <li>• Congdon, Roark T., "Architectural Model Building: Tools, Techniques &amp; Materials", Bloomsbury Academic, 2010.</li> <li>• Knoll, W. and Hechinger, M., “Architectural Models: Construction Techniques", Cengage Publications, 2014.</li> <li>• Dunn, N., “Architectural Modelmaking”, Laurence King Publishing, 2013.</li> <li>• Schilling, A., “Basics Model-building”, Birkhauser, Berlin, 2007.</li> <li>• Mi-Young, Pyo, “Construction and Design Manual: Architectural Model”, Dom Publishers, Germany, 2012.</li> </ul>				
<p><b>MODULE I</b>  <b>BASICS OF MODEL-MAKING TECHNIQUES (6 Hours)</b>  Techniques of cutting paper to create regular polygon shapes as 2D planes (3-sided to 10-sided polygons).   Creating basic solid shapes such as square, rectangle, circle &amp; triangle with various paper medium.</p> <p><b>MODULE II</b>  <b>GEOMETRIC &amp; FREE-FLOWING FORMS (10 Hours)</b>  Creating platonic solids with suitable paper medium.</p>				



Making of models using free flowing materials such as clay, plaster of paris etc.

**MODULE III**

**BLOCK & SITE MODELS (12 Hours)**

Creating block models of buildings and detailed site model using suitable materials for roads & landscape elements.

**MODULE IV**

**DETAILED ARCHITECTURAL MODELS (12 Hours)**

Creating a detailed building model: Exterior / interior using different materials and paper to represent the actual material in a suitable scale.

**TOTAL HOURS: 40**

<b>SEMESTER I Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-19</b>	<b>COMMUNICATIO N SKILLS</b>	<b>0-0-2</b>	<b>2</b>	<b>2017</b>
<p><b>Course Objectives</b> The Communications Skills course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Augment their communication skills in English by developing their listening, speaking, reading and writing skills.</li> <li>• Improve their speaking skills particularly with respect to clients, suppliers, business partners and colleagues and help to develop their architectural vocabulary.</li> <li>• Enhance their reading particularly architectural journals and books, building rules and regulations, and catalogues.</li> <li>• Help to cultivate their general as well as analytical writing skills especially writing resumes, letters, emails, proposals and reports.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• This course will assist the students to hone their communication skills to interact with potential clients and business partners. It would also enhance their architectural vocabulary so as to improve the efficacy of their project presentations.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Schmalz, Bill. Architect's Guide to Writing: For Design and Construction Professionals, Images Publishing Group Pty Ltd., 2014.</li> <li>• Greusel, D., Architect's Essentials of Presentation Skills, John Wiley &amp; Sons, New York, 2002.</li> <li>• Eric H. Glendinning &amp; Beverly Holmstrom, "Study reading - A course in reading Skills for academic purposes", Cambridge University Press, 1992.</li> <li>• John Kirkman, "Good style - writing for science and technology", E&amp;FN Spon, an Imprint of Chapman &amp; Hall, 1992.</li> <li>• Anderson, P.V, Technical Communication: A Reader-centered approach, Wadsworth, Eighth Edition, USA, 2014.</li> <li>• Krishna Mohan and Meera Banerji: Developing Communication Skills (Mac Millan India Ltd)[2000].</li> <li>• John Seely, The Oxford Guide to Writing and Speaking, Oxford University Press, New Delhi, 2004.</li> <li>• Lewis, N., Speak Better Write Better , W.R.Goyal Publishers&amp; Distributors, Delhi, 2011.</li> <li>• Wren, P.C. &amp; Martin, H., High School English Grammar &amp; Composition, S. Chand Publishing, 2017.</li> <li>• Thorpe, E. and Thorpe, S., Objective English, Pearson Education India, New Delhi, 2016.</li> <li>• Sen, L., Communication Skills, Prentice Hall India Learning Pvt. Ltd., New Delhi, 2007.</li> <li>• Carnegie, D., The Quick and Easy Way to Effective Speaking, Rupa &amp; Co., New Delhi, 2016.</li> <li>• Bansal, R. K. and Harrison, J.B., Spoken English: A Manual of Speech &amp; Phonetics, Orient Blackswan, Hyderabad, 2013.</li> <li>• Murphy Raymond, Essential English Grammar 2Ed, Cambridge University press</li> <li>• Thakkar Prathesh , The Ultimate Guide to IELTS Writing, MK Book Distributors</li> </ul>				

- Oxford Advanced Learners Pocket Dictionary 4th Ed.

## **MODULE I**

### **BASICS OF COMMUNICATION SKILLS (12 Hours)**

Introduction to Phonetics and Phonetic symbols – Relevance in the area of pronunciation-  
Transcription of words using phonetic symbols especially the recurring words in the field  
of Architecture –Reduction of speech sounds in natural speech -Oral presentations and role  
plays (5 minutes activities)

Practice session in using a dictionary effectively with special focus on the origin, meaning  
and pronunciation of words

Listening – Listening to news bulletins and related voice modulations- interviews and  
discussions from various media

Speaking – Giving directions and instructions, negotiating meaning, convincing people,  
describing places, telephone conversations, participating in small group discussions  
-stress , rhythm and intonation in connected speech

Reading –News papers and lengthy articles related to architecture and construction

Writing - process descriptions, formal emails & letters, blogs

Vocabulary Development – Abbreviations, appropriate words to describe topics in  
architecture

Grammar – Basics-Suitable tenses to write descriptions in the field of Architecture

## **MODULE II**

### **DESCRIPTIVE TECHNIQUES (8 Hours)**

Listening – Description of places, conversations and answering questions

Speaking - making a power point presentation on a given topic

Reading - architecture manuals / regulations

Writing - writing a resume/CV, business letters, report, Memos etc.

Vocabulary – Vocabulary building activities.

Grammar - collocations

## **MODULE III**

### **ANALYTICAL SKILLS (8 Hours)**

Listening - TED talks

Speaking - participating in group discussions

Reading - reading and interpreting visual information

Writing - writing analytical and argumentative essays

Vocabulary - suitable words to be used in analytical and argumentative essays

Grammar - subject-verb agreement

## **MODULE IV**

### **PRESENTATION SKILLS (12 Hours)**

Listening – Developing listening skills in relation to IELTS,TOEFL, GRE and CAT  
examinations

Speaking – Elements of effective presentation tools-Voice Modulation-Power point  
presentations-Audience Analysis-talking about one’s project proposal-body language-how  
to face the interview board-mock interviews-group discussion-debates-soft skills-emotional  
literacy

Reading - reading essays on construction, buildings, different schools of architecture

Writing – writing proposals, role of references / bibliography, table of contents, index  
Vocabulary - related vocabulary  
Grammar - Cohesive devices

**TOTAL HOURS: 40**



**UNIVERSITY OF CALICUT**

**Abstract**

Faculty of Engineering-B.Arch programme-Revised syllabus-Third to Sixth semester-Resolution of the Academic council-implemented-Orders issued.

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**G & A - IV - E**

U.O.No. 8825/2018/Admn

Dated, Calicut University.P.O, 24.07.2018

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*Read:-*1.U.O.No.11016/2017/Admn dated 31.08.2017

- 2.Item No.1 of Minutes of the meeting of the Board of Studies in Architecture held on 19-04-2018.
- 3.Item No. 2(i) of Minutes of Faculty of engineering meeting held on 03-07-2018
- 4.Item No.II (J) of minutes of academic council meeting held on 18-07-2018

**ORDER**

As per U.O read as (1), the revised regulations and the Syllabus for combined First and Second semester B.Arch Programme was implemented with effect from 2017 admission. According to paper read as (2), the Board of Studies in Architecture discussed and approved the Syllabus for Third to Sixth semester B.Arch programme. The resolution of the Board of Studies was approved by the Faculty of Engineering vide paper read as (3). According to paper read as (4), the Academic council, approved the Minutes of the meeting of the Faculty of Engineering held on 03.07.2018 and the Minutes of the meeting of the Board of studies in Architecture read as (2).

The Vice Chancellor has accorded sanction to implement the above resolution of the Academic Council.

The following orders are therefore issued:

- 1.The Revised Syllabus of Third to Sixth semester B.Arch Programme is implemented with effect from 2017 admission.  
(Syllabus appended)

Ajitha P.P

Joint Registrar

To

- 1.The Controller of Examinations
  - 2.Principals of affiliated B.Arch Colleges
- Copy to:PA to VC/PA to PVC/PA to Registrar/PA to CE/DR, B.Tech/EX&EG sections/SF/DF/FC

Forwarded / By Order

Section Officer

SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-31	ARCHITECTURAL DESIGN I	0-0-10	10	2017
<p><b>Course Objectives</b></p> <p>The Architectural Design I course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Help them to understand space requirements related to human activities and study anthropometric data.</li> <li>• Introduce concept to the process of design.</li> <li>• Introduce students to standards and norms related to different functions.</li> <li>• Introduce students to rules and regulations related to building design.</li> <li>• Enable them to conceive 3 dimensional forms and establish relation to functional requirements which will result in optimal utilization of space.</li> <li>• Help them to develop a basic understanding of building materials.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• To develop a basic understanding of space, form, structure and the built environment</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• De Chiara and Callender, Time Saver Standard for building types, McGraw Hill Co.</li> <li>• Neufert Architect's data, Bousmaha Baiche &amp; Nicholas Walliman, Blackwell science ltd.</li> <li>• KMBR</li> <li>• Simon Unwin, "Analyzing Architecture", Routledge 2003</li> <li>• Francis D.K.Ching, "Architecture, Form, Space and Order"; III Edition, John Wiley, 2007</li> <li>• Leland M.- Roth, "Understanding Architecture: Its Elements- History, and Meaning", Icon Editions, 1993</li> <li>• Steen Eiler Rasmussen, "Experiencing Architecture", MIT Press 1964</li> <li>• Peter von Meiss, "Elements of Architecture - From Form to Place", Span Press, 1992</li> <li>• Bryan Lawson, "How Designers Think", Architectural Press Ltd" London, 1980.</li> </ul>				

**Projects:**

Two projects - one minor and one major - shall be completed during this semester and these shall have minimum complexity in terms of design and site challenges.

Minor Project: Design of small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale like bus shelter/ fast food kiosks/ entrance gateways/ park Shelters etc.

Major Project: Design of a residence within a set of limited specific requirements

**Process & Deliverables:**

Students should attempt data collection from various reference books, carryout adequate number of relevant case studies. The concepts of architectural programming shall be introduced to assist the design process. Handmade sketches, manual drafting and scaled study models shall be made part of the design process. Deliverables shall be manually drafted presentation drawings including free hand perspectives, scaled working models etc.

**TOTAL HOURS: 120**

SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-32	THEORY OF DESIGN - II	2-0-0	3	2017

### Course Objectives

The Theory of Design II course for students of architecture would,

- introduce factors that lend meaning to design , expression, communication.
- introduce thorough case studies, tools for representing, analyzing and interpreting architecture.

### Course Outcome

- An understanding of Architecture as a product of historical context through introduction to aspects of style, character and architectural movements.
- An understanding of the generation of individual meaning in architecture through study of philosophies/ theories and exemplary works of architects.
- Development of architectural drafting skills in the representation of construction details.
- An exposure to analysis and experience of architecture through case studies.

### Text books

- Scott- Design fundamentals
- G .Broadbent - Design in Architecture
- Architectural Criticism - Definition, Sources, Types of Criticism by Wayne Attoe
- Jon Lang - Positive and Normative Theories in Architecture

### Reference Books

- Garry Stevens - The reasoning Architect
- K.W.Smithies, Principles of Design in Architecture, Van Nostrand Reinhold Company 1981
- Sam F. Miller, Design Process - A Primer For Architectural & Interior Design, Van NostrandReinhold Company , 1995
- Ernest Burden, Elements of Architectural Design - A Visual Resource, Van Nostrand Reinhold Company, 1994
- V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications, New Delhi, 1973
- Y.Ashihara - Exterior design in Architecture
- Diane Ghirardo - Architecture after Modernism
- Peter von Meiss, "Elements of Architecture - From Form to Place", Span Press, 1992
- Bryan Lawson, "How Designers Think", Architectural Press Ltd" London, 1980
- Hanno Rauterberg, "Talking Architecture, Interview with Architects", Prestel 2008
- The A-Z of Modern Architecture-Taschen 2007
- Antony Catanese and James C. Snyder, Introduction to Architecture, McGraw-Hill, 1979



**MODULE I (12 HRS)**

Architectural theory in historical perspective:

Types of Design: Pragmatic design, Iconic Design, Analogical Design, Canonic Design Advantages and Disadvantages and outstanding examples

Architectural Criticism:

Definition & Sources, to examine fundamental questions of what Architectural criticism actually is, its role and function in architecture and the relationship between criticism and judgment.

**MODULE II (6 HRS)**

Society and design:

Role of designer in the society. Design for performance, Behavioral Aspects of Design.

Design generation process: Role of logic and intuition in concept generation.

Step by step development of design from problem definition, site analysis to post occupancy evaluation as the last stage of design.

**MODULE III (10 HRS)**

Creativity and Design: Concepts of creativity. Techniques of creative thinking. Different tools of Creativity, Issues of creative design, Difference between Innovation and Creativity. Impact of computer applications on creativity and design.

**MODULE IV (12 HRS)**

Contemporary movements in architecture

Role of individual architects in the generation of architectural form, through study of exemplary works, architectural inspirations, philosophies, ideologies and theories of architects.

Modern Movement Theory including Organic Architecture - Le Corbuiser and Frank Llyod Wright

Post Modern Theory -Robert Venturi, Louis Sullivan

Deconstructivism - Zaha Hadid, Frank Gehry

**TOTAL HOURS: 40**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.  
Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.  
Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-33	BUILDING MATERIALS AND CONSTRUCTION - II	1-0-3	3	2017

### Course Objectives

The Building materials and construction course for students of architecture would,

- Introduce the study of building materials (concrete, iron, steel & aluminium), their application and construction methods.
- Help them to understand the details of construction.

### Course Outcome

- An understanding of the properties of various building materials and their applications.
- Exposure to the common construction techniques used for constructing various components of a building.
- Development of architectural drafting skills in the representation of construction details.

### Text books

- Arora S.P. and Bindra S.P., “Text book of Building Construction”, DhanpatRai& Sons, New Delhi, 2012.
- P C Varghese, Building Materials, Prentice Hall of India Pvt. Ltd, New Delhi, 2010
- Shetty M.S, Concrete Technology
- Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.
- Balagopal T.S. Prabhu, “Civil Engineering Drawing Hand book”

### Reference Books

- Don A. Watson Construction Materials and Processes McGraw Hill 1972.
- WB Mckay Building construction, Vol 1,2, Longman UK 1981.
- Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.
- Neville A M and Brooks J J , Concrete Technology

### MODULE I

#### CONCRETE (12hrs)

Ingredients of Concrete: Cement, Fine aggregate, Coarse aggregate, Water, Reinforcement.

Concrete: PCC and RCC, Grades, Properties, Water cement ratio.

Process of concreting : Formwork for concrete, Mixing of concrete, Cutting, bending and placing of reinforcement, Placing of concrete, Scaffolding, Curing

Properties of concrete: fresh concrete, workability, segregation and bleeding, factors affecting workability & strength. Various types of concrete.

*Exercise: site visit & field observations of onsite concreting work*

## **MODULE II**

### **DEEP FOUNDATION (16 hrs.)**

Pile foundation: Bearing piles, friction piles - concrete, timber, steel and composite piles. Cased and uncased cast in situ concrete piles, Bored piles, pressure piles and precast concrete piles. Screw piles & disk piles. Under reamed piles. Bored compaction piles. Sand piles. Sheet piles. Pile cap. Caissons: Box caissons, Open caissons & pneumatic caissons

Timbering and trenching of foundations

*Exercise: Drawings of various types of Pile foundations & site visit*

## **MODULE III**

### **IRON, STEEL, ALUMINIUM, (12 hrs.)**

Iron: Forms of Iron used for building construction-Properties and uses - Cast iron, Wrought iron

Steel: Properties , Uses, Anti corrosive measures, mechanical and heat treatment of steel

Forms of steel used for building construction: steel for reinforcement-Hot rolled bars, Cold rolled steel, TMT bars, Welded wire fabrics. Structural Steel, Stainless steel, Steel alloys, current developments.

Aluminium in building construction: Properties, Advantages, Available Forms- Extrusion, casting, foil, powder & sheet - uses- finishes - anodising, surface texture, colour coating & painting. Applications in buildings.

*Exercise: study of standard aluminium & steel products and profiles used for building construction.*

## **MODULE IV**

### **JOINERY, DOORS&WINDOWS (16 hrs.)**

Joinery: Joinery details in wood, Terms for various members, fasteners and fixtures used in joinery.

Door: Different types of doors and uses. Wooden doors, PVC doors, glass doors, Steel doors

Solid doors, Flush doors, revolving doors, folding doors, sliding doors, swinging doors, collapsible doors.

Windows: Aluminium, Steel & UPVC windows - French windows, bay windows - fixed, casement, sliding & pivoting windows.

*Drawings: Joinery details, Paneled door, battened door, glazed door , sliding door, folding door Aluminium and steel window.*

**TOTAL HOURS: 56**

## **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR17-34	BUILDING CLIMATOLOGY	3-0-0	3	2017
<p><b>Course Objectives</b>  The Building Climatology course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Help students develop an understanding and appreciation of climate and its influence on built form and architecture of a region.</li> <li>• Equip the students with the competence required to design climate responsive buildings, by providing an understanding of the various climatic zones and the climate responsive considerations in the design of spaces - built-up and open.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An understanding of the relation of climate to human comfort.</li> <li>• Awareness about various types of climate and the corresponding design strategies for climate-responsive buildings and spaces.</li> </ul>				
<p><b>Text books</b></p> <ul style="list-style-type: none"> <li>• Koenisberger, O. H., Ingersoll, T.G., Mayhew, A. and Szokolay, S.V., Manual of Tropical Housing and Building - Climatic Design, Orient Longman Pvt Ltd, Chennai, 2003.</li> <li>• Bureau of Indian Standards IS 3792 (1987), Hand book on Functional requirements of buildings other than industrial buildings, (Part I - IV), BIS, New Delhi, 1995.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Krishnan, A., Szokolay et.al, Climate Responsive Architecture-A Design Handbook for Energy Efficient Buildings, Tata McGraw Hill, New Delhi, 2010.</li> <li>• Evans, M., Housing Climate and Comfort - Architectural Press, London. (1980).</li> <li>• Allan, K., Design Primer for hot Climates, The Architectural Press Ltd, London, 1980.</li> <li>• Givoni, B., Passive and low energy cooling of Buildings, John Wiley and Sons, 1994.</li> <li>• Markus, T.A. and Morris E. N., Buildings Climate and Energy, Pitman Pub., 1980.</li> <li>• Fry. M and Drew. J, Tropical Architecture in the Dry and Humid Zones, Londres: Bestford, 1964.</li> <li>• Giovani, B., Man, Climate and Architecture, Van Nostrand Reinhold, 1981.</li> <li>• Kukreja, C.P.,Tropical Architecture, Tata McGraw Hill Pub. Co. Ltd New Delhi, 1978.</li> <li>• Olgyay, A. and Olgyay, V., Solar Control and Shading Devices, Princeton University Press, New Jersey, 1976.</li> </ul>				

**MODULE I****CLIMATE AND HUMAN COMFORT (12 Hours)**

Factors that determine climate of a place - Elements of climate - Measurement and representation techniques of climatic data - Global climatic zones - Macro, Micro, Site and Urban climate - Human body heat balance - Mechanism of comfort in human system in various climatic environments - Concept of effective temperature, its correction and application - ET/CET nomogram - Psychrometric chart - Comfort indices - Bio-climatic chart.

**MODULE II****PRINCIPLES OF THERMAL DESIGN (10 Hours)**

Basic concepts of heat transfer, terminology and units - K value and U value - Sol-air temperature and Solar gain factor - Heat exchange of buildings - Transmittance of composite walls - Thermal gradients - Periodic heat flow concept - Time-lag and Decrement factor - Thermal characteristics of common building materials and building components.

**MODULE III****MEANS OF THERMAL CONTROL (12 Hours)**

Structural controls: solar control - heat absorbing glasses - geometry of solar movement - altitude & azimuth angles - sun path diagram/solar chart - horizontal and vertical shadow angles - use of shadow angle protractor - design of shading devices.

Ventilation and air movement: functions of ventilation - stack effect - air flow through buildings - air flow around buildings - humidity control.

**MODULE IV****CLIMATE-RESPONSIVE ARCHITECTURAL DESIGN (8 Hours)**

Architectural design strategies for different climatic zones - Passive design techniques in built and un-built environment.

The climatic design process: forward analysis - plan development - element design - The Mahoney tables - Activity charts.

Models and Analogues: wind tunnel - solarscope - artificial sky.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.





SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR17-35	BUILDING SCIENCE LAB	0-0-3	3	2017
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• Building Science laboratory practical sessions are to introduce use of various equipment and materials used for understanding a building's performance in terms of structural strength, illumination levels of spaces, acoustical qualities, thermal properties of materials etc.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• A practical experience of the properties and behaviour of various building materials.</li> <li>• Hands-on experience of calculating climatic data using various climatic instruments.</li> </ul>				
<p><b>Course Content:</b></p> <ol style="list-style-type: none"> <li>1. Tests on Cement <ol style="list-style-type: none"> <li>a) Fineness of cement</li> <li>b) Normal Consistency</li> <li>c) Initial Setting time of Cement</li> <li>d) Final Setting time of Cement</li> </ol> </li> <li>2. Tests on aggregate for Concrete <ol style="list-style-type: none"> <li>a) Bulking of Sand</li> <li>b) Particle size distribution of coarse aggregate</li> </ol> </li> <li>3. Tests on building materials <ol style="list-style-type: none"> <li>a) Compressive strength of country burnt bricks</li> <li>b) Tensile strength of steel rods</li> </ol> </li> <li>4. Properties of Fresh Concrete <ol style="list-style-type: none"> <li>a) Workability tests</li> <li>b) Slump Test</li> </ol> </li> <li>5. Measurement of illumination levels from a point source by using lux meter</li> <li>6. Wet and dry bulb thermometer</li> <li>7. Determination of air circulation of room by using anemometer</li> <li>8. Finding the maximum and minimum temperature of a particular location by using maximum and minimum thermometer</li> </ol> <p><b>TOTAL HOURS: 30</b></p>				
<p><b>Sessional Requirements:</b>  Laboratory work Marks: 50 marks  Record: 10 marks  Tests: 30 marks</p>				

Regularity: 10 marks  
Total: 100 marks

SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-36	THEORY OF STRUCTURES - II	2-1-0	3	2017
<p><b>Course Objectives</b></p> <p>The Theory of Structures - II course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Help enable an understanding of fundamentals of stress and strain and their applications in structural analysis and design.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Understanding of the concepts of stress and strain.</li> <li>• Appreciation of the way in which stress and strain impacts beams and columns.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• F.V.Warnock, Strength of Materials, Sir Isaac Pitman Sons Ltd.</li> <li>• E.P. Popov, Mechanics of Materials , SI Version, Prentice Hall, India</li> <li>• William. A. Nash, Strength of Materials, SI Version, Schaum's Out line Series</li> <li>• S.S. Bhavikkatti, Structural Analysis Vol. I, Vikas Publishing House Pvt. Ltd.</li> <li>• Ramamrutham S. And R. Narayan, Theory of Structures, Dhanpat Rai Publishing Co., 2012</li> <li>• R.K Bansal., Strength of Materials, Lakshmi Publications Pvt Ltd</li> <li>• M.M. Ratwani &amp; V.N. Vazirani, Analysis of Structures, Vol. 1, Khanna Publishers - Delhi, 1987.</li> <li>• Timoshenko, S.P. and D.H. Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993</li> </ul>				
<p><b>MODULE I (12 hrs)</b></p> <p>Types of external loads, self-weight internal stresses, normal and shear stresses, strain, Hooke's law, Poisson's ratio, relationship between elastic constants, stress-strain diagrams, working stress, elongation of bars of constant and varying cross sections, thermal stresses.</p> <p>Stress on inclined planes for axial and bi-axial stress fields, principal stresses, Mohr's circle of stress, principal stresses. (Concept only).</p> <p><b>MODULE II (10 hrs)</b></p> <p>Theory of simple bending, limitations, bending stresses in beams of different cross sections, moment of resistance, beams of uniform strength, beams of two materials, principal stresses in bending, strain energy due to bending, shearing stresses in bending, distribution of shear stress in various cross sections.</p>				

**MODULE III (10 hrs)**

Differential equation of the elastic curve, slope and deflection of beams by method of successive integration, Macaulay's method, moment area method.  
Deflection of beams by strain energy method -application to simple beams.

**MODULE IV (10 hrs)**

Torsion of circular and hollow shafts, power transmission.  
Axial loading of short strut, Long columns, Euler's formula, Rankine's formula, eccentric loading, direct and bending stresses.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone.
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone.
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.
- Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER III Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-37	HISTORY OF ARCHITECTURE - II	3-0-0	3	2017

### Course Objectives

- The objective of the course is to develop an understanding of appreciation of Islamic architecture and its influence in India's local and regional history of architecture, its changes in social processes and lifestyle. Architecture is to be seen as an important and long lasting by-product of development of civilization by understanding the role of technology, construction techniques, climate and materials with inherent visual aspects like spatial organization, scale, compositional organization, Architectural vocabulary and design grammar.

### Reference Books

- Percy Brown , 'Indian Architecture ( Islamic Period)' ,D.B. Taraporevala Sons & Co. Private Ltd.,
- Bombay, 1997.
- Satish Grover , 'Islamic Architecture in India', CBS Pub, New Delhi, 2002
- Banister Fletcher, Dan Cruickshank Sir Banister Fletcher's a History of Architecture, Architectural
- Press, 1996
- Christopher Tadgell , 'The History of Architecture in India', Phaidon Press Ltd, 1994.
- John Julius Norwich : Great architecture of the world
- Stephen Gardiner: Introduction to architecture
- Henri Sterlin : Encyclopedia of world Architecture

### MODULE I - (12 Hours)

A brief introduction into origin & characteristics of Islamic architecture: building types, elements, structural systems, construction techniques.

Islamic Architecture of Syria and Egypt- Great Mosque of Damascus, Syria , Dome of the Rock, Jerusalem , The Mosque of Ahmad Ibn ,Tulun, Cairo

Persia - The Masjid-i Shah, Isfahan

Spain - The great mosque at Cordoba. The Alhambra

Morocco -King Hassan II Mosque, Casablanca

**MODULE II - (10 Hours)**

Beginning of Islamic Architecture in India

Islamic Architecture in Delhi (Imperial Style)

Slave dynasty -Quwat-ul-Islam mosque, Qutb Minar, Mosque at Ajmer, Sultan Ghari, Tomb of Iltumish, Tomb of Balban.

Khilji Dynasty -Alai Darwaza, Jamat Khana masjid

Tughlaq dynasty -Tomb of Ghias-Ud-din, City of Tughlaqabad, City of Firoz Shah Kotla, Khirki Masjid.

Sayyid and Lodi dynasty-Tomb of Mubarak Shah, tomb of Mohamed Sayyid, Garden tomb of Sikander Lodi , Bara Khan ka Gumbad, Chota Khan ka Gumbad, Shish Gumbad, Bara Gumbad.

**MODULE III - (10 Hours)**

Provincial styles:

Punjab -Tomb of Shah Rukhn-I-Alam.

Jaunpur -Atala Masjid, Jami Masjid

Bengal -Dakhil Darwaza, Firoze Minar, and Adina Masjid.

Gujarat -Jami Masjid, Teen Darwaza, Well retreats of Ahmedabad.

Malwa -Hindola Mahal, Jami Masjid at Mandu, Jahaz Mahal, Hawa Mahal

Deccan - Charminar at Hyderabad, Tomb of Golconda.

Bijapur - Jami Masjid, Golgumbaz.

**MODULE IV - (10 Hours)**

Evolution of Mughal style and the different eras of rule:

Early period -Babar, Humayun, Sher Shah

Akbar - Tomb of Humayun, Jahangir Mahal, Agra,

Fatehpur Sikri - city planning & the various structures inside.

Jahangir -Akbar's tomb.

Shah Jahan -Red fort at Agra, Taj Mahal, City of Shahjahanabad(Delhi fort), Jami Masjid at Delhi.

Aurangzeb -Tomb of Rabi Durrani at Aurangabad, Moti Masjid at Delhi fort.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER III Course No.	Course Name	L-T- P/S	Credits	Year of introduction
AR 17-38	COMPUTER-AIDED VISUALIZATION - I	0-0-2	2	2017
<p><b>Course Objectives</b></p> <p>The C A A D Laboratory -I course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Enable learning of CAD software by doing graded exercises</li> <li>• Help them to understand various CAD Commands - creating two dimensional drawings and editing commands.</li> <li>• Help in the preparation of hardcopy of drawings using normal architectural scales.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An understanding of CAD software for preparing two-dimensional drawings.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Omura George, “Mastering AutoCAD, BPB Publications, New Delhi</li> <li>• AutoDesk AutoCAD Manual</li> <li>• Kolareric Branko, Architectural Rendering and Modelling with AutoCAD, John Wiley, New York, 1998.</li> <li>• Synder James, Architectural Construction Drawings with AutoCAD, John Wiley, New York, 1998</li> </ul>				
<p><b>Projects:</b> Suggested Projects for the lab:</p> <ol style="list-style-type: none"> <li>1) Graded exercises - measured drawing, site plan, Component details. Lettering, dimensioning &amp; Layering standards.</li> <li>2) Preparation of drawings in layers &amp; layouts.</li> <li>3) Municipal drawing preparation for a medium-sized residence.</li> </ol> <p><b>Exercises:</b></p> <ol style="list-style-type: none"> <li>1. Starting up - Drawing I- Measured drawing (plan and section) of a room.</li> <li>2. Architectural Drawing II- Drawing Plans, sections and elevations of Residence design project</li> <li>3. Starting up- Preparing drawing with layer system, CTB &amp; Creating hatch patterns, Importing /exporting files</li> <li>4. Architectural Drawing III- Preparing drawings for approval of Apartment Design Project</li> </ol> <p><b>TOTAL HOURS: 30</b></p>				
<p><b>SESSIONAL REQUIREMENTS:</b></p> <p>Class work Exercises = 60 marks  Lab Series test = 2X15 = 30 marks  Attendance = 10 marks  Total = 100 marks</p>				





SEMESTER IV Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-41	ARCHITECTURAL DESIGN - II	0-0-10	10	2017

### Course Objectives

The Architectural Design II course for students of architecture would help,

- To create a holistic understanding of the socio-cultural, geographic and economic aspects that shapes the built environment
- To expose students to the methodology of conducting various surveys covering physical, visual characteristics and demographic aspects.
- To introduce concept to the process of design.
- To understand the climatic and topographic aspects related to the site and how they influence the design.
- To undertake a comprehensive study of a building/settlement/ or part of an urban area that is an example of design evolved organically over a period of time.
- To emphasis the importance of designing built form and open spaces that meet the aspirations of the community.

### Course Outcome

The Course creates an understanding of design as a response to context and program and develops a holistic approach to design.  
Students develop skills to create architectural solutions for simple problems with a thrust on evolution of concepts and response to site and climatic challenges.

### Reference Books

Julius Panero, Martin Zelnik, "Human Dimension and Interior Space", Whitney Library of Design, 1975  
 Ramsey et al, "Architectural Graphic Standards", Wiley, 2000  
 Kevin Lynch, "Site planning", MIT Press, Cambridge, 1984  
 Sam F. Miller, "Design Process: A Primer for Architectural and Interior Design", Van Nostrand Reinhold, 1995  
 Francis D. K. Ching, 'Architectural Graphics', Wiley, 2009  
 Francis D. K. Ching, 'Architecture: Form, Space and Order', John Wiley & Sons, 2007  
 Simon Unwin, 'Experiencing Architecture', Routledge, 2003  
 Simon Unwin, 'An Architecture Notebook' Routledge, 2000  
 Geoffrey Broadbent, 'Design in Architecture' John Wiley and Sons, 1973  
 Simon Unwin, 'Doorway', Routledge, 2007

**Projects:**

Two projects - one minor and one major - shall be completed during this semester and these are to address context in terms of topography, site and built elements.

Minor project: Projects involving public and community oriented buildings - multi room, single use, small span, double storied, having horizontal and vertical movement

Major project: Projects involving study of a building / settlement / or part of an urban area.

**Process and deliverables:**

Students should conduct data collection from various reference books, study the context, conduct relevant case studies; carry out detailed site analysis before attempting design.

Formulation of a detailed design brief, evolution of concept shall be part of the architectural programming.

Handmade sketches, manual drafting and scaled study models shall be made part of the design process.

Deliverables shall be manually drafted presentation drawings including free hand perspectives, graphical representation of concept, scaled models etc.

**TOTAL HOURS: 120**

**UNIVERSITY EXAMINATION PATTERN**

Jury will be conducted as per the B.Arch. Degree Course Manual.

SEMESTER IV Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-42	SITE SURVEYING AND ANALYSIS	2-0-1	3	2017
<p><b>Course Objectives</b></p> <p>To understand the fundamental concepts and methods of surveying using basic &amp; advanced instruments for surveying and levelling. To appreciate the importance of the site and context in the architectural design process.</p>				
<p><b>Course Outcome</b></p> <p>An understanding of the concepts and methods of surveying using various instruments. Knowledge about the various steps involved in the site analysis and planning process as a prelude to the architectural design process. An understanding about the process of layout of site utilities.</p>				
<p><b>Text Books</b></p> <p>Surveying Vol. I, II &amp; III, by Kanetkar T.P. Surveying Vol. I &amp; II, by Punmia B.C. Advanced Surveying by Satheesh Gopi, R. Sathikumar &amp; N. Madhu. Edward T. White, Site Analysis, Architectural Media Ltd., 1983. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.</p>				
<p><b>Reference Books</b></p> <p>Joseph De.Chiarra (J) and Lee Copleman - Urban Planning and Design Criteria - Van Nostrand Reinhold Co., 1982. Storm Steven, Site engineering for landscape Architects, John Wiley &amp; Sons Inc, 2004. John Ormsbee Simonds, "Landscape Architecture: A manual of Site Planning and Design", McGraw Hill, 1961. Thomas H. Russ, "Site Planning and Design Hand Book", Pearson Education, 2002. Diane Y. Carstens, "Site Planning and Design for the Elderly", Van Nostrand Reinhold, New York, 1993.</p>				
<p><b>MODULE I (12 Hours)</b></p> <p>General principles and classification of surveying-- Chain survey: instruments - ranging and chaining of lines - chain survey procedure - recording and field notes - plotting, conventional signs. Compass survey - Description, use and adjustments of prismatic and Surveyors compass - True magnetic meridians, bearings - local attraction - compass traverse - plotting - errors and adjustments. Plane Table Survey: Instruments and other accessories - different methods of plane table surveying.</p> <p><b>MODULE II (12 Hours)</b></p> <p>Levelling - levelling instruments - temporary and permanent adjustments of dumpy and tilting level - Height of instrument method, Rise and Fall method. Theodolite surveying - study of vernier theodolite - temporary and permanent adjustments - measurement of horizontal angles by repetition and reiteration -</p>				

measurement of vertical angles.

Introduction to Total Station Surveying - Advantages and disadvantages of Total Station Surveying.

**MODULE III (8 Hours)**

Importance of site analysis - On site and off site factors - Analysis of natural, cultural and aesthetic factors - topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects - Preparation of site analysis diagram.

Study of contours: slope analysis - grading process - grading criteria - functional and aesthetic considerations.

**MODULE IV (10 Hours)**

Context of the site: Impact of proposed developments on the surroundings especially with reference to large scale projects - Aspects such as increase in traffic, noise and pollution to surroundings - Study through notable examples.

Organization of vehicular and pedestrian circulation: types of roads, hierarchy of roads, networks, road widths and parking regulations.

Principles of positive drainage and grading for drainage - location 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.

Improving climatological conditions on site through landscaping.

**TOTAL HOURS: 42**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER IV Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-43	<b>BUILDING MATERIALS AND CONSTRUCTION - III</b>	1-0-3	3	2017

### Course Objectives

The Building materials and construction III course for students of architecture would,

Introduce to the student different components of buildings and various materials, their properties and uses.

Familiarize students with market study of building components and details.

### Course Outcome

Comprehend the application of various building components and their construction.

Exposure to the common construction techniques used for constructing various components of a building.

### Text books

Arora S.P. and Bindra S.P., "Text book of Building Construction", DhanpatRai& Sons, New Delhi, 2012.

P C Varghese, Building Construction, Prentice Hall of India Pvt. Ltd, New Delhi, 2010

Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

Balagopal T.S. Prabhu, "Civil Engineering Drawing Hand book"

### Reference Books

Don A. Watson Construction Materials and Processes McGraw Hill 1972.

WB Mckay Building construction, Vol 1,2, Longman UK 1981.

Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.

RC Smith & TL Honkala, 'Principles and Practices of Light Construction', Prentice Hall, Englewood Cliff, 1986.

Relevant BIS codes.

### MODULE I

#### WALL SYSTEMS (15hrs)

Concrete System: Concrete columns, concrete walls. Lintels and sunshades

Masonry System: Masonry walls unreinforced and reinforced, solid walls and cavity walls, masonry columns and pilasters, Arches.

Steel System: Structural steel framing, steel columns, light gauge steel studs, balloon framing.

Wooden System: Wood stud framing, stud wall sheathing, wood columns, wood post and beam framing.

Partition wall systems.

*Drawings: Types of arches , RCC lintel and sunshade*

### MODULE II

#### FLOOR SYSTEMS (15 hrs.)

Concrete: One-way slab, One-way joist slab, Two-way slab, Two-way slab and Beam.

Steel: One-way beam system, Two-way beam system, Triple beam system, Semi rigid connections, Open- web steel joists, Metal decking, Light-gauge steel joists.

Wood: Wood joists, Wood joist framing, wood beams supports and connections, plank and beam framing.

*Drawings : RCC column, slab and beam*

### **MODULE III**

#### **ROOF SYSTEMS (15hrs.)**

Flat roof, Sloping roof and Curved roof. Deciding the slope or curvature of roof, Roof terminology

Wood trusses: Different types of trusses, King post truss, Queen post truss, Fink Truss, North light truss

Structural Steel roof framing: Different types of Steel trusses and their construction details.

Roof covering - thatching, tiling, AC sheets, GI and Aluminium sheets, FRP and RMP sheets and modern roofing. Roof drainage systems

Introduction to Space frames and Composite roof Systems

*Drawings: Types of Arches, Truss - King post truss, Queen post truss, Steel-angular and tubular truss, details of roof covering and gutter details.*

### **MODULE IV**

#### **VERTICAL TRANSPORTATION SYSTEMS (15 hrs)**

Planning of vertical transportation systems - design parameters.

**Ramps:** Planning of ramps, slope, finishes, safety precautions.

**Stairs:** Planning staircases - Standards, rules and regulations. Components of stairs, Support conditions like inclined slab, cranked slab, cantilever. Stair plans- stairs with straight, circular and curved flights.

Construction details of Wood stair, fire escape stairs, Concrete stair, Steel stair and Composite stair.

**Elevators:** Planning and grouping of elevators. Elevator design parameters.

Different types of elevators - passenger elevators, observation elevators, hospital elevators and freight elevators. Construction details - lift shaft, lift pit, machine room etc.

**Escalators:** Planning and details of escalators and travelators.

*Drawings: Wooden stair, RCC stair, Steel Stair, Composite stair, Passenger lift, Capsule lift, Escalator.*

**TOTAL HOURS: 60**

#### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



SEMESTER IV Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
AR 17-44	<b>BUILDING SERVICES - I (WATER SUPPLY AND SANITATION)</b>	3-0-0	3	2017
<p><b>Course Objectives</b></p> <p>The objective of the course is to help students to develop an understanding of the fundamentals of water supply and sanitary engineering - students will learn about sources of water, water treatment, waste water treatment, solid waste management, etc.</p>				
<p><b>Course Outcome</b></p> <p>An understanding of demand, consumption, sources, treatment and distribution of water. Awareness about treatment and disposal of wastewater, and solid-waste management.</p>				
<p><b>Text books</b></p> <p>Modi, P. N., Sewage Treatment and Disposal and Wastewater Engineering, Standard Book House, New Delhi, 2008. Birdie, G. S., and Birdie, J. S., Water Supply and Sanitary Engineering, Dhanpat Rai and Sons, New Delhi, 2007. Garg, S. K., Environmental Engineering, Vol. II, Khanna Publications, New Delhi, 2009. Duggal, K. N., Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi, 2008.</p>				
<p><b>Reference Books</b></p> <p>Mark J. Hammer and Mark J. Hammer Jr., Water and Waste Water Technology, Prentice Hall of India Pvt. Ltd. New Delhi, 2009. Ernest W. Steel and Terence J. Mc Ghee, Water Supply and Sewerage, McGraw Hill, New York, 1991. Ehlers, V. M. and Steel, E. W., Municipal and Rural Sanitation, McGraw Hill, 2009. Fair, Geyer and Okun, Water and Wastewater Engineering, John Wiley and sons, Inc., 2010 Metcalf and Eddy, Wastewater Engineering Treatment, Disposal and Reuse, Tata McGraw Hill, 2007. Kiely, G., Environmental Engineering, McGraw Hill, McGraw Hill, 2009. Relevant BIS Codes.</p>				



**MODULE I (8 hrs)**

Water Supply Engineering - Quantity of water, types of water demand, fluctuation in demand, factors affecting consumption, forecasting population - design period. Sources of water - surface water sources, intakes, ground water sources.

**MODULE II (16 hrs)**

Quality of water - drinking water standards - physical, chemical and bacteriological analysis of water. Treatment of water - aeration, coagulation, flocculation, sedimentation, filtration, disinfection. Miscellaneous and advanced treatment methods - removal of iron and manganese, fluoridation and de-fluoridation, water softening, arsenic removal, desalination, membrane filtration. Transmission of water-gravitational, pumping and combined schemes. Lay out of distribution networks, intermittent and continuous systems of distribution-laying, testing and maintenance of distribution pipes.

**MODULE III (12 hrs)**

Wastewater characteristics-Preliminary treatment of wastewater - screens, grit chamber, detritus tank, sedimentation tank. Biological treatment - Activated sludge process, Trickling filter, Oxidation pond. Anaerobic treatment - Anaerobic digesters. Wastewater disposal - disposal into land, water bodies - stream, ocean - disposal by irrigation - sludge treatment and disposal. Septic tank and soak pit.

**MODULE IV (12 hrs)**

Solid waste management - sanitary land fill, incineration, composting. Sanitary plumbing - sanitary fixtures, systems of piping - Septic tank and soak pit. House drainage, connection of house drains and street sewers.

**TOTAL HOURS: 48****UNIVERSITY EXAMINATION PATTERN**

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone.
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone.
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.
- Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



SEMESTER IV Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
AR 17-45	THEORY OF STRUCTURES - III	2-1-0	3	2017

#### Course Objectives

The Theory of Structures III course for students of architecture would help them to understand the concept of indeterminate structures and the various methods of analysis of such structures.

#### Course Outcome

An understanding of shear force, bending moment in beams and frames. Exposure to various methods involved in analysis of indeterminate structures.

#### Reference Books

R Junarkar S. B. and Shah S. J., Mechanics of Structures (Vol. I), 30/e, Charotar Publishing House Pvt. Ltd., New Delhi, 2012  
 Junnarkar S. B. and H. J. Shah, Mechanics of Structures, Vol - II, 23/e, Charotar Publishing House, 2013.  
 Punmia B. C., A. K. Jain and A. K Jain, Theory of Structures (SMTS- II), Laxmi Publications Pvt. Ltd., 2004.  
 Ramamrutham S. And R. Narayan, Theory of Structures, Dhanpat Rai Publishing Co., 2012  
 M.M. Ratwani & V.N. Vazirani, Analysis of Structures, Vol. 1, Khanna Publishers - Delhi, 1987.  
 Timoshenko, S.P. and D.H. Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993.

#### **MODULE I (12 hrs)**

Determinate and Indeterminate beams.(Static Indeterminacy) - Consistent deformation method - fixed and propped cantilever Shear Force Diagram - Bending Moment Diagram

#### **MODULE II (12 hrs)**

Analysis of continuous beams using Three moment theorem Shear Force Diagram - Bending Moment Diagram, Support settlement case. (derivation not required)

#### **MODULE III (12 hrs)**

Introduction to slope deflection method-simple beams only (settlement case not required.)  
 Moment distribution methods - shear force and bending moment diagrams of beams (Simple cases)

#### **MODULE IV (12 hrs)**

Moment distribution methods - shear force and bending moment diagrams of frames (Non-sway only.)

**TOTAL HOURS: 48**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER IV Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17 - 46	HISTORY OF ARCHITECTURE - III	3-0-0	3	2017

### Course Objectives

The History of Architecture - III course for students of architecture would,

Help to provide awareness about the development of architecture in the Ancient Western World and the cultural and contextual determinants that produced that architecture. To study the influences of events which have led to the outcome of styles such as Romanesque, Gothic & Renaissance and their architects in Italy, France and Britain comprehending the rich vocabulary of forms & shapes and structural systems.

### Course Outcome

An understanding of demand, consumption, sources, treatment and distribution of water.  
Awareness about treatment and disposal of wastewater, and solid-waste management.

### Reference Books

Sir Banister Fletcher's - "A History of Architecture", Architectural Press, 1996  
Louis Grodecki- "Gothic Architecture", Rizzoli, 1991  
History of World Architecture (Series), Vols. Titled "Ancient Architecture, Primitive Architecture, Greek Architecture, Roman Architecture and Byzantine Architecture", 1980.  
Kenneth Frampton : Modern Architecture - A Critical History  
"Builders of Ancient World", A National Geographic Society Publication, 1986.  
Raeburn Michael, "Architecture of the Western World", Popular Press, England, 1988.  
John Julius Norwich: Great Architecture of the World.  
Stephen Gardiner : Introduction to Architecture  
Monographs of Modern Architects  
Henri Sterlin : Encyclopedias of World Architecture

### MODULE I ( 8 hours)

Introduction to society and culture of 400 -1150 AD in Europe  
Early Christian Architecture: Evolution of Church form, surface treatment and materials of construction, Old St. Peters Basilica.  
Byzantine Architecture: Greek cross and Latin cross plans, Technique adopted to construct domes, surface treatment and material of construction. Pendentive and Squinch arch construction, e.g., Hagia Sophia, St.Marks Venice.

### MODULE II (10 Hours)

Romanesque Architecture: Design evolution - Development of Romanesque architecture from Early Christian architecture, Planning principles and structural details of Romanesque architecture.

Types:

Italian Romanesque architecture (Pisa Cathedral Complex),

French Romanesque (Abbey-Aux-Hommes at Cane)

British Romanesque (Durham's Cathedral).

### **Module III (12 hours)**

Introduction to society and culture of 1150 -1350 AD in Europe

Gothic Architecture: Evolution of structural systems in Gothic Architecture -pointed arches, ribbed vaults, flying buttress, pinnacles etc;

Types:

French Gothic Architecture (Notre Dame (Reims Cathedral), Paris)

British Gothic Architecture (West Minister Abbey, Salisbury Cathedral)

Italian Gothic Architecture (Milan Cathedral)

### **Module IV (12 hours)**

#### **Renaissance Architecture:**

Introduction of different styles existed in renaissance period, to society and culture of 1400 -1800 AD. The Idea of rebirth and revival of Art, Architectural character during Renaissance period. Division of Renaissance architecture into Early, Mature and Late periods. Structural contributions - Ribbed dome, Lantern dome.

Italian renaissance -St.Peters Rome, Florence Cathedral. Works of Brunelleschi, Alberti, Bramante and Michael Angelo, Palaces and Villas, Palladio's contribution - Villa Rotunda

French renaissance: Palace of Louvres, Paris de Versailles.

British renaissance: St. Paul's Cathedral, London -White Hall Palace, London.

Contributions of Inigo Jones and Christopher Wren

Revival of classical orders and principles - Neo-Classicism

**TOTAL HOURS: 42**

#### **UNIVERSITY EXAMINATION PATTERN**

QI - 8 short type questions of 5 marks, 2 from each module

QII - 2 questions of 15 marks from module I with choice to answer anyone

QIII -2 questions of 15 marks from module II with choice to answer anyone

QIV- 2 questions of 15 marks from module III with choice to answer anyone

QV- 2 questions of 15 marks from module IV with choice to answer anyone



SEMESTER IV Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17 - 47	ENVIRONMENTAL STUDIES	2-0-0	3	2017
<p><b>Course Objectives</b></p> <p>The Environmental Studies course for students of architecture would,  Help them to understand the problems of pollution, loss of forest, solid waste disposal, degradation of environment, loss of biodiversity and other environmental issues and create awareness among them to address these issues and conserve the environment in a better way.</p>				
<p><b>Course Outcome</b></p> <p>An understanding of the importance of environmental issues.  Awareness about sustainable development.  An understanding of the importance of waste and water management.</p>				
<p><b>Text Books</b></p> <p>Daniels &amp; Krishnaswamy, Environmental studies, Wiley India pvt ltd, 2009  Raman Sivakumar, Introduction to environmental science and engineering, 2nd edn, Tata McGraw Hill, 2010  Anindita Basak, Environmental Studies, Pearson Education, 2009  Suresh K.D, Environmental Engineering and Management, Katson Books, 2007  Benny Joseph, Environmental studies, 2nd edn, McGraw Hill, 2009</p>				
<p><b>Reference Books</b></p> <p>Raghavan Nambiar, K Text book of Environmental Studies, Scitech Publishers(India) Pvt. Ltd  S.P Misra, S.N Pandey, Essential Environmental studies, Ane books, Pvt Ltd, 2009  P N Palanisamy, P Manikandan, A Geetha, Manjula Rani, Environmental Science, Pearson Education, 2012  D.L. Manjunath, Environmental Studies, Pearson Education, 2011</p>				



### **Module I (12 hours)**

The Multidisciplinary nature of environmental science. Definition-scope and importance-need for public awareness. Natural resources. Renewable and non-renewable resources: Natural resources and associated problems-forest resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their defects on forests and tribal people- water resources: Use and over utilization of surface and ground water, floods, drought , conflicts over water, dams-benefits and problems.- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.- Food resources: World food problems, changes caused by agriculture over grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.-Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy resources, Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

### **Module II (10 hours)**

Ecosystems-Concept of an ecosystem-structure and function of an ecosystem - producers, consumers, decomposers-energy flow in the ecosystem-Ecological succession- Food chains, food webs and Ecological pyramids-Introduction, types, characteristics features, structure and function of the following ecosystem-Forest ecosystem- Grassland ecosystem -Desert ecosystem-Aquatic ecosystem(ponds, streams, lakes, rivers, oceans , estuaries)  
Biodiversity and its consideration Introduction- Definition: genetic, species and ecosystem diversity- Bio-geographical classification of India -value of biodiversity: consumptive use, productive use, social ethical , aesthetic and option values  
Biodiversity at Global, national , and local level-India at mega -diversity nation- Hot spot of biodiversity-Threats to biodiversity: habitat loss, poaching of wild life, man , wild life conflicts - Endangered and endemic species of India-Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

### **Module III (10 hours)**

Environmental pollution Definition-Causes, effects and control measures of Air pollution- Water pollution -soil pollution-Marine pollution-Noise pollution-Thermal pollution-Nuclear hazards-Solid waste management: Causes, effects and control measures of urban and industrial wastes-Role of an individual in prevention of pollution. Pollution case studies-Disaster management: floods , earth quake, cyclone and landslides- Environmental impact assessment

### **Module IV (10 hours)**

Environment and sustainable development-Sustainable use of natural resources- Conversion of renewable energy resources into other forms-case studies-Problems related to energy and Energy auditing-Water conservation, rain water harvesting, water shed management-case studies-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust-Waste land reclamation Consumerism and waste products-Reduce, reuse and recycling of products-Value education.

**TOTAL HOURS: 42**

**Sessional Requirements**

Assignments = 15 marks

2 Tests 2 x 15 = 30 marks

Regularity = 5 marks

Total = 50 marks

**UNIVERSITY EXAMINATION PATTERN**

QI - 8 short type questions of 5 marks, 2 from each module

QII - 2 questions of 15 marks from module I with choice to answer anyone

QIII - 2 questions of 15 marks from module II with choice to answer anyone

QIV - 2 questions of 15 marks from module III with choice to answer anyone

QV - 2 questions of 15 marks from module IV with choice to answer anyone

SEMESTER IV Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-48	COMPUTER-AIDED VISUALIZATION - II	0-0-2	2	2017
<p><b>Course Objectives</b> The C A A D Laboratory -II course for students of architecture would, equip the students with skills required in using computer as a digital media for design and preparation of 3D images of Architectural drawings. provide an introduction to various Graphics Software.</p>				
<p><b>Course Outcome</b> An understanding of CAD and other software for preparing three-dimensional models and walk-throughs.</p>				
<p><b>Reference Books</b> 1. Adele and Seth Green Berg - Fundamental Photoshop. 2. Bain - Using Corel Draw. 3. Sketchup Manual. 4. Prezi manual.</p>				
<p><b>Projects:</b> Suggested Projects for the lab: 1. Introduction to 3D modeling and generating 2D drawings using application software like AUTOCAD, SKETCHUP, REVIT, ARCHICAD Etc. 2. Elementary animation- Walk through a small structure in Lumion. 3. Introduction to Graphics Software - Photoshop / Corel Draw / Prezi.</p> <p><b>Exercises:</b> 1. Architectural Drawing III- Preparing three dimensional drawing of Residence design project. 2. Presentation I- Preparing rendered image of Residence Design Project 3. Presentation II- Preparing a simple walkthrough of Residence Design project. 4. Presentation III - Preparing a simple schematic concept through Graphic software.</p> <p><b>TOTAL HOURS: 30</b></p>				
<p><b>SESSIONAL REQUIREMENTS:</b>  Class work Exercises = 60 marks Lab Series test = 2 x 15 = 30 marks Attendance = 10 marks Total = 100 marks</p>				

SEMESTER V Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-51	ARCHITECTURAL DESIGN - III	0-0-10	10	2017

### Course Objectives

The Architectural Design III course for students of architecture would help,

- To study the feasibility of a project/ activity with respect to surrounding/neighboring locality
- To understand the complexities related to designing public spaces
- To enable the students to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas.
- To enable the students to design for large groups of people in a socially and culturally sensitive manner, taking into account aspects such as user perception, crowd behaviour, large scale movement of people and identity of buildings.
- To emphasis on the importance of understanding the relationship between open space and built form, built form to un-built form and site planning principles involving landscaping circulation network and parking.
- To introduce MEP services, acoustics and other specialized inputs required during design process
- To understand LEED, IGBC and GRIHA rating systems

### Course Outcome

- The Course prepares the students to understand the process of designing buildings involving multiple layers, use of appropriate building materials, building services, structural grids and large span structures. Students will learn to integrate intelligent service systems into the design of the building.

### Reference Books

- Kerala Municipal Building Rules
- National Building Code
- Sam F. Miller, "Design Process: A Primer for Architectural and Interior Design", Van Nostrand Reinhold, 1995
- Julius Panero, Martin Zelnik, "Human Dimension and Interior Space", Whitney Library of Design,
- Wakita / Linde, The Professional practice of Architectural working drawing, John Wiley & sons, 1984.
- Andrew Alpern, 'Handbook of speciality Elements in Architecture', McGraw Hill Book CO., 1982.
- New Metric Handbook - Patricia Tutt and David Adler - The Architectural Press
- Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997

- Joseph De Chiara, Michael J Crosbie, “Time Saver Standards for Building Types”, McGraw Hill Professional 2001.
- Joseph De Chiara, Julius Panero, Martin Zelnik, “Time Saver Standards for Interior Design and Space Planning”, McGraw Hill 2001.

**Projects:**

Two projects - Students are expected to conceive large public spaces and multi-functional complexes with an emphasis on physical context and exploration of architectural vocabulary, fire and safety aspects for buildings, earthquake resistant design methods.

- A minimum of two projects shall be completed during the semester. These shall be multi storied buildings including Convention centres/ clubhouses/ medium sized office complexes/ Bus stations/ assembly halls or auditoriums.

**Process and deliverables:**

- Students have to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas. Apart from site and context, activities, services and construction methods shall also be studied and analyzed. Formulation of a detailed design brief, evolution of concept shall be part of the architectural programming.
- Energy saving measures used in the design shall be listed and integrated into design by students.
- They are expected to explore computer aided presentation techniques involving 2D and 3D drawings and models as required.
- Deliverables shall be computer assisted presentation drawings including 3d massing and graphical representation of concept explanation and design evolution, computer rendered perspectives etc.

**TOTAL HOURS: 120**

**UNIVERSITY EXAMINATION PATTERN**

Jury will be conducted as per the B.Arch. Degree Course Manual.

SEMESTER V Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-52	LANDSCAPE DESIGN	3-1-0	3	2017
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• The scope of the subject is to make students aware of architecture beyond buildings.</li> <li>• To familiarize students with the various components of landscape architecture and the principles of landscape design.</li> <li>• To provide an overview of Sustainable landscape system &amp; Urban Landscape terms.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Understanding of the scope of landscape architecture.</li> <li>• Understanding basic landscape architecture from an architect's perspective.</li> </ul>				
<p><b>Text books</b></p> <ul style="list-style-type: none"> <li>• Landscape Architecture: The Shaping of Man's Natural Environment, New York, J. O. Symonds. McGraw Hill Publications.</li> <li>• The Landscape of Man - Geoffrey and Susan Jellicoe, Thames and Hudson, 1991.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• An Introduction to Landscape Architecture - Michael Laurie, Elsevier, 1986.</li> <li>• Brian Hackett, Planting Design, McGraw Hill Inc., 1979.</li> <li>• Cliff Tandy, "Handbook of urban landscape", Architectural Press, 1973.</li> <li>• Appleton, The Experience of Landscape, Wiley, 1996.</li> <li>• Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993.</li> <li>• Dee, C. Form and Fabric in Landscape Architecture : A visual introduction, Taylor &amp; Francis, 2001.</li> </ul>				
<p><b>MODULE I (10 Hours)</b>  Introduction to landscape architecture definitions, importance, need and scope; Role of landscape design in architecture and their comparison.  Landscape and garden design in history - French, English, Chinese, Japanese, Persian and Moghul. Study of notable examples.</p> <p><b>MODULE II (10 Hours)</b>  Principles of Landscape design - Unity, Line, Form, Texture, Color, Scale, Balance, Simplicity &amp; Variety, Emphasis, Sequence.  Plant materials, classification, characteristics, use and application in landscape design; Role of plants in landscape design, avenue planting, Local &amp; Scientific names of plants.</p>				

Landscape components: Hard & soft-scape in landscape, landscape lighting, street furniture.

**MODULE III (8 Hours)**

Landscape's effect on climate & Microclimate, Relationship between climate, landscape and architecture.

Landscape as environmental modifier against noise, soil erosion, land, air, water pollution, water logging & depletion of water resource.

Landscape water harvesting systems - swale, bio-swale, ponds- Use of Geo-textiles in landscaping.

Urban open spaces, urban avenue, urban forest and urban heat island.

**MODULE IV (14 Hours)**

Effects & construction of: Podium landscape, green walls, xeriscaping, green retaining wall, green fire tender road.

Landscape water elements: Fountain, cascade, mirror pool, swimming pool - Mechanism of plant room.

Landscape grading, land form design & drainage design.

Preparation of landscape master plan for a third year level design project with hard-soft scape and levels along with site sections.

**TOTAL HOURS: 42**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER V Course No.	Course Name	L-T- P/S	Credits	Year of introduction
AR 17-53	<b>BUILDING MATERIALS AND CONSTRUCTION - IV</b>	1-0-3	3	2017

### Course Objectives

The Building materials and construction course for students of architecture would,

- Introduce students to the various building finishes and their application.
- Provide exposure to the various materials used as wall and floor finishes through relevant market studies and site visits.

### Course Outcome

- An understanding of the properties and application of various building materials used as building finishes, construction methods.
- Students should be able to identify or assign finishes appropriate for different design projects.

### Text books

- Arora S.P. and Bindra S.P., “Text book of Building Construction”, Dhanpat Rai & Sons, New Delhi, 2012.
- P C Varghese, Building Construction, Prentice Hall of India Pvt. Ltd, New Delhi, 2010
- Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

### Reference Books

- WB McKay Building construction, Vol 1,2, Longman UK 1981.
- Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.
- Harry Parker, ‘ Materials and Methods of Architectural Construction’, John Wiley & Sons Canada, 1958.
- Relevant BIS codes.

### MODULE I

#### WALL FINISHES (12 hrs)

Plaster: Lime plaster and gypsum plaster. Fire resistant plaster, X-Ray shielding plaster and acoustic plaster. Plaster over masonry and ceiling.

Paints and varnish: Characteristics of an ideal paint and varnish. Classification - various types of paints. Painting process. Defects in painting works. Process of varnish.

Wall cladding- stone cladding, tile cladding, Wooden cladding and metal cladding. Stucco finish and other finishes.

Sketches : Stone cladding, Metal cladding



**MODULE II****FLOOR FINISHES (12 hrs)**

Types of flooring, methods of laying, furnishing of floors with different floor finishes like cement, colored cement, mosaic, terrazzo, tiles, wood, parquet flooring, stone, brick etc.

Classification & properties of tiles used in flooring. Selection criteria & Methods of fixing various types of tiles.

Different type of resilient and vibration resistive floor like rubber, Linoleum and PVC flooring.

Sketches : Tile flooring, wooden flooring

**MODULE III****WOOD SUBSTITUTES (15 hrs)**

Industrial products as substitutes for natural hard wood. Characteristics, physical properties, areas of application, available forms and sizes of: Veneers and veneer ply woods, particle board, hard board, fiberboard, block board, lamina-boards, glulam, laminates, cement particle board, e-board, bamboo ply, etc.

**MODULE IV****GLASS AND GLAZING (15 hrs.)**

Glass products : Types of glass - wired glass, fiber glass, laminated glass, glass building blocks, Heat strengthened glass- toughened glass, laminated glass Special purpose glasses- Low emissivity glass, Solar control glasses and variable transmission glass, Fire resistant glass, Self cleaning glass their properties and uses in buildings

Glazing: Single, double and triple glazing Glazed curtain walls & sky lights.

Sketches : Structural glazing

**TOTAL HOURS: 54**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



SEMESTER V Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-54	<b>BUILDING SERVICES II (LIGHTING &amp; ELECTRICAL SERVICES)</b>	3-0-0	3	2017

#### Course Objectives

- To introduce students to electrical services and illumination and to sensitize them with respect to their integration into Architectural Design.

#### Course Outcome

- An understanding of the fundamentals of electrical services in buildings.
- Knowledge about the Indian Electricity Rules.
- An awareness about the present trends in lighting practices.

#### Reference Books

- Electrical Technology - H. Cotton
- Electrical wiring, Estimating and Costing - L .Uppal
- Electrical Wiring, Design and Estimation - Raina & Bhattacharya
- Electrical systems for Architects - Aly. S. Dadras
- Simplified design of building lighting - Marc Schiler
- National Electrical Code
- Lighting Manual

#### MODULE I (12 Hours)

Introduction to electrical services, commonly used terminology.

Supply and distribution of electricity to buildings - familiarization with Substations and components like High Tension and Low Tension Panels and switchgear, transformers, captive power plants - electrical system in multi storied commercial and industrial buildings, apartments, hospitals etc.

#### MODULE II (12 Hours)

Distribution systems, underground and overhead - Cabling systems, surface and concealed wiring systems, PVC and metal conduits, casing and capping system. Panel boards, switches, distribution boards.

Earthing systems and protective devices such as fuses, MCB's, MCCB's, ELCB's etc. -lightning protection - safety standards and IS codes. Cinema Act - Electrical installation in a cinema theatre.

Introduction to Indian Electricity Rules.

Introductory exercise in electrical load calculations and estimation.

#### MODULE III (10 Hours)

Commonly used terminology in illumination - laws of illumination - measurement

of luminous flux and lux meter.

Ambient, task and accent lighting - direct and indirect luminary systems.

Natural lighting - use of daylight - concept of day light factor.

Atrium lighting - methods and uses.

Energy efficient lighting system.

#### **MODULE IV (8 Hours)**

Sources of illumination - point source - row lighting, area illumination - evaluation of total flux

- colouring aspects of lamps - linear and surface sources of illumination - common luminaries - incandescent, fluorescent/CFL, HID's, MV, SV lamps etc.

Criteria and standards for different purpose/activity illumination - flood lighting, functional buildings like hospitals, sports stadia, swimming pools and underwater luminaries - street lighting, commercial display lighting.

Design considerations, estimation exercise, preparation of a lighting and electrical scheme.

**TOTAL HOURS: 42**

#### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER V Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-55	DESIGN OF STRUCTURES - I	2-1-0	3	2017
<p><b>Course Objectives</b></p> <p>The Design of Structures I course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• provide them with the knowledge of the behaviour of reinforced concrete structural elements and enable them to design such elements.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Awareness about the analysis and design of reinforced concrete structural elements.</li> <li>• An exposure to the relevant IS codes for structural analysis and design.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Pillai S. U. and Menon D., Reinforced Concrete Design, Tata McGraw Hill</li> <li>• Sinha S. N., Reinforced Concrete Design, Tata McGraw Hill</li> <li>• Varghese P. C., Limit State Design of Reinforced Concrete, Prentice Hall of India</li> <li>• Punmia B. C., Jain A. K. and Jain A. K., Limit State Design of Reinforced Concrete, Laxmi Publications (P) Ltd., 1st Edition, 2007.</li> <li>• Park and Paulay, Reinforced Concrete</li> <li>• Mallick S. K. and Gupta A. K., Reinforced Concrete, Oxford and IBH.</li> <li>• Jain A. K., Reinforced Concrete- Limit State Design, Standard Book House.</li> <li>• Jain and Jaikrishna, Plain and Reinforced Concrete Vol I, Nemchand</li> <li>• Gambhir M. L., Design of Reinforced Concrete Structures, Prentice Hall of India</li> <li>• IS 456:2000- Code of Practice for Plain and Reinforced Concrete</li> </ul>				
<p><b>MODULE I (12 hours)</b></p> <p>Limit State Method of design of RC sections - principles and assumptions - partial safety factors  Analysis and design of singly reinforced rectangular sections subjected to flexure, shear and torsion using Limit State Method. Design for shear. Bond-flexural and anchorage bonds, development length.</p> <p><b>MODULE II (12 hours)</b></p> <p>Analysis and design of doubly reinforced rectangular sections subjected to flexure, shear and torsion. Effective flange width of flanged beam sections. Analysis of flanged sections. (Simple problems only)</p> <p><b>MODULE III (12 hours)</b></p>				

Design of one way slab. Design of two way slabs with corners held down and corners not held down.

#### **MODULE IV (12 hours)**

General principles in the design and detailing of various types of stairs - stairs with waist slab, stringer beam stairs, and stairs with cantilever steps. (Concept only)

Design of columns subjected to axial load.

Types of footings. Design of isolated footings for axially loaded columns.

#### **NOTE:**

- 1) All designs shall be done using limit state method of design.
- 2) Special importance shall be given to detailing.
- 3) SI units shall be followed.
- 4) Use of IS: 456:2000 shall be permitted in the examination hall.

**TOTAL HOURS: 48**

#### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER V Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-56	HISTORY OF ARCHITECTURE IV	3-0-0	3	2017
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>Introducing the students to various design philosophies of Modern &amp; Post Modern Architecture.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London.</li> <li>Sigfried Giedion, Space time and Architecture: The Growth of a new tradition, Harvard University Press. <ul style="list-style-type: none"> <li>Tzonis Alexander, Santiago Calatrava, International Publications, January 2005, New York.</li> <li>Steele James, Hassan Fathy - The complete works, London: Thames and Hudson.</li> <li>Ghirardo, Diana, Architecture after Modernism, 1996, Thames and Hudson.</li> </ul> </li> </ul>				

## **MODULE I (9 Hours)**

### **SELF CONSCIOUS MODERNITY**

Neo classicism, industrial revolution and its impact, new materials - steel, glass, concrete, arts and crafts movement, Art Nouveau - works of Gaudi, Chicago school, Art Deco, Louis Sullivan works, Adolf Loos and his arguments on ornamentation, Futurism, Expressionism - works of Mendelsohn and Taut, Destijl movement, Walter Gropius: Bauhaus and Harvard, Peter Behrens and the German Werkbund.

## **MODULE II (12 Hours)**

### **EARLY MODERN ARCHITECTURE**

Cubism, Constructivism, works of architects: Philip Johnson - Glass house, Connecticut, Seagram Building, New York, Mies Vander Rohe - Barcelona Pavilion, Illinois Institute of Technology, Chicago, F. L. Wright - Falling water, Pennsylvania, Guggenheim Museum, New York , Richard Neutra - Kaufmann Desert House, California, Oscar Niemeyer - Cathedral of Brasília, Museu Oscar Niemeyer ,Brazil Alvar Alto - Finlandia Hall, Finland , Le Corbusier - Villa Savoye, France , Notre Dame Ronchamp, Paris, Louis Kahn - The National Assembly Building, Bangladesh, Kimbell Art Museum, Texas.

## **MODULE III (12 Hours)**

### **LATER MODERN ARCHITECTURE**

Post Modernism and International style. Ideas and works of architects: Paul Rudolph - Arts and Architecture building, Yale University, Orange County Government Center, New York, I. M. Pei - Grand Louvre, Paris, Everson Museum of Art, Kenzo Tange -Olympic Arena, Tokyo, Fuji, Broadcasting Center, Tokyo, Minoru Yamasaki - Dahrn International Airport, McGregor Memorial Conference Community Center, Detroit, Kisho Kurokawa - The Museum of Modern Art, Wakayama, Capsule Tower, Tokyo, Richard Meier - Jubilee Church, Los Angeles, Smith house, Connecticut, Toyo Ito - U House, Tokyo, Serpentine Pavilion, London, John Utzon - Sydney Opera House.

### **ALTERNATIVE PRACTICES AND IDEAS**

Critical regionalism, works and ideas of Hassan Fathy, Geoffrey Bawa, Tadao Ando, Laurie Baker and Paulo Soleri, Robert Venturi, Renzo Piano, Pompidou Centre, Richard Rogers, Mario Botta, Alvaro Siza.

## **MODULE V (12 Hours)**

### **21st CENTURY ARCHITECTURE**



Deconstructivism - Works of Zaha Hadid - London Aquatic Complex, 2012 Olympics, Zaragoza Bridge Pavilion, Spain, Daniel Libeskind - Jewish Museum, Berlin, World Trade Center, New York, Frank Gehry -Guggenheim Museum, Bilbao, Spain, Peter Eisenman - Cardinal Stadium, Arizona, City of Culture of Galicia, Santiago Calatrola and his structural concepts - Lyon-Satolas TGV Station, France, Milwaukee Art Museum, U.S.A, News forms and ideas of Norman Foster - American Air Museum, Cambridge, UK, Stansted Airport, London , Greg Lynn -Embryological house, U.S.A

**TOTAL HOURS: 45**

#### **UNIVERSITY EXAMINATION PATTERN**

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone.
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone.
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.
- Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER V Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-57	SPECIFICATION, ESTIMATION AND COSTING	2-1-0	3	2017

**Course Objectives**

- To enable the students to prepare detailed and approximate estimate and to have a clear picture of the project expenditure.
- To enable the students to have a thorough idea regarding the quality and quantity of materials, quantity and classes of skilled and unskilled labour, tools and plants required for the project.
- To equip the students with basic knowledge about property valuation.

**Course Outcome**

- An understanding of the concepts and methods of estimating project costs.
- Knowledge about the specification of various building materials.
- An understanding about the process of valuation.

**Text Books**

- Dutta B N, Estimation and costing in Civil Engineering, UBSPD, 1992
- Chakrabarthi, Estimation, costing and specification in Civil Engineering, 1981
- Mahajan S P, Civil Estimating and Costing, Sathyaprakasam, 1988
- Shah N A, Quantity surveying and specification in Civil Engineering, 1981

**Reference Books**

- IS 1200(1968), Methods of measurement of building and civil engineering works

**MODULE I (12 Hours)**

Preparation of specification for materials of construction and items of work: Detailed specifications of common building materials like cement, sand, brick, stone, timber, tile, steel, concrete, etc. - building components like foundation, flooring: PCC, tile, timber, slabs and beams, door and window: wooden, aluminium, steel, stairs, roofs, etc.

Specification for first class buildings and second class buildings.

Introduction to Estimation, Types of estimates, detailed estimate, revised estimate, supplementary estimate, maintenance estimate, approximate estimate. Explanation of terms-contingencies; work charged establishments, provisional sum, lump sum item.

Introduction to approximate estimate methods-plinth area method, cubic rate method, unit rate method and bay method.

**MODULE II (15 Hours)**

Quantity Surveying.

Methods of building estimate-centre line method and long wall-short wall method.

Preparation of detailed estimate for simple buildings of load bearing walls.  
Details of measurements and calculation of quantities & Abstract of estimate.

**MODULE III (10 Hours)**

Analysis of rates for main items of work in buildings based on PWD schedule of rates and standard data book.

Introduction to valuation of real properties: Depreciation - sinking fund -methods of valuation - straight line method - constant percentage method -S.F method- rental method -profit based method depreciation method - valuation of land - belting method - development method -hypothecated buildings scheme method.

**MODULE IV (8 Hours)**

Cost parameters of the building -building shape, height, enveloping area, structural elements, service finishes, architectural features-initial cost and maintenance cost.

**TOTAL HOURS: 45**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VI Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-61	ARCHITECTURAL DESIGN - IV	0-0-10	10	2017

### Course Objectives

The Architectural Design IV course for students of architecture would help,

- To understand the design requirements of high rise buildings with respect to services [HVAC, STP], fire and safety aspects etc.
- To study vertical transportation requirements and design considerations for high rise buildings.
- To understand the role of architect as primary consultant for a project and co-ordinate with various other consultants offering specialized services.
- To understand the dimension of marketing as required for a building intended for outright sale/lease/ rent and outline market standards or requirements.
- To understand the design and form of building typologies that are the result of pressure on urban lands with a thrust on issues like urban land economics, technology and ecology
- To create an awareness with regard to the design of green buildings and sustainable architecture.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of High-rise buildings and service intensive buildings.

### Course Outcome

- The Course prepares the students to conceive large scale multi-storied buildings and complexes for Residential/ Commercial/ Institutional/ Mixed-Use in an urban context with focus on visual characteristics, service integration and sustainable practices.

### Reference Books

- Kerala Municipal Building Rules
- Ernst Neuferts, "Architects Data", Blackwell, 2002
- National Building Code of India, Vol. 1-5, 2005
- Kevin Lynch, "Site Planning", MIT Press, Cambridge, 1984
- Mili Mazumdar, "Energy Efficient Buildings in India", TERI, New Delhi, 2012
- Diane Tsang, "SPACE Shopping Mall", Pace Publishing, 2011
- Lara Menzel, "Office Architecture and Design", Braua Publishers, 2009
- Sheri Koones, "Prefabulous and Sustainable: Building and Customizing an affordable, Energy efficient home", ABRAMS, 2010
- Daniel Williams, "Sustainable Design: Ecology, Architecture & Planning", John Wiley & sons Inc, New Jersey, 2007

- Richard P. Dober, “Campus Architecture: Building in the Groves of Academe”, McGraw-Hill, 1996

**Projects:**

- A minimum of two projects and a short project on concept presentation shall be completed during the semester. Projects may be on multi-storied commercial, public, semi-public and any other appropriate design. Projects shall have enough emphasis on technology and the application of various building services and circulation systems. These shall be high rise apartments/ large scale office buildings/ mall-multiplex/ super hypermarkets/ hospitals. The short project of Concept presentation shall be for a gated community/integrated township with a focus on marketing aspects.

**Process and deliverables:**

Institutional buildings -

- These are buildings with complex spatial organizations, multifunctional spaces, large spans and variable circulation patterns. Environmental issues are emphasized and the design studio aims to inculcate the techniques of designing for sustainability.
- Students are expected to do the landscape layout in detail to develop appreciation of a holistic environmental design. E.g. College / specialty Hospital / theatre etc.
- Study of the various techniques of energy-efficient design and recycling technologies for water and wastes is mandatory as these have to be incorporated in the design proposals. Awareness about LEEDS rating and best practices is expected.

Office buildings -

- Students get exposed to the various services, structural systems and vertical access systems such as elevators, escalators etc of multi-storied buildings both in designing and detailing.
- Knowledge about various types of cores, fire-fighting systems and special building rules applicable to multi-storied buildings are to be incorporated in design.
- Students will be required to do the Interior design scheme in detail.
- Sale area computations and sale drawings shall be prepared. E.g. Multi-storied office buildings.

**TOTAL HOURS: 120**

**UNIVERSITY EXAMINATION PATTERN**

Jury will be conducted as per the B.Arch. Degree Course Manual.

SEMESTER VI Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-62	INTERIOR DESIGN	1-0-3	3	2017

### Course Objectives

- To introduce the discipline of interior design to students and to develop the basic skills required for handling simple interior design projects.

### Course Outcome

- Awareness about the basics of Interior Design.
- Exposure to the prevailing trends in materials and finishes.

### Reference Books

- Ching, Francis, "Form, Space and Order", Van Nstrand Reinhold, London.
- Ching, Francis, "Interior Design illustrated", Van Nostrand Reinhold, London, 1987.
- Helsel, M.D., "Interior Designer's Drapery Sketch File", Watson Guptill Publishing Co., 1969.
- Scott, "Design Fundamentals".
- Panero Julious & Zclink Martin, "Human Dimensions and Interior Space".
- Alexander and Mercourt, "Design of interior environment".
- Halse, "The use of colour in interiors".
- Colin, Boyne and Lance Wright, "The best architects Working Details" Vol. 1 & 2.
- Shirish Vasat Bapat , "Living Areas - Internal Spaces".
- Lan Grant, "Great Interiors", Spring Books.

### Module I (12 hours)

Introduction to interior designing.

Brief description of interior designing. History based on different style and furniture designs in interior designing (traditional, contemporary, minimalist, industrial, Islamic, Victorian, Gothic etc.)

Study on anthropometrics of different space (residential, commercial, hospital, educational, industrial)

Project: Views- One point, two points, Birds-eye and worms-eye of interiors, Building elements in interiors.

### Module II (12 hours)

Principles and forms in Interior Design.

Effect of enclosure on space perception - size, volume, proportion and shape of enclosures, ideal space proportions, use of scales for space representation, psychological

effect of space, modulation of space - design elements, criteria for different situations.  
Back ground for applied decoration - color, texture, plane and fixtures, emphasizing space through change of levels and structural forms.  
Introduction to furniture layout, flooring layout, and reflected ceiling layout.

Project: preparation of interior drawing - design flooring pattern/ wall pattern/ ceiling pattern with its detailed drawings and perspective views.

### **Module III (18 hours)**

Interior lighting and ventilation: Natural and Artificial lighting in interior designing - Different modes of natural lighting and its effect on interior designing - Effect of natural ventilation in interior design - Different type of artificial lighting and its effect in interior designing.

Surface treatments: Elements of furnishing and surface treatment their need and scope- decorative materials for ceiling, walls, floors, drapery and upholstery for openings and furniture.

Introduction to wall finish drawings, electrical and lighting drawing.

Project: Design a lobby space or bedroom with working drawing.

### **Module IV (18 hours)**

Interior landscaping: Elements and application of interior landscape, interior plant materials, growth condition, maintenance, importance of plantscaping - aesthetics, functional etc.

Exhibits in interiors - private and public.

Water bodies in interiors

Professional practice and material estimation - Study on material estimation and presentation.

Introduction to fixed furniture, detail drawing and material board.

Project: Complete interior detail of a studio apartment or Lobby or any commercial space.

**TOTAL HOURS: 60**



### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VI Course No.	Course Name	L-T- P/S	Credits	Year of introduction
AR 17-63	BUILDING MATERIALS AND CONSTRUCTION - V	1-0-3	3	2017

### Course Objectives

The Building materials and construction course for students of architecture would,

- Introduce to the student the advanced structural concepts in Architecture.
- Help them understand the details and application of advanced construction methodologies.

### Course Outcome

- An understanding of the properties of various building materials and their applications.
- Exposure to advanced construction techniques used for constructing various components of a building.

### Text books

- Arora S.P. and Bindra S.P., "Text book of Building Construction", Dhanpat Rai & Sons, New Delhi, 2012.
- P C Varghese, Building Construction, Prentice Hall of India Pvt. Ltd, New Delhi, 2010
- Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

### Reference Books

- WB McKay Building construction, Vol 1,2, Longman UK 1981.
- Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.
- Relevant BIS codes.
- Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction- Principles, Materials & Methods', John Wiley & Sons Inc., New York, 2001.

### MODULE I

#### STUDY OF ADVANCED CONCRETE (12 hrs)

Lightweight, high density, fiber reinforced, polymer concrete, outline of manufacture, properties and uses of the above.

Admixtures - Water repellent, waterproofing compounds, accelerators, air entraining agents, hardeners, plasticizer - Their properties and uses.

## **MODULE II**

### **ADVANCED STRUCTURAL CONCEPTS IN ARCHITECTURE (16 hrs)**

**Pre stressed concrete structures:** Precast pre stressed construction.. Two-way waffle slab, Two-way flat plate, Pre tensioning, Post tensioning, Hollow core slabs, T beam and slab.

**Tensile structures:** Concept of tensile structures, classification, uses, materials used. Application of cable structures in architecture.

**Plate structures:** Definition, classification and application, folded plates, flat slab and coffered slab.

**Special Structures:** Concept, Classification and Application of Pneumatic Structures, Kinetic Structures and Mobile Structures, Portal frames: Definition, and Application.

Sketches : folded pate, Post tensioned slab, Pre tensioned slab, Portal frame.

## **MODULE III**

### **PRE-FABRICATION & MODULAR CO-ORDINATION (12 hrs)**

Introduction to concepts of Modular Coordination. Definition of Basic Module. Modular controlling dimensions, Planning Modules.

Introduction to concepts of prefabrication. Advantages & disadvantages of onsite & off-site prefabrication. Methods of prefabrication .Process of prefabrication. Various issues related to prefabrication industry & Examples of prefabrication concepts.

## **MODULE IV**

### **DAMP PROOFING, CONSTRUCTION JOINTS (12 hrs)**

Damp proofing: Causes and methods of damp proofing of foundation, walls, floors , roofs. DPC of bathrooms, swimming pools, roof gardens, water tanks.

Construction Joints and Expansion joints: Definition, Methods of construction, filling of joints and waterproofing.

Drawings : Sketches of construction joints, expansion joints.

Sketches of DPC for foundation, walls, roofs.

**TOTAL HOURS: 52**

## **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VI Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-64	BUILDING SERVICES III (HVAC & MECHANICAL SERVICES)	3-0-0	3	2017

**Course Objectives**

- To impart the knowledge and skills required for understanding the building services of Heating, Ventilation and Air-conditioning and their integration with Architectural Design.

**Course Outcome**

- An understanding of the fundamentals of HVAC & Mechanical services in buildings.
- Knowledge about the ASHRAE standards.
- An awareness about the present trends in HVAC & Mechanical services.

**Reference Books**

- Refrigeration & air conditioning- Ramesh Chandra Arora
- Refrigeration & Air conditioning-Manohar Prasad
- Refrigeration & air conditioning- Ahmadul Ameen
- Refrigeration & Air conditioning-C.P.Arora
- Refrigeration & Air conditioning-W.F.Stocker
- Refrigeration & Air conditioning-P.L.Balleney
- Refrigeration & Air conditioning-Dossat
- Heating ventilation and A/C by Fage C Mcquiston & Jarald D Parker - John Wiley & Sons
- Refrigeration & air condition by Regiput
- ASHRAE data book

**Module I (11 hours)**

General introduction - Principles of heat transfer - Conduction - Convection - Radiation - Fourier law of heat conduction - Conduction through plane wall, Newton's law of cooling - heat transfer through composite cylinder - critical thickness of insulation - free and forced convection, Over all heat transfer coefficient - simple problems - Stephan Boltzmann's law, radiation shield, reflectivity, absorptivity, transmissibility, Kirchhoff's law, emissive power, emissivity, Wien's displacement law - Insulation - Properties of insulation.

**Module II (11 hours)**

Principles of Refrigeration - Capacity - Coefficient of performance (COP)- Carnot refrigeration cycle - vapor compression systems - Theoretical and practical cycles - Thermodynamic analysis using PH diagram - Standard refrigerants including eco-

friendly refrigerants and their properties - Study of refrigeration system components - Compressors - Condensers - Expansion devices - evaporators - cooling towers.

### **Module III (9 hours)**

Psychrometry - Psychrometric properties - Psychrometric chart - Psychrometric process - adiabatic mixing - Sensible heating and cooling - humidifying and dehumidifying - bypass factor - sensible heat factor - room sensible factor - RSHF and GSHF line - Human comfort - comfort chart - Effective temperature - Factors governing effective temperature.

### **Module IV (14 hours)**

Air conditioning systems - Room air conditioning systems - window A/C, split-packaged systems - central and unitary systems - summer - winter - year round air conditioning systems - Cooling load calculation - various heat sources - Design of air conditioning systems - AHU, Duct design - air distribution systems - draft - throw - entrainment ratio - spread - location of air outlets - location of return air openings - general consideration in air duct design and layout - noise and noise control. Determination of duct size using equal friction (constant pressure loss) method.

**TOTAL HOURS: 45**

### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VI Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-65	DESIGN OF STRUCTURES - II	2-1-0	3	2017
<p><b>Course Objectives</b></p> <p>The Design of Structures II course for students of architecture would,</p> <ul style="list-style-type: none"> <li>Familiarize them to the fundamental aspects of structural behaviour and design of steel structures and also expose them to the concept of design of timber structures.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>Awareness about the analysis and design of steel structural elements.</li> <li>An exposure to the relevant IS codes for structural analysis and design.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>A.S. Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971</li> <li>Dayaratnam P., Design of Steel Structures, Oxford and IBH Publishing Co.</li> <li>IS 883:1994 - Code of Practice for Design of Structural Timber in Buildings</li> <li>IS 800:2007 - Code of Practice for use of Structural Steel in General Building Construction</li> <li>L.S. Negi, Design of Steel Structures - Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997</li> <li>S. Ramachandra, Design of Steel Structures - Standard Book House, Delhi, 1984</li> <li>N. Subramanian, Design of Steel Structures</li> <li>S.K. Duggal, Limit State Design of Steel Structures</li> </ul>				
<p><b>MODULE I (12 hours)</b> Steel: Introduction, Properties of structural steel, Design of riveted and welded connections. (Moment connections not required) design of struts and ties</p> <p><b>MODULE II (12 hours )</b> Design of tension member - plate, single angled member, Compression Member- Design of Strut-normal sections, single angled section.</p> <p><b>MODULE III (12 hours )</b> Solid and Built -up Columns for axial load-battens and lacing (Theory only). Design of laterally restrained beam</p> <p><b>MODULE IV (12 hours)</b></p>				

Introduction to design of timber beams , types of timber - classification, allowable stresses-design of beams-flexure, shear, bearing and deflection considerations, design of struts and ties and columns

**NOTE:**

- 5) Use of IS 800:2007 and IS 883:1994 shall be permitted in the examination hall

**TOTAL HOURS: 48**

**UNIVERSITY EXAMINATION PATTERN**

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone.
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone.
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.
- Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VI Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-66	HISTORY OF ARCHITECTURE V	3-0-0	3	2017

### Course Objectives

- To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.

### Course Outcome

- Introducing the students to various Design philosophies of colonial, post independent and contemporary architecture in Indian context.

### Reference Books

- Miki Desai, Architecture and Independence, Oxford University Press, 2000.
- Vikram Bhatt and Peter Scriver, Contemporary Indian Architecture: After the Masters, Mapin.
- Lang, Desai, Desai - Architecture & Independence, Oxford University Press, New Delhi.
- Sarbjit Bahga et al, Modern Architecture in India, Galgotia Publishing Company, New Delhi.

### MODULE I ARCHITECTURE IN COLONIAL INDIA (8 Hours)

Early colonial period - Examples - St.Pauls Cathedral, Calcutta, Victoria Memorial - Architectural character of Indo-Saracenic and Classical revival -University of Madras Senate House, Ripon Building, Central railway station Chennai - Later Colonial period - Contribution of Edwin Lutyens & Herbert Baker to the lay-out and Architecture of New Delhi - Rashtrapathi Bhavan & Parliament House.

### MODULE II (12 Hours) POST-NEHRUVIAN MODERNIST ARCHITECTURE

Modernism, Utilitarian modernism and Neo-modernism, Brutalism. Criticisms on the modern movement in India, countering the stigma of colonialism, the neo-vernacular, the community architectural movement, integrating the new and the old, revivalism and post-modernism.

### MODERNISM AFTER CORBUSIER AND KHAN



Corbusier' works in India - Chandigarh and the Ahmedabad buildings - their influence on the modern rationalists; Louis Kahn's works in India - their influence on the empiricists.

### **MODULE III**

#### **POST INDEPENDENT ARCHITECTURE (12 Hours)**

Influences of post-independence Architects - Architecture of Charles Correa - British Council Library Delhi, Kanchenjunga Apartments, Mumbai , Achyut Kanvinde - IIT Kanpur, Nehru science center, Mumbai, Anant Raje - Bhopal Development Authority Headquarters, Institute for Forest Management , Bhopal, B.V.Doshi - Sangath Office, Ahmedabad, IIM Bangalore, Raj Rewal - Pragati Maidan New Delhi, Asian Games Village, New Delhi, Uttam Jain - University of Jodhpur, Jodhpur, Neelam Cinema Theatre, Sanchore, Hasmukh C Patel's - Entrepreneurship Development Institute of India, Gandhinagar, Sabarmathi River-front Development, Ahmedabad.

### **MODULE IV**

#### **WORKS OF CONTEMPORARY ARCHITECTS (10 Hours)**

Architects and their ideologies - Nari Gandhi, Hafeez Contractor, Christopher Benninger, Brinda Somaya, Sanjay Mohe - Lecture Hall Block, IIM Bangalore, Karunashraya, Bangalore, Sanjay Puri - Mosaic Hotel Delhi, CIE Cochin, CNT - Tata Dhan Academy, Madurai, Dr. Reddy's laborator , Hyderabad, Morphogenesis - Pearl Academy of Fashion, Jaipur, PVR Bangalore, Jaisim -C R Simha, Bangalore, IIPM, Bangalore, Shirish Beri - Laboratory for the Conservation of Endangered Species, Hyderabad, Chitra Vishwanath - Yellow Train School, Coimbatore.

**TOTAL HOURS: 42**

### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



SEMESTER VI Course No.	Course Name	L-T-P/D	Credits	Year of introduction
AR 17-67	TOWN PLANNING	3-0-0	3	2017
<p><b>Course Objectives</b></p> <p>Town Planning course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Introduce the history and evolution of Town Planning and various concepts, also its relevance in present scenario.</li> <li>• Help them to acquire basic knowledge of various legislation and development schemes in Town Planning.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Understanding of the importance of Town Planning and various concepts.</li> <li>• Basic awareness about the various Town planning regulations.</li> </ul>				
<p><b>Text books</b></p> <p>Arthur B. Gallion, “Urban Pattern”.            AE.J. Morris, “History of Urban Form”.            Peter Hall, “Urban and Regional Planning”.            C.A. Doxiadis, “Ekistics: An Introduction to Town and Country planning”.</p>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Keeble Lewis, “Principals and Practice of Town Planning”.</li> <li>• Kevin Lynch, “Image of the city”.</li> <li>• Peter Hall &amp; Ulrich Pfeiffer, “Urban Future”.</li> <li>• Ministry of Urban Affairs, Govt. of India - “Urban Development Plans Formulation and Implementation Guidelines”.</li> <li>• John Ratcliffe, “Introduction to Town and Country Planning”.</li> </ul>				
<p><b>MODULE I (12 HOURS)</b>  <b>HISTORY &amp; EVOLUTION</b></p> <p>Origin and evolution of Human settlements: Development of Town planning in the historical perspective -Town planning in ancient, medieval, renaissance, industrial &amp; post-industrial age - Town planning in India: ancient, medieval, colonial and modern - Development of new towns and cities: Chandigarh and Navi Mumbai. Contributions to modern town planning thoughts: Patrick Geddes, Ebenezer Howard, C A. Doxiadis, Lewis Mumford, Le Corbusier and Clarence Stein.</p>				

**MODULE II (12 HOURS)  
NEED FOR TOWN PLANNING**

Impact of Urbanization on cities, Urban Environmental Problems: Land Use, Traffic and Road Network, Urban Land use: CBD, Urban Nodes, fringe areas and suburbs, Urban Rural Continuum - Contemporary urban problems: growth and changes, overcrowding, slums, sporadic growth and conurbation - Need for sustainable city planning.

**MODULE III(12 HOURS)  
URBAN DEVELOPMENT PLANNING SYSTEM AND PROCESS**

Regional Plan, Master plan, Development Plan, Annual Plan - Town Planning Schemes and Neighborhood Planning - The planning components/elements: land use, zoning, floor area ratio, land development techniques & surveys.

**MODULE IV(9 HOURS)  
NEED FOR TOWN PLANNING LEGISLATION**

Land Acquisition Act - 74th Amendment Act - Coastal Regulation Zones and its relevance - SEZ - JNNURM.

Land use Plan Tools for land use control - Zoning regulations, building byelaws, Subdivision regulations, Plot reconstitution, Betterment Tax.

**TOTAL HOURS: 45**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

<b>SEMESTER VII Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-71</b>	<b>ARCHITECTURAL DESIGN - V</b>	<b>0-0-12</b>	<b>12</b>	<b>2017</b>

### **Course Objectives**

The Architectural Design V course for students of architecture would help,

- To enable the student to comprehend and conceive grouping of buildings wherein relationship between open space and built form, built form to built form plays an important role
- To enable the student to design multifunctional buildings with complex spatial organizations for a large user groups across a section of a society.
- To understand the importance of site planning principles in projects of large scale emphasizing the role of landscape in achieving sustainability.
- To understand circulation patterns in buildings or group of buildings having multiple entries and exits.
- To study and apply the standards in terms of services in buildings having large number of occupants along with aspects of segregation and integration of users, services and goods.
- To understand the building codes formulated for energy conservation and its applications.
- To introduce concepts of inclusive design in public buildings

### **Course Outcome**

- The Course prepares the students to conceive buildings in groups with focus on transitional, incidental spaces in between along with massing of buildings and emerging circulation patterns.

### **Reference Books**

- Kerala Municipal Building Rules
- National Building Code of India, Vol 1-5, 2005.
- Kevin Lynch, "Site Planning", MIT Press, Cambridge, 1984.
- Richard P. Dober, "Campus Architecture: Building in the Groves of Academe", McGraw-Hill, 1996.
- Kanvinde, "Campus design in India", American year Book, 1969
- UDPFI guidelines
- Alexander C, 'A Pattern Language', Centre for Environmental Structure Series
- Alexander C, 'Timeless way to build', Centre for Environmental Structure Series

**Projects:**

A minimum of two projects shall be completed during the semester. Projects may be on campus design and housing layouts with buildings of public, semi-public nature. Projects shall have enough scope for application of various socio – economic, environmental factors taking into consideration demographic, cultural, historic aspects of a design problem. These shall be campus design/ housing / institutional buildings of public and semipublic nature.

**Process and deliverables:**

- Campus Design – Projects that has scope to design a group of buildings so that apart from learning about grouping of buildings students learn to segregate and integrate pedestrian and vehicular traffic, creation of human scaled open spaces and their networking, impacts on micro climate, landscaping, way finding and signage and so on.
- Housing –Projects having low, medium, high risebuildings having detached, semi-detached, row, cluster houses, walk up apartments - typologies for varied user groups with necessary civic amenities and services.Design should be inclusive in nature with enough potential for future growth and unpredictable change.

**UNIVERSITY EXAMINATION PATTERN**

Jury will be conducted as per the B.Arch. Degree Course Manual.

<b>SEMESTER VII Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-72</b>	<b>URBAN DESIGN</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• To introduce urban design principles and theories and the concept of public realm</li> <li>• To enable students to perceive urban spaces as a three-dimensional entity that operates at multiple scales</li> <li>• To create inquisitiveness among students to understand the buildings and the city as the product of a complex and multi-layered community based process</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Ability to use appropriate language and terminology to describe urban spaces,</li> <li>• Gain ability to understand, interpret and apply theories of urban design and familiarize a range of methodological approaches that guide urban space design and development</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Community Design and Culture of Cities – Eduardo E. Lozano</li> <li>• Exterior Design in Architecture – Yoshinobu Ashihara</li> <li>• Architecture of Towns and Cities – Paul D.Spreiregen</li> <li>• The Social Logic of Space –Bill Hillier and Julienne Hanson</li> <li>• The New Theory of Urban Design – Alexander Christopher</li> <li>• The Image of the City – Kevin Lynch</li> <li>• Design of Cities – Edmund N. Bacon</li> <li>• Life Between Buildings: Using Public Space-Jan Gehl</li> <li>• Cities for People-Jan Gehl</li> <li>• The City Shaped: Urban Patterns and Meanings Through History- Spiro Kostof</li> <li>• The Urban Pattern- City Planning And Design- Arthur Gallion</li> <li>• The New Landscape – Charles Correa</li> <li>• The Architecture of Cities – Rossi, Aldo</li> <li>• The Concise Townscape – Cullen, Gordon</li> <li>• Finding lost space-Theories of Urban Design – Roger Trancik</li> <li>• The Art of Building Cities: City Building According to Its Artistic Fundamentals – Sitte, Camillo</li> </ul>				
<p><b>MODULE I (8 Hours)</b></p> <p>Definition of Urban Design, its evolution as a discipline interfaced between Architecture, and Urban Planning, Need, scope and Objectives Urban Design;  Urban form of traditional cities and historic place making from ancient-medieval-renaissance-industrial and modern times; concepts of post-modern urbanism and its influences in contemporary urban space design and development.</p>				

**MODULE II (12 Hours)**

Methodological approaches in understanding urban spaces: visual surveys-Kevin Lynch's Image of the city, ecology-landform-climate-shape-size-pattern-grain-texture, public spaces-morphology-building typology-open spaces-street networks-character districts-pedestrian paths-vista & skyline-circulation pattern-activity nodes etc.; urban Scale: relation with human vision-neighbourhood size; enclosure qualities; built-open relationships, urban mass etc.; Gordon Cullen's Townscape analysis; basic urban design principles, concepts of urban spatial organization; place making theories etc.

**MODULE III (12 Hours)**

Overview of the contribution of Urban Theorists in understanding public spaces- Camillo Sitte, Jane Jacobs, Donald Appleyard, William H. Whyte, Le Corbusier, F.L.Wright, Edmund Bacon, Christopher Alexander, Peter Calthorpe, Aldo Rossi, Bill Hillier, Rob Krier, Richard Rogers, Charles Correa, Jan Gehl, John Lang etc.

Emerging concepts in Urban Space Design: Neighbourhood concept; Space Syntax Theory, Transit-Oriented Development, New Urbanism, Mixed Use Developments, Smart City Concepts

**MODULE IV (10 Hours)**

Understanding Urban Design Projects through case studies: Brownfield development (Urban redevelopment-revitalization- renewal-regeneration-rehabilitation, Urban Conservation etc.), Greenfield development, urban water front development etc.

Urban design process, structure plan, development control guidelines -master plan/development plan -zoning regulations-formulation of policies for landscape, infrastructure & built-forms, relevant acts and regulations, Art and Heritage commission, other government and non-government agencies, Urban design project implementing agencies, financing agencies etc.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



SEMESTER VII Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-73	ARCHITECTURAL DETAILING AND WORKING DRAWING	0-0-4	3	2017

### Course Objectives

- To be conversant with project delivery methods of architectural design including digital methods.
- To understand the need of integrating structural design, construction and service requirements in architectural planning and design.
- To enable the development of architectural design drawings to make it the basis for structural and service drawings.
- To prepare architectural details and working drawing for a project.

### Course Outcome

- Preparation of individual portfolios containing relevant drawings done in the semester preferably in digital form derived from the works of the student.
- Competency in preparation of drawings required for construction of a building project.
- Realization of the need for integration of all technical aspects of construction in architectural design.
- Ability to design and detail buildings.

### Reference Books

- Ralph W Liebing, Architectural working drawings
- Edward J Muller, James G Faussett, Philip A Grau. Architectural drawing and Light construction
- Jefferis, A. and Madsen, D.A. (2005). Architectural Drafting and Design. 5th Ed. New York: Thomson Delmar Learning.
- Osamu, A. W., Linde, R. M. and Bakhoun, N. R. (2011). The professional practice of architectural working drawings. 4th Ed. Hoboken: John Wiley & Sons.

### Module I (12 hours)

Study of Architectural standards to be followed in the preparation of working drawing & detailing. Case study of sample detailed drawings and working drawings from general to specific details- Site plan, grading plan, landscaping plan, centre line drawings, building plans, enlarged detailed plans, sections, staircase details, toilet details, joinery, water supply/plumbing, fire protection, mechanical, electrical drawings and HVAC details.

Students may be divided into groups for study and seminars on various topics.

### Module II (20 hours)

Developing the design of a medium complexity building done by the student in the previous semester upto the stage for the preparation of working drawing or for a new design project for preparation of working drawing.

- Preparation of working drawing for the design project including
- Developing site plan, grading plan, landscaping plan and details, floor plans, Detailed Part plans, Roof Plan /Terrace Plan, schedules etc
  - Excavation drawings, Foundation drawings, Center-line drawings, Floor Plans, Sections, Elevations.
  - Basic internal electrical and plumbing lay outs.
  - Enlarged plans for areas like toilet, kitchen, staircase etc.

### **Module III (12 hours)**

Details of joinery, finishing materials, built-in furniture, components like doors, windows, ventilators, wardrobe, storage cabinets, counters, fittings and fixtures etc. Details of septic tank, STP, Rain water harvesting etc.

### **Module IV (8 hours)**

Documentation of construction details for various types of staircase, lifts, dumb waiters, escalators etc. through case study. Students may be divided into groups for study and seminars on various topics.

**TOTAL HOURS: 52**

### **Sessional requirements:**

Class work (Drawings & projects)	-70 marks
Assignment	-20 marks
Regularity	-10 marks
Total	-100 marks

SEMESTER VII Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-74	<b>BUILDINGSERVICES - IV (ACOUSTICS &amp;FIRE FIGHTINGSERVICES)</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>

### Course Objectives

The Building services – IV (Acoustics & Fire-fighting services) course for students of architecture would help

- To understand the importance of acoustics in buildings.
- To get familiarized with various acoustical materials, their properties and their construction details.
- To integrate architectural design with acoustic considerations.

### Course Outcome

- An understanding of the fundamentals of acoustics.
- Knowledge about Fire safety building rules.
- Awareness about fire safety and noise control in day to day life.

### Reference Books

- Kinsler, L. E., & Frey, A. R. (1962). *Fundamentals of acoustics*. New York: Wiley.
- Templeton, Duncan (Ed.) (1993). *Acoustics in the Built Environment*. Oxford: Butterworth Architecture.
- Knudsen, V. O., & Harris, C. M. (1988). *Acoustical designing in architecture*. Woodbury: Acoustical Society of America.
- Cavanaugh, W. J., Tocci, G. C., & Wilkes, J. A. (2010). *Architectural acoustics: Principles and practice*. Hoboken, NJ: John Wiley & Sons.

### MODULE I (9 Hours)

Introduction to Acoustics: Nature of Sounds- Propagation of Sound- Velocity, Frequency, and wavelength of sound-sound intensity-sound pressure- loudness-Decibel- Human ear and hearing characteristics.

### MODULE II (10 Hours)

Sound in Enclosed Space , Acoustical Construction And Materials: Room acoustics- behavior of sound in enclosed spaces-sound reflection, diffusion, and diffraction -room resonance- sound absorption coefficient- sound absorptive materials and applications - porous absorbers-membrane absorbers- cavity resonators-space absorbers variable absorbers-measurement of sound absorption.

**MODULE III (10 Hours)**

Reverberation: Reverberation-Calculation of reverberation time- sabine's formula- acoustical defects in the enclosed spaces, acoustical design of auditoriums-rooms for music, speech.

**MODULE IV (13 Hours)**

Noise Control. Acoustic Design of Various Buildings And Fire Safety Provisions

Effect of noise in human being- air borne and structure borne noise- noise criteria-transmission loss noise control in specific building types- auditoriums, schools, hospitals, residences and offices.

Fire resistance of building elements, fire rating and assessment. Building bye-laws relating the fire safety provisions in the buildings. Firefighting equipment - automatic sprinklers, fire alarms, smoke detector etc.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module

Q II - 2 questions of 15 marks from module I with choice to answer anyone

Q III - 2 questions of 15 marks from module II with choice to answer anyone

Q IV - 2 questions of 15 marks from module III with choice to answer anyone

Q V - 2 questions of 15 marks from module IV with choice to answer anyone

<b>SEMESTER VII Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-75</b>	<b>Building Economics and Sociology</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>

### **Course Objectives**

- To familiarize the students with the basic concepts of sociology & economics and their influence on architecture

### **Course Outcome**

- Introduction to sociology and elements of sociology and how it influences architecture.
- Understanding the issues faced by Indian society in relation to urbanization and housing
- Introduction to basics of economics
- Understanding economics factors affecting different stages of a building.

### **Reference Books**

- Jones, Paul (2011). The Sociology of Architecture: Constructing Identities. Liverpool University Press.
- Houses forms and culture – Amos Rappoport
- Urban sociology – Dr. Valsyayan
- Openstacks College (2012) Introduction to Sociology. Openstacks College.
- Samuelson, P. and Nordhaus, W. (2010) Economics. McGraw-Hill Education
- Building Economics for Architects. Wiley- Mann, Thorbjoern (1992)

### **MODULE I (10 hours)**

Introduction to sociology: Definition of sociology, Nature and scope and utility in architecture and the built environment; Definitions of sociological terms: society, community, family, culture. Relation between culture and built form (exploration of architectural examples).

### **MODULE II (10 hours)**

Communities: Origin, growth and nature of settlements and communities. Their characteristics and spatial patterns.

Urban and Rural Communities: Definitions of the terms “urban” and “rural”. The social, economic and spatial characteristics associated with urban and rural settlements

Cities and Society: Urbanization – definition; causes. Effects of urbanization on rural areas. Impact of growing urbanization on urban life, viz. health, housing, transportation. The origin and characteristics of slums in Indian cities. Governmental and non-governmental approaches to engaging with issues regarding slums in Indian cities.

**MODULE III (10 hours)**

Introduction to economics: Definition of economics; Definitions of terms: Goods; Utility, Value, Price and Wealth, micro and macroeconomics.

Economics and the market: Consumption, wants and needs and their characteristics.

Concepts of economics: Supply and demand Opportunity cost; Laws of supply and demand.

**MODULE IV (12 hours)**

Urban land values: Various factors affecting the value of urban land.

Building Economics: Building Efficiency and cost reduction through planning and design of building components. Total cost of building, Initial cost, Operational cost, maintenance cost. Life cycle cost.

**TOTAL HOURS: 42**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

<b>SEMESTER VII Course No.</b>	<b>Course Name</b>	<b>L-T- P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-76-1</b>	<b>SUSTAINABLE ARCHITECTURE AND PLANNING</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course objectives</b> The objective of the course is to develop</p> <ul style="list-style-type: none"> <li>• An understanding to reduce, or completely avoid depletion of critical resources; prevent environmental degradation caused by facilities and infrastructure throughout their life cycle; and create built environments that are livable, comfortable, safe, and productive.</li> <li>• An understanding of relevant techniques in formulating various sustainable strategies.</li> <li>• An insight into various Energy Efficient Materials and Sustainable Construction Technology.</li> <li>• An awareness regarding various policies and principles related to sustainability in a global level.</li> </ul>				
<p><b>Course outcome</b></p> <ul style="list-style-type: none"> <li>• The programs seek to prepare students to be successful professionals recognized for their consideration of global and societal concerns, ethics, and sustainability in the process of making design decisions.</li> </ul>				
<p><b>REFERENCES:</b></p> <ul style="list-style-type: none"> <li>• Brenda and Robert Vale; Green Architecture- Design for a Sustainable Future; Thames and Hudson, 1996</li> <li>• Daniel Vallero and Chris Brasier; Sustainable Design- The science of sustainability and Green Engineering; Wiley, 2008</li> <li>• Trivedy R. K- Handbook of Environmental Laws, Guidelines, Compliance &amp; Standards, Vol. 1 &amp; 2</li> <li>• Sustainability How-to Guide Series Green Building Rating Systems- IFMA Environmental Stewardship and Sustainability Strategic Advisory Group (ESS SAG)</li> <li>• Jong-Jin Kim, Brenda Rigdon; Qualities, Use, and Examples of Sustainable Building Materials .</li> <li>• Szokolay, S. V., 2004. Introduction to Architectural Sciences: The Basis of Sustainable Design, Architectural Press, Oxford.</li> <li>• TERI, 2004. Sustainable Building Design Manual Volume 2, The Energy &amp; Resources Institute, India.</li> </ul>				
<p><b>MODULE I (10 Hrs)</b> Impact of people on the environment and vice versa, Introduction to sustainability, Sustainable development goals, Sustainable architecture and Green Building definition, its historical precedence, E's of sustainability - environmental, economic, social and cultural dimensions. Its correlation to population growth. "Three R's" of sustainability, Goals of Sustainable development. Global, national &amp; local relevance. Basics of Green rating systems - BREAM, LEED, IGBC, GRIHA, BEE.</p>				

**MODULE II (12 Hrs)**

Integrated approach to environmental design, Building and its interactions with the environment, Urban ecology

General principles for minimizing environmental impact of buildings- Site planning considerations, Building design considerations, working with climate: passive design principles, building envelope design, indoor environment quality, sustainable building services

Energy management, Waste management, Water management, Environmental management of sensitive areas

**MODULE III (12 Hrs)**

Sustainable Building Materials – Biodegradable & Non-Biodegradable Materials –Eco-friendly building materials, Concept of Renewable, Recyclable and Reusable materials, Regional materials, alternative materials, Sustainable building technologies – Traditional, vernacular and advanced technologies

Environmental Impact of building materials-embodied energy of different building materials and technologies, operational energy, carbon foot print- considerations for choice of materials for low energy- life cycle analysis- optimizing construction, site management, post occupancy building management, sick building syndrome.

Energy Efficient Construction Technologies - Technologies developed by CBRI, TERI, Traditional Building Construction Technologies, Introduction to other Technological interventions to save Energy, Intelligent Buildings –Case studies.

**MODULE IV (8Hrs)**

Policies and principles: Bruntland Commission Report, Basic understanding of Earth Summit, Kyoto protocol, UN frame work convention of climate change

National policies on sustainable and energy efficient development, Environmental Legislations, The Energy Conservation Act 2001 (Amendments 2010)- Main Amendments and its legal framework, Energy Conservation Building Code (ECBC), Environmental impact assessment (EIA) based on the Environmental Protection Act (EPA) 1986, LEED, IGBC, GRIHA, ECBC, BEE

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.



<b>SEMESTER VII Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-76-2</b>	<b>COST-EFFICIENT CONSTRUCTION TECHNIQUES</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• To introduce the concept of cost-efficient construction techniques.</li> <li>• To study and analyze various cost-efficient construction techniques.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An awareness of various cost-efficient construction techniques developed by various agencies and the knowledge to adopt appropriate technology for various situations.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Centre for Resourceful building Technology ( April, 1995) - Indigenous building materials – An overview</li> <li>• Hand book of low cost housing</li> <li>• G.C. Mathew - Low cost housing in development countries</li> <li>• Publications of CBRI, SERC, RRL, NBO, COSTFORDetc</li> <li>• Proceedings of International Seminar on Low cost Housing and Alternative Building Materials(1988), CBRI Roorkee</li> <li>• Jagdish– Sustainable Building Technologies</li> <li>• Baker Laurie (1988) – Mud</li> <li>• Hassan Fathy (1997) – An Architecture for People</li> <li>• Geoffrey Bawa (2015) –A Conscious Perception</li> </ul>				
<p><b>MODULE I (8 Hours)</b></p> <p>Introduction to cost-efficient construction techniques – significance, need and approaches.  Cost factors – land cost, cost for site development, services, initial construction cost, maintenance cost, life cycle cost and social cost.  Time factor, labor requirement, transportation cost, wastage reduction and recycling of materials - sustainability considerations.</p> <p><b>MODULE II (12 Hours)</b></p> <p>Concept of systemsapproach,standardization, modular coordination &amp; prefabrication for cost reduction. Introduction to Integrated building construction and management (detailed study is not expected).  Various planning techniques. Cost reductionof earth work,roads,pavement and other site components and services.  Critical study of techniques for cost reduction for foundation developed by various agencies.</p>				

**MODULE III (12 Hours)**

Cost-efficient construction techniques for walls and wall finishes developed by various agencies – use of industrial and agricultural waste – Mud plastering, Mud construction- Adobe, CSEB, Wattle & Daub, Rammed Earth, Straw Bale etc. - use of interlocking bricks, prefabricated components - documentation and critical analysis based on different materials and finishes.

**MODULE IV (10 Hours)**

Study and critical analysis of cost-efficient construction methods for roof and floor slabs - Techniques developed by various agencies – Prefabricated Slab, Waffle slab, Filler slab, Thin slabs, etc.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VII Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-76-3	<b>BARRIER-FREE ENVIRONMENT DESIGN</b>	3-0-0	3	2017

### Course Objectives

- To introduce the concept of barrier-free environment design to students.

### Course Outcome

- Awareness about the fundamental principles of Barrier-free built environment.
- Exposure to the special design considerations for diverse building types.
- Awareness about Standards and Regulations stipulated by authorities.

### Reference Books

- Barrier free design: A Manual for Building Designers and Managers, James Holmes-Seidle, Architectural Press, 1996.
- Barrier free design, Oliver Heiss, Birkhauser, 2010.
- Building without barriers for the disabled, Harkness, Sarah P. and Groom, James N., Watson-Guptill Publications, 1976.
- Disability and Rehabilitation Handbook, Goldenson, Robert M., McGraw Hill USA, 1978.
- Handbook on Barrier Free and Accessibility, CPWD, New Delhi, 2014.
- Guidelines and Space Standards for Barrier-free Built Environment for Disabled and Elderly Persons, CPWD, New Delhi, 1998.

### Module I (8 hours)

Back ground of the subject - Types of disabilities- temporary, characteristic and long established conditions - Why a barrier-free environment? - Goal of a barrier-free design - Fundamental principles for designing Barrier-free built environment.

### Module II (12 hours)

Typical barrier problems of the disabled- Listing common barriers-parking and approaches - Travel within buildings - Services - Hazards.

Special design considerations for building types - Housing, Institutions, Public buildings, Transportation terminals, and outdoor spaces.

### Module III (12 hours)

Construction and Maintenance standards considering the types of Disabilities - Mobility devices - Material study - Techniques and details for the design elements within and outside the buildings - Case studies.

**Module IV (10 hours)**

Objectives of barrier free standards- existing standards - Study of norms and bye-laws set by Central Government which would be applicable to all buildings and facilities used by the public.

**TOTAL HOURS: 42**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

SEMESTER VII Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-76-4	VERNACULAR ARCHITECTURE	3-0-0	3	2017

### Course Objectives

- To introduce the discipline of vernacular architecture to students and to provide an exposure to the diversity of vernacular traditions in Indian architecture.

### Course Outcome

- Awareness about the fundamental theories of Vernacular Architecture.
- Exposure to the vernacular traditions in various regions of India.

### Reference Books

- A Rapoport (1969) *House Form and Culture*, Prentice-Hall, Englewood-Cliffs, New Jersey.
- B Rudofsky (1964) *Architecture without Architects*, Academy Edition, London.
- P. Oliver (1992) *Encyclopedia of Vernacular Architecture*, University of Oxford Press, Cambridge.
- V.S. Pramar, *Haveli – Wooden Houses and Mansions of Gujarat*, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
- S. Muthiah et al, *The Chettiar Heritage*; 2000.
- Thampuran, Ashalatha. (2001). *Traditional Architectural Forms of Malabar Coast*, Calicut :VastuvidyaPrathishtanam.
- Desai et al, *The Bungalow in Twentieth Century India*, Ashgate Publishing Ltd, 2012.
- Desai, Madhavi. (2007). *Traditional Architecture: House Form of the Islamic Community of Bohras in Gujarat*, Pune: Design Directions Pvt. Limited.
- Aishwarya Tipnis (2011) *Vernacular traditions; Contemporary architecture*, The Energy & Resource Institute (TERI) publication.

### Module I (8 hours)

#### Introduction to vernacular architecture

Definitions, theories and classifications,  
Urban and Rural Vernacular,  
Various factors influencing Vernacular Architecture,  
Role of sustainability in Vernacular architecture,  
Traditionalism and Vernacular.

### Module II (12 hours)

#### Tribal Architecture of India – Building materials and construction techniques

Forms, spatial planning, cultural aspects, symbolism, materials and construction techniques of different tribal settlements in India - *Naga houses of North East India, Bhil houses of Madhya Pradesh and Gujarat, Toda houses of Tamil Nadu* etc.

Documenting any vernacular settlement in your locality – relation of houses and settlement, belief systems, architectural morphology, contextual responses, materials and construction methods etc.

**Module III (12 hours)****Regional variations in Vernacular Traditions of India**

Forms, spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following:

*Havelis of Rajasthan*

*Bohra Houses of Gujarat*

*Banglas(village huts) of Bishnupur, Bengal*

*Chettinad Houses of Tamil Nadu*

*Nalukettu (and its variations) of Kerala*

**Module IV (10 hours)****Contemporary vernacular architecture**

ICOMOS International charter on built heritage

Importance of vernacular in 21st century

Developmental vernacular.

Knowledge of Vernacular in contemporary regional designs – works of eminent Architects

**TOTAL HOURS: 42**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

## **EIGHTH SEMESTER (S8)**

**AR17-81**

### **PRACTICAL TRAINING**

**Credits: 15**

The students shall undergo practical training immediately after the completion of the 7<sup>th</sup> semester B.Arch. examinations as per the practical training manual. The training shall be under a registered architect with minimum of five years experience and approved by the Dept of Architecture of the teaching institution. The students are required to submit a report including the details of their work illustrated with sketches, prints and other documents connected with the projects on which he/she has worked both in office and at site, a work diary, originals of monthly report, and a certificate regarding their conduct and performance of work done during the training period. Evaluation committee will award the marks of end semester examination as per the B.Arch Degree Course Manual-Practical Training. For details refer Practical Training Manual.

<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-91</b>	<b>ARCHITECTURAL DESIGN - VI</b>	<b>0-0-12</b>	<b>12</b>	<b>2017</b>

### **Course Objectives**

The Architectural Design VI course for students of architecture would help,

- To help students comprehend a group of buildings in a public realm having multiple stakeholders.
- Learn to address the interface between public and private realm of buildings.
- To develop design solutions as a response to the surrounding urban environs.
- To help students understand the correlation between, physical, socio-cultural, environmental and socioeconomic dimensions such as heritage, gender, class, dynamics of urban growth of the built environments.
- To enable the students to address issues in urban areas – transportation, sustainability, heritage, sprawl, place making, identity, collective memory Mixed use programming.
- Learn to apply basic tools of master planning in a large scale project
- To enable the student to solve large span structures.

### **Course Outcome**

- The Course prepares the students to perceive buildings as part of a larger urban fabric emphasizing on the interrelationships between the disciplines of architecture, urban design and town planning.

### **Reference Books**

- Kerala Municipal Building Rules
- National Building Code of India, Vol. 1-5, 2005.
- Kevin Lynch, Site Planning, MIT Press, Cambridge, 1984.
- Carmona, M., Heath, T., Oc, T. and Tiesdell, S. (2010). Public Places Urban Spaces. Oxford Architectural Press.
- Lang, J. T. (2005). Urban Design: A Typology of Procedures and Products. Oxford:Elsevier/Architectural Press.
- Jonathan Barnett, An Introduction to Urban Design, Harper and Row; 1982
- Jan Gehl, Life between Buildings- Using Public Space, ArkitektensForleg 1987.
- Time Savers Standard for Urban Design, Donald Watson, McGraw Hill, 2005.
- Malcolm Moore & Jon Rowland Eds, Urban Design Futures, Routledge, 2006.
- Edmund Bacon, Design of Cities, Penguin, 1976.
- Gordon Cullen, The Concise Townscape, The Architectural Press, 1978.
- Lawrence Halprin, Cities, Reinhold Publishing Corporation, New York, 1964.
- Gosling and Maitland, Urban Design, St. Martin's Press, 1984.
- Bjorn N Sadaker, On span and space: Exploring structures in architecture



**Projects:**

An urban study is to be conducted -either by undertaking an intense study in an urban context or by introducing a large scale urban project which will impact on the immediate environs necessitating a detailed contextual study.

Study should address the above stated objectives and issues are to be identified. Architectural solutions for the urban area with necessary policy guide lines shall be worked out as the major project.

A building which requires large span structures shall be the second project.

**Process and deliverables:**

- Projects where there is an exploration of buildings in the urban context with a thrust on understanding interdependencies between architecture, urban design and town planning; private and public realms.
- Adaptive usage of heritage buildings/areas, urban revitalization projects, water front development, new town developments, transportation terminals, transit-hubs, market squares, densification along transit corridors, mixed use complexes etc. can be projects which can be taken up.
- Buildings that require large span structures like convention centers, sports complex, galleries and pavilions, transportation terminals where in new age materials and construction techniques can be explored by students.

**UNIVERSITY EXAMINATION PATTERN**

Jury will be conducted as per the B.Arch. Degree Course Manual.

<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-92</b>	<b>EARTHQUAKE- RESISTANT STRUCTURES</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>

### **Course Objectives**

- To familiarize the basic concepts of seismic design.
- To integrate the architecture design process with seismic concept to produce safe buildings.
- To gain an understanding of the tools for hazard and vulnerability assessment at the city level and to have an overview of the different types of technological hazards.

### **Course Outcome**

- Understanding of the concepts of seismic design.
- Development of the skill set required for design of earthquake-resistant structures.

### **Reference Books**

- Ambrose, J; Vergun, D: Simplified building design for wind and Earthquake forces, John Wiley, New York, USA
- Arnold, C; Reitherman, R : Building configuration and Seismic design, 1982, John Wiley, New York USA
- Bolt, B.A: Earthquakes, Fourth edition, 1999, W H Freeman, Sanfransisco, USA
- Dowrick, D.J: Earthquake resistant design for Engineers and Architects, 1987, Second edition, John Wiley, New York,USA
- Hugo Bachmann : Seismic conceptual design of buildings- Basic principle for engineers, architects, building owners and authorities; Swiss Federal Office for Water and Geology and Agency for Development and Cooperation, Switzerland.
- Lagario, H.J: Earthquakes: An architect's guide for non structural seismic hazards, John Wiley and sons, New York, USA.
- Murty, C.V.R: Earth quake tips, National information centre for Earthquake Engineering, IITK, Kanpur.
- IGNOU: Notes on disaster management.
- Ramani, S. Disaster management- Advanced course on modern trends in housing- SERC, Vol 2, Chennai, 1980.

### **Module I (10 hours) Introduction**

Seismic zones in India and earthquake hazard. Role of architect and structural designer in safe building design, Comparison of seismic and conventional design. Causes of earthquake, social & economic consequences. Major Earthquake case studies, impact on built environment, classification of observed building failure patterns: Global, Indian.

Basic terms: Fault line, focus, Epicenter distance, Focal depth, Peak ground acceleration etc. Impact of soil characteristics on buildings, seismic zoning and micro zoning

**Module II (10 hours) Earthquake Basics:**

Consequences of earthquake ground motion: Ground rupture and ground failure, liquefaction, Landslides, Fire, Tsunamis. Structure of the Earth-Plate Tectonics-Evolution of Indian subcontinent. Waves generated by ground motion and their characteristics: Body Waves (Longitudinal waves; Transverse waves), Surface waves (Rayleigh waves). Attenuation of waves, Random direction of Shaking. Distribution of earthquakes: Global, Indian. Measurement of earthquakes: Introduction of instruments used for measuring earthquakes, Seismograph, accelerometer, various scales of magnitude, various scales of intensity.

**Module III (12 hours) Design of buildings for earthquake resistance:**

Factors affecting earthquake loading: Mass, Natural period, Damping, Ductility. Seismic Design Code Provisions: Basic terms used in seismic codes and their meanings, horizontal design seismic coefficient, base shear of building and vertical distribution of loads. Building Configuration: scale of building- size in horizontal plane- size in vertical plane- Building proportions- Symmetry of building (Torsion), Re-entrant corners, Redundancy, irregularities in building, Horizontal plane, Vertical plane (Soft storey; short column; discontinuous walls).

**Module IV (10 hours) Disaster Management:**

Introduction to the concept of disaster management and mitigation. Types of disasters-nature, causes, impact. Hazard and vulnerability assessment, concepts, tools and techniques, pre-disaster mitigation and protection of lifelines and critical facilities against natural hazards. Concepts and overview of technological hazards at the city level. Safety management system: Strategies for implementation, fire safety at the city level, emergency planning, preparedness and response at the city level. Principles and methods of community-based approaches for disaster management practice.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V- 2 Questions of 15 marks from module IV with choice to answer anyone.

<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-93</b>	<b>DISSERTATION</b>	<b>0-3-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• To understand the process involved in a research.</li> <li>• To conduct research in a structured manner.</li> <li>• To compile and write the work done at various stages of research in a comprehensible manner.</li> <li>• To learn Standard referencing conventions and technical writing norms.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• The Course provides an opportunity for students to undertake independent research on a topic of their choice related to architecture.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Borden, I. and Ray, K. R. (2006). The dissertation: an architecture student's handbook. 2nd Ed. Oxford : Architectural Press.</li> <li>• Fink, A. (1998). Conducting research literature reviews: from paper to the Internet. Thousand Oaks : Sage.</li> <li>• Groat L.&amp; Wang D. (2002), Architectural Research Methods, John Wiley and Sons Inc</li> <li>• Kothari C. R. 1990 Research Methodology Sultan Chand &amp; Sons, New Delhi</li> <li>• Creswell, John W. 2003 Research Design: Qualitative, Quantitative and Mixed Methods Approach Sage Publications</li> </ul>				
<p><b>Manual:</b></p> <p><b>Allotment of Guide</b></p> <ul style="list-style-type: none"> <li>• A guide has to be allotted to each student for supervising the dissertation work by the head of the institution.</li> </ul> <p><b>Area of Research</b></p> <ul style="list-style-type: none"> <li>• Area of research has to be identified by the student from architecture and its allied subjects. A concern which is currently relevant to the society has to be brought out from the identified area of research. The research concern so identified has to have scope to be conducted as a study for dissertation and has to be approved by the Department of Architecture. Student is expected to have a critical understanding of the topic, analyse the results on the data collected and present the work in a structured manner.</li> <li>• Students may be encouraged to utilise dissertation as an opportunity for pre-Thesis study but this is optional. Selection of topic may be done in such a manner that the study done here can form the base work for the Thesis of the semester X.</li> </ul> <p><b>Conduct of work</b></p> <ul style="list-style-type: none"> <li>• The dissertation work shall be independently carried out by the student under the guidance of their respective guides in the IX semester degree course period.</li> </ul>				

- On the day of registration to IX semester students shall submit the choices of their research concern to the dissertation coordinator appointed by head of the department.
- A review board shall be constituted with a senior faculty as Chairman, dissertation coordinator and guide. After the approval of the topic in the first review they are required to submit the synopsis and start the study.
- The Schedule of work at various stages is outlined in the table given below. Students shall present the progress of the study at various stages during the IX semester.
- At the completion of study prior to final evaluation students are expected to submit a report of maximum 8000 words. Standard referencing conventions and technical writing norms must be adhered to.
- Final assessment of the students' work shall be based on the report as well as oral presentation with a greater weightage given for writing and research content of the study.
- Report should be checked for plagiarism which shall not be tolerated.

#### **Evaluation**

- The entire 100 marks allotted to the dissertation will be awarded in the following manner.
- Approval of topic 10 marks (internal)
- Two progress assessment 20 marks each (internal)
- Final evaluation 50 marks (conducted by Institute)

After the approval of the topic the internal evaluation shall be conducted in 2 progress assessment stages by the review board. Internal marks shall be awarded as given below:

- Preliminary Stage – Literature study, Data Collection (20marks)
- Intermediate Stage – Results and Interpretation, Draft Report (20 Marks)

The Final evaluation shall constitute 50 marks and shall be conducted by the Dissertation review Board constituted by the Institute. The dissertation assessment board for final evaluation shall consist an external member either from academic or a research institute or a practicing COA registered architect with minimum five years' experience who shall be identified and appointed by the institute apart from Chairman who will be a senior faculty member appointed by the institute and Members Dissertation Coordinator/Internal faculty member. The jury members will independently evaluate the final presentation.

- Evaluation of the final report in the form of bound volume - 25 marks.
- Evaluation of research work and Presentation of Slides- 25 marks.

Head of the Department shall publish the marks of the Dissertation on the next working day after the completion of the Jury.

- A candidate has to obtain 50% aggregate marks for dissertation (internal assessment + Jury) for a pass.
- If the dissertation is not completed satisfactorily, the student has to work further and again appear for a final assessment on a specified date, not earlier than one month after the first evaluation.
- A candidate who fails for dissertation in this final assessment stage as well, has to reappear either in full or for the Final Jury only with any regular batch. He/she is required to register with the Head of the Department for the same.

S. No.	Evaluation Stage	% Marks Allotted	Evaluation Board	Schedule
1	<b>Approval of topic</b> – Research proposal detailing the aim, objective, methodology and scope of the study.	10%	The project guide and two other faculty members of the same institute.	First week of IX Semester
2	<b>Preliminary Stage</b> – Review of literature and data collection methodology.	20%	The project guide and two other faculty members of the same institute.	Fourth week of IX Semester
3	<b>Intermediate Stage</b> – Data collection, Analysis and Inferences.	20%	The project guide and two other faculty members of the same institute.	Tenth - twelfth week of IX Semester
4	<b>Final Evaluation (Conducted by Institute)</b> – Final Presentation and Report (2 copies, bound)	50%	<b>Chairman:</b> A senior faculty member appointed by the institute <b>Members:</b> 1. Dissertation Coordinator/Internal faculty member, 2. An external member either from academic/research institute or practicing COA registered architect with minimum five years' experience shall be appointed by the institute.	End of IX Semester

<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR17-94</b>	<b>CONSTRUCTION AND PROJECT MANAGEMENT</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• To establish and develop project management skills with reference to construction management.</li> <li>• To understand CPM network analysis and network logic.</li> <li>• To learn probabilistic time estimate and PERT network analysis.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Understanding of the different methods and techniques used in scheduling a project.</li> <li>• Ability to schedule a project using various techniques.</li> </ul>				
<p><b>Text books</b></p> <ul style="list-style-type: none"> <li>• Srinath, L.S: PERT and CPM Principles and Application.</li> <li>• Robert B. Hanis: Precedence and Arrow Networking Techniques for Construction.</li> <li>• Steven James, D: Techniques or Construction Network Scheduling.</li> <li>• Bhattacharjee,S.K: Fundamentals of PERT/CPM and Project Management.</li> </ul>				
<p><b>Module I (10 hours)</b></p> <p>Introduction to construction management, need and importance, objectives of project management, types of construction management, introduction to traditional management systems, role of Project or Construction Managers in the building industry. Project management cycle-planning, scheduling, monitoring and controlling</p> <p><b>Module II (10 hours)</b></p> <p>Introduction to construction scheduling techniques - Bar chart - Gantt chart. - Work break down structure, Network representation, Principles and application of CPM &amp; PERT.</p> <p><b>Module III (10 hours)</b></p> <p>Network analysis, development of CPM network-Identification of critical path-Different float computations. PERT Network- Probabilistic time estimates of activities-Analysis of PERT Network – Development of Critical path.</p> <p><b>Module IV (12 hours)</b></p> <p>Expediting the project - Time cost tradeoff – Optimization, Allocation of resources - Resource levelling and smoothing - Project management software packages.</p> <p><b>TOTAL HOURS: 42</b></p>				

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V- 2 Questions of 15 marks from module IV with choice to answer anyone.



<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-95</b>	<b>PROFESSIONAL PRACTICE</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Professional Practice course for students of architecture would help,</p> <ul style="list-style-type: none"> <li>• To gain an exposure to architectural professional practice and the role of concerned professional and statutory bodies.</li> <li>• To have an understanding about the code of conduct and ethics in professional practice as per the Architects Act 1972.</li> <li>• To study about project management and execution practices such as tendering, contracting etc.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Understanding of professional and statutory bodies controlling the profession of architects.</li> <li>• Understanding of the professional function and responsibilities of architects.</li> <li>• Understanding of the processes of competitions, tenders, contracts and project execution.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Architect's Act 1972</li> <li>• Publications of Handbook on professional practice by IIA</li> <li>• Publication of Council of Architecture – (Architects professional conduct/Regulations 1989, competition guidelines</li> <li>• Roshan Namavati "Professional Practice" "Lakshmi book depot, Mumbai 1984</li> <li>• Ar. V.S. Apte "Architectural Practice and procedure" Mrs. Padmaja Bhide 2008</li> </ul>				
<p><b>MODULE I (6 Hours)</b></p> <p>ARCHITECT'S ACT 1972            Functions and powers, Architects Regulations, Architect's office and its management. Role of Indian Institute of Architects- Code of conduct for architects, punitive action for professional misconduct.</p> <p><b>MODULE II (12 Hours)</b></p> <p>ARCHITECTS SERVICES            Scale of fees for professional services as per COA , Mode of engagement of architects- comprehensive services, practical services and specialized services</p> <p>COA guidelines for Architectural competitions – Types of competitions (open, limited, ideas competition) – single stage and two stage competitions</p>				

**MODULE III (14 Hours)****TENDER & CONTRACT**

Tender – definition -Types of tenders (open and closed tenders) – conditions of tender – Tender Notice- Tender documents – EMD – submission of Tender – Tender scrutiny – Tender analysis – Recommendations – work order – E- Tendering (advantages, procedures, conditions)

Contract – definition – contract agreement – articles of agreement – Terms and conditions of contract, Bill of quantities and specifications – certification of contractors bills at various stages

New trends in project formulation and different types of execution (BOT, DBOT, BOLT, BOO etc.) Execution of projects – the process (Expression interest, request for proposal, mode of evaluation – classification – valuation reports – methods of valuation

**MODULE IV (10 Hours)****LEGAL ASPECTS**

Arbitration – definition, advantages of arbitration, sole and joint arbitrators, Role of umpires, award, conduct of arbitration proceedings – Arbitration clause in contract agreement (role of architect, expected matters)

Easement – meaning, types of easements, acquisition, extinction and protection

Copyrights and patenting – provisions of copyright acts in India and abroad, copyrights in architectural profession-consumer protection act- intent, Architects responsibility towards clients

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module

Q II – 2 questions of 15 marks from module I with choice to answer anyone

Q III - 2 questions of 15 marks from module II with choice to answer anyone

Q IV - 2 questions of 15 marks from module III with choice to answer anyone

Q V - 2 questions of 15 marks from module IV with choice to answer anyone

<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-96-1</b>	<b>Architectural Conservation</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• To introduce the concept of Conservation</li> <li>• To appreciate the value of heritage and realize the need for conservation</li> <li>• To understand the present conservation scenario</li> <li>• To learn the process of conservation</li> <li>• To equip with necessary skills to initiate a conservation strategy</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• An understanding of the value and necessity of conservation</li> <li>• Awareness about the various procedures involved in conservation</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Ashurst, John &amp; Ashurst, Nicola (1988). Practical Building Conservation – English Heritage Technical Handbook Vol I, II, III, IV and V, Gower Technical Press. England.</li> <li>• Earl, John. (2003). Building Conservation Philosophy. Donhead Publishing Ltd. Dorset. UK.</li> <li>• Feilden, Bernard (1989), Guidelines for Conservation, A Technical Manual, INTACH, New Delhi</li> <li>• Feilden, Bernard M. (1982). Conservation of Historic buildings. Butterworth Co. London.</li> <li>• Hollis, Malcolm. (2000). Surveying Buildings. RICS Business Services Limited. Coventry. UK.</li> <li>• Marshall, John. (1922). Conservation Manual. Govt. Press. Delhi.</li> <li>• Oxley, R. (2003). Survey and Repair of Traditional Buildings., Donhead Publishers. Dorset. UK.</li> <li>• Richardson, Barry A. (1995). Remedial Treatment of Buildings. Butterworth Heinemann Ltd. Britain.</li> </ul>				
<p><b>MODULE I (10 hours)</b>  Definitions: Tangible and Intangible - Natural heritage, Built heritage, Cultural Heritage, Challenges to Conservation, Values, Ethics, Introduction to Degrees of Intervention, Need and scope for multidisciplinary expertise, Classification of Heritage, World Heritage Sites, Grades of Monuments</p> <p><b>Module II (10 hours)</b>  History and Evolution of Conservation, Contributions of John Ruskin, William Morris, Violet-le-Duc, formation of SPAB, Scrape and Anti –Scrapesocieties, Formation of the ASI – Alexander Cunningham  Agencies: International and National - United Nations, ICCROM, ICOMOS, ASI, State departments of Archaeology, Town Planning departments, State Art and Heritage Commission &amp; INTACH.  Charters: Venice charter (1964), Burra charter (1979).</p>				

**MODULE III (12 hours)**

Preparatory procedures for conservation: Reconnaissance survey, Listing, Inventories, Preliminary inspections, Documentation, Research,

Evaluation and Assessment: Techniques of Documentation (measured drawings, photogrammetric techniques)

Degrees of intervention: Prevention, Preservation, Consolidation, Restoration, Rehabilitation, Reproduction, Reconstruction.

To formulate a case for conservation (case study – class work)

**MODULE IV (10 hours)**

Causes of decay in Cultural Property: Natural causes (gravity, sun, rain, frost and snow and ice, groundwater, dust, wind) - Biological causes (animals, birds, insects, trees and plants, fungi, moulds and lichen, algae and moss) - Natural disasters (earthquakes, fire) - Manmade causes (wars, alterations, changes in groundwater levels, atmospheric pollution, vibration damage, fire, theft, vandalism and arson, tourism, neglect)

Deterioration – Systematic investigation, recording of decay, assessment and diagnosis of failures and damages in historic buildings.

**TOTAL HOURS: 42****UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

<b>SEMESTER IX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-96-2</b>	<b>SERVICES IN HIGH RISE BUILDINGS</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Services in High Rise Buildings course for students of architecture would help,</p> <ul style="list-style-type: none"> <li>• To learn how to incorporate different services in a high rise building.</li> <li>• To understand the complexity in design of services in tall buildings and to provide safe and efficient services.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• Upon completion of study the students shall be able to incorporate different services in a high rise building.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• National Building Code of India 2005- Bureau of Indian Standards, 2005.</li> <li>• Manual on Water Supply and Treatment (1991) third Edition, Central Public Health and Environmental Engineering Organization, Ministry of Urban Development, New Delhi</li> <li>• W.G. McGuiness and B.Stein 'Mechanical and Electrical equipment for buildings, John Wiley and sons Inc., N.Y.</li> <li>• Riley Shuttleworth,(1983)'Mechanical and electrical Systems for Construction', McGraw Hill Book Co. U.S.</li> <li>• ASHRAE: Handbook-HVAC Systems and Equipment (1992), HVAC Applications (1991) ASHRAE, Inc. Atlanta.</li> <li>• Energy Conservation building code-2007-Bureau of Energy Efficiency-Govt. of India.</li> <li>• ASHRAE the Hand Book on Green Practices.</li> <li>• Langdon -Thomas.G.J., -'Fire Safety in Buildings, Principles and practice'- Adam and Charles Blade, London, 1972.</li> </ul>				
<p><b>MODULE I (6 Hours)</b></p> <p>Introduction-High rise buildings-definition. Services in High Rise Buildings – Standards - integration of Services – Relative costs –ergonomics aspects of Service Design – Concepts of Intelligent Architecture and Building Service Automation.</p> <p><b>MODULE II (12 Hours)</b></p> <p>Water Supply, Drainage and Fire safety in tall buildings-Water Supply and waste water system planning collection systems – Water storage and distribution systems –Rain water harvesting – Sewage treatment-Recycling and reuse of water-Fire Safety in high rise buildings- Fire Detection and Fire alarm systems - planning and Design-Provisions in the NBC</p>				

**MODULE III (15 Hours)**

Lighting, Ventilation and Air-conditioning - Natural lighting systems – Energy efficiency in lighting systems – Load and Distribution – Planning for intelligent lighting system.  
Natural and Mechanical Ventilation Systems - Air-conditioning systems and load estimation - Planning and Design - Automation and energy Management

**MODULE IV (9 Hours)**

Electrical, Mechanical, Security and Surveillance systems  
Electrical wiring systems in high rise buildings, Automation - Planning and Design of elevator systems and services - Elevator lobby area - Escalators, moving walls and ramps - safety aspects.  
Security system - Access control and Perimeter Protection - CCTV intruder Alarm safety and security.

**TOTAL HOURS: 42****Note:**

*Site visits during different construction stages of Air conditioning, Electrical Wiring, Water supply, Drainage, Firefighting and Vertical transportation systems shall be incorporated, and students shall submit a report as part of their field study.*

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module

Q II – 2 questions of 15 marks from module I with choice to answer anyone

Q III - 2 questions of 15 marks from module II with choice to answer anyone

Q IV - 2 questions of 15 marks from module III with choice to answer anyone

Q V - 2 questions of 15 marks from module IV with choice to answer anyone

SEMESTER IX Course No.	Course Name	L-T-P/S	Credits	Year of introduction
AR 17-96-3	ARCHITECTURAL JOURNALISM	3-0-0	3	2017

### Course Objectives

- To create an awareness in students about architectural journalism and photo journalism.

### Course Outcome

- To create an awareness in students about architectural journalism and photo journalism.

### Reference Books

- Agarwal V. B., Handbook of Journalism.
- Kamath K. V., Professional Journalism.
- Kamath K. V., Journalist hand book.
- Roger Hicks, Practical Photography, Cassel. London 1996.
- Atoe Wayne, "Architecture and Critical imagination", John Wiley & sons, Ltd., 1978.
- Nieman Reports: Architectural Criticism: Dead or Alive by Blair Kamin.
- The Failures of Architecture Criticism, by Lance Hosey in the Huffington Post.
- Writing Architecture: A Practical Guide to Clear Communication about the Built Environment, by Carter Wiseman
- Architectural website, such as archrecord.com; archpaper.com; Archdaily .com; and dezeen.com

### MODULE I (12 Hours)

#### Introduction to Architectural Journalism & writing

What is Journalism and why it is important? Relation between Architecture and Journalism. Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism.

**Assignment:** Reading a broad range of contemporary and historical writings by journalists and critics and discuss how these stories reveal different approaches, attitudes, and biases in covering design.

Writing on different kinds of articles - from news stories to critical essays on particular buildings and social issues. Reading a broad range of contemporary and historical writings by journalists and critics and discuss how these stories reveal different approaches, attitudes, and biases in covering design.

**Assignment:** Writing Architecture:

A Practical Guide to Clear Communication about the Built Environment, by Carter Wiseman  
Read book/Write 500-word description of a project you designed for a studio. Explain your overall design strategy for the project and the key elements within it. Engage the reader and communicate what makes the project interesting or important.

**Assignment:** Reporting on architecture

Architectural website, such as archrecord.com; archpaper.com; archdaily.com; and dezeen.com  
Read stories on one site/Write essay on the particular perspective and biases of this site. Who are the targeted readers of this site and what do they expect from it?

**MODULE II (12 Hours)****The state of Architectural Criticism**

Introduction to Criticism and Importance of Criticism. Relationship between Architecture and Criticism. Failures of Architectural Criticism. Analysis of various critical themes, and their comparison and learn how to criticize a built environment in various aspects and writing about criticism.

**Assignment:** The state of architectural criticism today

Nieman Reports: Architectural Criticism: Dead or Alive by Blair Kamin.  
<http://niemanreports.org/articles/architecture-criticism-dead-or-alive>.

**Assignment:** Ada Louise Huxtable/Charles Jencks

Collected Reflections on a Century of Change, by Ada Louise Huxtable, Walker Books, 2010. Read the series of essays on the World Trade Center and Ground Zero from the book/Write a 500-word essay examining Huxtable's views over time—what changed in her approach and what remained the same.

**MODULE III (10 Hours)****Structure of Architectural Journals & Photo Journalism**

Learning to document the collected information. Formatting, page composition, editing write-ups, content writing. Learning the techniques of clicking photographs through specific angles of built environment and their editing and modification. Learning the technique of how the photographs are supporting the write-ups about built environment, to help them understand the expression of pictorial, verbal and visual relationship of architecture journalism.

**MODULE IV (8 Hours)****The Built Environment & How We Live Today?**

Looking at and explaining a building in today's scenario. What's happening now and what should be the future? Read articles and write an essay on recent projects. Writing about the new technologies in today's architecture and new construction techniques.

**Assignment:** The built environment and how we live today

Mysteries of the Mall: And Other Essays, by Witold Rybczynski, Farrar, Straus and Giroux, 2015. Write a 500-word essay on a topic Rybczynski did not cover in the book.

**TOTAL HOURS: 42**

**UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module

Q II - 2 questions of 15 marks from module I with choice to answer anyone

Q III - 2 questions of 15 marks from module II with choice to answer anyone

Q IV - 2 questions of 15 marks from module III with choice to answer anyone

Q V - 2 questions of 15 marks from module IV with choice to answer anyone



<b>SEMESTERIX Course No.</b>	<b>Course Name</b>	<b>L-T-P/S</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>AR 17-96-4</b>	<b>URBAN HOUSING</b>	<b>3-0-0</b>	<b>3</b>	<b>2017</b>
<p><b>Course Objectives</b></p> <p>The Urban Housing course for students of architecture would,</p> <ul style="list-style-type: none"> <li>• Help them understand the housing problems in India and the importance of housing and related infrastructure at an individual level to a National level.</li> <li>• Make students aware of the issues related to housing and familiarize them with the different housing schemes, policies, finance, acts and design standards.</li> </ul>				
<p><b>Course Outcome</b></p> <ul style="list-style-type: none"> <li>• To develop a basic understanding about the issues related to Housing in India, its importance in the overall development of the country, the various measures introduced by the government to delve with the issues and thus recognize the role and scope of architects in resolving the housing issues in India.</li> </ul>				
<p><b>Reference Books</b></p> <ul style="list-style-type: none"> <li>• Innovative Approaches To Housing for the Poor – K. Thomas Poulouse</li> <li>• Harjinder Singh, Leslie Kilmartin – Housing in the Third World</li> <li>• Karl Kramer – Housing Groups</li> <li>• Habitat India – Dr. Misra and B.S. Bhooshan</li> <li>• Habitat Asia – Dr. Misra and B.S. Bhooshan</li> <li>• National Housing and Habitat Policy 2007</li> <li>• National Housing Policy Paper, Government of India, Ministry of Urban Development, New Delhi, May 1988.</li> <li>• Slum Improvement Act, 1956</li> <li>• Reading Material on Housing – Lectures Compiled by ITPI</li> <li>• UDPFI guidelines</li> </ul>				
<p><b>MODULE I (10Hours)</b> <b>Importance and Shortcomings</b></p> <ul style="list-style-type: none"> <li>• Evolution of early settlements form, types of settlements.</li> <li>• Housing Typologies viz. traditional houses, plotted development, multi-storied housing, slums and squatters, night shelters, etc.</li> <li>• Importance and role of Housing at an individual to a National level</li> <li>• Nature and magnitude of housing problems in India: Housing shortage; reasons for housing shortage: Housing stock; Affordable housing; Slums: Causes and effects of slums, their origin and growth.</li> </ul> <p><b>MODULE II (10 Hours)</b> <b>Agencies and Policies</b></p> <ul style="list-style-type: none"> <li>• Housing Policies and programs introduced in the various Five Year Plans, NitiAyog.</li> <li>• National Urban Housing and Habitat Policy (2007): Need &amp; Objectives, Critical appraisal</li> </ul>				

of the same.

- Housing agencies at Central, State and Local level.
- Co-operative housing in India. Housing the poor through Non Governmental agencies and through mass involvement – Concept of aided self help. Importance of community participation in housing projects.

### **MODULE III (10 Hours)**

#### **Initiatives and Schemes**

- Important Housing Schemes in India for various economic categories Eg. RAY, PMAY, VAMBAY , schemes under JNNURM etc.
- Slum Clearance Program- Improvement method, Complete removal method. The slum area improvement and clearance act, 1956, Slum free cities – guiding policies and a way forward.
- Housing Finance: Institutional finance for housing, Sources of housing finance and essential characteristics, Major housing finance agencies at the National and the State level like the NHB, HDFC, LICHF, GIC, etc.
- Study of High-rise Housing: Problems and Prospects.

### **MODULE IV (12 Hours)**

#### **Design and Planning for Residential Neighbourhoods**

- International case studies of affordable housing- Alejandro Aravena, Shigeru Ban etc.
- Principles of neighbourhood planning & Case studies .
- Planning and design criteria for modern neighbourhoods, norms and criteria for area distribution, net residential density and gross residential density, UDPFI guidelines for housing.

**Total Hours: 42**

### **UNIVERSITY EXAMINATION PATTERN**

Q I - 8 short type questions of 5 marks, 2 from each module.

Q II - 2 Questions of 15 marks from module I with choice to answer anyone.

Q III - 2 Questions of 15 marks from module II with choice to answer anyone.

Q IV - 2 Questions of 15 marks from module III with choice to answer anyone.

Q V - 2 Questions of 15 marks from module IV with choice to answer anyone.

## **TENTH SEMESTER (S10)**

### **AR17-101 ARCHITECTURAL THESIS**

**Credits: 25**

Students are required to prepare an Architectural Design Thesis during the last six months of the B.Arch. Degree program. The duration of the thesis will be six months from the date of commencement of the tenth semester of B.Arch. Degree Course. The thesis project shall include an individual's work on a topic selected by the students and approved by the department. The project selected may be either a live architectural project or hypothetical one so that the student gets training in tackling projects similar to what he/she is likely to face in his/her professional career. For details refer Thesis Manual.