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.

No lateral admission shall be permitted as per the minimum standards of Architectural Education Regulations 1983 of Council of Architecture and AICTE notification, July 1992.

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 I: Basic Design, Architectural Designs I, II, III, IV, V, and VI, Building Materials and Construction – I, II, III, IV, V and VI, Architectural Drawing and Graphics, Architectural Graphics I and Architectural Graphics II, and Interior Design.

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.

Group I:	Assignments/class projects	–	70%
	Test	–	20%
	Attendance	–	10%
Group II:	Assignments	–	30%
	Test	–	50%
	Attendance	–	20%

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 an 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.

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

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.

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

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.

$$\text{CGPA} = \frac{\sum \text{Credits for semester} \times \text{GPA obtained for the semester}}{\sum \text{credits for the semester}}$$

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 8^{th} and 9^{th} 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 manual.

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.ARCH. 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 revaluated 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 with in a time stipulated by the Department. However he can continue the higher semesters.

III DISSERTATION

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 6^{th} 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 6^{th} 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 8^{th} semester. The students under the guidance of their respective guides shall independently carry out their dissertation work during the 8^{th} and 9^{th} semester degree course period. There will not be any regular class hours set apart for this purpose in the 8^{th} semester.

6. **Evaluation** :

i) The dissertation will be considered as an individual subject of the 9^{th} 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 IX^{th} semester should submit their choices of their thesis project within a month after the commencement of the IX^{th} 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 X^{th} 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.

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

30 + 45 *marks*

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

30 + 45 *marks*

Review 3 - Review of Previous stages, Final Layout, Final Design for various building blocks through relevant Plans, Sections, Elevations, Views etc. Details of Building and Site Services, Site Planning and Landscape schemes. Preparation of relevant Detailed Drawings. Application of Special Topic in the design scheme. Preparation of Draft Report.

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.
3. Building construction techniques and the details of the use of new materials.
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 (S_1 S_2)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1101	Basic Design *	10	---		6	---	---	200	300	500
08AR1102	Building Materials & Construction - I	6	1		2	4	100	---	100	200
08AR1103	History of Architecture I	4	2		---	3	100	---	50	150
08AR1104	Architectural drawing and Graphics	6	---		4	4	100	---	100	200
08AR1105	Theory of Design	4	2		---	3	100	---	50	150
08AR1106	Basic Computer Graphics	2	1		1	3	100	---	50	150
08AR1107	Structural Mechanics I	4	3		---	3	100	---	50	150
08AR1108	Geometrical Drawing	6	2		2	4	100	---	50	150
08AR1109	Mathematics	4	3		---	3	100	---	50	150
	Total	**46**	**14**		**15**		**800**	**200**	**800**	**1800**

** 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 (S_3)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1301	Architectural Design – I *	5	---		10	--	---	200	300	500
08AR1302	Building Materials & Construction – II	3	1		2	4	100	---	100	200
08AR1303	History of Architecture – II	2	2		---	3	100	---	50	150
08AR1304	Architectural Graphics – I	3	---		3	4	100	---	100	200
08AR1305	Structural Mechanics – II	3	3		---	3	100	---	50	150
08AR1306	Surveying & Leveling	3	3		---	3	100	---	50	150
08AR1307	Climatology	3	3		---	3	100	---	50	150
08AR1308	Building Workshop	1	---		2	---	---	---	50	50
	Total	**23**	**12**		**17**		**600**	**200**	**750**	**1550**

** 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 (S_4)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1401	Architectural Design- II*	5	---		10	--		200	300	500
08AR1402	Building Materials & Construction – III	3	1		2	4	100	---	100	200
08AR1403	History of Architecture III	2	2		---	3	100	---	50	150
08AR1404	Architectural Graphics II	3	---		3	4	100	---	100	200
08AR1405	Architectural Acoustics	2	2		---	3	100	---	50	150
08AR1406	Environmental Design I	2	2		---	3	100	---	50	150
08AR1407	Computer Application in Architecture	3	1		3	3	100	---	50	150
08AR1408	Structural Mechanics III	3	3		---	3	100	---	50	150
	Total	**23**	**11**		**18**		**700**	**200**	**750**	**1650**

** Architectural Design-*II *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*

Fifth Semester (S_5)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1501	Architectural Design- III*	5	---		10	---	---	200	300	500
08AR1502	Building Materials & Construction – IV	4	1		3	4	100	---	100	200
08AR1503	History of Architecture IV	2	2		---	3	100	---	50	150
08AR1504	Building Services : Water Supply & Sanitary Engineering	2	3		---	3	100	---	50	150
08AR1505	Structural Mechanics IV	3	3		---	3	100	---	50	150
08AR1506	Landscape Architecture	3	3		---	3	100	---	50	150
08AR1507	Environmental Design II	2	2		---	3	100	---	50	150
08AR1508	Humanities	2	2		---	3	100	---	50	150
	Total	**23**	**16**		**13**		**700**	**200**	**700**	**1600**

** 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 (S_6)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1601	Architectural Design-IV*	5	---		10	--	---	200	300	500
08AR1602	Building Materials & Construction – V	4	1		3	4	100	---	100	200
08AR1603	History of Architecture V	2	2		---	3	100	---	50	150
08AR1604	Estimation & Specification	2	3		---	3	100	---	50	150
08AR1605	Design of RCC Structures	2	3		---	3	100	---	50	150
08AR1606	Interior Design	4	---		3	4	100	---	100	200
08AR1607A	Building Services : Electrical Services	2	2		---	2	50	---	25	75
08AR1607B	Building Services : HVAC	2	2		---	2	50	---	25	75
	Total	**23**	**13**		**16**		**600**	**200**	**700**	**1500**

** Architectural Design-*IV *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*

Seventh Semester (S_7)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1701	Practical Training-*	5	---	---	---		--	200	--	200
	Total	**5**					---	**200**	**--**	**200**

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

Eighth Semester (S8)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1801	Architectural Design –V*	5	---		10	---	---	200	300	500
08AR1802	Building Materials & Construction – VI	4	1		3	4	100	---	100	200
08AR1803	Town Planning	3	3		---	3	100	---	50	150
08AR1804	Advanced Structural Systems	3	3		---	3	100	---	50	150
08AR1805	Housing	3	3		---	3	100	---	50	150
08AR1806	Elective I	3	3		---	3	100	---	50	150
08AR1807	Elective II	3	3		---	3	100	---	50	150
	Total	**24**	**16**		**13**		**600**	**200**	**650**	**1450**

** 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_9)

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks			Total
			L	T	P		W	J	S	
08AR1901	Architectural Design-VI*	5	---		10	---	---	200	300	500
08AR1902	Professional Practice	3	3		---	3	100	---	50	150
08AR1903	Urban Design	3	3		---	3	100	---	50	150
08AR1904	Construction Management	3	3		---	3	100	---	50	150
08AR1905	Disaster Mitigation & Management	3	3		---	3	100	---	50	150
08AR1906	Elective III	3	3		---	3	100	---	50	150
08AR1907	Elective IV	3	3		---	3	100	---	50	150
08AR1908	Dissertation-**	1	---	1	---	---	---	50	50	100
	Total	**24**	**18**	**1**	**10**		**600**	**250**	**650**	**1500**

** 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_{10})

Course no.	Name of the Subject	Credits	Hours/Week			Duration of exam	Marks		Total
			L	T	P		Internal jury	External jury	
08AR2001	Thesis and Viva Voce-*	15	--	--	29	--	250	250	500
	Total	**15**					**250**	**250**	**500**
			Carry over from previous semesters						**11250**
			GRAND TOTAL						**11750**

****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*

08AR1101 BASIC DESIGN – I Credits 8 0-0-6

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

- Krome Barratt, 'Logic and Design in Art, Science and Mathematics',Globe Pequot Press,The,2005
- Francis D. K. Ching, 'Architecture: Form, Space and Order', John Wiley & Sons, Incorporated,2007
- Simon Unwin, 'Analizing Architecture', Routledge, 2003

08AR1102 BUILDING MATERIALS AND CONSTRUCTION-I Credits 6 1-0-2

Module I

Introduction to Vernacular and conventional Building Materials

Brick: Raw materials and manufacture – Properties – Uses - Classification – BIS Specification - Tests – Suitability for construction.

Stone: Classification – Properties – Suitability for Construction – Various Stones used for Construction – Dressing and various finishes in stone masonry.

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

Timber: Various kinds of Timber – properties – suitability for construction – defects in timber – seasoning of timber – BIS specification.

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

Introduction to masonry – Superstructure – brick masonry – general principles – construction bonds – type of bonds – relative merits and demerits of different bonds.

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, battened, glazed & sliding.

Windows –types- panelled, battened, 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

1. Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, Limited, 1958
2. W.B.Mckay, 'Building Construction', Orient Longman

3. Robin Barry,'The Construction of Buildings (Vol. I-V)', Blackwell Publishing, 2000
4. Olin,Harold & Schmidt, 'Building Construction – Principles, Material & Methods', American Savings and Loan Institute Press,1970
5. Francis Ching, 'Building Construction & Illustrated', John Wiley, 1991
6. Relevant BIS Codes

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 II, III &IV with choice to answer any two

08AR1103 HISTORY OF ARCHITECTURE – I Credits 4 2-0-0

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

Early temples: Evolution of architectural style, major influences on development of form and other architectural elements. Gupta and early Chalukyan styles -- Gupta temple, Tigawa. Dasavatara Temple, Deogarh. Ladkhan and Durga temples, Aihole.

Hindu temple architecture: Principles of Design and Construction

Dravidian style : Pallava, Chola, Hoysala, Vijayanagara, Madura styles. Temple complexes -- Rathas, Mamallapuram. Shore temple, Mamallapuram. Kailasanatha, Kanchipuram. Brihadeswara temple, Thanjavur. Hoysaleswara temple, Halebid. Vittalaswami temple, Hampi. Meenakshi temple, Madurai. Sriranganathaswami temple, Srirangam.

Indo Aryan Style: Orissan, Khajuraho, Gujarat -- Parasurameswara, Mukteswara, Lingaraja temples, Bhubaneswar. Sun temple, Konark. Kandariya Mahadeo temple, Khajuraho. Sun temple, Modhera.

Module IV

Introduction to Kerala Architecture

Domestic architecture - Evolution of early forms of Kerala architecture, early mud houses to timber houses. Typologies: ekasala, dwisala, , trisala, chatursala,nalukettu, ettukettu etc – palatial complexes- Padmanabhapuram palace, Thuckalay. Krishnapuram palace Kayamkulam

Religious architecture – Early Hindu Temples, Churches, and Mosques. Evolution of religious architectural form. morphology of Kerala temple Temple arts performance centres - Kalithattu, Koothambalam, etc.-- Koodal Manikyam temple, Thrissur. Kandiyoor Mahadeva temple, Mavelikkara. Vadakkumnathan temple, Thrissur. Cheraman Masjid, Kodungalloor. Orthodox Syrian Church at Chengannur

References

1. Percy Brown, 'Indian Architecture: Buddhist and Hindu Periods', D. B.Taraporevala,1965
2. Satish Grover, 'The Architecture of India: Buddhist and Hindu', Vikas, 1980
3. Christopher Tadgell , 'The History of Architecture in India', Phaidon, 1994

4. Satish Chandra, 'History of Architecture and Ancient Building Materials in India', Tech Books International, 2003
5. James C. Harle , 'The Art and Architecture of the Indian Subcontinent:' Second Edition,Yale Univ Pr,1994
6. Banister Fletcher, 'Dan Cruickshank Sir, Banister Fletcher's a history of architecture: A History of Architecture', Architectural Press, 1996
7. Dora P. Crouch, June G. Johnson, 'Traditions in Architecture: Africa, America, Asia, and Oceania', Oxford University, 2000
8. Michael Raeburn, 'Architecture of the Western World', Rizzoli, 1982
9. Ilay Cooper, 'Barry Dawson, Traditional Buildings of India', Thames and Hudson, 1998
10. Balagopal T S Prabhu, A Achyuthan, 'Text Book of Vastu Vidya',
11. Ronald.M.Bernier, 'Temple Arts of Kerala', S.Chand, 1982
12. Susan Visvanathan, 'Christians of Kerala', Oxford University Press, 1993
13. Ashalatha Thampuran, 'Traditional Architectural Forms of Malabar Coast', Vastuvidyapratishthanam Academic Centre, 2001

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

08AR1104 ARCHITECTURAL DRAWING AND GRAPHICS Credits 6 0-0-4

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

1. F.D. Mayock ,'Technical Drawing',
2. Frank Ching , 'Architectural Graphics', John Wiley, 2002
3. Francis D.K. Ching, 'Drawing, Space, Form, Expression',
4. Cooper Douglas, 'Drawing and Perceiving', Van Nostrand Reinhold, 1992
5. H.W. Janson – 'History of Arts, Prentice Hall' (Higher Education Division, Pearson Education,2002

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

08AR1105 THEORY OF DESIGN Credits 4 2-0-0

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

Works of following Master architects and their ideologies and philosophies in brief –– Louis Sullivan, , Frank Lloyd Wright, Le Corbusier, Mies Vander Rohe, Walter Gropius, Achyut P.Kanvinde Laurie Baker, Charles Correa, B.V.Doshi.

References

1. Francis D. K. Ching, 'Architecture - Form, Space and Order', Van Nostrand Reinhold Company , 1979
2. K.W.Smithies, 'Principles of Design in Architecture', Van Nostrand Reinhold Company , 1981
3. V.S.Pramar, 'Design Fundamentals in Architecture', Somaiya Publications, New Delhi, 1973
4. Leland M.Roth, 'Understanding Architecture', Craftsman house company,1994

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

08AR1106 BASIC COMPUTER GRAPHICS Credits 2 1-0-1

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

1. Omura George, "Mastering AutoCAD (Release 14)", BPB Publications, New Delhi, 1997.
2. Omura George, "AutoCAD 2000", BPB Publications, New Delhi, 1997.
3. Kolareric, Branko, "Architectural Rendering and Modelling with Auto CAD R14", John Wiley, New York, 1998.
4. Synder, James, "Architectural Construction Drawing with AutoCAD R14", John Wiley, New York, 1998.

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

08AR1107 STRUCTURAL MECHANICS – I Credits 6 3-0-0

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

Center of gravity of planes and solid bodies – moment of inertia concept – theorem of parallel axis and perpendicular axis – moment of inertia of composite section - principal axis and principal moment of inertia – simple plane trusses – different types of trusses – analysis by method of joints, method of section and graphical methods

Module III

Stresses and strains – General concepts – Stress – Strain relation-factor of safety – discussion on elastic constants - principle of super position – stresses in composite bars – stresses due to change in temperature, Concepts of strain energy.

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:

1. Tayal, "Engineering Mechanics",
2. R K Bansal, "Engineering Mechanics", Lakshmi Publications pvt ltd
3. Vazarani, "Mechanics of structures"
4. M. Chakraborthi "Strength of Materials", SK Kataria & Sons, New Delhi,
5. Abdul Mubeen, "Mechanics of Solids", Parson Publications
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,
8. I.B. Prasad, Textbook of Applied Mechanics, Khanna 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

03AR1108 GEOMETRICAL DRAWING Credits 6 2-0-2

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

Solids : Simple solids in simple position , prisms, regular pyramids, tetrahedron, octahedron, cone, spheres and their combinations placed in different positions. Auxiliary projections of simple solids and their combinations. Change of position and auxiliary plane method.

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

1. N.D.Bhatt, 'Elementary Engineering', Charotar, 1991
2. Cari LaraSvensan and William Ezara Street, 'Engineering Graphics',
3. K. Venugopal, 'Engineering Drawing and Graphics', New Age Publishers, 2004
4. S. Rajaraman, 'Practical Solid Geometry',

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

08AR1109 MATHEMATICS Credits 4 3-0-0

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.(cartisian only)

Module II

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

Module III

Statistics : Measure of central tendency -Mean , Median, Mode . Measures of dispersion Mean deviation– Standard deviation , variance , correlation coefficient , rank correlation coefficient.-fitting of straight line and parabola by method of least squares.

Module IV

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

References

I. B.S. Grewal, 'Higher Engineering Mathematics', Khanna Publishers

2. B.S. Grewal, 'Elementary Engineering Mathematics', Khanna Publishers

3. M.K.Venkataraman, 'Higher Mathematics for Engineering and Science', National Publishing Company

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

University Examination Pattern

Q1 – 8 short type questions of 5 marks each, 2 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

O8AR1301 ARCHITECTURAL DESIGN – I

L-T-P:0-0-10 Credits- 5

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
7. Unwin, Simon, 'Analyzing architecture'

08AR1302 BUILDING MATERIALS AND CONSTRUCTION – II

L-T-P:1-0-2 **Credits-3**

Module I

Soils – Their classification, physical properties and behaviour – Bearing capacity, safe bearing capacity, Determination of SBC, Standard Penetration test – Sand – fineness, bulking qualities - Methods of improving bearing capacity.

Shallow Foundations – Types- Pad, Strip, Raft-Method of construction.

Deep Foundations-Types- Piles, Piers, Caissons-Materials and method of construction.

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

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

Paints, distempers & varnishes – types –composition – properties - application– Uses –BIS specifications- Covering capacity, method of distempering wall surfaces, and painting of timber and iron work.

References:

1. M.S.Shetty, 'Concrete Technology', S.Chand & Co.ltd, New Delhi, 1986.
2. S.C.Rangwala, 'Engineering Materials', Charotar Publishing House, India, 1997.
3. Dr.B.C.Punmia, 'Building Construction', Laxmi Publications Pvt.Ltd., New Delhi, 1993.
4. P.C. Varghese, 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005.
5. Arthur Lyons – 'Materials for Architects and Builders' - An introduction Arnold, London,1997.
6. W.B.Mckay, 'Building Construction', Longmans, UK, 1981.
7. Francis D.K.Ching, 'Building Construction Illustrated' VNR.1975.

8. Ramachandra S., 'Design of Steel Structures', Standard Book House, Delhi, 1984.
9. Relevant BIS Code Pertaining to Materials of Construction

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, and 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

08AR1303 HISTORY OF ARCHITECTURE – II

L-T-P:2-0-0 **Credits- 2**

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
Sayyid and Lodi dynasty: Tomb of Mubarak shah, tomb of Mohamed Sayyid, Garden tomb of Sikander Lodi, Bara Khan Ka Gumbad, Chota Khan Ka Gumbad, Shish Gumbad, Bara Gumbad.

Module III

Provincial styles:
Punjab: - Tomb of Shah Rukhn-I-Alam.
Jaunpur: - Atala Masjid, Jami Masjid
Bengal: - Dakhil Darwaza, Firoze Minar, and Adina Masjid.
Gujarat: - Jami Masjid, Teen Darwaza, Well retreats of Ahmedabad.
Malwa: - Hindola mahal ,Jami Masjid at Mandu, Jahaz Mahal, Hawa Mahal
Deccan: - Charminar at Hyderabad, Tomb of Golconda.
Bijapur: - Jami Masjid, Golgumbaz.

Module IV

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.

References

1. Percy Brown , 'Indian Architecture (Islamic Period)' ,D.B. Taraporevala Sons & Co. Private Ltd., Bombay, 1997.
2. Satish Grover , 'Islamic Architecture in India', CBS Pub, New Delhi, 2002
3. Banister Fletcher, Dan Cruickshank Sir Banister Fletcher's a History of Architecture, Architectural Press, 1996
4. Christopher Tadgell , 'The History of Architecture in India', Phaidon Press Ltd, 1994.

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

08AR1304 ARCHITECTURAL GRAPHICS -I
L-T-P:0-0-3 Credits-3

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

Form in nature, Generation of visual images with analogies from nature. Relation of colour and form. Use of colours, composition with colour. Colour theory - Colour Principles, Colour scheme, Colour combination . Introduction to drawing fundamentals- Drawing lines, curves and shapes- Basic shapes and form- Rendering in 3D form- Shading and shadow- Type of shadows – Drawing still life, Out door sketching

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

1. Philip Meggs, 'A history of Graphic Design' John Wiley & Sons; 3 edition (September 9, 1998)
2. Alexander W. White, 'The elements of Graphic Design space, Unity, Page, Architecture, and types' Allworth Press; 1 edition (November 1, 2002)
3. Mark A, Thomas, Poppy Evans, 'Exploring Elements of Design' Delmar Cengage Learning; 2 edition (August 15, 2007)
4. Steven Heller, Seymour Chwast, 'Graphic Style: From Victorian to Digital' Harry N. Abrams; 1 edition (Jun 27, 2002)
5. Preston Blair, 'Cartoon Animation'
6. Victor Perard, 'Anatomy and Drawing'

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

08AR1305 STRUCTURAL MECHANICS – II

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

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:

1. S.B Junnarkar, 'Mechanics of Structures', Charotar Book Stall Anand (W.R) 1959
2. B C Punmia and Jain, 'Strength of Materials & Theory of Structures: Vol – 1, LakshmiPublications
3. Ramamrutham, 'Strength of Materials', Dhanpat Rai Publishing co (p) Ltd

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

08AR1306 SURVEYING & LEVELLING
L-T-P:3-0-0 Credits-3

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

Theodolite survey**:** Study of instrument, Temporary adjustment of theodolite, Measurement of horizontal angle by repetition and reiteration methods, Measurement of vertical angle, Field book, Field work of theodelite traversing, Introduction to modern surveying equipments like 'Total Station'.

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:

1. Kanetkar and Kulkarni, 'Surveying and Levelling', Vol I, Pune Vidyarthi Griha
2. B.C. Punmia, 'Surveying and Levelling', Vol I and Vol II, Laxmi Publications pvt Ltd
3. Dr. P.B. Shahani, 'Surveying and Levelling', Vol I and Vol II
4. R. Agor, 'Surveying and Levelling', Khanna Publishers
5. S.K.Duggal, 'Surveying', Vol. I, Tata Mc Graw Hill Ltd
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

08AR1307 CLIMATOLOGY
L-T-P:3-0-0 Credits -3

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

Man and Climate: Body's heat production, heat loss and balance - Acclimatization, metabolism, physiological response. Thermal Comfort: Factors affecting thermal comfort – Effective temperature and corrected effective temperature - Thermal comfort indices – Application of psychometric chart – Bioclimatic chart and effective temperature homogram

References

1. O.H.Koenigsberger, T.G. Inger Soll, Alan Mathew, S.V. Szokolay, 'Manual of tropical Housing and Building'.
2. B. Givoni, 'Man, Climate and Architecture'
3. Maxwell Fry and Jane Drew, 'Tropical 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

08AR1308 BUILDING WORKSHOP

L-T-P:0-0-2 **Credits – 1**

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

Detail study of building model making using materials like Plywood board, Perpex board, Forex sheet, Veneers, Etaflex, Rubber, and Softwood like Balsa wood -Cutting, finishing, painting techniques.

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

Evaluation Pattern		
Attendance	-	10 marks
Class Work	-	20 marks
Test	-	10 marks
Documentation	-	10 marks

08AR1401 ARCHITECTURAL DESIGN – II
L-T-P:0-0-10 Credits-5

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
4. Ramsey/Sleeper, 'Architectural graphic standards' Wiley
5. BIS, various codes of practice and National Building code of India

08AR1402 BUILDING MATERIALS AND CONSTRUCTION –III
L-T-P:1-0-2 Credits-3

Module I

Study of Glass and glass products – composition, types of glass – wired glass, fiber glass, laminated glass, glass building blocks, their properties and uses in buildings – Application of glass in construction – Structural glazing, curtain wall glazing-toughening-Insulation, applications in the building Industry -current developments.

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

Thermoplastics and thermosets - properties and architectural uses of plastics - structural plastics – reinforced plastics and decorative laminates - plastic coatings, adhesives and sealants - modifiers and plasticizers – fillers and stabilizers - fabrications of plastics.

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

Study of Roof structure – Terminology - Wood, steel – trusses – King post truss, queen post truss with details of joints - fixing – detail of eaves projection with soft boarding, north light details, girders, space frames.

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.

Details of construction joints, expansion joints in buildings – Method of construction – Filling of joints – Water proofing.

Drawings –

(1) Reinforcement details of column, beam, lintel, slab & waist slab.

(2) Construction and expansion joint details

References :

1. M.S.Shetty, 'Concrete Technology', S.Chand & Co.ltd,New Delhi,1986.
2. S.C.Rangwala, 'Engineering Materials', Charotar Publishing House, India, 1997.
3. Dr.B.C.Punmia, 'Building Construction', Laxmi Publications Pvt.Ltd., New Delhi, 1993.
4. P.C. Varghese, 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005.
5. Don A.Watson, 'Construction Materials and Process', McGraw Hill Co.,1972.
6. Jack M.Launders, 'Construction Materials and Methods' , Careers, South Holland, Illinois, Wilcox Co.Ltd.,1986.

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

08AR1403 HISTORY OF ARCHITECTURE – III

L-T-P:2-0-0 Credits -2

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 French Gothic Architecture – Notre Dame, Paris.

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.

French : Palace of Louvers, Paris de Versailles.

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

References

1. Sir Banister Fletcher's – "A History of Architecture", Architectural Press,1996
2. Louis Grodecki – "Gothic Architecture", Rizzoli,1991
3. History of World Architecture (Series), Vols. Titled "Ancient Architecture, Primitive Architecture, Greek Architecture, Roman Architecture and Byzantine Architecture", 1980.
4. "Builders of Ancient World", A National Geographic Society Publication, 1986.
5. Raeburn Micheal, "Architecture of the Western World", Popular Press, England, 1988.

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

08 AR1404 ARCHITECTURAL GRAPHICS II
L-T-P:0-0-3 Credits-3

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

Introduction of raster images – image resolution – RGB, CMYK, Index colour modes and their application – basic drawing in Photoshop – Using airbrush, pencil brush tools. Concept of layers in Photoshop – Transparency and blending modes- creative use of layers and blending modes. Channels – Using channels to save selections – Colour correction in Photoshop –adjusting hue, saturation and values of images. – Advanced colour correction and image manipulation techniques – using filters and effects – preparation of images for print and web

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

1. Adobe creative team, ‘Adobe illustrator Classroom in a Book’ Adobe Press
2. Luanne Seymour Cohan, ‘Adobe illustrator CS Creative studio’
3. Jack Drafahl -Sue Drafahl, ‘Step-by-Step Digital Photography: A Guide for Beginners [Illustrated]

4. Jim Miotke, 'The Betterphoto Guide to Digital Photography' (Amphoto Guide Series

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

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 from first three modules only

08AR1405 ARCHITECTURAL ACOUSTICS
L-T-P: 2-0-0 **Credits-2**

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

Effect of noise in human being - Noise sources - air borne and structure borne sound transmission - Noise criteria - Transmission loss - permissible noise levels for different types of building. Noise control in specific type of buildings - auditorium - Hotels -Schools - Hospitals - Residences and Industrial buildings.
Noise control in specific buildings - Auditoriums, Schools, Hospitals, Residences, Offices.

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

1. Kinsler and Fry, 'Fundamental of acoustics', Wiley
2. Knudson and Harris, 'Acoustical Designing to Architecture'
3. Ducan Templation, 'Acoustics in the built environment'
4. Acentec, 'Architecture acoustics - building guide'
5. Cavanaugh, 'Architectural acoustics' Joseph A. Wilkes - 1998

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

08AR1406 ENVIRONMENTAL DESIGN -I
L-T-P: 2-0-0 Credits-2

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

1. Watson Donald, 'Climatic Design : Energy Efficient Building Principles & Practices", Mc Graw Hill Book company, New York, 1983.
2. Givonji B., "Man, Climate and Architecture", Elsevier, Amsterdam, 1986.
3. Bansal Naveendra K., Hauser Gerd and Minke Gernot, "Passive Buildings Designs : Handbook of Natural Climatic Control", Elsevier Science, Amsterdam 1997.
4. Baker Nick and Steemers Koen, "Energy and Environment in Architecture", E& FN, Spon. London, 1999.

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

08AR1407 COMPUTER APPLICATIONS IN ARCHITECTURE
L-T-P: 1-0-3 Credits –3

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 1V

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
3. Mitchell, 'Computer Aided Architectural Design', Van Nostrand
4. Broad bent, 'Design in Architecture', Wiley International

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

08AR1408 STRUCTURAL MECHANICS – III

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

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 :

1. S P Junnarkar , 'Mechanics of Structures Vol – 2', Tata MC Graw Hill 2004
2. B C Punmia & Jain, 'Strength of materials Vol – 2', Standard publisher Distributor
3. Ramamrutham, 'Theory of Structures'

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

08AR1501 ARCHITECTURAL DESIGN – III

L-T-P: 0-0-10 **Credits- 5**

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

03AR1502 BUILDING MATERIALS AND CONSTRUCTION – IV

L-T-P: 1-0-3 **Credits-4**

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

Fire safety of buildings – Fire resistance of building elements, fire rating and assessment, means of escape and their design, building byelaws regulating the height and spread of buildings – fire fighting equipment – Automatic sprinklers.
Study of sound, thermal insulation of buildings – study of insulation materials.

References:

1. S.C.Rangwala,'Engineering Materials', Charotar Publishing House,India,1997.
2. B.C.Punmia,'Building Construction',Laxmi Publications Pvt.Ltd.,New Delhi,1993.
3. Sharma S.K. & Kaul, B.K.,'Text book of Building Construction'
4. Arora S.P. & Bindra,'A text book of Building Construction'
5. Vazrani V.N. & Chandola S.P, 'Building Construction'
6. Relevant BIS Code Pertaining to Construction of Materials

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

08AR1503 HISTORY OF ARCHITECTURE – IV

L-P-T: 2-0-0 **Credits-2**

Module I

Post Renaissance Architecture in Europe – Industrial revolution – Causes, consequence and impact in Architecture – Its influences in building, technology and modern building materials Steel, glass, RCC etc. Art – Nouveau and Art and crafts movement – Advances in Engineering –Joseph Paxton – Eiffel tower, Paris – Antonio Gaudi

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
3. Pehnt, Wolfgang, 'Encyclopedia of Modern Architecture', Thames & Hudson. 1963
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

08AR1504 BUILDING SERVICES: WATER SUPPLY AND SANITARY ENGINEERING

L-T-P: 3-0-0 **Credits-2**

Module I

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

Waste water treatment: Principles and techniques-disposal of treated water-design of septic tank and oxidation ponds- solid waste treatment.

References

1. S. K.Garg, 'Water supply and Sanitary Engineering', Delhi
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

08AR1505 STRUCTURAL MECHANICS – IV

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

Module I

Three hinged arches. –Circular and Parabolic shapes –Normal Thrust and Radial shear -BMD
Two Hinged Arches- Circular and Parabolic Shapes-Normal 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 – Influence of water/cement ratio on strength – Workability – Segregation and bleeding of concrete – Introduction 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

08AR1506 LANDSCAPE ARCHITECTURE
L-T-P:3-0-0 Credits 3

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

Elements of landscape – major and minor elements, natural and man made elements and tangible and intangible elements – Water – Land forms – vegetation – space – sculpture – Furniture – Lamp posts, dust bins and display boards etc. Aesthetics principles – scale – proportion – unity – rhythm – angle of vision and approach – views – avenue planting – Scientific and local names of plants – Classification of plants according to size, types, form, colour and texture.

Module III

Site planning considerations – Selection of site – Location of structures – Ecological value of site – Identification of site features – Functional suitability of site – Movement of pedestrian and vehicles – Parking.
Landscape engineering – Cutting and filling – Grading – retaining walls – Drainage – Constructions of verticals, walls, fencing, pools etc – pavements – ponds – fountains – sculpture – steps – ramps – underwater construction – precautions to riverbank and coastal constructions – Lighting in garden and ponds – Avenue lighting – terrace gardens – Terrace pool – Rock garden.

Module IV

Horticulture aspects – planting and transplanting – planting techniques – techniques of propagation – cutting, pruning, grafting training etc – Lawn – Preparations- mowing, maintenance etc. – Hydroponics – Bonsai.
Landscape indoors – Functions and behavior of plants on interiors, light, air and water requirements – Drainage – Indoor plant materials – Potting and repotting – Lighting – raising of interior plants.

References

1. Kevin Lynch and Gary hach, 'Site Planning'
2. Jellicoe & Jellicoe, 'Landscape of man'
3. Motloch J.C, 'Introduction to landscape'
4. Bring M, 'Japanese Gardens'
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

08AR1507 ENVIRONMENTAL DESIGN II

L-T-P: 2-0-0 **Credits – 2**

Module I

Space Ship Earth Concept – Environmental problems like Ozone depletion, Global warming, Carbon dioxide concentration, etc,. – Sustainable Development – Brundtland Commission's report (1983) – Earth Summit & Rio Declaration (1992) – Kyoto Protocol (1997) – Recent developments – Sustainable & Green building constructions

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

Global Water scenario – Kerala water scenario – Local water scenario – Reasons for scarcity – Needs of water conservation – Ground water depletion – Water efficient landscaping – Xeriscape – Gray water – Black water – water recycling– Water conservation – Rain Water Harvesting – Rain data in Kerala – Capacity calculations for water harvesting tanks – water collection from roof – filtering rain water – Conservation of other natural resources

Module IV

Waste recycling – Solid Waste Management – House hold waste – Recycling techniques – Composting at home – Town/ city level recycling – Construction waste – State-of-the art of Vilappilshala waste recycling plant of Thiruvananthapuram

References

1. Smith R.J., Philips, G.M., Sweeney, 'Environmental Science", Longman Scientific & Technical, Essex, England, 1982.
2. Goulding, John, R, Lewis, Owen J and Steemers, Theo C., "Energy in Architecture", Bastford Ltd., London, 1986.
3. TEDDY (TERI's year books), TERI, New Delhi.
4. Annual Reports, Ministry of Non-Conventional Energy Sources, Government of India, New Delhi.
5. Energy Conservation Building Code 2006.
6. Sustainable Building Design Manual Vol 1 & 2, 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

08AR1508 HUMANITIES

L-T-P: 2-0-0 **Credits- 2**

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'
4. James V. Mc Cannel, 'Understanding Human Behaviour'
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

08AR1601 ARCHITECTURAL DESIGN – IV

L-T-P: 0-0-10 Credits-5

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

03AR1602 BUILDING MATERIALS AND CONSTRUCTION – V

L-T-P: 1-0-3 **Credits- 4**

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.

Soil stabilization: soil blocks-Drawings of foundations - types, S.S. Block - S.S.Cast in situ walls - flooring - roofing - plastering. Bamboo, casuarina coconut, palm, hay coir, jute ,properties- uses-fire retardant treatment insection proofing. Types of foundations - walls - simple roof trusses, floors for rural structures.

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

Air conditioning and electrification details : Study of air conditioning and electrification in buildings – advancement in the field – Application of different systems – Positioning in buildings – layout – Specification.

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:

1. S.C.Rangwala, 'Engineering Materials', Charotar Publishing House,India,1997.
2. B.C.Punmia, 'Building Construction',Laxmi Publications Pvt.Ltd.,New Delhi,1993.
3. Arthur Lyons – 'Materials for Architects and Builders - An Introduction' - Arnold,London,1997.
4. Don A.Watson, 'Construction Materials and processes',McGraw Hill Co.,1972.
5. W.B.Mckay, 'Building Construction' ,Longmans,U.K.1981.
6. R. Chudler, 'Construction Technology' – Vol I to IV
7. J.K. Mc Kay, 'Building Constrcution 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

09AR1603 HISTORY OF ARCHITECTURE – V

L-T-P: 2-0-0 **Credits-2**

Module I

Modern Architecture

Introduction to Modern Architecture-Chicago School of Architecture, Bauhaus School, and Taliesin School of Architecture – Great masters like Louis Sullivan, Frank Lloyd Wright – Le Corbusier – Walter Gropius – Mies Vander Rohe.

Module II

Impressionism –Expressionism – Cubism – Neoclassicism – Neoplasticism Suprematicism – Constructivism – Futurism – Post modernism- Post- Post Modernism– Deconstructivism –Critical regionalism

Work and philosophy of following architects – Eric Mendelson, Earo Saarinen, Alvar Alto, Louis Khan, Marcel Breuer, Kenzo Tange, Kisho Kurokawa, Philip Johnson, PL Nervi, Christopher Alexander, Frei Otto, Geoffrey Bawa, Hassan Fathy.

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 Foreign Architects in India and their influence – Edwin Lutyens, Le Corbusier, Louis Khan, Philip Johnson.

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

08AR1604 ESTIMATION AND SPECIFICATION

L-T-P: 3-0-0 **Credits- 2**

Module 1

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
4. Estimating and costing by Chakravarthi.
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 **Credits- 2**

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

08AR1606 INTERIOR DESIGN

L-T-P: 0-0-3 Credits 4

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 2 D 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. Shrish Vasant Bapat, 'Basic Design & Anthropometry'
2. Shirish Vasat Bapat, 'Living Areas – Internal Spaces'
3. Halse, 'Use of Colours in Interiors'
4. Ching, 'Interior Design Illustrated' , Wiley
5. Yoshinoku Ashihara, 'Exterior Design', Van Nostrand Reinhold Inc.,U.S.
6. Earnest Pickering, 'Architectural Design', New York : Wile
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

08AR1607A BUILDING SERVICES-ELECTRICAL SERVICES

L-T-P: 2-0-0 **Credits- 2**

Module I

Fundamentals of electrical engineering: Faraday's Law, Lenz's Law, Statically and dynamically induced emf, self and mutual induction. Alternating current: generation of sinusoidal voltage current, RMS and average values, form factor and peak factor. Three phase systems: Representation- star and delta connection, concept of balanced and unbalanced loads in three phase systems.

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

1. K. B. Raina, S. K. Bhattacharya , 'Electrical Design, Estimating and costing'
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

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

08AR1607B BUILDING SERVICES – HVAC
L-T-P: 2-0-0 Credits - 2

Module I

General introduction – Objectives – Principles of heat transfer – Conduction – Convection – Radiation – Fourier Law of heat conduction – Thermal conductivity – Heat transfer coefficient – Conduction through plane wall – Overall heat transfer coefficient – Simple problems – Insulation – Properties of Insulation – Critical thickness of insulation(only description).

Module II

Air conditioning – Definition – Comfort and industrial air conditioning. Reversed carnot cycle, COP. (simple problem to find COP based on Carmot cycle) Difference between heat pump and refrigerator.
Principles of vapour compression system – Simple cycle – Representation of TS and PH diagrams – COP – Refrigerants and their properties – Mixture refrigerants – Refrigeration systems components – Compressors – Condensers – Evaporators – Expansion devices – Cooling towers. Simple vapour absorption system. Solar energy for refrigeration.

Module III

Psychrometry – Psychrometric properties – dry bulb temperature, wet bulb temperature, humidity ratio, relative humidity, dew point temperature, relative humidity, degree of saturation, Psychrometric chart – Psychrometric process – adiabatic mixing – sensible heating and cooling – humidifying and dehumidifying - bypass factor – Sensible heat factor – Room sensible heat factor – RSHF and GSHF line – Design condition – Apparatus dew point temperature. Air washer. Effect of ventilation. Simple problem using psychrometic chart.

Module IV

Summer air conditioning system – winter air conditioning system – heating systems – year round air conditioning – Comfort air conditioning – factors effecting human body comfort – Comfort chart – Air distribution systems – duct systems – sizes, Layout and mountings – Effects of bends of ducts.
Air conditioning systems – Room air conditioners – Split system – Packaged system – all air system – chilled water system – zoning – Market survey – Noise and noise control. Project work – Drawing should be prepared showing all details of the system of a building / part of building (to be combined with design project).

References

1. Manohar Prasad, 'Refrigeration & Air conditioning'
2. C.P. Arora, 'Refrigeration & Air conditioning'
3. W.F. Stocker, 'Refrigeration & Air conditioning'
4. P.L. Ballaney, '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 8^{th} semester B. Arch degree course. (**Refer Practical Training Manual for details)**

08AR1801 ARCHITECTURAL DESIGN – V
L-T-P: 0-0-10 Credits-5

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
2. National Building Code
3. Kerala Municipal Building Rules
4. Callendar *et al*, "Time Saver Standards", Mc Graw Hill
5. Paul D. Spreinegar, "Urban Design, the Architecture of Towns and Cities", Mc Graw Hill.
6. Gorden Culen, "Townscape".
7. Edurand Bacon, "Design of Cities".
8. Edward D. Mills, "Planning the Architects Handbook".
9. Julius Panero & Zeluik, "Human Decision and Interior Space", Whitney Library of Design Publication, 1989.

08AR1802 BUILDING MATERIALS AND CONSTRUCTION-VI
L-T-P: 1-0-3 Credits- 4

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

1. P.C. Varghese- 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005.
2. Hand book of Timber Engineering – BIS
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

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

08AR1803 TOWN PLANNING

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

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:

1. Arthur .P. Gallion- 'Urban Pattern'
2. AEJ Morris- 'History of Urban Form from Pre-history to Renaissance'
3. Peter Hall- 'Urban & Regional Planning'
4. C.A. Dioxidis- 'An Introduction to Science of Human Settlements'

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

08AR1804 ADVANCED STRUCTURAL SYSTEMS

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

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

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

08AR1805 **HOUSING**

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

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 Poulose- '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 Poulose 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'
2. Pual. H. Wright, Norman J. Ashfod – 'Transportation Engineering – 'Planning and design'
3. Vukan R. Vuchic – 'Urban public transportation'
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

08AR1806 Elective I 2. VERNACULAR ARCHITECTURE

L-T-P: 3-0-0 Credits – 3

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

Vernacular Towns – evolution process , character, morphology, growth and decay. Case studies of Vernacular towns within Kerala. Knowledge of vernacular architecture in contemporary regional designs. Traditionalism and Vernacular.

References

1. Heath, Kingston wm- 'Vernacular Architecture and Regional design'- Cultural process and environmental response- 'Elsevier science and technology'- 30 April 2007
2. Henry H. Glassie- 'Vernacular architecture'- Pan books, London- 1966
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

Basis of Environmental Science. Ecology & Eco system- Major Ecosystems. Flow of Energy-food chain-food web- Ecological pyramid

Module-II

Man and his physical Environment- Impact of population growth, urbanization, industrialization on air environment-land environment- water environment. Global Environment issues- green house effect-ozone layer depletion-global warming-acid rain-deforestation.

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:

1. P D Sharma- 'Ecology & Environment'- Rastogi Publications.
2. Gouri Suresh- 'Environmental Studies and Ethics'- I.K. International Publishing House Pvt. Ltd.
3. Charls H South wick- 'Ecology & the Quality of our environment'. D Van Nostrand Company, 1972
4. Joseph Morgan- 'Introduction to Environmental Science'. W.H. Freeman and Company.
5. S D Maurya- 'Urbanization & Environmental Problems'
6. B D Nag Chanduri-'The Global Environmental Movements'

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

08AR1807 Elective II 1.ARCHITECTURAL CONSERVATION
L-T-P: 3-0-0 Credits- 3

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.

References

1. Bernard M. Fielden- 'Conservation of Historic Buildings' –, Architectural Press, 2003
2. Ashurst, J. and Dimes, F.G. Conservation of Building and Decorative Stone, Butterworth-Heinemann, London. -1990.
3. Jukka Jokilehto, Butterworth - Heinemann – 'A History of Architectural Conservation' -,1999
4. ICOMOS, Earthen Architecture: The conservation of brick and earth structures. A handbook. (1993)
5. Poul Beckmann and Robert Bowles – 'Structural Aspects Of Building Conservation', Elsevier Butterworth-Heinemann, 2004

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

08AR1807 Elective II 2. ENERGY EFFICIENT BUILDINGS

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

Module I

Energy Efficiency – Reasons for Energy Crisis - Need for the Energy Conservation – Concept of conventional, non-conventional, renewable, non-renewable energy sources – Global Energy use – Impacts of energy use – Merits and demerits of both conventional and nonconventional Energy sources

Module II

Indian Energy scenario – Bureau of Energy Efficiency - ECBC rules – Kerala Energy scenario- Energy efficient buildings in Kerala context – Role of designing according to the climate – Passive, active and hybrid systems of thermal comfort – Relation between climatically responsive buildings and Energy efficient buildings – Concept of human comfort – Factors influencing human comfort

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

Concept of embodied energy – Transportation energy – Life cycle energy – Total energy assessment in buildings – Energy Audit – Energy efficient lighting – Energy efficient active systems

References

1. Watson Donald, 'Climatic Design : Energy Efficient Building Principles & Practices", Mc Graw Hill Book company, New York, 1983.
2. Givonji B., "Man, Climate and Architecture", Elsevier, Amsterdam, 1986.
3. Bansal Naveendra K., Hauser Gerd and Minke Gernot, "Passive Buildings Designs : Handbook of Natural Climatic Control", Elsevier Science, Amsterdam 1997.
4. Baker Nick and Steemers Koen, "Energy and Environment in Architecture", E& FN, Spon. London, 1999.
5. Annual Reports, Ministry of Non-Conventional Energy Sources, Government of India, New Delhi.
6. Energy Conservation Building Code 2006.

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

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

1. Giere R.N. "Understanding Scientific Reasoning", Holt Rinehart & Winston, U.K., 1991.
2. Moroney M.J., "Facts from Figures", Penguin, 1990.
3. Day R.A., "How to Write and Publish a Scientific Paper", Cambridge University Press, R.K. 1991.
4. Seigel S. & Castellan N.J., "Nonparametric Statistics for the Behavioural Sciences", Mc Graw Hill Book Company, New York, 1988.

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

08AR1901 ARCHITECTURAL DESIGN – VI

L-T-P: 0-0-10 Credits-5

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
2. National Building Code
3. Kerala Municipal Building Rules
4. Callendar *et al*, "Time Saver Standards", Mc Graw Hill
5. Paul D. Spreinegar, "Urban Design, the Architecture of Towns and Cities", Mc Graw Hill.
6. Gorden Culen, "Townscape".
7. Edurand Bacon, "Design of Cities".
8. Edward D. Mills, "Planning the Architects Handbook".
9. Julius Panero & Zeluik, "Human Decision and Interior Space", Whitney Library of Design Publication, 1989.

08AR1902 **PROFESSIONAL PRACTICE**

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

Module I

Architects Act 1972 – Council of Architecture – Functions and powers of Council of Architecture – Architects (Professional conduct) Regulations – Standard terms for comprehensive architectural services, landscape and for urban design works – Guidelines for architectural competition, rules and regulations of copyrights.

Indian Institute of Architects – Function of Indian Institute of Architects – Election of members, students and subscribers, privilege to members.

Module II

Tenders – Inviting, opening and acceptance of Tenders – Tender notice – Work order letter – Tender document – Special notice and Tender acceptance letter – Public, private and negotiated tenders – Types of tenders–

Day work – Piece work – Daily labour – Earnest money deposit – security deposit – Retention amount.

Contract – Definition and general principles – Types of contract –Discharge of contract – Contract document – Schedule of quantities – Contract drawings – Contract Sum – Contract bills – Architects instructions.

Duties and liabilities of contractor – architect and employer under the contract – Clerk of works – Engineer in charge – Resident engineer – Nominated sub contractor – consultants – liquidated damages – Variation and extras prime cost and provisional sum – Determination of contract. – Certificates of Payments.

Arbitration – Advantages of arbitration – Appointment of Arbitrators and Umpire – Powers and duties of arbitrators – role of umpire – Arbitration agreement – Conduct of arbitration proceedings – Publications of the award - Filing of award – Kinds of arbitration –Arbitration and building contract.

Module III

Valuation – Definition – Purpose of valuation – Value, price and cost - Market value – Factors affecting value – Value classification – Classification of ownership – Freehold and leasehold –Different methods of valuation – Rental method – Land and building basis method, development method, profit basis method – Illustrated examples and problems

Module IV

Management – Principles of management – Practice of management – Levels of management – Scientific management – Personal Management – Role of Management – Leadership, motivation and co-ordination.

Office management – System approach for pre-construction stage – Drawing sizes and sheet title – Forwarding letters – Payment bills - Registers for dispatch and documents – Work output charts Stampings – Preparation of minutes – Accounting – Double entry, single entry and book keeping.

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'
4. V.N. Vazirani & S.P. Chandala- 'Construction Management & Accounts'.
5. Hand book of Professional Documents – Council of Architecture.
6. Architects Reference Manual – Workshops professional practice for Architects by IIA Kerala Chapter and Trivandrum Centre, November 1996.

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

08AR1903 **URBAN DESIGN**

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

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

1. Paul.D.Sperigen, 'Architecture of towns and cities'
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'
11. Andres Duany, Elizebeth Plter- Zyber and Robert Alminanna , 'The new civic art'

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

08AR1904 CONSTRUCTION MANAGEMENT

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

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 break down 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

1. Callaghan,M.T, Quackenbush,D.G. and Rowings-, J.E, 'Construction Project Scheduling', McGraw-Hill (1992)'
2. Robert B. Harris-, 'Precedence and Arrow Network Techniques for Construction
3. Stevens James D, 'Techniques or Construction Network Scheduling'
4. Bhattacharjee S.K-,'Fundamentals of PERT/CPM and Project Management'.
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

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

08AR1905 DISASTER MITIGATION AND MANAGEMENT

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

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'
2. Government of India, (2004), 'Disaster Management in India' – A Status Report, Ministry of Home Affairs (Disaster Management Division), New Delhi.
3. Zebrowski, Ernest Jr, (1997)-, 'Perils of a Results Planet: Scientific Perspectives on Natural Disasters', Cambridge University Press, Cambridge.
4. Guha-Sapir D., Hargitt, D and Hoyois P. (2004), 'Thirty Years of Natural Disasters: 1974-2003', The Numbers, UCL Presses, De Lou vain.
5. Ministry of Home Affairs (MHA), (2004)-, 'National Programme for Capacity Building of Architects in Earthquake Risk Management (NPCBAERM)', National Disaster Management Division (Government of India), New Delhi.
6. Hewitt, K (1983), 'Interpretation of a Calamity', Allen & Unwin Inc., London.
7. Heide, Auf der E (1989)-, 'Disaster Response: Principles of Preparation and Coordination', C.V.Mosby, Baltimore.
8. Amarnath Chakrabarti, Devdas Menon, Amlan K. Sengupta, 'Handbook on Seismic retrofit of buildings'

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

08AR1906 Elective III 1. ENVIRONMENTAL PSYCHOLOGY
L-T-P: 3-0-0 Credits-3

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 behvaiour 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
3. Canter and Lee, ' Psychology and the built environment' - 1974
4. Bryan Lawson , 'Language of Space'
5. Gifford R, 'Environmental Psychology, Principles and Practices', 2002
6. Kopec D, 'Environmental Psychology for design', 2006
7. Linda N. Groat, 'Architectural research methods', David Wang 2002
8. Amos Rappaport, 'The Meaning of the Built Environment', 1982 (updated edition 1990)

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

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

Recycling and Reuse : Pre building, Building, Post building stages - Architectural Reuse, Waste prevention, Construction and Demolition recycling- Conservation of natural and building resources- Energy and material savings – types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes

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:

1. B.C.Bose, "Integrated approach to sustainable Development", Rajat Publications, Delhi
2. Laurie Baker's, "Chamoli Earthquake hand book", Costford, Centre of science and technology for rural development.
3. Fuller Moore, "Environmental control systems Heating, Cooling, Lighting". McGraw Hill, Newyork.
4. Caring A.Langston, Grace K.C.Ding, "Sustainable practices in built environment", second edition, Butterworth-Heinmann Linacre House Jordanhill Oxford.
5. R.N.Trivedi, "Environmental Sciences", Anmol Publications Pvt Ltd, 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

08AR1906 Elective III 3. TOURISM AND ENVIRONMENT
L-T-P: 3-0-0 Credits -3

Module I

Defining Tourism- Tourism as an Industry. Tourism products,
Characteristics of Tourism products.
Brief history of tourism. Nature and growth of tourism.-Global, India and Kerala. Tourism as world's largest industry. Tourism and development.

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.
Mass tourism and 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

1. Alen A. Lew & Michael Hall – 'A companion to Tourism', Blackwell Publishing.
2. Martin Opperman & Kye-Sung Chon-'Tourism in developing countries'
3. Roy A Cook,Laura.J Yale. 'Tourism the Business of Travel '.
4. Stephen .J Page- 'Tourism Management ,Managing for Change', Elselver Publishers- New Delhi.
5. Sunil Gupta- 'Tourism towards 21st century'.
6. Anu Rowe,John D. Smith- 'Travel and Tourism, Cambridge press'.
7. P.C.Sinha- 'Tourism Management'.
8. Puspinder S. Gill- 'Dynamics of Tourism', Anmol Publishing Pvt Ltd
9. Salah Wahab- 'Tourism development and growth'

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

08AR1907 Elective IV 1. SERVICES IN TALL BUILDINGS
L-T-P: 3-0-0 Credits -3

Module -I

Introduction

Standards of services in High Rise Buildings – Integration of Services – Relative costs – Ergonomic aspects of Service Design – Concepts of Intelligent Architecture and Building Automation.

Module II

Water Supply, Drainage and Fire safety-

Water Supply and waste water collection systems – Water storage and distribution systems – Planning and Design –Selection of pumps – Rain water harvesting – Sewage treatment- Recycling of water. Passive Fire Safety - Fire Detection and Fire alarm systems – Planning and Design.

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

Natural lighting systems – Energy efficiency in lighting systems – Load and Distribution – Planning and Design –Automation – Planning and Design of elevator systems and services – Elevator lobby area – Escalators, moving walls and ramps – safety aspects. Security system – Access control and Perimeter Protection – CCTV intruder Alarm Safety and Security.

References

1. Manual on Water Supply and Treatment (1991) third Edition, Central Public Health and Environmental Engineering Organization, Ministry of Urban Development, New Delhi.
2. 'National Building Code of India' Sep 1983 – Bureau of Indian Standards, 1984.
3. W.G. McGuiness and B.Stein, 'Mechanical and Electrical equipment for buildings, John Wiley and sons Inc., N.Y.
4. Riley Shuttleworth, 'Mechanical and electrical Systems for Construction', McGraw Hill Book Co., U.S.A., 1983.
5. ASHRAE: Handbook–HVAC Systems and Equipment(1992), HVAC Applications (1991) ASHRAE, Inc. Atlantla.
6. Langdon – Thomas G.J., - 'Fire Safety in Buildings, Principles and Practice' – Adam and CharlesBlade,London,1972.

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
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08AR1907 Elective IV 2. COST EFFECTIVE TECHNOLOGY IN BUILDING CONSTRUCTION

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

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

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

08AR1907 Elective IV 3. REGIONAL PLANNING
L-T-P: 3-0-0 Credits-3

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

1. John Glasson – 'An Introduction to regional Planning 2nd Edition', Hatchinson – London (The Britt Environment Series)
2. Allen G. Noble, et.al, (eds), 'Regional Development nt and Planning for the 21st Century: New priorities New Philosophies', Aldershot, USA, 1998
3. David Mosse, et.al, 'Development Process; concepts and Methods for working with complexity', Loutledge, London, 1998
4. Hamilton F,(eds) 'Industrialisastion in Developing and Peripheral Regions', Croom Helm,1983
5. Chand Mahesh and U.K. Puri, 'Regional Planning in India', Allied Publishers, New Delhi, 1983
6. Isward Walter, 'Methods of Regional Analysis – An Introduction to Regional Science', MIT Press, Cambridge, 1960
7. RP Misra, Sundaram. 'Regional Planning in India'.

University Examination Pattern

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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)**