UNIVERSITY OF KERALA

B.ARCH DEGREE COURSE
(2008 SCHEME)

REGULATIONS AND MANUAL
DETAILED SCHEME
AND
SYLLABUS
UNIVERSITY OF KERALA
B.ARCH DEGREE COURSE (10 SEMESTERS)
REGULATIONS 2008
AND MANUALS

1. Conditions for admission

Candidates for admission to the B.Arch. Degree course shall be required to have passed the Higher Secondary Examination, Kerala or 12th standard V.H.S.E, C.B.S.E, I.C.S.E or any other examination accepted by the University as equivalent there to, with Mathematics as an optional subject and obtaining not less than 50 percent marks in aggregate or a Diploma in Engineering awarded by the Board of Technical Education, Kerala or an examination recognized as equivalent thereto after undergoing an institutional course of at least three years securing a minimum of 50% marks in the final diploma examination or International Baccalaureate Diploma, after ten years of schooling, with not less than 50% marks in aggregate and with Mathematics as compulsory subject of examination, subject to the usual concessions allowed for backward and other communities as specified from time to time.

All Admissions to Architecture degree course shall be subject to passing of National Aptitude Test in Architecture (NATA) conducted by the Council of Architecture.


2. Duration of the Course

2.1 The course for the B.Arch Degree shall extend over a period of 10 semesters including 1 semester practical training after the completion of the 6th semester B.Arch examination and 1 semester (6 months) thesis work after the completion of the 9th semester B.Arch examination. The I and II semesters shall be combined.

2.2 The course shall cover the group of subjects as given in the curriculum and scheme of Examination given in the annexure

2.3 Each semester other than thesis work shall ordinarily comprise of not less than 16 working weeks.

2.4 A candidate who could not complete the programme and pass all examinations within Twelve (12) years since his first admission to the B.Arch programme will not be allowed to continue and he has to quit the Programme. However he can be readmitted to the first year of the programme if he/she satisfies the eligibility norms applicable to the regular candidates prevailing at the time of readmission

3. Eligibility for the Degree

Candidates for award of the Degree of Bachelor of Architecture shall be required to have undergone the prescribed course of studies in an Institution maintained by or affiliated to the University of Kerala
for a period of not less than 10 semesters (including Practical training and Thesis Project) and to have passed all the B.Arch Degree Examination specified in the annexure and conducted by the University.

4. Subjects of Study

The subjects of study shall be in accordance with the scheme and syllabi prescribed in the annexure.

5. Electives

All students shall choose electives as prescribed in the scheme and curriculum.

6. Evaluation

Candidates in each semester will be evaluated both by continuous assessment and end semester University examination. The individual maximum marks allotted for continuous assessment and University examination for each subject is as prescribed by the scheme of study.

7. Continuous Assessment (C.A)

The marks awarded for the continuous assessment will be on the basis of the day-to-day work, periodic tests (minimum two in a semester) and assignments/class projects (minimum of three). The faculty member concerned will do the continuous assessment for each semester. The C.A. marks for the individual subjects shall be computed by giving weight age to the following parameters.

7.1 All subjects of the B.Arch Degree Course excluding Dissertation, Practical Training, Thesis & Viva Voce are grouped into two.

They are:

Group II: All subjects other than mentioned in Group I.

7.2 C. A. Marks shall be awarded as per the following norms for each group.

<table>
<thead>
<tr>
<th>Group</th>
<th>Assignments/class projects</th>
<th>Test</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>70%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Group II</td>
<td>30%</td>
<td>50%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Note: This split-up is applicable only for the internal marks.

7.3 The C. A. marks allotted for attendance for all subjects shall be awarded full only if the candidates have secured the 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. The CA marks obtained by the student for all subjects in a semester is to be published at least 5 days before the commencement of the University examinations. Anomalies if any may be scrutinized by the department committee and the final CA marks after publication in the Dept. notice board are to be forwarded to the university within the stipulated time.

7.4 The Practical Training, the Dissertation and the Thesis and Viva Voce, Jury for Basic Design, Architectural design I to VI, Tour, Documentation, shall be conducted as per the manuals given along with the syllabus.

8. Examinations

8.1 There shall be University Examinations at the end of combined first and second semester and at the end of every semester from III semester onwards in subjects as prescribed under the respective scheme of examinations for B.Arch Degree course except practical training. Semester classes shall be completed at least 10 working days before the commencement of the University examination.

8.2 A student will be permitted to appear for the University Examination only if he/she satisfies the following requirements:

8.2.1 He/she must secure not less than 75% attendance in the total number of working periods during all semesters and shall be physically present for a minimum of 60% of the total working periods. In addition he/she also shall be physically present in at least 50% of the total attendance for each subject.

8.2.2 He/she must earn a progress certificate from the Head of the Institution of having satisfactorily completed the course of study in the semester as prescribed by the regulations.

8.3 It shall be open to the Vice-Chancellor to grant condonation of shortage of attendance on the recommendation of Head of Institution in accordance with the following norms:

8.3.1 The attendance shall not be less than 60% of the total working periods
8.3.2 He shall be physically present for a minimum of 50% of the total working periods
8.3.3 The shortage of attendance shall not be condoned more than twice during the entire course. The condonation for the combined I and II semester will be reckoned as a single condonation for attendance purpose.
8.3.4 The condonation shall be granted subject to the rules and procedures prescribed by the University from time to time.

8.4 A student who is not eligible for condonation of shortage of attendance shall repeat the course the next immediate chance offered.

8.5 Examinations for all subject (Theory, Drawing, Architectural Design Jury and Thesis Viva Voce.) will be conducted by the University. However there is no separate minimum marks for the jury examination for Basic Design and Architecture Design I to VI. He shall secure 50% marks in aggregate (C.A marks + Jury) for promotion to higher semester. However the student will get a make up chance if he fails to get 50% marks in aggregate for Basic Design/ Architecture Design.
8.6 The examination will be held twice in a year – April/May session (for even semester) and October/November session (for odd semester). 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 VIII and IX Semester examination will be conducted in both the sessions. This schedule will not be changed.

9. Letter Grades

For each subject in a semester, based on the total marks obtained by the student in the University examination and Continuous assessment put together a letter grade (S, A+, A, B+, B, C+, C, D, E and F) will be awarded. All letter grades except ‘F’ will be awarded if the marks for the University examination is 40% or above and the total mark (C.A marks + University Exam mark) is 50% or above. No absolute mark will be indicated in the mark list. Letter grade corresponding to total marks (C.A marks + University Exam mark) and the corresponding grade point in a ten-point scale is described below.

<table>
<thead>
<tr>
<th>% of Total marks (C.A marks + University Exam mark)</th>
<th>Letter Grade</th>
<th>Grade Point (G.P)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 % and above</td>
<td>S</td>
<td>10</td>
<td>Excellent</td>
</tr>
<tr>
<td>85 % and above but less than 90%</td>
<td>A+</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>80 % and above but less than 85%</td>
<td>A</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>75 % and above but less than 80%</td>
<td>B+</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>70 % and above but less than 75%</td>
<td>B</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>65 % and above but less than 70%</td>
<td>C+</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>60 % and above but less than 65%</td>
<td>C</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>55 % and above but less than 60%</td>
<td>D</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>50 % and above but less than 55%</td>
<td>E</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>Below 50% (C.A + U.E) or below 40 % for U.E only</td>
<td>F</td>
<td>0</td>
<td>Failed</td>
</tr>
</tbody>
</table>

10. Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA)

Grade point average is the semester wise average points obtained by each student in a 10-point scale. GPA for a particular semester is calculated as per the calculation shown below.

\[
GPA = \frac{\sum \text{Credit} \times \text{GP obtained for the subject}}{\sum \text{credit for subject}}
\]

Cumulative Grade point Average (CGPA) is the average grade points obtained by the students till the end of any particular semester. CGPA is calculated in a 10-point scale as shown below.

\[
CGPA = \frac{\sum \text{Credits for semester} \times \text{GPA obtained for the semester}}{\sum \text{credits for the semester}}
\]
GPA and CGPA shall be rounded to two decimal points. The Grade card issued to the students shall contain subject number and subject name, credits for the subject, letter grades obtained, GPA for the semester and CGPA up to that particular semester.

11. Minimum for a pass

a) A candidate shall be declared to have passed a semester examination in full in the first appearance if he/she secures not less than 5.5 GPA with a minimum of ‘E’ grade for the all individual subjects in that semester.
b) A candidate shall be declared to have passed in an individual subject of a semester examination if he/she secures grade ‘E’ or above.
c) A candidate who does not secure a full pass in a semester examination as per clause (a) above will have to pass in all the subjects of the semester examination as per clause (b) above before he is declared to have passed in that semester examination in full.

12. Improvement of Marks

12.1 A candidate shall be allowed to re-appear for a maximum two papers of a semester examination excluding Basic Design / Architectural Design in order to improve the grades already obtained, subject to the following conditions:
12.1.1 The candidate shall be permitted to take the improvement examination only along with next available chance.
12.1.2 The candidate shall not be allowed to appear for an improvement examination of the subjects of the 8th and 9th semester.
12.1.3 The grades obtained by the candidate for each subject in the improvement chance he has appeared for/already existing grades-whichever is better will be reckoned as the grades secured.
12.1.4. First & Second semester will be counted as a single chance and they can improve a maximum of three subjects
12.2 A candidate shall be allowed to repeat the Paper/ Course work in one or more semesters in order to better the C. A. marks already obtained, subject to the following conditions:
12.2.1 The candidate shall not be allowed the improvement of Basic Design / Architecture Design Jury. But he will get a make up chance if he fails to get the minimum marks to get promoted to higher semester as shown in the manuual.
12.2.2 He/She shall repeat the particular Paper/ Course work in a particular semester only once and that too at the earliest opportunity offered to him/her
12.2.3 He/She shall not combine this course work with his regular course work.
12.2.4 He/She shall not be allowed to repeat the course work of any semester if he has already passed that semester examination in full.
12.2.5 The C. A. marks obtained by the repetition of course work alone will be considered for all purposes, and in cancellation of the previous C. A. marks of that semester.
12.3 A candidate shall be allowed to withdraw from the whole examination of a semester only in accordance with the rules for cancellation of examination of the University.
13. Eligibility for Promotion to Higher Semester
A student who has secured required attendance as per the regulation and 50% marks (C.A marks + Jury) for Basic Design / Architectural Design will be eligible for promotion to higher semester.

14. Classification of Successful candidates
i) A candidate who qualifies for the degree passing all the subjects of the ten semesters within six academic years (twelve consecutive semesters after the commencement of his/her course of study) and secures not less than 8 CGPA up to and including tenth semester (overall CGPA) shall be declared to have passed the B.Arch degree examination in FIRST CLASS WITH DISTINCTION
ii) A candidate who qualifies for the degree passing all the subjects of the ten semesters within six academic years (twelve consecutive semesters after the commencement of his/her course of study) and secures less than 8 CGPA but not less than 6.5 CGPA up to and including tenth semester shall be declared to have passed the B.Arch degree examination in FIRST CLASS.
iii) All other successful candidates shall be declared to have passed the B.Arch Degree examination in SECOND CLASS
iv) Successful candidates who complete the examination in five academic years (Ten consecutive semesters) after the commencement of the course of study shall be ranked on the basis of the CGPA in all ten semesters put together. In the case of a tie in the CGPA the total marks of the students who have got same CGPA shall be considered for finalizing the rank. Students who pass the examination in supplementary examination are also covered under this clause

15. Study tour and documentation camp
15.1 Students shall undertake study tours in S3 or S4 and S8 or S9 semesters of the course as part of architectural design and shall undertake a documentation camp in S6 as per the manual attached.
15.2 The tour shall be considered as part of the working periods of the semester.
15.3 The tour may be conducted during the vacation / holidays taking not more than 5 working days, combined with the vacation / holidays if required. Total number of Tour days shall not exceed 15 days.

16. Revision of Regulations
The University may from time to time revise, amend or change the regulations, curriculum, scheme of examinations and syllabi. These changes unless specified otherwise will have effect from the beginning of the academic year following the notification by the University.
B.ARC H. DEGREE COURSE
MANUALS-2008

I. BASIC DESIGN AND ARCHITECTURAL DESIGN I TO VI

1. The Evaluation of Basic Design and Architectural Design I to VI is based on continuous Evaluation and by a panel of Jury.
2. The marks for the Continuous Assessment will be awarded by the staff member in charge.
3. University shall nominate a Chairman, two external examiners and two internal examiners as panel of Jury. First pair of examiners (consisting of one external examiner and one internal examiner) shall conduct the main Jury Examination (Normal chance) and the second pair of external and internal examiners conduct the make up jury examination if required. The staff member in charge of the subject should also be present during the Jury.
4. Internal examiner shall be one member from among the faculty members of teaching institution other than the faculty member who evaluated the work for awarding the internal mark.
5. External Examiner shall be from among the faculty members of other teaching institutions or an Architect registered with the Council of Architecture, incorporated under Architect’s Act 1972, with not less than 5 years experience.
6. Students shall submit the portfolio consisting the assignments done for the subject during the course period, with the approval of the staff-in-charge of the subject latest by fore noon on the previous working day of the commencement of the jury.
7. The staff-in-charge of the subject shall submit a report consisting the details of assignments given and its objectives and weightage given to each work to the Chairman through the Department.
8. The jury members (internal and external examiners together) will evaluate the portfolio on the basis of the report of the staff-in-charge and in consultation with him.
9. Students shall be present and explain their work to the Jury members at the time of evaluating their portfolio.
10. There is no separate minimum marks for the jury examination for Basic Design and Architecture Design I to VI. He shall secure 50% marks in aggregate (C.A marks + Jury) for promotion to higher semester.
11. A student who has appeared for the main Jury and could not get 50 % aggregate mark (C.A marks + Jury) shall be provided a make up chance to make him eligible for promotion to higher semesters. In the make up chance the student will get an opportunity to present his portfolio and get it reevaluated by another panel of Jury.
12. Main Jury for Design shall be conducted before the commencement of the University theory examinations of the particular semester and the make up jury shall be conducted within one week of the completion of the University theory examinations.
13. Students who could not get minimum marks for Jury even after make up chance have to repeat the course work for the paper along with the next batch of students.
14. The Jury members shall submit the consolidated marks to the Chairman on the last day of Jury.
15. The Chairman should submit the mark sheet to the University and a copy of the same should be given to the Head of the Department for publishing in the notice board.
II PRACTICAL TRAINING (VII Semester)
(Immediately after the registration to the Seventh semester B. Arch degree course)

1. Introduction
As per the B. Arch curriculum students shall undergo one semester practical training immediately after the completion of the sixth semester B.Arch examinations. 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 duration of practical training is one semester. Only those who have completed the practical training successfully as directed in this manual shall be permitted to register for the 8th semester B. Arch degree course.

2. Selection of Firm for Practical Training.
Candidate shall select a registered architect with good experience and reputation in the field of Architectural practice for practical training and the same should be approved by the Dept of Architecture of the teaching institution in advance before the commencement of the VI semester university examination. The trainer should have valid registration with the council of Architecture and have a minimum of five years experience in the practicing field. He 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.

3. Type of works to be carried out during training period
The students are expected to get exposure in the following aspects:
   i) Site visit and Site Supervision.
   ii) Preparation of drawing for getting building permissions, working drawings, service drawings etc.
   iii) Preparation of estimates, specifications, contract documents, and tender documents.
   iv) Discussion with clients and other consultants.

4. 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, immediately after the completion of each month. The report shall be duly signed by the Trainer Architect or an authorized officer supervising the work in the prescribed format.

5. 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, original of monthly report, a certificate regarding their conduct and performance of work done during the training period and regarding the successful completion of one semester under the approved Architect /Firm in the absence of which the students will not be permitted to appear for the Jury.
6. **Evaluation of practical training**

A two member jury from the faculty of Dept. of Architecture appointed by the Head of the Department of the teaching institution shall evaluate the qualitative achievement of the trainee during practical training period. Head of the Department of the institution shall publish the Jury marks on the next working day after the completion of the jury. Candidates who could not get at least 50% marks have to reappear for the Jury within a time stipulated by the Department. However he can continue the higher semesters.

### III DISSEMINATION

1. **Aim of the dissertation**
   To provide the students an opportunity to undertake research work on a topic of their choice.

2. **Allotment of Guide**
   The head of Department of Architecture of the teaching institution will allot a guide to each student for supervising His/ Her dissertation work.

3. **Area of research**
   Any topic approved by the Dept. of Architecture of the teaching institution concerned, related to built environment. It shall involve a compilation of secondary data followed by a study at primary level, to achieve the aim and objectives of the research work.

4. **Selection of the topic**
   Students admitted to the 6th semester B.Arch. Degree course shall submit the choices of their topic for dissertation in consultation with the guide within one month after registration to 6th semester, from which the dept. of Architecture of the teaching institution will approve one topic for each student.

5. **Conduct of work**
   The students with the approval of the guide may commence their dissertation work during their training period. The Schedule / Mode of presentation of their work at Preliminary, Intermediate and Final stage with the split-up of C.A. marks pertaining to each stage shall be published by the Department of Architecture of the teaching institution immediately after the commencement of the 8th semester. The students under the guidance of their respective guides shall independently carry out their dissertation work during the 8th and 9th semester degree course period. There will not be any regular class hours set apart for this purpose in the 8th semester.

6. **Evaluation**
   i) The dissertation will be considered as an individual subject of the 9th semester B.Arch. degree course.
   ii) The entire 100 marks allotted to the dissertation will be awarded in the following manner.
   iii) C.A marks to be awarded by the guide. - 50 marks
   iv) The Head of Dept. of the teaching institution shall constitute a jury of three members including the guide for evaluating the final presentation of the dissertation work.
v) The other 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.

vi) The jury members after consultation among themselves will independently evaluate the final presentation as described below.

vii) Evaluation of the final report in the form of bound volume - 10 marks. Evaluation of the technical paper presented in a seminar organized for this purpose by the Dept. of Architecture of the teaching institution - 40 marks.

viii) Head of the Department shall publish the marks of the Dissertation on the next working day after the completion of the Jury.

ix) A candidate who failed to obtain at least 50% of the marks for dissertation (C.A marks + Jury) have to reappear either in full or for the Final Jury (pertaining to the Final report and presentation of the technical paper) only with any regular batch. He/she is required to register with the Head of the Department for the same.

IV THESIS AND VIVA VOCE

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

ii) The Head of the department of teaching institution will allot a guide for each student considering the nature of the work and specialization of the faculty member. As far as possible students preference may also be considered before allotting the guide.

iii) Students admitted to the IXth semester should submit their choices of their thesis project within a month after the commencement of the IXth semester classes in consultation with the guide.

iv) Students shall obtain approval for the project of Thesis and Viva voce from the Department of the teaching Institution.

v) The duration of the thesis will be six months from the date of commencement of the Xth semester B.Arch Degree Course.

vi) 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. The project and its programming shall be worked out by the student himself/herself under the guidance of the guide.

vii) 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 must be with 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.

viii) Students are required to maintain a work diary of the thesis work.

ix) All students are required to schedule their thesis work, get it approved by the guide, at the beginning of the thesis and submit a copy of the same to the thesis coordinator nominated by the Head of the Department.
Internal Evaluation

1. Internal evaluation of each student will be done by a three member jury constituted by the Department. One member of the jury will be the guide. 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.

2. 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 X semester. Each review shall be graphical (including models) and oral presentation.

3. Students have to obtain a total of 40% marks (C.A. marks including the marks awarded by the guide) combining four stages of reviews to become eligible for the external jury.

4. Out of the total 250 marks to be awarded as marks for internal assessment 100 marks will be allotted by the guide and the remaining 150 marks will be allotted through the four reviews, by the jury excluding the guide, the split up of which is as given below.


30 + 45 marks

Review 2 - Review of Previous stage, Arriving at layout 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.

30 + 45 marks


30 + 45 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

10 + 15 marks

5. The 100 marks (30 + 30 + 30 + 10) should be awarded by the guide before the each stages of review.
External evaluation

1. External jury consisting Chairman, one external examiner and one internal examiner appointed by the University shall conduct the Thesis and Viva Voce Examination.
2. The Jury members (excluding the chairman) shall submit the consolidated marks to the Chairman on the last day of Viva Voce and the Chairman should submit the mark sheet directly to the University.
3. Students shall secure 40% of marks in the external jury and 50% aggregate (Internal + External) for successfully completing the thesis and Viva voce. Supplementary chances will be given to the students who failed in the final jury.
4. Students fail in the thesis and Viva- voce can register as a repeat batch in the same Institution immediately after the declaration of the results.

Suggested Areas for Special Topic

1. Structural drawings supported with detailed calculation
2. Detailed estimates and specifications.
4. Equipment and design of any one building service like air conditioning, Electrification and illumination, sanitation and water supply or acoustics.
5. Furnishings, fittings and finishes.
6. Climatic research and its applications.
7. Or any other topic approved by the teaching institution

Documents to be Submitted for the Jury

1. 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 along with the final submission in A3 size format.
2. Two copies of the Final Report shall be submitted on the date and time announced by the Dept. of Architecture of the Teaching Institution.
3. The total number of design sheets for final submission shall not exceed 30 (thirty) A1 size sheets
4. Models to be submitted on the date of Viva voce examination at least by 9 A.M
5. 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 College.
V STUDY TOUR / DOCUMENTATION CAMP FOR ARCHITECTURAL DESIGN

1. The study tour / visiting important places of Architectural interest shall be conducted as part of Architectural Design in III/IV and VIII/IX semesters and shall officially be accompanied by the concerned faculty members handling the subject.
2. The study tour in S3/S4 shall be important places of Architectural interest within South India and S8/S9 shall be within the country.
3. Study tour in S3/S4 shall be of 7 days duration and S8/S9 shall be of 15 days duration. Students shall submit a tour report within 15 days after the tour period.
4. The documentation camp is of 7 days duration and shall be conducted as part of Architectural Design course in VI semester. The concerned faculty members handling the subject shall also be present in the camp.
5. The documentation camp consists of preparation of measured drawings of selected buildings / historic places inside and around the state of Kerala.
6. The originals of materials produced as part of the study tour and camp shall be submitted to the Department of the concerned college and such materials submitted shall be the property of the Department.
7. The study tour/documentation camp and materials produced will be treated as an assignment and marks will be awarded accordingly.
## DETAILED SCHEME
(Annexure - I)

### Combined First and Second Semester (S₁ S₂)

<table>
<thead>
<tr>
<th>Course no.</th>
<th>Name of the Subject</th>
<th>Credits</th>
<th>Hours/Week</th>
<th>Duration of exam</th>
<th>Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L  T  P</td>
<td>W  J  S</td>
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<tr>
<td>08AR1101</td>
<td>Basic Design *</td>
<td>10</td>
<td>--- 6</td>
<td>--- 200</td>
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<tr>
<td>08AR1102</td>
<td>Building Materials &amp; Construction - I</td>
<td>6</td>
<td>1 2 4</td>
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<td>08AR1104</td>
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* * Basic Design Evaluation shall be conducted by a Jury appointed by the University as per the manual

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

### Third Semester (S₃)

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* Architectural Design-1 Evaluation shall be conducted by a Jury appointed by the University as per the manual

**L** - Lecture  **T** - Tutorial  **P** - Drawing/Studio/Practical  **W** - Written University Examination  **J** - Jury  **S** - Sessional Marks
### Fourth Semester (S₄)

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*Architectural Design-II Evaluation shall be conducted by a Jury appointed by the University as per the manual.

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*Architectural Design-III Evaluation shall be conducted by a Jury appointed by the University as per the manual.

**L** - Lecture  
**T** - Tutorial  
**P** - Drawing/Studio/Practical  
**W** - Written University Examination  
**J** - Jury  
**S** - Sessional Marks
### Sixth Semester (S6)

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* Architectural Design-IV Evaluation shall be conducted by a Jury appointed by the University as per the manual

L - Lecture  T - Tutorial  W - Written University Examination  J - Jury  S - Sessional Marks

### Seventh Semester (S7)

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* Practical training as per the manual after the successful completion of Sixth Semester

J - Jury

### Eighth Semester (S8)

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* Architectural Design-V Evaluation shall be conducted by a Jury appointed by the University as per the manual
L – Lecture; T – Tutorial; P - Drawing/Studio/Practical; W - Written University Examination; J- Jury; S - Sessional Marks

### Ninth Semester (S\textsubscript{9})

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* Architectural Design-VI Evaluation shall be conducted by a Jury appointed by the University as per the manual

** Evaluation of dissertation shall be conducted as per the manual
L – Lecture; T – Tutorial; P - Drawing/Studio/Practical; W - Written University Examination; J- Jury; S - Sessional Marks

### Tenth (Final) Semester (S\textsubscript{10})

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**Thesis viva voce shall be conducted as per the manual

P - Drawing/Studio/Practical
LIST OF ELECTIVES

Electives-I
1. Transportation Planning
2. Vernacular Architecture
3. Environmental Management

Electives-II
1. Architectural Conservation
2. Energy Efficient buildings
3. Research Methodology

Electives III
1. Environmental Psychology
2. Sustainable Architecture
3. Tourism and Environment

Electives IV
1. Services in tall buildings
2. Cost Effective Technology in Building Construction
3. Regional Planning
Objectives:

Basic Design provides the foundation to principles, process and vocabularies of architecture and to equip the students to understand the conceptual, visual and perceptual issues involved in the design process.

To understand the architectural elements as determining factor to perceive and articulate space, to stimulate form–space relation and to understand the principles of composition in the organization of space, shape, form, colour and texture.

To introduce visual design principles which form the basis of architectural design through a set of exercises on visual composition in 2D and 3D. The exercises are oriented to develop awareness of relationship between space, function and architecture. The course will have emphasis on analytic study of ergonomics, relationship between function, form, materials and structural systems.

The Course also prepares ground for the students to gain an understanding into the fundamental issues in architectural design and develop skills to create architectural solutions for simple problems.

Module-1

• Introduction to Architecture - meaning - importance – relevance.
• Fundamental elements of design and their definitions – point, line, shape, form, structure, space, texture, value and colour.
• Introduction to the principles of design – unity, balance, symmetry, proportion, scale, hierarchy, rhythm, contrast, harmony, focus, figure and ground etc.
• Perception of colour and light
• Use of patterns, composition, abstracts etc in design

Module-11

• Anthropometric studies – average measurements of human body in different postures, its proportion and graphic representation, application in design of simple household and street furniture.
• Basic human functions and their implications for space requirements. Minimum and optimum areas for various functions.

Module-111

• Study of simple structural systems and behavior under load.
• Working model of structures (Like post and lintel, cantilever, trusses, arches, space frame, suspension etc)

Module-1V

• Detailed study of spaces such as living, dining, bedroom, kitchen, toilet etc. including furniture layout, circulation, fixtures, openings, lighting, ventilation, orientation etc.
• Visual analysis of built forms, sculptural and spatial qualities, analysis of solid and void relationship
• Integration of form and function in the design of single room spaces (bus shelter, phone kiosk, snack corner, ATM Center, milk booth, security cabin, flower kiosk, temporary shelter, viewing gallery etc.) stressing on concept generation and development of rich design process.

References

Module I

Introduction to Vernacular and conventional Building Materials


Clay Products and Ceramics: Tiles – terra cotta – stoneware, ceramic materials, properties, raw material for manufacture and uses.


Cement: Composition, Manufacture, Properties and uses.

Concrete-Plain Cement concrete and Reinforced cement concrete: Composition, Properties and Uses.

Module II

Introduction to all types of foundations

Shallow foundation-wall footing, column footing.
Functions of foundation – Materials used for construction of foundations.
Damp Proofing.

Measured drawings: Wall Footing, column footing

Module III


English and Flemish bond in detail 1, 1½, 2, 2½ brick walls – corners, junctions and cross junctions – special bonds like rat trap, herring-borne bonds, decorative brick work – brick jallies.

Measured drawings:

English bond 1, 1 ½, 2, 2 ½ brick walls
Flemish bond 1, 1 ½, 2, 2 ½ brick walls
Bond in column, cross walls
Jallies ½ & 1 brick jallies

Module IV

Introduction to carpentry—General principles, Details of joints in timber –Doors – types- panelled, battenled, glazed & sliding.

Windows –types- panelled, battenled, glazed, top hung, pivoted - gable window, dormer window, bay window, French window.

Terms for various members, fasteners and fixtures used in joinery.

Measured drawings:
Timber joints
Panelled doors, sliding doors
Panelled windows, glazed windows

References

6. Relevant BIS Codes

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<td>QII – 4 questions of 10 marks each from Module I, II, III, IV with choice to answer any two</td>
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| **PART-B (Drawing)**          |
| QIII – 4 questions of 20 marks each from Module II, III & IV with choice to answer any two |
Module I

A brief introduction to World Architecture

**Prehistoric:** Factors of evolution. General characteristics.

**Ancient Egypt:** History, evolution and characteristics – Great Pyramid at Giza.

**Ancient Mesopotamia:** History, evolution and characteristics - Ziggurat

**Ancient Greece:** History, evolution and characteristics - Classical Orders, Optical corrections - Acropolis, Agora, Stoa, Theatre

**Ancient Rome:** History, evolution and characteristics - arches, lintels, Roman engineering skills- Pantheon, Colosseum, Forum, Basilica

**Introduction to Eastern Architecture:** Pre colonial - Pagoda, temple.

**Pre Colombian America:** History, evolution and characteristics with one building as example

Module II

**Indus Valley Civilisation:** City Planning. Domestic Architecture. Building materials and construction techniques -- Mohenjodaro, Harappa

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

**Buddhist:** Major typologies – Stupa, Chaitya hall, Vihara. Development of Chaitya arch -- Lomas Rishi. The Great Stupa at Sanchi. Chaitya Hall, Karli. Vihara 1 at Ajanta

Module III


**Hindu temple architecture:** Principles of Design and Construction


Module IV

**Introduction to Kerala Architecture**


References


**University Examination Pattern**

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
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<tbody>
<tr>
<td>Q1</td>
<td>8 short type questions of 5 marks, two from each module</td>
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<tr>
<td>QII</td>
<td>2 questions A and B of 15 marks of Module I with choice to answer any one</td>
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<td>QIII</td>
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<td>QIV</td>
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<tr>
<td>QV</td>
<td>2 questions A and B of 15 marks of Module IV with choice to answer any one</td>
</tr>
</tbody>
</table>
PART -1

Module I
Introduction to Architectural drawings using different mediums such as pencil, ink, types of papers, reproduction methods. Demonstration of drawing instruments and their use.
Concept of orthographic projections, drawing conventions such as plan, elevation and section, symbols, lettering, dimensioning, values in drawn lines, tone, texture, color and light, sciography.
Architectural representation of materials on drawings, terminology and abbreviations used in architectural drawings. Different types of lettering for titles and annotation of drawings.

Module II
MEASURED DRAWING
Use of scale in drawings, scaling and measuring of 3D forms and representing them in plan, elevations and sections using different scales. Reduction and enlarging of given drawings, tracing in pencil and ink medium.
Measured drawing to scale of furniture pieces, rooms, doors, windows etc. Drawing by method different polygons, circle, ellipse, hyperbola, parabola, and spiral.

BUILDING DRAWING
Drawing Plan, elevation, sections and details of buildings.
Representation of wall thickness and openings in walls in plan and section.
Measured drawing / documentation of small buildings / structures

PART-11

Module III
Introduction to visual arts - its relation to architecture – study of fundamentals of visual arts- - line, shape, form, space, colour, value, and texture - use of various media like pencil, crayon etc three dimensional composition of spaces and their graphic expression- exercises given to meet the requirements of elements of art.

Module IV
Principles of visual art – balance – unity – pattern - emphasis, movement, rhythm, contrast are introduced - exercises to explain the conditions.
Exposure to the life and works of famous artists, art forms and movements

References

University Examination Pattern
Q1 – 2 questions A and B of 50 marks with choice to answer any one
QII – 2 questions A and B of 50 marks with choice to answer any one
Module I

ORGANISATION OF FORMS AND SPACES
Definition of architecture, Primary elements of architecture – Point, Line, Plane, Volume. Primary forms, properties of form, transformation of forms - dimensional transformation, subtractive, additive forms, organization of additive forms - Articulation of forms.
Space defining elements-horizontal, vertical, openings in space defining elements, Spatial relationship, Spatial organization.

Module II

PRINCIPLES OF DESIGN
Exploration of the basic principles of composition such as Proportion, Scale, Balance, Rhythm, Unity, Contrast, Character with building examples.
Ordering Principles such as Axis, Symmetry, Hierarchy, Datum, Rhythm & Repetition.
Visual Perception-proximity, Repetition, simplest and largest figure, continuity and closure, figure/ground relationship.

Module III

ARCHITECTURAL DESIGN PROCESS
Data, Site Study, Analysis & Synthesis, Design Brief, Concept and Design

Module IV

WORKS OF MASTER ARCHITECTS

References

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Introduction to computer fundamentals including- algorithms, simple model of computer, data representation etc–
Computer evolution – concepts of main frames, workstations and personal computers-
Hardware / software – operating system

Module II
Information Technology and network concept – INTERNET
Introduction to DTP and bitmap editors
Introduction of estimation package – appropriate packages.

Module III
Windows basic introduction to CAD packages like AutoCAD, ArchiCAD etc. Setting up and controlling AutoCAD/ArchiCAD drawing environment – creating and editing commands

Module IV
Organizing a drawing with layers – Advanced geometry editing & using blocks inquiry tools –CAD design center.

Text annotation – Creating hatch patterns - dimensioning Plotting slide presentation &. Importing / exporting files.

References

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module – I
Forces: Force and Moment Concepts – Force system acting on a body and their resultant – equilibrium concept and free body diagram, frictional force – simple practical problems related to the above cases. Beams – Different types of Beams – Support conditions - Different types of loads

Module – II

Module III
Discussion on the load causing shear stress – simple problems on above cases

Module IV
Analysis of simply supported, cantilever and over hanging beams – shear force and bending moment diagrams – analytical and graphical
Definition of a structure – Function –types of loads acting in a structure with introduction to Indian Standards – Introduction to design principles

References:
4. M. Chakraborthi “Strength of Materials”, SK Kataria & Sons, New Delhi,
6. Dr D.S. Kumar – Textbook of Engineering Mechanics , SK Kataria & Sons, New Delhi,
7. R.K. Rajput, Textbook of Engineering Mechanics, Danpat Rai & Sons, New Delhi,

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I

SCALES: Construction of plain scale and diagonal scale
CONIC SECTIONS: Construction of conic sections given the distance of focus from the directrix and eccentricity. Construction of ellipse – concentric circle method, rectangular method and intersecting arc method. Construction of parabola by rectangular method and by tangent method. Construction of hyperbola – given the asymptotes and a point on the curve
SPIRALS: Construction of Archimedean spiral and Logarithmic spiral
HELIX: Construction of cylindrical helix, conical helix and square helical spring

Module II

First angle projection
Points and Lines: Orthographic projection of lines for any given condition, determination of true length, traces and inclinations to the planes of projection of any given line
Planes: Traces of planes, plane figure inclined to one or both the reference planes

Module III

Intersection of surfaces: Line of intersection of two prisms, two cylinders and cone
Section of solids: Section of simple solids by planes inclined. True shape of sections.
Development of surfaces: Development of surfaces of simple solids, prisms, cylinders, pyramids, cones, spheres and truncated solids.

Module IV

Isometric Projection: Isometric scale, isometric view of planes, simple solids, truncated solids, combination of objects
Perspective projection: Perspective projection of simple solids and their combinations by visual ray method and vanishing point method.

References

University Examination Pattern

Q1 – 8 short type questions of 5 marks each, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I

**Calculus**: Successive differentiation, \( n^{th} \) derivative, Leibniz rule, Curvature, Circle of curvature, Evolute. Application of integration - Area bounded by plane curve, length of plane curves, volume of a solid of revolution, surface area of revolution (Cartesian only).

Module II

**Analytic geometry**: Conics, parabola, ellipse, hyperbola, rectangular hyperbola - derivation, properties, Tangents, normals.

Module III


Module IV

**Probability distribution**: Probability density function, distribution function, properties, mathematical expectation, mean, variance. Binomial, Poisson - Mean and variance, Normal distribution.

References

4. Miller and Frieund,” Probability and Statistics for Engineers”, Pearson Education

<table>
<thead>
<tr>
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<td>QV</td>
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</tbody>
</table>
Objective
To stimulate creative thinking of the students.

To introduce the students the principles of Architectural design and application in the design of single space built environments meant for single as well as multifunctional activities.

Short project – Multiuse, single unit spaces such as cafeteria, prayer hall etc…

Major Project – Multi use, multifunctional spaces involving vertical and horizontal interconnection between many spaces such as Nursery school, Health centre, cottages etc…

References
1. Maitland Graves, ‘Treat of colour and design’
2. Edward.D. Mills, ‘Planning the architects’ handbook’
3. De. Chiara and Callender, ‘Time saver standards or building types’
4. Andrew Alpern, ‘Handbook of specialty elements in Architecture’
5. Julius Panero & Zelnik, ‘Human dimensions and Interior space’
6. Neuferts’ Architects data
Module I


Execution problems in loose and clayey soil, Shoring, Timbering.

Drawings – Raft Foundation, Pile Foundation, Well Foundation

Module II

Metals and metal products as building material:

Steel – Composition, Properties, anticorrosive measures, mechanical and heat treatment of steel - Market forms of steel : Steel for Reinforcement - Hot rolled bars, CTD Bars, TMT bars , Welded wire fabrics; Steel for Pre stressed concrete; Structural steel; Stainless steel, steel alloys, current developments.

Iron - Brief study on manufacture, composition, properties and uses of cast iron, wrought iron, pig iron.

Other metals : Aluminium and its alloys, copper and its alloys

Module III

Steel doors and windows – Standard sections – Channel, box, extruded etc. – Connections – Specifications

Aluminium doors and windows – Standard sections – Connections and specifications.

Door and window fittings – Door and window hinges like butt hinges, pin hinges, parliament hinges, garnet hinges, counter flap hinges, strap hinges, piano hinges, auto-closing hinges - Door and window bolts like sliding door bolt, tower bolt, flush bolt – door handles- door locks- other fastenings to door and windows like hook and eyes, window stays, door stoppers, door closers, caster wheels, floor springs, pivots, magnetic catchers for wooden cupboards etc.

Drawings – Steel windows and doors, Aluminium doors, windows and hand rails, Door and window fittings.

Module IV


References:

9. Relevant BIS Code Pertaining to Materials of Construction

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<tr>
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<tbody>
<tr>
<td>PART-A</td>
</tr>
<tr>
<td>Q1   – 8 short type questions of 5 marks, two from each module</td>
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<tr>
<td>QII  – 4 questions of 10 marks each from Module I, II, III, and IV with choice to answer any two</td>
</tr>
<tr>
<td>PART-B (Drawing)</td>
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<tr>
<td>QIII – 4 questions of 20 marks each from Module I, II, III &amp; IV with choice to answer any two</td>
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</table>
Module I

Beginning of Islamic Architecture in India:
A brief introduction into origin & characteristics of Islamic architecture: building types, elements, structural systems, construction techniques
Imperial style of Delhi: 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

Module II

Tughlaq dynasty: Tomb of Ghias-Ud-din, City of Tughlaqabad, City of Firoz shah Kotla, Khirki Mazjid, Octagonal tomb of Telengani

Module III

Provincial styles:
Jaunpur: - Atala Masjid, Jami Masjid
Bengal: - Dakhil Darwaza, Firoze Minar, and Adina Masjid.
Malwa: - Hindola mahal, Jami Masjid at Mandu, Jahaz Mahal, Hawa Mahal
Deccan: - Charminar at Hyderabad, Tomb of Golconda.
Bijapur: - Jami Masjid, Golgumbaz.

Module IV

Evolution of Mughal style and the different eras of rule:
Early period: Babar, Humayun, Shershah
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), and Jami Masjid at Delhi.
Aurangazeb: - Tomb of Rabi Durrani at Aurangabad, Moti Masjid at Delhi fort.

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<td><strong>QIV</strong></td>
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<td><strong>QV</strong></td>
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</tbody>
</table>
Module I
Introduction to basic elements and concepts of visual design: line, texture, colour, form balance, proportion, size, shape, mass, unity and verity. Exercises on visual composition and layout. The use of grids in graphic design. Concept of Visual Design, visual structure, visual interest, visual analysis.

Module II

Module III
Perspective drawing- Leonardo’s window- Vanishing point and orthogonal lines- Single point perspective- Overlapping and intersection-Two point perspective – Overlapping and intersection into two point perspective- Three point perspective – foreshortening.

Module IV
Figure drawing- Proportion of the male and female- Human skeletal system- Skull- Hand and legs bone – Drawing a human model -Cartoon construction – Construction of head – Facial expression – Squash and Stretch on head – Character types – Cute, screwball, goofy character – basic feathers of the different character types. Sculpture making – Relief sculptures, round sculptures using clay. Molding and casting using plaster-of- Paris and cements

References
5. Preston Blair, ‘Cartoon Animation’

University Examination Pattern
Q1 – 8 short type questions of 5 marks each, two from each modules
QII (Drawing) – 2 questions A and B of 60 marks with choice to answer any one
Module I
Theory of simple bending, bending stresses in symmetrical beams, section modulus, bending of composite beams

Module II
Shear stresses in beams, concept of shear stresses in beams, distribution of shear stresses on simple cross sections.

Module III
Torsion – Concept of twisting of beams, torsion equation, torsional stresses in simple sections, Slope and deflection of statically determinate beams, simple problems using double integration, Macaulay’s Method, Moment area method.

Module IV
Columns, different types, discussion on radius of gyration, elastic stability of slender column – Euler’s formula for Panel end columns and columns with other end conditions, Rankine’s formula and IS code Formula

References:

University Examination Pattern
| Q1   | 8 short type questions of 5 marks, two from each module |
| QII  | 2 questions A and B of 15 marks of Module I with choice to answer any one |
| QIII | 2 questions A and B of 15 marks of Module II with choice to answer any one |
| QIV  | 2 questions A and B of 15 marks of Module III with choice to answer any one |
| QV   | 2 questions A and B of 15 marks of Module IV with choice to answer any one |
Module I
Chain Surveying: Principles of chain surveying, Study of instruments used in chain surveying, base line, tie line, Offsets – perpendicular offset, oblique offset, Field book, Obstacles in chain surveying, Errors in chaining, Preparation of plans, Computation of areas by division into triangles, trapezoidal rule and Simpson’s rule, Planimeter and Pentagraph.

Module II
Compass Surveying: Study of prismatic compass, Compass traversing – open and closed traverses, Bearing and its designation, Local attractions and correction of traverse for local attraction, Errors in compass surveying, Plotting adjustment of closing error in compass traverse.

Plane table surveying: Study of instruments and accessories, Setting up of plane table, orientation, leveling and centering method of plane tabling – radiation, intersection, resection and traversing – Two and three point problems – their practical application and methods of solution, Advantages and disadvantages of plane table surveying, Errors in plane tabling.

Module III

Module IV
Levelling: Principles of leveling; Study of instruments – Dumpy level and leveling staff, Temporary adjustments of level, Booking and reduction of levels – ‘line of collimation method’ and ‘rise and fall method’, Difficulties in leveling, Reciprocal leveling, Sources of error in leveling, Basic ideas on plotting of longitudinal and cross sections, Contouring – Contour interval – Characteristics, uses of contours.

References:
3. Dr. P.B. Shahani, ‘Surveying and Levelling’, Vol I and Vol II
6. David Clerk, ‘Surveying’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Introduction to Climate: Need to study climate – Weather and Climate – Tilt of earth axis – Solar radiation quantities – Sun path diagram – Earth’s thermal balance and atmosphere – Global wind pattern – Thermal forces, trade winds, westerly and polar winds

Module II
Elements of Climate: Temperature, humidity, Wind, Precipitation – Measurements of climatic elements – Special characteristics and vegetation of a region – Graphical representation of climatic information – Micro and macro climate – Urban and rural climate – Site climate

Module III
Tropical climate – Classification of Tropical climates and its characteristics – warm-humid, warm-humid island, hot dry desert, hot dry maritime desert, composite or monsoon and tropical upland climates – Climate of Kerala – Kerala rain data

Module IV

References
2. B. Givoni, ‘Man, Climate and Architecture’
4. T.A. Markers & E.N. Morris, ‘Building Climate and Energy’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Objective
To create an awareness and understanding of the three dimensional forms through training in building model making.

Carpentry - Study of carpentry hand tools and power tools - Introduction to basic carpentry processes and joints - Different type of wood fastening

Welding – Introduction to welding - Classification of welding - Study gas welding tools and arc welding tools - Welding joints


Plumbing - Study of hand tools, Different types of pipe joints

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<td>Attendance</td>
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<td>Class Work</td>
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<tr>
<td>Test</td>
<td>10 marks</td>
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<tr>
<td>Documentation</td>
<td>10 marks</td>
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</tbody>
</table>
Objective
To introduce the students the functional, symbolic, social-needs, and the link between the architectural space and human activities. Design of multifunctional residential buildings involving vertical and horizontal interconnection between spaces.

Major Project – Multifunctional multilevel Residential buildings
Short Project – Preparation of Municipal drawings.

References
1. Edwad d. Mills, ‘Planning the architects handbook’
2. D. Chiara & Callender, ‘Time saver standards for building types’
3. Neufert’s Architects Data
5. BIS, various codes of practice and National Building code of India
Module I


Study of plastics – thermosetting and thermoplastic, resins, fabrication of plastics, polymerization and condensation - Application of plastic in building construction.

Module II

Industrial Timber products:
Timber board – Veneers, Plywood, Block Boards, Particles Boards, Hard Boards , Fibre board, Block board and Lamin board
Wooden flush door shutters, Glulam, Laminates-decorative laminates.

Timber Floors – Single, double and framed floors with joints between joist with wall plate, joist with beam and sub beam with main beam, strutting of joists.

Module III

Roofing Tiles – Clay Mangalore, Allahabad and country type tiles, their properties and method of fixing.
Light roofing materials - Galvanised iron sheets, asbestos cement sheets, corrugated aluminium sheets, PVC sheets and other light roofs like glass fibre reinforced plastic sheets, bituminous sheets with accessories shingles etc. and method of their fixing.

Detail drawing – Steel – King post truss, Queen post truss-angular and tubular truss, details of covering and gutter details.

Module IV

Introduction to framed structures. - Concrete floors, walls, beams and columns.

Reinforced cement concrete-Reinforcements used in RCC – Suitability & performance - Reinforcement details of RCC elements like column, beam, lintel, slab, waist slab etc. BIS specification.

Drawings –
(1) Reinforcement details of column, beam, lintel, slab & waist slab.
(2) Construction and expansion joint details
References:

University Examination Pattern
PART-A
Q1 – 8 short type questions of 5 marks, two from each module
QII – 4 questions of 10 marks each from Module I, II, III, IV with choice to answer any two

PART-B (Drawing)
QIII – 4 questions of 20 marks each from Module I, II, III &IV with choice to answer any two
Module I

Early Christian Architecture
Evolution of Church form, surface treatment and materials of construction, e.g., St. Peters Rome (earlier one)
Byzantine Architecture
Greek cross and Latin cross plans, Technique adopted to construct domes, surface treatment and material of construction. e.g., Hagia Sophia

Module II

Romanesque Architecture
Design evolution, Planning principles and structural details of Romanesque architecture.
Italian Romanesque architecture – Architectural characteristics of the churches of northern Italy, Central Italy and South Italy, eg. Pisa Cathedral
French Romanesque – Abbey-Aux-Hommes at Cane.
British Romanesque – Durham’s Cathedral

Module III

Gothic Architecture
Evolution of structural systems in Gothic Architecture – Arches, vaults, flying buttress, pinnacles etc.
Characteristics of British Gothic Architecture – West Minister Abbey
Characteristics of Italian Gothic Architecture – Milan Cathedral.

Module IV

Renaissance Architecture
Introduction of different styles existed in renaissance period.
Italy – Works of Michael Angelo, St. Peters, Rome.
Works of Bramante, Florence, Villa of Pope Julius.

References
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<td>QV</td>
<td>2 questions A and B of 15 marks of Module IV with choice to answer any one</td>
</tr>
</tbody>
</table>
Module I
Introduction to vector drawing program- Adobe Illustrator, Freehand, Coral draw etc. properties of vector graphics – Stroke and fill tools, Bezier drawing with pen tool - Creative use of shape- using the path finder – Boolean operations using shapes. Vector drawing techniques – node editing – tracing from raster images - using colour in vector graphics – different color palettes – gradient and gradient mesh- Using type tools and type controls- type along the path -use of filter and effects

Module II

Module III
Techniques of representation to acquire the necessary skill to represent visual images. Exercise on converting visual images into 2D representation. Corporate design – Student design a corporate logo. Symbols and signage- graphic symbol design project. Poster design project- Student design a poster for an event/cause/awareness campaign – Brochure design project- Student design a brochure for an event/cause/awareness campaign.

Module IV (Evaluation may done by internal assessment)
Color photography, communicating ideas through photography. Study of photographic images, documentary and reportorial techniques, emphasis on experimental manipulation. The study of the chemistry, optics and techniques of photography as a means of understanding and controlling the process of photography for visual expression. Techniques of using studio camera. Styles of lighting, set building and design. Process and practice of photographic illustration. Various trends in photography. Photography as applied to various factors like different locations, time, materials and environment. Introduction to film theory and design for the dynamic media. The course will help the students to plan and script a storyboard. It will introduce students to the procedures in using digital video equipments to shoot and computerized equipment for non-linear editing. Students study camera techniques, editing concepts, including the aesthetics of good editing, titling incorporating digital graphics. The students will make a short video program during the course.

References
2. Luanne Seymour Cohan, ‘Adobe illustrator CS Creative studio’

5. Roger Walton, ‘The Big Book of Graphic Design’ (Big Book (Collins Design))

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<thead>
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<tbody>
<tr>
<td>Q1    – 8 short type questions of 5 marks each, two from each modules</td>
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<tr>
<td>QII (Drawing) – 2 questions A and B of 60 marks with choice to answer any one from first three modules only</td>
</tr>
</tbody>
</table>
Module I
The nature of sound - propagation of sound-velocity, frequency and wavelength of sound. Sound pressure - Sound intensity and loudness- Decibel and Phons- The human ear and hearing characteristics.

Module II
Room acoustics - Behavior of sound in enclosures - sound reflection, diffusion and diffraction room resource Sound absorption coefficient - Reverberation Reverberation time - Calculation of reverberation time - Sabine's formula - Erying's formula - Acoustical defects in the enclosed spaces.

Module III

Module IV
Sound absorptive materials and construction - Porous material - membrane absorbers -cavity resonators - space absorbers - variable absorbers - their absorptive characteristics - mounting and distribution of absorptive materials - measurements of sound absorption Acoustical design of auditoriums - Room for music, multipurpose rooms - Recording and broad casting studios.

References
2. Knudson and Harris, ‘Acoustical Designing to Architecture’
3. Ducan Templation, ‘Acoustics in the built environment’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Built Environment – History of Built Environment - Passive Environmental control mechanism – Influence of industrial revolution on Built Environment – Modern/International architecture & its influence – Factors influencing thermal comfort – Passive design of building: Design considerations for shelter in the tropics – Basic needs of shelter in different climates

Module II
Principles of passive design – Heat flow to built environment – Conduction, Convection, Radiation – Thermo physical properties of building materials – Thermal properties of roof, wall, window etc. – Time lag – Solar gain factor – Ventilation and air movement – Functions of Ventilation – Air movement in and around the building – Building elements that effect ventilation – Control by orientation – Size and proportion of windows – Stack effect

Module III
Shelter for warm-humid climate – Basic climatic conditions – Orientation, openings and ventilation – Requirements in form, planning, layout – Specification for walls and roofs – Effect of special characteristics of site like water body, vegetation etc.

Module IV
Climate of Kerala – Rainfall data – Traditional buildings of Kerala – Elements of thermal comfort – Design and planning aspects – Climatic functions and impacts of spaces like courtyard, attic, verandah, etc. – Choice of materials for construction- Transition of built form after Gulf boom

References

University Examination Pattern
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QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I

Development of computer and its application
Evolution of Computers, Organization of computer systems, Developments in hardware and software technology. Internet and on-line resources. Overview of current applications CAD concepts. Computer as a design medium, applications and limitations of computer in Architecture.

Module II

Computer Aided Drafting
Concept of Computer aided drafting – Conventional drafting and CAD. Brief overview of related software. Units of a CAD workstation, their operation and critical parameters. Description of building geometry and topology, General concepts.

Module III

Computer Graphics
Understanding 3D co-ordinate system – Using view ports. 3D drawing & editing commands, solid modeling – Advanced solid modeling commands – Editing solids.

Introduction to rendering in 3D – Rendering process, animation and virtual reality. Enhancing digital images from CAD applications using other packages.

Module IV

Computer Aided Data Analysis
Database management systems, Basics of data analysis, Software for data analysis. Requirements of Engineering/Architectural databases, Office management systems. Analysis of structural problems, cost estimation and analysis. Analysis of project network, Analysis of environmental aspects such as lighting and sound. Distribution using simplified models.

References
1. Shyam tikoo, ‘AutoCAD 2008’
2. DH Sanders, ‘Computers Today’ Mc Graw Hill

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Analysis of statically indeterminate beams (propped cantilever and fixed beams) consistent deformation method

Module II
Analysis of continuous beam by theorem of three moments and slope deflection methods.

Module III
Analysis of continuous beam by moment distribution method. Shear Force and bending moment diagram and discussion of elastic curves for various loading conditions.

Module IV
Analysis of simple portal frames with or without sway by moment distribution method, Shear force diagram, bending moment diagram.

References :

University Examination Pattern
Q1  – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Objectives
To provide an opportunity to analyze, understand the project brief, site and the cultural context of the design problems. To introduce the students the design of multi functional spaces with complex features incorporating built and unbuilt spaces.

Major Project – Projects may be on recreation, assembly, convention, institution/education use etc…

Short project- Preparation of Working drawings of buildings or selected areas of buildings.

References:
1. Edwad D. Mills, ‘Planning the architects handbook’
2. D. Chiara & Callender, ‘Time saver standards for building types’
3. Neufert’s Architects Data
4. Ramsey/Sleeper, ‘Architectural graphic standards’
5. BIS, various codes of practice and National Building code of India
Module I

Materials for Finishes - Wall and roof finishes - properties – application - maintenance – Study of advances in field of materials- Finishes in plasters, cement, timber etc. – epoxy, polyurethane products. Natural Floor Finishes – Shahabad, Kotah- different types of Marble, Granite etc. Artificial Floor Finishes – Ceramic tiles, Mosaic tiles, Cement tiles, etc.

Module II

Introduction to vertical transportation system – Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral, helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever - foundations, finishes for staircases- Design of staircases – details of RCC, wood, steel staircases – fixing details and specifications – detailing out of handrails and balusters – materials and fixing details.

Drawings – RCC, wood and steel staircases.

Module III

Lifts – Calculation of requirements and number of lifts considering quality and quantity of services – details of construction of lift shaft, lift pit, lift car – machine room etc. Standard sizes – Lifts of various types such as passenger, goods, hospital etc. Modern development in the field of vertical transportation – Capsule lift.

Escalator – Different types – provision to be made during construction – installation of escalator.

Drawing – Typical lift shaft, lift pit and machine room details, Capsule lift, Escalator details

Module IV


References:
6. Relevant BIS Code Pertaining to Construction of Materials
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<tr>
<th>University Examination Pattern</th>
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<tbody>
<tr>
<td><strong>PART-A</strong></td>
</tr>
<tr>
<td>QI    -- 8 Short type questions of 5 marks, two from each module</td>
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<td>QII   -- 2 Questions A and B of 10 marks each from Module I, with choice to answer any one</td>
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<td>QIII  -- 2 Questions of A and B of 10 marks each from Module IV, with choice to answer any one</td>
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<td><strong>PART-B (Drawings)</strong></td>
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<tr>
<td>QIV   -- 2 questions of A and B of 20 marks each from Module II, with choice to answer any one</td>
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<tr>
<td>QV    -- 2 questions of A and B of 20 marks each from Module III, with choice to answer any one</td>
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</tbody>
</table>
Module I

Module II
Indian Colonial Architecture-Portuguese
Introduction to Portuguese colonial architecture in India. The styles and trends of architecture brought by Portuguese to India and their evolution – The Impact of Portuguese architecture in India – The characteristics of Portuguese Colonial Architecture with examples from Goa-Bom Jesus Cathedral Complex-Old Goa-Fountainahs

Module III
Indian Colonial architecture-French
Introduction to French colonial architecture in India. The styles and trends of architecture brought by French to India and their evolution – The Impact of French Architecture in India – The characteristics of French Colonial Architecture with examples from Puducherry, Mahe etc

Module IV
Indian Colonial architecture-British
The styles and trends of architecture brought by British to India and their evolution – The impact of Indo-Sarcenic style on the British Architecture in India – The characteristics of British Colonial Architecture with examples from work of Edwin Lutyens.

References:
1. Sir Banister Fletcher’s – “A History of Architecture”
2. History of World Architecture series
4. Colonial architecture of India

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII  – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV  – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV   – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Sources of water supply: Quantity of water-forecasting population-rate of consumption for various purposes-factors affecting the consumption of water
Quality of water: impurities in water, drinking water standards-physical, chemical and biological analysis
Treatment of water: Sedimentation-coagulation-filtration and disinfection

Module II
Design of sedimentation tank-slow sand filter and rapid sand filter
Distribution system of water: Methods of distribution-design of distribution system-Hardycross method-method of layout of distribution pipes-pipe appurtenances

Module III
Sewage: Types of sewage-quantity of storm water-characteristics of sewage
Sewerage systems: Drains- catch basins-manhole-flushing tanks-sewer materials- inspection chamber-traps- principles of house drainage- systems of plumbing

Module IV

References
2. K. N. Duggal, ‘Elements of Public Health Engineering’, New age international
3. S. K. Hussain, ‘Water supply and Sanitary Engineering’
4. Chatterjee, ‘Water supply and Sanitary Engineering’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Three hinged arches. –Circular and Parabolic shapes –Normal Thrust and Radial shear -BMD
Two Hinged Arches- Circular and Parabolic Shapes-N ormal Thrust and Radial Shear- BMD

Module II
Analysis of Cable structures- Suspension Bridges-Saddle and Fixed Pulley arrangement.
Analysis of continuous beams, One leg frames, symmetric portal frames and Sway frames using Kani’s Method.

Module III
Stiffness method of analysis-propped cantilever-, continuous beams-Direct stiffness method-analysis of trusses-BMD and SFD
Introduction to any one Structural analysis and design software package like STAAD PRO,ANSYS,NISA CIVIL etc(one assignment should be given )

Module IV
Concrete Technology - Materials used and its properties – Mix proportion – Volume and weight batching –
Water cement ratio – Mixing and placing of concrete – Curing – Development of strength – Grade of concrete –
to reinforced cement concrete – Importance of mix design.

References
1. Theory of Structures - RAMAMRUTHAM
2. Strength of materials Vol – 2 - B C PUNMIA & JAIN
3. Analysis of Structures - Aslam Kasimali
4. Analysis of Structures - Harry West
5. Structural Analysis - Hibbeller
6. Properties of Concrete - A.M. Neville

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Man and landscape development in Historical Perspective – Garden of ancient world – Babylon, Egypt, Persia, Greece, Rome.
Islamic tradition and Mughal in India –Japanese – Renaissance in Europe – English styles

Module II

Module III

Module IV

References
1. Kevin Lynch and Gary hach, ‘Site Planning’
2. Jellicoe & Jellicoe, ‘Landscape of man’
5. Simonds, ‘Landscape architecture’
6. Hackett, ‘Planting design’
7. Kassler, ‘Modern Gardens and the Landscape’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I

Module II
Energy and buildings - Relation between Energy Efficiency and Sustainable development – Sustainability & Architecture - Sustainable Buildings - Different Green rating systems – EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating– Examples of Sustainable buildings.

Module III

Module IV

References

3. TEDDY (TERI’s year books), TERI, New Delhi.

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Introduction to sociology.
Primary concepts- Society, family, Institutions, groups, association and Community. Relating these concepts to architecture. Relevance of study of sociology for architects.

Module II
Man Environment and Society. Unity and diversity in India. Rural society, Village community, traditional patterns and trends of change. Society, architecture and settlement pattern of Kerala

Module III
Social change, Social stratification, (Class and caste) Urbanism and urbanization. Modernization. Influences of these concepts in architecture

Module IV
Cultural anthropology, Culture and architecture. Concept of social structure. Relation between social structure and spatial structure. Social aspects of housing. Social problems of slums

References:
1. Vidya Bhushan, ‘An Introduction to Sociology’
2. K. Singh, ‘Principles of Sociology’
3. Dr.Valsyayan, ‘Urban Sociology’
5. Dr. K. Kumar, ‘Rural Sociology’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Objective
To introduce the students the design of multifunctional multistoried buildings. Projects shall have enough emphasis on technology and the application of various building services and circulation systems.

Major Project – Projects may be on multistoried housing, commercial, public, semi public etc...

Short project- Documentation Camp – Documentation camp consists of preparation of measured drawings of selected buildings / historic places inside and around the state of Kerala.

References:
1. Edwad d. Mills, ‘Planning the architects handbook’
2. D. Chiara & Callender, ‘Time saver standards for Building types’
3. Neufert’s Architects Data
4. Ramsey/Sleeper, ‘Architectural Graphic Standards’
5. BIS, various codes of practice and National Building code of India
Module I

Rural - material and construction:
Mud as a building material: Classification and engineering properties – stabilization – details of mud wall construction, adobe construction – Structural aspects – construction details of mud structure.

Module II

Water supply and plumbing details: Plumbing equipments and accessories, Types of plumbing systems, BIS specification. Plumbing layout –details of ducts Drainage system.
Drawing – Water supply and plumbing layout at the building level.

Module III

Drawings – Electrical layout in buildings.

Module IV

False ceiling: False ceiling using aluminium, timber and steel sections with asbestos sheets, soft boards, acoustic boards, plaster of paris etc - details of fixing concealed lighting and air conditioning- case studies.
Wall paneling – construction details using different materials, materials available in local market.- case studies.

References:
6. R. Chudler, ‘Construction Technology’ – Vol I to IV
University Examination Pattern

PART-A
Q1  – 8 Short type questions of 5 marks, two from each module
QII – 2 Questions A and B of 10 marks each from Module I, with choice to answer any one
QIII - 2 Questions of A and B of 10 marks each from Module IV, with choice to answer any one

PART-B (Drawings)
QIV – 2 questions of A and B of 20 marks each from Module II, with choice to answer any one
QV --2 questions of A and B of 20 marks each from Module III, with choice to answer any one
Module I

Modern Architecture

Module II

Module III
Innovation and ideas of Archigram – post modern architects like Peter Cook, Paolo Soleri, Robert Venturi
Contemporary architects: Norman Foster, Richard Rogers, James Sterling, Peter Eisenman, Renzo Piano, Daniel leibskind, Zaha hadid, Frank O Gehry, Santiago Calatrava, , Rem koolhaas

Module IV
Works of Indian Architects – Laurie Baker, Charles Correa, B.V. Doshi, A.P. Kanvinde, Raj Rewal, , Joseph Allen Stein

References
1. Sir Banister Fletcher, ‘A History of Architecture’
2. History of World Architecture series
3. Encyclopedia of Modern Architecture
4. Contemporary Indian architecture

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Specifications-Importance, objectives, types-Principles of specification writing, CPWD and BIS specifications, Kerala standard specifications.

Module II
Specifications for materials-Coarse aggregates, bricks, cement and sand Specifications for clearing, dismantling and demolition, excavation and earthwork, mortars, concrete work, masonry work, stonework, wood work, iron and steel work, flooring, roofing and finishing work.

Module III
Estimating-Units of measurement of various items of work-Mode of measurement-Methods of estimating-Exercise to write down the detailed estimate to find out the quantity of various items of work of different types of structures-tiled roof, load bearing and framed structures.

Module IV
Schedule of rates for labour and materials, rate analysis, standard data for items, bills of quantities, and estimated cost. Introduction to computer applications in estimation.

References
1. Central PWD specifications
2. Kerala standard Specifications
3. Standard Data Book
5. IS 1200-and relevant IS Codes

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
08AR1605  DESIGN OF RCC STRUCTURES

L-T-P: 3-0-0  

Module I

Basic design philosophy of Limit state method — Behaviour and Design of singly_reinforced beams under flexure and shear by limit state method.

Behaviour and Design of Doubly reinforced beams under flexure and shear by limit state method.

Module II

Design of T-beam under flexure and shear
Design of One Way slab under flexure and shear

Module III

Design of Two way slab under flexure and shear both conditions of Corner free to lift up and corner prevented from lifting up.

Design of short columns subjected to axial loads [ Use SP 16 Chart ]

Module IV

Design of Column members subjected to combined axial load and uniaxial bending by limit state method.[ Use SP 16 Chart ] column subjected to biaxial moment .

Design of Footings- Square and Rectangular shapes only. Subjected to Axial compressive loads.

References:

1. Limit state Design - Ashok K Jain
2. Design of concrete structures - Unnikshnan Pillai & Devdas Menon
3. Limit state Design - RamaChandran

University Examination Pattern

Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Space: Space as raw material – Qualitative and quantitative study – Organization of space – Order, growth, division, sequence and scale.
Surfaces: Functions of surfaces – Ratio, proportion, colour, material, texture, dimensions of 2D surfaces like walls, ceiling, floors, dividers etc.
Project: Design of murals / floor pattern / ceiling patterns for reception areas / Lounges for hotels – apartments, showroom etc.

Module II
Principles of visual composition – Colour in interiors, Building elements in interiors
Human Perception of interiors- Views
Project: Detailed case study of specific room in residences / hotels / offices etc., Preparation of interior view

Module III
Furniture – furnishings – Styles, materials, functions.
Design of interior spaces – Bedrooms, kitchen, living rooms, dining rooms, toilets, show windows, sales counters, toilets, reception desks, lobbies (Hotels, offices, hospitals) – Models showing interior spaces with colour scheme – furniture, accessories of any one space mentioned above.
Project: Design of interior spaces of hotels, offices, hospitals, show rooms etc.

Module IV
Interior plantscaping – Plant materials, growth condition, maintenance, importance of plantscaping – Aesthetics, functional etc.
Exhibits in interiors – private and public interiors.
Latest trends in the choice of materials, finishes, etc, in interiors – Market surveys, field visits etc.
Project: Plantscaping of private and public interior spaces

References
1. Shirish Vasant Bapat, ‘Basic Design & Anthropometry’
2. Shirish Vasant Bapat, ‘Living Areas – Internal Spaces’
3. Halse, ‘Use of Colours in Interiors’
7. Ching, ‘Form, Space & order’, Wiley
8. Krome Barnet, ‘Logic in Design’

University Examination Pattern

PART A
Q1 – 8 short type questions of 5 marks, two from each module

PART B
Q II - Drawing- One Question of 60 marks covering the syllabus of all the four modules
Module I

Module II
Classification of voltages, electrical services in buildings, general aspects of design of electrical domestic installations, power and light loads, MCB, MCCB, SFU, ELCB.

Module III
Electrical installation in commercial and high rise buildings, concept of rising mains, principles of lighting in buildings, definitions and units, types of luminaries and fittings, design of illumination scheme in halls and auditoriums.

Module IV
Electrical safety: pipe and plate earthing, lighting protection in buildings, safety regulation in domestic, commercial and high rise buildings.

References
2. Uppal, ‘Electrical wiring, Estimating and costing’
3. J. B. Gupta, ‘Electrical wiring’
4. National electrical Code (NEC)
5. Bureau of Indian Standards – IS 732, IS 742, IS 3043
Module I

Module II

Module III

Module IV

References
1. Manohar Prasad, ‘Refrigeration & Air conditioning’
2. C.P. Arora, ‘Refrigeration & Air conditioning’
3. W.F. Stocker, ‘Refrigeration & Air conditioning’
5. S.C. Arora and Domkunduwaranes, ‘Refrigeration & Air conditioning’

Note. Psychrometric chart is permitted in the examination hall

University Examination Pattern
Part A
Four short type questions of 5 marks each, one from each module
Part B
Four Questions of 10 marks each, one from each module, with choice to answer any THREE
PRACTICAL TRAINING (VII Semester)
(Immediately after the registration to the Seventh semester B. Arch degree course)

As per the B. Arch curriculum students shall undergo one semester practical training immediately after the completion of the sixth semester B.Arch examinations. 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 duration of practical training is one semester. Only those who have completed the practical training successfully as directed in the manual shall be permitted to register for the 8th semester B. Arch degree course. (Refer Practical Training Manual for details)
Objective
To introduce the students the planning and design of large-scale buildings with high degree of complexity by understanding architectural, socio-cultural, and economic issues connected with architecture. Integrated approach to design encompassing site planning, building design, environment and services.

Major Project – Housing projects, Institutional building projects involving Campus planning etc…

Short project - Design of related areas of Major project

References
1. BIS Codes
3. Kerala Municipal Building Rules
6. Gorden Culen, “Townscape”.
7. Eduand Bacon, “Design of Cities”.
Module I

**Advanced building materials for construction:** Geosynthetics - uses in construction, classification and properties, materials for water proofing and damp proofing, adhesives, sealants and joint fillers.

Module II

**Study of advanced concrete:**
Special concrete and concreting methods: Lightweight, high density, fibre reinforced, polymer concrete - outline of manufacture, properties and uses of the above - ready mixed concrete - guniting - cold weather and underwater concreting - current developments in concrete products and methods of concreting.

Module III

**Prestressed Concrete** - Precast prestressed construction for large span structures - Constructional details of various structures in steel, concrete - Portal frame, folded plates, domes, etc. Principles of cellular structures, Space frames, tensile structure, pneumatic structure. Properties and application of materials and method of construction.

**Drawings** – Folded plates, portal frames, space frames.

Module IV

Introduction to earthquake resistant structures – Concepts of stability, prevention of collapse – Study of shear wall and diagonal framing – Architectural details of earthquake resistant buildings.

**Drawings** – Reinforcement and bending detail in R.C. Band, Details of providing Vertical steel bars in Brick masonry.

References

3. Subramanilal N- ‘Elementary Space Structure’
4. V.S. Faster- ‘Advanced Building Construction’
5. Hiki. K- ‘Shells membranes and space frames’
6. IS 4326: 1993

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<td>QV   --2 questions of A and B of 20 marks each from Module IV, with choice to answer any one</td>
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</tbody>
</table>
Module I
Origin & evolution of human settlements – Relevance of study of evolution of human settlements –
Human settlements as an expression of civilization –
Town planning in ancient- Mesopotamia, Greece, Rome, Industrial and Post industrial age.
Contribution of Ebenezer Howard, Le Corbusier, Clarence Stein, Patric Geddes, C.A. Dioxidis

Module II
Impact of urbanization on cities, Urban environmental problems – land use, traffic and road network,
Urban land use – CBD, urban nodes, fringe area and suburbs

Module III
Master plans – Development plans – Town planning schemes – Neighbourhood planning – Area
planning – Regional planning – The planning components / elements like land use, zoning, floor area
ratio, land development techniques, surveys.

Module IV
Urban Development Authorities, its setup and functions, Land Acquisition Act, 74th Amendment,
Coastal Regulation Zone Act, SEZ, JNNURM

References:
2. AEJ Morris- ‘History of Urban Form from Pre-history to Renaissance’
3. Peter Hall- ‘Urban & Regional Planning’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
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QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one

72
Module I
Structures in Architecture, Loads on structures – Different types – load characteristics – use of occupancy loads – Earth and water loads, Dynamic loads, earthquake loads etc. Structural requirements – basic requirements like strength, equilibrium, stability, functionality, economy and aesthetic.

Module II
Structural Materials – Review of traditional materials – properties and uses of modern materials like steel, Aluminum, reinforced concrete, pre-stressed concrete, plywood (different types), structural plastics, glasses, composites such as ferro-cement, fibre reinforced concrete.

Module III
Structural elements – behaviour and application of tension, compression, flexural and torsional elements and trusses, frames, plates, arches, cables and grid construction. Structural systems, different types – behaviour of different structural systems under loads.

Module IV
Discussion on optimization of structural elements and systems. Reinforcement detailing of structural elements like beams, columns, slabs, footings, continuous beams and slabs. Structural safety, quality control aspects of structural elements and structural systems. Durability criteria and fire safety as per IS provisions.

References:
1. Salvadori & Heller- ‘Structures in Architecture’
2. Salvadori & Leany- ‘Structural design in Architecture’
3. Zuk- ‘Concepts of structures’
4. Cowan- ‘Architectural structures’
5. Engil and Heinrinch- ‘Structural systems’
6. Robert A Coliman- ‘Structural system design’
7. T Y Lin and S D Solesharg- ‘Structural concepts and systems for Architects & Engineers’
8. I S 456, 2000

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</tr>
<tr>
<td>QV  – 2 questions A and B of 15 marks of Module IV with choice to answer any one</td>
</tr>
</tbody>
</table>
Module I
Introduction to housing in early settlements with emphasis on the evolution of settlement pattern in Kerala.
Nature and magnitude of the housing problem in India-Housing Shortage as a result of Population Explosion. Urbanisation and Poverty issues in the Indian context. Role of Housing in the National level with a study on the changing priorities in the housing policies and the major housing programmes carried out in the various five year plans.

Module II
Study of Urban and Rural Housing - Housing design and standards conforming to the local climatic and socioeconomic conditions.
Important earlier Housing Schemes in India for various categories like HIG, MIG, LIG, EWS etc
Study of Slums as a consequence of rapid urbanization and industrialization, and its impact on the urban housing scenario. Examples of the major Slum clearance and Slum Improvement Schemes .and initiatives.

Module III
Concept of Aided Self Help- Housing the poor through the NGO’s and through mass involvement of the beneficiaries through studies of relevant and innovative housing schemes or projects.
National Housing Policy and its need, objectives and role in housing in the present day context.

Module IV
Housing Finance, Sources of Housing Finance and its essential characteristics. Major Housing Finance agencies at the National and State level like the NHB, HDFC, LICHFL, GIC, UTI, Commercial Banks etc

References
1. K. Thomas Pouluse- ‘Innovative Approaches to Housing for the poor’
2. Dr. Misra and Dr.B.S. Bhooshan- ‘HabitatAsia’
3. Dr. Misra and Dr.B.S. Bhooshan- ‘Habitat India’
4. Arthur Gallion- ‘Urban Pattern’
5. Reading Material in Housing -Compiled by K. Thomas Pouluse for ITPI students
6. Five Year Plans- Government of India Publications

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
08AR1806 Elective I 1. TRANSPORTATION PLANNING

L-T-P: 3-0-0  Credits-3

Module I
Scope of the subject - Nature of traffic problems in cities and measures to meet the problems - Land use and city planning controls – Interdependence of land use and traffic. Systems approach to transport planning

Module II
Traffic and the environment - Detrimental effects of traffic on the environment – Noise, air pollution, vibration, visual intrusion and degrading the aesthetics, severance and land consumption – situation in India.

Module III
Transportation survey - Type of surveys – origin destination survey, need and uses of OD surveys, survey methods. O.D matrix.

Module IV
Traffic signs – importance – Need for international standardization - General principles and type of traffic sign - Traffic signals.
Parking – Parking problems and ill effects – Parking space requirement standards.
Traffic control aids and street furniture - Avenue planting and landscape – Qualities of trees in avenue planting

References
1. L.R. Kadiyali – ‘Traffic Engineering and transport Planning’
4. Donald F Wood - ‘Contemporary Transportation’.

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module – 1
Etymology, Definitions, Vernacular and the architect, Regional influences on vernacular Architecture, Humanitarian response, Urban and rural vernacular architecture, role of sustainability in vernacular architecture, Environment & Resource Management

Module - II
Building materials and traditions, Vernacular building materials- Recognize the different ways in which these materials were used at different times and in different parts of the country, Documenting vernacular traditions, knowledge systems, Assess the likely sources of stylistic and decorative features of vernacular buildings and employ these to assist in dating analyzing their role and application in the present context.

Module -III
Recording vernacular buildings- Why record buildings? Recording basics (measuring and recording historic buildings) Drawing up; conventions and equipment Documentary sources and what they can tell us Briefing for recording day(s) Recording the chosen building(s) Reviewing the results; and role of photography in documenting vernacular buildings.

Module - 4

References

3. Lindsay Asquith, Marcel Vellinga, Taylor and Francis- ‘Vernacular architecture in the Twenty first century’- 2006 USA

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
03AR1806 Elective I 3. ENVIRONMENTAL MANAGEMENT

L-T-P: 3-0-0 Credits – 3

Module-I

Module-II

Module- III
Introduction to Environmental Impact Assessment (EIA), need, significance in various sectors, objectives- Role of EIA in planning and decision making process in planning level. Environmental Laws-existing of India – pollution control &environmental protection.

Module- IV
Sustainable development- definition, economical dimension- environmental dimension- Frame work for achieving sustainability, assessment of sustainable performance.

References:
5. S D Maurya- ‘Urbanization & Environmental Problems’

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Q1 – 8 short type questions of 5 marks, two from each module
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QIII – 2 questions A and B of 15 marks of Module II with choice to answer any one
QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I

Introduction to Conservation
Definition, Need, Objectives and Scope of Architectural Conservation.
Beginning of the Conservation movement - Contributions of John Ruskin & William Morris
Definitions: Cultural heritage, Natural heritage, Built heritage - Ancient Monument.
Agencies involved in conservation - ICCROM, ICOMOS, ASI, State departments of Archaeology,
Town Planning departments, State Art and Heritage Commission & INTACH.
Venice charter (1964), Burra charter (1979).
Ethics of Conservation practice.
Authenticity & Integrity in Conservation practice.

Module II

Traditional Building Construction
Historic building materials and construction techniques with special reference to Kerala.
- Lime Mortar, Laterite wall, Wooden wall and Roof in Kerala’s traditional Architecture.
Defects in construction techniques / structure :- foundation, wall, wooden roof, Spanning elements – arches, vaults, domes.

Module III

Causes of decay in materials and structure - Climatic causes – Thermal movements, rain, frost, snow, moisture, wind.
- Botanical, biological and micro biological causes – Animals, birds, insects, fungi, moulds, lichens
- Natural disasters – Fire, earthquakes, flood, lightning
- Manmade causes – Wars, pollution, vibration, vandalism and neglect

Module IV

Technique of Conservation
Preparatory procedures for conservation
- Identification of the ‘values’ in the object, monument or site:-
‘emotional’, ‘cultural’ and ‘use’ values.
- Inventories, Initial inspections
- Documentation - Research, Analysis and recording (Reports)
Seven Degrees of intervention
- Prevention of deterioration, Preservation, Consolidation, Restoration, Rehabilitation, Reproduction, Reconstruction.

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</table>
Module I

Module II

Module III
Built Environment – Passive Environmental control mechanism – Factors influencing thermal comfort – Passive design of building: Design considerations for shelter in the tropics – Basic needs of shelter in different climates – Shelter for hot-dry, warm-humid, composite climates – Form, planning, layout, specification for walls and roofs, effect of special characteristics of site like water body, vegetation etc. – Orientation, openings and ventilation

Module IV

References

University Examination Pattern
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QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
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QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one

80
0AR1807 Elective II 3. RESEARCH METHODOLOGY

L-T-P: 3-0-0  Credits- 3

Module I
Research Aims & Literature Search
Research Aims and Philosophy, research paradigms. Literature search and review, the use of libraries and data bases, aim and structure of a literature review. Developing research proposals.

Module II
Statistics for Research
Statistics for research – statistical concepts, probability, the hypothesis and testing it, descriptive statistics, central tendency and dispersion. Inferential statistics. Introduction to parametric and non-parametric methods.

Module III
Scientific Writing
Introduction to scholarly technical writing and publishing a paper, writing a research report, presentation of scientific research, structure of a research report.

Module IV
Physical and Behavioural research
Introduction to behavioural research and physical research. Behavioural research, obtain data, questionnaires, interviews, un-obstructive and obstructive measures, scales such as a semantic differentials, physical research, laboratory, resources available, equipment for laboratory and site measurement. Field survey and its relevance

References

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QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Objective
To introduce the students the analysis, planning, design with the understanding of a wide range of related issues in urban or rural context

Major Project: Projects involving Architectural Design solutions in Urban Areas. Development/redevelopment of markets, plazas, city square; transport and public areas, etc.

Short project- Design of related areas of Major project

References
1. IS Codes
3. Kerala Municipal Building Rules
6. Gorden Culen, “Townscape”.
7. Edurand Bacon, “Design of Cities”.
Module I
Indian Institute of Architects – Function of Indian Institute of Architects – Election of members, students and subscribers, privilege to members.

Module II
Contract – Definition and general principles – Types of contract – Discharge of contract –

Module III

Module IV
Supervision – Quality control, daily report system, visual recording, site records and appurtenances – Bench mark – Supervision of large projects.
Profession – Options on centering the profession – short comings while running own office – Duties and responsibilities of the principal architect – Secure clientage – Disciplines environment of the office.

References
1. Roshan H. Namavathy- ‘Professional Practice – Estimation & Valuation’
2. Roshan H. Namavathy- ‘Theory and Practice of Valuation’
3. Asok Nair- ‘Professional Valuation Practice’

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<td>– 2 questions A and B of 15 marks of Module IV with choice to answer any one</td>
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Module I

Introduction to urban design
Definitions of urban design, Urban Design and Its Evolution
The scope and objectives of urban design
Need for urban design in contemporary India-
- The relation between Architecture, Urban design and urban planning

Module II

Urban Spaces and Urban Image
Behavioral issues in urban design - Principles of urban spatial organization, urban scale, urban spaces, urban massing, quality of urban enclosure
Image of the city and its elements - Perceptions of urban environment: Kevin Lynch’s principles

Module III

Basic theories and techniques in Urban Design
Surveying methods and techniques: conducting and urban design survey
Introduction to basic theories in Urban design( Kevin lynch, Christopher Alexander, Bill hillier, Peter kalathorpe), Urban design policies – Formulation of policies for various components like landscape, infrastructure and built forms – Urban design Principles – scale and mass, Skyline studies – Urban spaces and their characteristics space linkage

Module IV

Urban renewal, scope need and procedure – Urban conservation and economic considerations-
Urban design projects in various scales : National, metropolitan city and project levels, case studies –
Road form and hierarchy-Road pattern, Pedestrian areas, malls, Urban elements, open spaces, and water front developments.
Project Preparation – Agencies involved in the execution – coordination, role of planning authorities -
Role of urban arts commission, urban project financing agencies and their functions

References
2. Bill Hillier and B.J Hudson, ‘The social logic of space’
3. Alexander Christopher, ‘The new theory of urban design’
4. Kevin Lynch, ‘The image of the city’
5. Charles Correa, ‘The new landscape’
6. Rossi, Aldo, ‘The architecture of cities’
7. Collen, Garden , ‘Townscapes’
8. Roger Trancik , ‘Finding lost spaces’
9. Sitte, Canmitto , ‘The Art of Building cities’
10. Time saver standards, ‘Urban Design’
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</tbody>
</table>
Module I
Introduction to construction economics and finance – Time value of money, Cash flow, Depreciation, Cost benefit analysis. Introduction to project management – Objective of construction management, Types of construction projects, Project Planning, scheduling, monitoring & control.

Module II
Introduction to Construction Scheduling techniques- Bar chart, Gantt chart, Work breakdown structure, Network representation, Network analysis, Principles and application of CPM, Network crashing.

Module III
Resource scheduling- resource allocation and resource leveling, other scheduling Methods – PERT and Linear Scheduling Method (LSM)
Project control- Earned value, Cost and Schedule Performance

Module IV
Project monitoring, Claims, Delay Analysis, Expediting the project, Duration cost trade off, Optimization.
Project management software packages – MS Project.

References
2. Robert B. Harris-, ‘Precedence and Arrow Network Techniques for Construction
5. N. P. Vohra- ‘Quantitative Techniques in Management’

University Examination Pattern
Q1 – 8 short type questions of 5 marks, two from each module
QII – 2 questions A and B of 15 marks of Module I with choice to answer any one
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QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module 1
Hazard, Disaster, Risk, Vulnerability. Disaster – an over view; Disaster – the Indian Perspective; Typology of disasters and increased understanding.

Module 2
Natural hazards and Disasters -Earthquake, cyclone, floods, droughts, landslides, lightning. –Causes, hazardous effects, mitigation measures. Man induced hazards & disasters:- soil erosion-causes, conservation measures; nuclear explosion-environmental problems, corrective measures; fire-mitigation measures; terrorism.

Module 3
Preparedness and mitigation - Preparing hazard zonation maps, Predictability/ forecasting & warning, Community preparedness, retrofitting, Population reduction in vulnerable areas, Awareness, Capacity building.

Module 4
Disaster Management; Community health and casualty management; Disaster Management – role of various agencies; Relief measures; Post disaster- Recovery, Reconstruction and Rehabilitation. Remote-sensing and GIS applications in real time disaster monitoring.

References
1. Goel.S.L, ‘Encyclopaedia of Disaster Management’

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QIV – 2 questions A and B of 15 marks of Module III with choice to answer any one
QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I

Introduction to Environmental Psychology
Emergence as a discipline, Importance in architecture, Basic principles of psychology - changing understanding of man and his mental and emotional processes, corresponding relevance in design of built environment, Language of architecture (rhythm, balance, harmony, etc) and its elements (physical, aesthetic, sensory, colour, noise, light etc.), articulation of mass and space and its role in evoking emotions. Space syntax.

Module II

Environment and Human response
Behavioural response to the built and unbuilt environment, Processes involved in assessing and appraisal of environment, Responses to environment - Individual (environmental perception, spatial cognition, comfort, anthropometrics), Social (proxemics, territoriality, crowding, privacy), and Societal (neighbourhood, community, work). Inducing behaviour through design.

Module III

Application in different environments
Design of spaces and places for occupants of varying ages, gender, use and group size, Educational (class room design, ambient noise, attention), Workplace (types of office design), Health care, religious, commercial, recreational, environments. Open spaces, cityscapes. Case studies.

Module IV

Research methods
Use of research to enhance the architectural quality, measure satisfaction levels, direct behaviour in specific environments. Post occupancy evaluation, behavioural mapping, cognitive mapping, semantic differential techniques, trace measures. Case studies.

References
1. ET Hall, ‘The Hidden Dimension’ 1966
2. Proshansky, ‘Environmental psychology- People and their physical settings’ –1976
4. Bryan Lawson, ‘Language of Space’

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08AR1906 Elective III  2. SUSTAINABLE ARCHITECTURE
L-T-P:  3-0-0  Credits-3

Module -I

Concepts of sustainability: Energy and Global environment, Energy use and Climate change – Its impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -synergy with nature, Bioregionalism - community basis shelter technology within bioregional patterns and scales, Ethical- environmental degradation.

Module -II

Sustainable planning & Design: Sustainable Development -Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas - Model ecosystem of the site, environmental monitoring and testing during construction- phasing of development - limits of change - Design facility within social and environmental thresholds.

Module -III

Sustainable Building Materials and Construction: Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energy efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal inertia and air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials and on site growth of food, fuel and building materials.

Module -IV


Case Studies and Rating systems: Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc. – Indian systems – TERI GRIHA rating, LEED India rating, IGBC

References:
2. Laurie Baker’s, “Chamoli Earthquake hand book”, Costford, Centre of science and technology for rural development.

University Examination Pattern
Q1  –  8 short type questions of 5 marks, two from each module
QII  –  2 questions A and B of 15 marks of Module I with choice to answer any one
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QV  –  2 questions A and B of 15 marks of Module IV with choice to answer any one
3. TOURISM AND ENVIRONMENT

Module I


Module II

Tourism – Need for accommodations, choices of accommodations. Traditional architecture and tourist accommodations. Hill resorts, Sea side resorts, Lake Side resorts, House boats, conventional hotels etc. Tourism destination development. Different types of tourism.

Module III

Tourism environment and Society. Tourism and natural environment.
Environmental impacts of tourism.
Impacts on ecosystems-Impacts on wild life, coastal areas, hill stations, backwaters, eco-sensitive areas heritage sites etc
Tourism impacts- Resource evaluation, Economic effects, socio cultural effects, Physical effects.

Module IV

Eco-tourism, Sustainable tourism. Need for sustainable tourism development. Sustainable tourist resorts/hotels-design principles. Tourism and Resort architecture in Kerala- Case studies (its architecture and environmental impacts)

References
2. Martin Opperman & Kye-Sung Chon-‘Tourism in developing countries’
3. Roy A Cook, Laura J Yale. ‘Tourism the Business of Travel ‘.
9. Salah Wahab- ‘Tourism development and growth’

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Module -I

Introduction

Module II
Water Supply, Drainage and Fire safety-

Module -III
Ventilation and Air-Conditioning
Natural and Mechanical Ventilation Systems – Air-conditioning systems and load estimation – Planning and Design – Automation and energy Management.

Module -IV
Electrical, Mechanical Security and Surveillance systems

References

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QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Cost effective techniques: Need, Planning aspects, construction aspects, maintenance and longevity aspects

Module II
Choice of materials in Indian/Kerala conditions, indigenous building materials, organic and inorganic building materials, alternative building materials, use of industrial and agricultural wastes - Survey of such materials development by research organizations like CBRI, SERC etc.

Module III
Significance of construction technology: Relevance of improving of traditional technology, relevance of innovative technology/alternate technology, survey of such technologies by various research institutes.

Module IV
Critical analysis (in terms of initial investment, maintenance cost and longevity of buildings) of the local adaptation of the innovative technologies by various agencies.

References
1. Hand book of low cost housing
2. G.C. Mathew, ‘Low cost housing in development countries’
3. Publication of CBRI, SERC, RRL, NBO, COSTFORD.

University Examination Pattern
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QV – 2 questions A and B of 15 marks of Module IV with choice to answer any one
Module I
Aims and objectives ands need for regional planning. Concept of region, types and classification of regions, delineation of planning regions by various techniques

Module II
Regional analysis- Input output analysis – growth model, core periphery model, industrial location theory, agricultural land use model. Spatial structure of region – central place theory, growth pole and growth centers

Module III
Regional development pattern – Regional disparities Backward and developed Regions. Characteristics and reasons for backwardness. Regional Planning case studies – India and abroad

Module IV
Regional planning in India – Multi level planning District planning, special area Development Programme and schemes. Regional planning as a tool to integrate rural and urban areas.

References
7. RP Misra, Sundaram. ‘Regional Planning in India’.

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THESIS AND VIVA VOCE

Students of the B.Arch. Degree course are required to prepare an Architectural Design Thesis during the last six months (Xth Semester) of the B.Arch. Degree program. (Refer Thesis and Viva voce manual for details)