

SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)
Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 119.



SYLLABUS

**BACHELOR OF ARCHITECTURE (B.Arch)
(TEN SEMESTERS DEGREE PROGRAMME)
REGULATIONS 2010**

SATHYABAMA UNIVERSITY

REGULATIONS 2010

Bachelor of Architecture (B.Arch)
(Ten semesters Degree Programme)

1.0 PRELIMINARY DEFINITIONS AND NOMENCLATURE

In these Regulations, unless the context otherwise requires:

- (i) "Programme" means Degree Programme that is B. Arch programme.
- (ii) "Faculty" means a Faculty of the University, namely Faculty of Architecture
- (iii) "COA" means Council of Architecture, the governing body for Architectural education.

2.0 ELIGIBILITY FOR ADMISSION

2.1 Candidates for admission to the first semester of the ten semesters B.Arch degree programme shall be required to have passed

- (i) 10+2 scheme of Senior School Certificate Examination or equivalent with Mathematics as subjects of examination at the 10+2 level with a minimum aggregate of 50%
(Or)
- (ii) 10+3 Diploma (any stream) recognised by Central/ State Governments with 50% aggregate marks.
(Or)
- (iii) International Baccalaureate Diploma, after 10 years of schooling, with not less than 50% marks in aggregate and with Mathematics as compulsory subject of examination.

2.2 In addition, the candidate shall write an Aptitude test (**NATA - NATIONAL APTITUDE TEST IN ARCHITECTURE**) which shall test the aptitude of the candidate in free hand drawing, perception of colours, visualization of colours, visualization of forms, the effect of light and shade on forms and general knowledge.

2.2.1 National Aptitude Test in Architecture (NATA)

As per the Minimum Standards prescribed by Council of Architecture (COA) under the Architects Act, 1972, admission of candidates to first year of 5-year B.Arch. degree programme shall be subject to their passing an aptitude test in architecture. The admission to the first year B.Arch degree programme is on the basis of marks obtained in the National Aptitude Test in Architecture (NATA) administered by COA.

2.2.1.1 Test Content

The test is in two parts. A paper based drawing test for two hours and computer based online aesthetic sensitivity test for one hour.

The test measures aptitude of the candidate through two sections - a paper based section for drawing and computer based section for aesthetic sensitivity.

2.2.1.1.1 Drawing Test

This is a two hour paper where candidate has to attempt two questions. The drawing aptitude is judged on the following aspects -

- Ability to sketch a given object proportionately and rendering the same in visually appealing manner.
- Visualising and drawing the effects of light on the object and shadows cast on surroundings.
- Sense of perspective drawing.
- Combining and composing given three dimensional elements to form a building or structural form.
- Creating interesting two dimensional compositions using given shapes and forms.

- Creating visual harmony using colours in given composition.
- Understanding of scale and proportions.
- Drawing from memory through pencil sketch on themes from day to day experiences.

2.2.1.1.2 Aesthetic Sensitivity Test

This is computer based test of one hour where candidate has to answer 40 multiple choice questions.

The aesthetic sensitivity test measures perception, imagination and observation, creativity and communication along with architectural awareness and comprises of -

- Visualising three dimensional objects from two dimensional drawings.
- Visualising different sides of three dimensional objects.
- Identifying commonly used materials and objects based on their textural qualities.
- Analytical reasoning.
- Mental Ability.
- Imaginative comprehension and expression.
- Architectural awareness.

2.3 Weightage

The following shall be the weightage:

| | |
|------------------------|-----------------|
| Architectural Aptitude | : 50% (Maximum) |
| Qualifying Examination | : 50% (Maximum) |

Note: In order to pass an Aptitude Test in Architecture, a candidate must obtain a minimum of 40% marks.

3.0 DURATION AND STAGES OF THE PROGRAMME

- The 5 years Bachelor's Degree programme in Architecture is conducted in two stages.
 - The First stage of the programme shall be the first 3 academic years or 6 semesters of institutional academic studies. The First stage shall be completed within 5 years of admission to the B.Arch. programme.
 - The Second stage of the programme shall be of 2 academic years/ 4 semesters including one year of practical training.
- The Architecture programme shall be of a minimum duration of 5 academic Years / 10 semesters inclusive of one year of practical training after the first stage in a professional's office.
- The maximum time limit for completing the programme will be 7 years or 14 consecutive semesters from the time of commencement of the programme.
- Registration of the candidates under the Architects Act, 1972, is acceptable only after successful completion of both the stages.

4.0 GENERAL STRUCTURE OF THE PROGRAMME

The B.Arch degree programme will have a curriculum with syllabi consisting of theory and design such as:

- General core subjects comprising of Mathematics, Mechanics and Structural Analysis and Design, History of Architecture, Theory of Architecture, Building Materials, Urban Housing, Project Management, Specification and Estimation, Contemporary Architecture, Introduction to Human settlements, Professional Practice etc.
- Studio oriented subjects comprising Building Construction, Building Services, Interior Design, Climatic Design, Site Planning, etc

- (iii) Compulsory studios consisting of Architectural Design, Architectural Drawing and Graphics, Art Studio, Computer Studio etc.
- (iv) Elective subjects for specialization in allied fields.
- (v) Compulsory Educational Tours in the third semester along with the rural studio and in the eighth semester before going for the Practical Training.
- (vi) A Practical training in eighth and ninth Semester for exposure to the Architectural profession's office procedures and principles.
- (vii) A Thesis work in the tenth Semester

5.0 ATTENDANCE

The candidate has to secure a minimum of 90% attendance in all the subjects to appear in the end semester examination.

6.0 PROMOTION TO HIGHER SEMESTERS

The candidate shall be promoted to the next semester only if he/she secures a minimum of 50% in the continuous assessment of studio oriented subjects in the respective semester. The candidate shall not be promoted to the second stage of the programme unless he/she secures a pass in all the subjects offered in the first year (I & II semester).

6.1 Credit limit for promotion to higher semester

| Promotion To Higher Years | | Minimum Credits to be earned |
|---------------------------|------|---|
| II YEAR | I | Should have earned all 10 credits in Design Studio I, Graphics Studio I, Art Studio |
| | II | Should have earned all 8 credits in Design Studio II and Graphics Studio II |
| III YEAR | III | Should have earned all 7 credits in Design Studio III & Computer Studio |
| | IV | Should have earned all 7 credits in Design Studio IV |
| IV YEAR | V | Should have earned all 8 credits in Design Studio V |
| | VI | Should have earned all 8 credits in Design Studio VI |
| V YEAR | VII | Should have earned all 10 credits in Design Studio VII & Working Drawings Studio |
| | VIII | Should have earned all 16 credits in Design Studio VIII, Educational Tour & Synopsis |

7.0 ASSESSMENT PROCEDURE

7.1 Assessment procedure for theory and studio oriented subjects

| Subjects | Maximum marks | | | Minimum marks required to pass | | |
|--------------------------|---------------|----------|-------|--------------------------------|----------|-------|
| | Internal | External | Total | Internal | External | Total |
| Theory subjects | 20 | 80 | 100 | - | 35 | 50 |
| Studio oriented subjects | 50 | 50 | 100 | 25 | 25 | 50 |

- (i) For theory subjects evaluation shall be done through internal assessment and class assignments during the semester.
- (ii) For **studio based theory subjects**, a candidate is allowed to appear in the University theory examination, only if he/she secures a minimum of 25 marks in the internal evaluation.

7.2 Design Studio

Evaluation of Studios like Design Studio, Art studio, Graphic Studio, Computer Studio, Working Drawing Studio shall be done by continuous internal assessment by internal and external examiners for each project with appropriate weightage. A candidate is allowed to appear in the University practical examination on Design studio, only if he/she secures a minimum of 50% in the internal evaluation of the Design Studio.

7.2.1 Architectural Design Examination

Architectural design examination will be conducted at the end of the 2nd, 4th & 6th semester which will be evaluated by an external examiner appointed by the University. The Architectural Design Examinations shall have the following duration.

| Semester | Duration |
|--------------------------|----------|
| 2 nd Semester | 6 hours |
| 4 th Semester | 12 hours |
| 6 th Semester | 18 hours |

7.3 Practical Training

As per the norms laid by the Council of Architecture, India, a candidate has to undergo practical training for one year in an approved architectural firm established not less than five years. The students can decide to work in a single architectural firm for the entire one year duration or can split in to two architectural firms based on their preference. However each session (VIII & IX semester) should have a minimum of ninety working days. In addition to the training in the architectural firms the students should critically analyze and document a building (Historic or Vernacular) reflecting the regional context or a contemporary building designed by an eminent architect. The one year practical training will be evaluated in two stages at the end of the eighth and ninth semester by internal and external examiners appointed by the University. A minimum of 50% marks has to be secured to pass in the same.

7.4 Educational Tour

The student has to participate in two educational tours organized by the department during his/her study in the third and eighth semester.

The **Tour I** will be evaluated along with the Rural Study of second year, as a part of Design Studio III.

The **Tour II** will be evaluated based on the pre and post tour reports submitted by the students. The evaluation will be done by examiners appointed by the university. A minimum of 50% marks has to be secured to pass in the same.

In case a student is not able to participate in Tour II due to reasons of ill health or other valid reasons in, he/she will participate in the Tour with the permission of Head of the Department in the subsequent year. In case a student has not participated in Tour II he/she will not be permitted to submit the thesis.

7.5 Synopsis

The entire thesis process comprises of synopsis, pre-thesis study and thesis. The intent of synopsis is to initiate the selection of Thesis topic in the beginning of the eighth semester itself. The students should work on three alternative topics of which one will be assigned to him/her to proceed to the next phase which include the literature review and data collection. The students will be allotted a supervisor who will direct them in the entire thesis process. The Synopsis will be evaluated by the examiners appointed by the university.

7.6 Pre-Thesis Study

The students will proceed for case studies and data collection of their approved synopsis in consultation with their respective supervisor. The findings and outcome of this study will be reviewed and evaluated by examiners appointed by the university.

7.7 Guidelines for Conduct of Architectural Thesis/Project

- (i) The Architectural Thesis/Project will be initiated in the beginning of eighth semester.
- (ii) The Architectural Thesis/Project shall be prepared under the guidance of an experienced teacher/qualified professional.
- (iii) There will be five continuous assessments during the semester conducted by a review committee comprising of the Head of the Department, Internal supervisor and External supervisor.

- (iv) A candidate, who fails to secure a pass in the continuous assessment marks in Thesis, shall not be allowed to appear for the Viva-Voce examination and has to reappear for the same in the next academic thesis session, with the same or a different Architectural Thesis/Project.
- (v) A jury comprising of an internal and external examiners shall conduct the final Viva-Voce examination of the Architectural Thesis/Project in the institution at the end of the Tenth semester.
- (vi) A candidate shall be declared to have passed in the Thesis if he/she secures not less than 50% each in the internal assessment and in the Viva- Voce examination conducted by the university.
- (vii) If he/she fails to secure a pass in the Thesis he/she shall improve the Thesis on the same topic on the lines suggested by the Jury and resubmit the same in the subsequent semester .In such cases the continuous assessment marks already secured by the candidate shall remain valid. The resubmitted Thesis shall be assessed for the remaining marks through a Viva-Voce examination conducted by the University.

8.0 ELIGIBILITY FOR THE AWARD OF DEGREE

A student shall be declared to be eligible for the award of the Bachelor of Architecture (B.Arch.) degree provided the student has successfully completed the programme requirements and has passed all the prescribed examinations in the ten semesters within the maximum period specified in clause 3.

9.0 AWARD OF CREDITS AND GRADES

All assessments of a course will be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, Letter Grades will be awarded based on the percentage of marks obtained by the candidate as per the range shown.

Range of Marks for Grades

| Range of Marks | Grade | Grade Points (GP) |
|----------------|-------|-------------------|
| 90-100 | A++ | 10 |
| 80-89 | A+ | 9 |
| 70-79 | B++ | 8 |
| 60-69 | B+ | 7 |
| 50-59 | C | 6 |
| 00-49 | F | 0 |
| ABSENT | W | 0 |

9.1 Cumulative Grade Point Average Calculation

The CGPA calculation on a 10 scale basis is used to describe the overall performance of a student in all subjects from first semester to the last semester. F and W grades will be excluded for calculating GPA and CGPA.

$$CGPA = \frac{\sum_i C_i GP_i}{\sum_i C_i}$$

Where C_i - Credits for the subject
 GP_i - Grade Point for the subject
 \sum_i - Sum of all subjects successfully cleared during all the semesters

10.0 CLASSIFICATION OF THE DEGREE AWARDED

- (i) A candidate who qualifies for the award of the Degree having passed the examination in all the subjects of all the semesters in **his/her first appearance** within a maximum period of 10 consecutive semesters after commencement of study securing a CGPA not less than 9.0 shall be declared to have passed the examination in **First Class – Exemplary**.
- (ii) A candidate who qualifies for the award of the Degree having passed the examination in all the subjects of all the semesters in **his/her first appearance** within 10 consecutive semesters after commencement of study securing a CGPA not less than 7.5 shall be declared to have passed the examination in **First Class with Distinction**.
- (iii) A candidate who qualifies for the award of the Degree having passed the examination in all the subjects of all the semesters within a maximum period of 10 consecutive semesters after commencement of study securing a CGPA not less than 6.0 shall be declared to have passed the examination in **First Class**.
- (iv) All other candidates who qualify for the award of the Degree having passed the examination in all the subjects of all the 10 semesters within a maximum period of 14 consecutive semesters after his/her commencement of study securing a **CGPA not less than 5.0** shall be declared to have passed the examination in **Second Class**.
- (v) A candidate who is absent in semester examination in a course/project work after having registered for the same, shall be considered to have appeared in that examination for the purpose of classification of degree
- (vi) A candidate can apply for revaluation of his/her semester examination answer paper in a theory course, within 1 week from the declaration of results, on payment of a prescribed fee along with prescribed application to the Controller of Examinations through the Head of Department. The Controller of Examination will arrange for the revaluation and the result will be intimated to the candidate concerned through the Head of the Department. Revaluation is not permitted for the studio oriented subjects and practical subjects including the project work, Thesis.

Final Degree is awarded based on the following:

| | |
|-------------------------|--------------------------------|
| CGPA \geq 9.0 | - First Class - Exemplary |
| CGPA \geq 7.50 < 9.0 | - First Class with Distinction |
| CGPA \geq 6.00 < 7.50 | - First Class |
| CGPA \geq 5.00 < 6.00 | - Second Class |

Minimum CGPA requirements for award of B. Arch Degree is 5.0 CGPA.

11.0 DISCIPLINE

Every student is required to observe disciplined and decorous behaviour both inside and outside the University and not to indulge in any activity which will tend to bring down the prestige of the University. If a student indulges in malpractice in any of the University theory / Studio oriented examination, he/she shall be liable for punitive action as prescribed by the University from time to time.

12.0 REVISION OF REGULATIONS AND CURRICULUM

The University may from time to time revise, amend or change the regulations, scheme of examinations and syllabi if found necessary.

BACHELOR OF ARCHITECTURE (5 YEARS)
REGULATIONS 2010 – CURRICULUM
FIRST SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|------------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SMTX1005 | Mathematics | 02 | 01 | - | 3 | 1 |
| SCIX1014 | Applied Mechanics | 02 | 01 | - | 3 | 2 |
| SARX1001 | History of Architecture I | 02 | - | - | 2 | 3 |
| SARX1002 | Theory of Architecture I | 02 | - | - | 2 | 4 |
| SARX1003 | Introduction to Building Materials | 02 | - | - | 2 | 5 |
| PRACTICAL | | | | | | |
| SARX4001 | Design Studio I | - | - | 09 | 5 | 6 |
| SARX4002 | Graphics Studio I | - | - | 05 | 3 | 7 |
| SARX4003 | Art Studio | - | - | 04 | 2 | 8 |
| TOTAL | | 10 | 02 | 18 | 22 | |

SECOND SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|-------------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SCIX1015 | Analysis and Design of Structures I | 02 | 01 | - | 3 | 9 |
| SARX1004 | History of Architecture II | 02 | - | - | 2 | 10 |
| SARX1005 | Theory of Architecture II | 02 | - | - | 2 | 11 |
| SCHX1001 | Environmental Science & Engineering | 03 | - | - | 3 | 12 |
| SARX3001 | Climatic Factors | 01 | - | 02 | 2 | 13 |
| SARX3002 | Building Construction I | 01 | - | 02 | 2 | 14 |
| PRACTICAL | | | | | | |
| SARX4004 | Design Studio II | - | - | 09 | 5 | 15 |
| SARX4005 | Architectural Design Examination I | - | - | - | 2 | 15 |
| SARX4006 | Graphic Studio II | - | - | 05 | 3 | 16 |
| TOTAL | | 11 | 01 | 18 | 24 | |

* L - Lecture Hours ** T - Tutorial Hours ***P - Practical Hours

THIRD SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|--------------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SCIX1016 | Analysis and Design of Structures II | 02 | 01 | - | 3 | 17 |
| SARX1006 | History of Architecture III | 02 | - | - | 2 | 18 |
| SARX3003 | Climatic Design | 01 | - | 02 | 2 | 19 |
| SARX3004 | Site Planning | 01 | - | 02 | 2 | 20 |
| SARX3005 | Building Services I | 01 | - | 02 | 2 | 21 |
| SARX3006 | Building Construction II | 01 | - | 02 | 2 | 22 |
| PRACTICAL | | | | | | |
| SARX4007 | Design Studio III | - | - | 09 | 5 | 23 |
| SARX4008 | Computer Studio | - | - | 04 | 2 | 23 |
| TOTAL | | 08 | 01 | 21 | 20 | |

FOURTH SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|---------------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SCIX1051 | Analysis and Design of Structures III | 02 | 01 | - | 3 | 24 |
| SARX1007 | History of Architecture IV | 02 | - | - | 2 | 25 |
| SARX1008 | Specification & Estimation | 02 | - | - | 2 | 26 |
| SARX3007 | Interior Design | 01 | - | 02 | 2 | 27 |
| SARX3008 | Building Services II | 01 | - | 02 | 2 | 28 |
| SARX3009 | Building Construction III | 01 | - | 02 | 2 | 29 |
| PRACTICAL | | | | | | |
| SARX4009 | Design Studio IV | - | - | 14 | 7 | 30 |
| SARX4010 | Architectural Design Examination II | - | - | - | 2 | 30 |
| TOTAL | | 09 | 01 | 20 | 22 | |

FIFTH SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|--------------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SCIX1052 | Analysis and Design of Structures IV | 02 | 01 | - | 3 | 31 |
| SARX1009 | History of Architecture V | 02 | - | - | 2 | 32 |
| SARX1010 | Urban Housing | 02 | - | - | 2 | 33 |
| SARX1011 | Theory of Design | 02 | - | - | 2 | 34 |
| SARX3010 | Building Services III | 01 | - | 02 | 2 | 35 |
| SARX3011 | Building Construction IV | 01 | - | 02 | 2 | 36 |
| PRACTICAL | | | | | | |
| SARX4011 | Design Studio V | - | - | 15 | 8 | 37 |
| TOTAL | | 10 | 01 | 19 | 21 | |

SIXTH SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|--------------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SCIX1053 | Analysis and Design of Structures V | 02 | 01 | - | 3 | 38 |
| SARX1012 | Contemporary Architecture | 02 | - | - | 2 | 39 |
| SARX1013 | Introduction to Human Settlements | 02 | - | - | 2 | 40 |
| | Elective I | 02 | - | - | 2 | |
| SARX3012 | Building Services IV | 01 | - | 02 | 2 | 41 |
| SARX3013 | Building Construction V | 01 | - | 02 | 2 | 42 |
| PRACTICAL | | | | | | |
| SARX4012 | Design Studio VI | - | - | 15 | 8 | 43 |
| SARX4013 | Architectural Design Examination III | - | - | - | 2 | 43 |
| TOTAL | | 10 | 01 | 19 | 23 | |

SEVENTH SEMESTER

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|-------------------------------|-----------|-----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SARX1014 | Steel in Architectural Design | 02 | 01 | - | 3 | 44 |
| SARX1015 | Urban Design | 02 | - | - | 2 | 45 |
| SARX1016 | Project Management | 02 | - | - | 2 | 46 |
| | Elective II | 02 | - | - | 2 | |
| | Elective III | 02 | - | - | 2 | |
| PRACTICAL | | | | | | |
| SARX4014 | Design Studio VII | - | - | 15 | 8 | 47 |
| SARX4015 | Working Drawing Studio | - | - | 04 | 2 | 47 |
| TOTAL | | 10 | 01 | 19 | 21 | |

EIGHTH SEMESTER (PRACTICAL TRAINING I)

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|--------------------|----------|----------|----------|-----------|----------|
| PRACTICAL | | | | | | |
| SARX4016 | Design Studio VIII | - | - | - | 10 | 48 |
| SARX4017 | Educational Tour | - | - | - | 3 | 48 |
| SARX4018 | Synopsis | - | - | - | 3 | 48 |
| TOTAL | | - | - | - | 16 | |

NINTH SEMESTER (PRACTICAL TRAINING II)

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|------------------|----------|----------|----------|-----------|----------|
| PRACTICAL | | | | | | |
| SARX4019 | Design Studio IX | - | - | - | 10 | 48 |
| SARX4020 | Pre Thesis Study | - | - | - | 3 | 48 |
| TOTAL | | - | - | - | 13 | |

TENTH SEMESTER (THESIS)

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|------------------|--------------------------|-----------|----------|-----------|-----------|----------|
| THEORY | | | | | | |
| SARX1017 | Professional Practice | 02 | - | - | 2 | 49 |
| | Elective IV | 02 | - | - | 2 | |
| | Elective V | 02 | - | - | 2 | |
| PRACTICAL | | | | | | |
| S21XPROJ | Design Studio X (THESIS) | - | - | 24 | 12 | 50 |
| TOTAL | | 06 | - | 24 | 18 | |

TOTAL CREDITS FOR THE PROGRAMME: 200

LIST OF ELECTIVE COURSES

NOTE: ONE SUBJECT SHOULD BE CHOSEN FROM EACH GROUP COMPULSORILY

| SUBJECT CODE | SUBJECT TITLE | L | T | P | CREDITS | PAGE No. |
|---------------------|--|----|---|---|---------|----------|
| Elective I | | | | | | |
| SARX1018 | Indian Vernacular Architecture | 02 | - | - | 2 | 51 |
| SARX1019 | Environment and Behaviour | 02 | - | - | 2 | 52 |
| SARX1020 | Sustainable Architecture | 02 | - | - | 2 | 53 |
| Elective II | | | | | | |
| SARX1021 | Facilities Management | 02 | - | - | 2 | 54 |
| SARX1022 | Introduction to GIS and Remote Sensing | 02 | - | - | 2 | 55 |
| SARX1023 | Urban and Regional Planning | 02 | - | - | 2 | 56 |
| Elective III | | | | | | |
| SARX1024 | Landscape Design | 02 | - | - | 2 | 57 |
| SARX1025 | Environmental Planning and Design | 02 | - | - | 2 | 58 |
| SARX1026 | Architectural Conservation | 02 | - | - | 2 | 59 |
| Elective IV | | | | | | |
| SARX1027 | Construction Management | 02 | - | - | 2 | 60 |
| SARX1028 | Advanced Construction Techniques | 02 | - | - | 2 | 61 |
| SARX1029 | Design for Disaster Management | 02 | - | - | 2 | 62 |
| Elective V | | | | | | |
| SARX1030 | Architectural Journalism | 02 | - | - | 2 | 63 |
| SARX1031 | Architectural Anthropology | 02 | - | - | 2 | 64 |
| SARX1032 | Contemporary Process in Architecture | 02 | - | - | 2 | 65 |
| SCIX1054 | Structural Systems | 02 | - | - | 2 | 66 |

| SMTX1005 | MATHEMATICS | L | T | P | Credits | Total Marks |
|----------|-------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | – | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | – | 35 | 50 |

OBJECTIVES:

To develop skills of students in Engineering Mathematics, in solving differential equations of different types and to study the properties of lines and planes in space, along with sphere and providing a tool to understand 3D material.

UNIT I INTEGRATION & FUNCTIONS OF TWO VARIABLES**10 hrs.**

Integration of rational, trigonometric and irrational functions, properties of definite integrals, Reduction formulae for trigonometric functions. Taylor's Theorem with remainder Maxima and Minima (Simple Problems)

UNIT II ORDINARY DIFFERENTIAL EQUATIONS**10 hrs.**

Linear, second order and higher order Differential equations with constant coefficients. Differential equations with variable coefficients of Euler type.

UNIT III BASIC STATISTICS AND PROBABILITY**10 hrs.**

The arithmetic mean, median, mode, standard deviation and variance. Regression and correlation, elementary probability theory, conditional probability.

UNIT IV TRIGONOMETRY AND MENSURATION**10 hrs.**

Trigonometric(sine, cosine and tan functions) and exponential function, De-moiver's theorem. Area of plane figures, computation of volume of solid figures.

UNIT V GEOMETRY IN ARCHITECTURE**8 hrs.**

Ratio and systems of proportion – definition and derivation of golden ratio, Fibonacci series.

Total: 48 hrs.**REFERENCES:**

1. Grewal B.S., Higher Engineering Mathematics, 36th Edition, Khanna Publishers, 2002,
2. Kreyszig.E, Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons, 2001.
3. Narayanan S., Manicavachagom Pillay T.K., Ramanaiah G., Advanced Mathematics for Engineering students, Volume I, 2nd Edition, S.Viswanathan Printers and Publishers, 1992.
4. Veerarajan T, Engineering Mathematics for First Year, 2nd Edition, Tata McGrawHill Publications, 2008
5. Kandaswamy P & co., Engineering Mathematics for First Year, IX Revised Edition, S.Chand&Co Pub., 2010.
6. Kappraff Jay, Connections; The Geometric bridge between art and science,

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 2 marks.

 $10 \times 2 = 20$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $5 \times 12 = 60$ marks

| SCIX1014 | APPLIED MECHANICS | L | T | P | Credits | Total Marks |
|----------|-------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | – | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | – | 35 | 50 |

OBJECTIVES:

To Analyse and Understand the behaviour of structural systems, material and geometric properties of structural sections.

UNIT I FORCES**12 hrs.**

Definition – Coplanar – Concurrent – Non-Concurrent - Parallel Forces – Triangular and Parallelogram Law of Forces – Equilibrium of Forces – Conditions for Static Equilibrium – Concept of Transfer of Forces in Beams, Cables, Arches & Domes. Various Types of Load – Dead, Live, Wind, Impact, Earthquake etc& their Effect on Structures .Various Types of Structural Members -Support Conditions – Reaction Moments-Pin Jointed Determinate Trusses – Analysis by Method of Joints and Method of Sections.

UNIT II ELASTIC PROPERTIES**12 hrs.**

Definition -Stress, Strain – Tensile, Compressive & Shear – Linear & Lateral Strain – Poisson's ratio - Stress Strain Curve for Mild Steel & High Tensile Steel – E,K,G and their Relationships – Application to Uniform Sections.

UNIT III GEOMETRICAL PROPERTIES OF SECTIONS**12 hrs.**

Area – Centroid – C.G of Various Sections (Including Cutout Holes) – Moment of Inertia – Parallel & Perpendicular Axis Theorem – Moment of Inertia of Various Section – Section Modulus.

UNIT IV SHEAR FORCE & BENDING MOMENTS**12 hrs.**

Definition – Relation between Loading, Shear Force & Bending Moment – Simply Supported, Cantilever and Overhanging Beams Subjected to Concentrated, UDL, UVL and their Combinations.

Total: 48 hrs.**REFERENCES:**

1. Junnarkar, Mechanics of Structures (Vol – I), 21st edition, Charotar publishing house, India, 1995
2. Bansal.R.K., Strength of Materials, Laxmi Publications Pvt Limited, India, 1990.
3. Rajput.R.K., Strength of Materials, S.Chand &Co, New Delhi, 1996.
4. Punmia.P.C., Strength of materials and Theory of structures, Vol 1, Laxmi publications, Delhi, 1994.
5. Ramamrutham, Strength of Materials, Dhanpatrai & Sons, Delhi, 1990.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks**(80% problem, 20% theory)**

| SARX1001 | HISTORY OF ARCHITECTURE I | L | T | P | Credits | Total Marks |
|----------|---------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To get students acquainted with the factors that shape architecture. Analyzing built forms, the limitations of the building process over ages and the influences of events which have dictated the outcome of architecture of Egypt, Empires of western Asia, Greece, Rome and Byzantine and Comprehending the rich vocabulary of forms & shapes and structural systems.

UNIT I ARCHITECTURE OF PREHISTORIC**8 hrs.**

Paleolithic & Neolithic - Factors influencing Architecture. Architectural character.

Introduction to Egyptian art with examples, Factors influencing Egyptian civilization - Tomb & temple Architecture - Great Pyramid of Cheops, Gizeh; Great temple of Ammon, Karnak, Abu Simbel

Empires of Western Asia – Mesopotamian, Assyrian, Babylonian and Persian culture. Factors influencing Architecture, Architectural character – Ziggurat of Ur; Palace of Sargon, Khorsabad, Palace of persepolis.

UNIT II GREECE**8 hrs.**

Introduction to Greek art with examples, Factors influencing architectural character, Evolution of city states, Architecture in archaic and classic Hrs. Factors influencing Architecture. Architectural character, evolution of temple form. Building Examples – The Acropolis, Athens; The Parthenon, Athens; The Erectheion, Athens; The Tower of Winds, Athens; The theatre at Epidaurous, sanctuaries, Agoras & monuments, Ricardii

UNIT III ROME**8 hrs.**

Introduction to Roman art with examples, Evolution of republican states. Factors influencing Architecture. Tuscan & Composite orders, construction techniques. Building Examples - The Colloseum; The Thermae of Caracalla; The Pantheon, Rome, The Circus Maximus, Aqueducts

UNIT IV EARLY CHRISTIAN & BYZANTINE**8 hrs.**

Birth and spread of Christianity. Evolution of church forms. Factors influencing Architecture.

Building examples - St. Clemente; St.Hagia Sophia, Constantinople; St. Vitale, Ravenna; St. Mark, Venice.

Total: 32 hrs.**REFERENCES:**

1. Sir Bannister Fletcher, A History of Architecture, University of London, The Antholone Press - 1986.
2. Pier Luigi Nervi, History of World Architecture series, Hary.N.Abraham Inc. Publication New York - 1972
3. Lloyd / H. W. Miller, History of world Architecture series, Faber Ltd, London -1986.
4. Spiro Kostof, A history of Architecture - settings and Rituals, Oxford University Press London 1985

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

$8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$4 \times 12 = 48$ marks

| SARX1002 | THEORY OF ARCHITECTURE I | L | T | P | Credits | Total Marks |
|----------|--------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To develop a vocabulary for design process by exposing the students to emotional effects and aesthetic design relationships like proportion scale, balance, symmetry etc., by studying architectural examples. Understanding color, its properties, influence, combinations and symbolism and meaning in cultures.

UNIT I INTRODUCTION TO ARCHITECTURE**8 hrs.**

Definition of architecture, Elements of Architecture backed by need and followed by fulfillment of need.

Architectural design, an analysis, Integration of Aesthetics and Function.

UNIT II FORM & SPACE**8 hrs.**

Concepts of space Physical/ psychological - indoor/ outdoor – Visual & Emotional effects of geometrical forms & their derivatives - Architectural elements and their part played in modulating space, types of openings, qualities of architectural space- Presentation of any analytical study of a sculptural building form and its critical appraisal of visual character.

UNIT III SCALE & PROPORTION**8 hrs.**

Definition Human Scale – Divine -Dramatic - Means by which they can be achieved with suitable example - Type of proportion with suitable example.

UNIT IV ORDERING PRINCIPLES AND COLOUR**8 hrs.**

Ordering principles:Axis, Symmetry, Hierarchy, Datum, Rhythm, Repetition, Transformation, Balance, Contrast, Pattern. Colour: Understanding colour - use of colour - its application - symbolism using colours.

Total: 32 hrs.**REFERENCES:**

1. Francis D K Ching, Form - Space - order - Van nostrandreinhold company New-York - 1979
2. V S Pramar, Design Fundamentals in Architecture,Somayya Publication Pvt. Ltd.- 1973
3. Antony J Catanese&Smyder, Introduction to Architecture,McGraw Hill Books Co. New York 1988.
4. Talbot Hamlin-Forms and functions of 20th century Architecture(vol 2) – Columbia University press – Newyork - 1952
5. Approach to Architectural design ARG Isaac Butterworth & co. London 1977.
6. Senner Golfried, The four elements of Architecture - Cambridge University press London. U.K.-1984

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1003 | INTRODUCTION TO BUILDING MATERIALS | L | T | P | Credits | Total Marks |
|----------|------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To expose the student to different materials of construction, components and elements of buildings, and to get exposed to various building materials their properties and uses.

UNIT I INTRODUCTION**8 hrs.**

Introduction to building and various building materials, Definition of building, building types and building Materials (Soil, stone, brick, clay, rural materials, timber, cement, concrete, iron, steel, aluminium, plastics and glass). Introduction to various types of Buildings as per NBC.

UNIT II NATURAL BUILDING MATERIALS**8 hrs.**

Soil- Definition of soil, Types of soil, soil classification, excavation techniques, test for soil, sand and its classification.

Stone- Classification of rocks, Various types of building stones and their physical properties, Quarrying techniques, Tests for stone, Deterioration & Preservation of stone, Various stone finishes and joints.

Timber- Classification, Physical properties and uses, defects in timber, conservation, seasoning, decay and preservation of timber and treatment of timber

Mud, bamboo, casuarinas, palm, coconut, hay, husk, their properties and uses.

UNIT III BRICK AND CLAY**8 hrs.**

Brick- properties and uses, manufacturing process, types of bricks.

Clay- properties, various uses of clay products like floor types, roof tiles, hollow clay blocks.

Lime- properties and uses+, manufacturing process.

UNIT IV ALLIED BUILDING MATERIALS**8 hrs.**

Cement – ingredients, properties and uses, tests for cement, varieties of cement.

Concrete, iron, aluminium, glass, plastics – introduction, properties, types and uses.

Total: 32 hrs.**REFERENCES:**

1. Arora.S.P&Bindra S.R " A text Book of Building Construction" DhanpatRai& Sons, New Delhi 1994.
2. Barry.R. "The construction of Buildings (Vol. 1)", Orient Longman, London, 1969.
3. W.L.Schroeder, Soils in Construction, John Wiley and Sons, New York, 1980.
4. S.C Rangwala, Engineering Materials, Charotar Publishing House, Anand, 1982.
5. HUDCO – All you wanted to know about soil stabilized mud blocks – HUDCO, New Delhi, 1989.
6. Sushil Kumar -Building Construction- Standard publishers and Distributors-2010
7. Chudley- Constrution Technology (Vol 1)-Longman publications 3rd Edition - 1999

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

8 × 4 = 32 marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

4 × 12 = 48 marks

| SARX4001 | DESIGN STUDIO I | L | T | P | Credits | Total Marks |
|----------|-----------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 9 | 5 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

OBJECTIVES:

To make students, familiar with the making and purpose of design and train them in visual composition using two-dimensional and three dimensional objects and to develop aspects of visual perception.

DESIGN STUDIO I**Basic Design- Elements Of Design**

The design exercises shall be aimed at understanding the role of basic elements of design –

Point, Line, Plane and Volume- in paintings, compositions, murals, sculptures, buildings and nature.

Form

The design exercises shall be aimed at understanding:

The properties of form: Shape -Primary shapes or circle, triangle and square- Family of shapes – Developing shapes from given geometric shape and working out compositions from them. Creation of Motifs from geometrical and natural shapes and their applications in practice.Primary solids or sphere, cylinder, cone, pyramid and cube-Texture-study of textures Colour - The design exercises shall be aimed at developing the skills to create visually pleasing colour schemes based on principles of colour theory, colour symbolism, harmony and contrast. Use of colour in giving expression to Architectural forms. Impact of light in modulating colours-Transformation of form- dimensional, subtractive and additive- centralized, linear, radial, clustered and grid forms for arriving at new shapes and compositions. Interlocking of forms- interlock of forms differing in geometry (circle, square or triangle) or orientation (rotated grid).

Form & Space-Figure & Ground relationships

Architectural elements and their part played in modulating space- Horizontal and Vertical space-defining elements (linear or planar) and openings in them.

Scale & Proportion

Proportioning systems – Classical orders, Golden Section, Scale - Visual scale and Human scale and Anthropometrics - Use and applicability exercises related to understanding space, influence of anthropometrics in shape & form using day today examples.

Ordering Principles Of Design

The design exercises shall be aimed at understanding the application of various ordering principles of design in 2 dimensional and 3 dimensional compositions & understanding their application and use in built forms and in abstract versions: Axis, Symmetry, Hierarchy, Datum, Rhythm, Repetition, Transformation, Balance, Contrast, Pattern -arrangement of shapes to obtain symmetrical, asymmetrical, organic patterns and the like. Creating expressions in patterns through the use of value, colour, texture etc.

Articulation of Forms And Spatial Relationships

The design exercises shall be aimed at understanding :

Articulation and its role as a form modifier – edges and corners, surfaces -

Spatial relation ships - Space within a space, interlocking spaces, adjacent spaces and spaces linked by a common space.

Principles of Composition

Specific qualities of - Dominance, Unity, Harmony, Punctuating effect, Dramatic effect, Climax, Contrast, Accentuation, Fluidity with building examples.

Total: 120 hrs.

REFERENCES:

1. Paul Jacques, Grills Form and Function and Design-1975
2. Wang Wucius, Van Nostrand Rein Hold, Principles of three dimensional design - 1976
3. Wang Wucius, Principles of Two dimensional design, Van nostrand Rein hold -1972
4. George A. Covington & Bruce Hannan, Van Nostrand Rein hold Access by design, 1996.
5. Majore Elliot Bevin, Half Rinehart and Wintan Design through Discovery, ,Newyork 1977.
6. Carolyn M Bloomer – Principles of visual perception – Van Nostraud Reinhold co, - 1976

| SARX4002 | GRAPHICS STUDIO I | L | T | P | Credits | Total Marks |
|----------|-------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 5 | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 100 | - | 50 | - | 50 |

OBJECTIVES:

To introduce to the students the basics of architectural graphics in terms of both two dimensional and three dimensional drawing.

UNIT I INTRODUCTION TO GRAPHICS**20 hrs.**

Principles of Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing, lettering, formatting, and scaling- Construction of Different scales and their uses in practice.

UNIT II GEOMETRICAL DRAWING**20 hrs.**

Introduction to plane geometry and exercise in construction of straight lines, circles, tangents, regular polygons, and Ellipse.

UNIT III ORTHOGRAPHIC PROJECTIONS**20 hrs.**

Projections of points, lines and planes (First Angle Projection only)

Projection of solids ,Section of Solids, Development of solids

UNIT IV ISOMETRIC PROJECTIONS**20 hrs.**

Introduction to isometric, Axonometric & oblique projections.Isometric projection of lines, planes and solids.

Total: 80 hrs.**REFERENCES:**

1. CooperFlouglas, Drawing & Perceiving, Van Nostrand Rein hold, New York 1995.
2. Hale Robert Beverly Watson Drawing lessons from the Great Masters,Guptill publication New York 1964
3. Bhatt N.D, Engineering drawing, Charotar publishing house, Anand, India, 1990.
4. Edward J Muller, James G Fausett, Philip A Grau, Architectural Drawing & Light Construction – Preutice-Hall Inc.,-1993

| SARX4003 | ART STUDIO | L | T | P | Credits | Total Marks |
|----------|------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 4 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 100 | - | 50 | - | 50 |

OBJECTIVES:

To understand free hand drawing as a means to communicate and to train the students to sketch and render natural forms, built forms and presentation drawings manually in various media.

UNIT I FREE HAND DRAWING**12 hrs.**

Pencil Sketching and rendering of Solids -cube, cone, cylinder, pyramid and sphere and other simple three dimensional compositions. Free hand sketching of natural and building elements in pencil.

Sketching -Geometrical shapes & Still life-furniture, objects, equipments. Sketching human forms [Knowledge of anatomy] expressions, graphical representations. Understanding depth, light & Shade, Sciography etc.

UNIT II PAINTING**12 hrs.**

Geometrical shapes & Still life-furniture, objects, equipments. Sketching human forms [Knowledge of anatomy] expressions, graphical representations. Understanding depth, light & Shade, Sciography etc with different media like water colours, poster colours etc.

UNIT III MODEL MAKING**12 hrs.**

Study of linear forms - Creating wire sculptures, mobile sculptures, atrium sculptures, space sculptures, geodesic domes etc. for outdoor and indoor architectural spaces using match sticks, steel wires, bamboo splits etc.-Study of planar forms - creating abstract sculptures out of mount board, metal foils or any other planar material and also exploring the adoptability of these sculptures to architectural functions-Study of paper forms-exploration of various folded paper forms and its possible use in architectural spaces.

Study of primary solids – Making mount board models of cubes, cuboids, square pyramid, cylinder and cone-Study of solids and voids - creation of abstract and semi abstract symbolic sculptural forms and spaces-Study of Fluid/Plastic forms- use of clay, plaster or any other moldable material and create plastic and free flowing sculptural forms-Study of textures - vitiating a cube by way of textures, texture applicability in murals and interior decoration-Origami / Tessellations. Models using clay, plaster of paris, wax, wire, match sticks etc.

UNIT IV PHOTOGRAPHY**12 hrs.**

Introduction to photography, exercises on presenting the created models using photography as a technique.

Total: 48 hrs.**REFERENCES:**

1. Rendering in Pencil, Gruptill Publication New York - 1977.
2. Bath, Learn to draw, Victoria publishing ltd, U.K. 1981.
3. Francis D K Ching, Drawing a Creative Process, Van Nostrand, Reinhold New York 1990.
4. Drawing & Sketching, Brock Hampton Press London 1993.
5. The art of drawing trees, heads, colours, mixing,. Drawing Landscape & painting, water colour painting, oil painting etc. The Grumbacher Library Books, New York 1966.

| SCIX1015 | ANALYSIS AND DESIGN OF STRUCTURES I | L | T | P | Credits | Total Marks |
|----------|-------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To introduce stresses & deflections in beams, columns & masonry.

UNIT I STRESSES IN BEAMS**12 hrs.**

Theory of Simple Bending – Bending and Shear Stresses in Beams – Examples on Simple Sections – Stress Distribution Diagrams Core or Kern of Sections.

UNIT II DEFLECTIONS OF BEAMS**12 hrs.**

Slope and Deflection at a Section – Double Integration and Macaulay's Method for Simply Supported & Cantilever Beams with Distributed and Point Loads.

UNIT III THEORY OF COLUMNS**12 hrs.**

Short & Long Column – Euler's Method & its Limitations – Derivation of Euler's Formula (Different End Conditions) – Rankine's Formula for Column, Effect of Eccentric Loading.

UNIT IV MASONRY**12 hrs.**

Design of Brick Masonry – Load Bearing Walls – Piers & Footings – Use of Nomograms – Codal Requirements

Total: 48 hrs.**REFERENCES:**

1. Bansal. R.K., Strength of Materials by, Laxmi Publications Pvt Limited, India, 1990.
2. Ratwani & Vazirani, Analysis of structures, Vol 1, Khan publications, Delhi, 1990.,
3. Junnarkar, Mechanics of Structures (Vol – I), 21st Edition, Charotar publishing house, India, 1995
4. Punmia.P.C, Strength of materials and Theory of structures, Vol 1, Laxmi publications, Delhi, 1994.
5. Jain A R & Jain B K, Theory and Analysis of structures, Vol 1, Nemchand & Bros, Roorkee, 1987.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

$8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$4 \times 12 = 48$ marks

(80% problem, 20% theory)

| SARX1004 | HISTORY OF ARCHITECTURE II | L | T | P | Credits | Total Marks |
|----------|----------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To understand the progress in civilization, leading to the development of art and architecture and to know how architecture and planning evolved from ancient, Buddhist and Hindu forms of buildings with selected examples.

UNIT I ANCIENT INDIA**8 hrs.**

Indus Valley Civilization – Introduction to art, Culture and pattern of settlement, Aryan migration – Vedic village and rudimentary forms of wood and bamboo. Wooden construction under the Mauryan rule.

UNIT II BUDDHIST ARCHITECTURE**8 hrs.**

Introduction to Buddhist art, Hinayana and Mahayana Buddhism – cultural factors that shaped development of forms in their buildings- Lomas Rishi. Architectural Productions during Ashoka's rule – Ashokan Pillar, Sarnath –sanchistupa.Salient Features of Stupas, Chaityas and Vihara.Rock cut Architecture in the Western and Eastern Ghats – examples:-bhaja, Karli, main caves of ajantha and ellora, Rani Gumpha- Udaigiri.

UNIT III HINDU ARCHITECTURE**8 hrs.**

Introduction to Hindu art, Evolution of Hindu Temple .Early Shrines of Gupta and Chalukyan-Tigawa temple, Ladh Khan and Durga temple at Aihole. Papanatha and Virupaksha temples at Pattadakkal. Dravidian culture - Rock cut productions under the Pallavas – Shore Temple and Rathas at Mahabalipuram ,Kailasanatha and Vaikuntaperumal Temples, Kanchipuram- Chola period- Brihadeeswara Temple,Tanjore- Pandya style :Evolution of Gopuram – Complexity in Temple Plan of Srirangam Temple, Meenakshi Temple, Madurai-Nayak style – Rameshwaram temple

UNIT IV INDO ARYAN STYLE**8 hrs.**

Salient Features of Indo Aryan Temple.E.g:Lingaraja Temple-Bhuvaneswar, Sun Temple-konark, Temple at Puri, KandariyaMahadeo and Lakshmana Temple-kajuraho.

Total: 32 hrs.**REFERENCES:**

1. Percy Brown – Indian Architecture (Buddhist and Hindu Period) – Taraporevala and Sons, Bombay, 1983.
2. Satish Grover – The Architecture of India(Buddhist and Hindu Period) – Vikas Publishing House Pvt.Ltd.,New Delhi,1981
3. Volwahsen – Living Architecture - India(Buddhist and Hindu) – Oxford and IBM – LoChristopher Taddell – The History of Architecture of India from the Dawn of Civilization to the end of the Raj – Longman Group,U.K.Ltd.,London,1990
4. Henri Stierlin – Hindu India- From Khajuraho to the Temple city of Madurai – Taschen 2002
5. Carmen kagal,vistara:the architecture of India,published by festival of India,1986.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1005 | THEORY OF ARCHITECTURE II | L | T | P | Credits | Total Marks |
|----------|---------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To understand that forms and spaces can be defined by articulation. Understand the importance of the concept of ordering of forms and spaces by establishing spatial relationships and organization. To recognize the various principles of composition and to describe the path of our movement as circulation or movement through space with an experience and perception of forms and spaces in a sequence. To study the functional aspects of design.

UNIT I ORGANISATION OF FORMS AND SPACES**8 hrs.**

Articulation and its role as a form modifier –edges and corners, surfaces-Spatial relation ships, Spatial organization.

UNIT II PRINCIPLES OF COMPOSITION**8 hrs.**

Specific qualities of - Dominance, Unity, Harmony, Punctuating effect, Dramatic effect, Climax, Contrast, Accentuation and Fluidity with building examples-Circulation - Building entrance -configuration of path - circulation patterns - circulation within buildings, types of circulation.

UNIT III DETERMINANTS**8 hrs.**

Climate as determinant-Principles of climatic comfort climate shaping form with examples from history-Structure & Building materials as determinants-Socio cultural determinants-Culture temporal & regional influences as determinant in architecture – Beliefs, Aspiration, values of the user-Definition of personal space, territory, etc. Examples from past and modern era,

UNIT IV WORKS OF CONTEMPORARY ARCHITECTS**8 hrs.**

Works of modern and post modern architects and their ideologies and philosophies towards architecture- Louis Sullivan, F.L. Wright, Louis Kahn, Le Corbusier, Philip Johnson, Charles Correa and Michael Graves- Case studies

Total: 32 hrs.**REFERENCES:**

1. Francis D K Ching, Form - Space - order - Van nostrandreinhold company New-York - 1979
2. Pramur. V S, Design Fundamentals in Architecture,Somayya Publication Pvt. Ltd.- 1973
3. Antony J Catanese&Smyder, Introduction to Architecture,McGraw Hill Books Co. New York 1988.
4. Talbot Hamlin-Forms and functions of 20th century Architecture(vol 2) – Columbia University press – Newyork - 1952
5. Approach to Architectural design ARG Isaac Butterworth & co. London 1977.
6. Senner Goltfried, The four elements of Architecture - Cambridge University press London. U.K.-1984

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SCHX1001 | ENVIRONMENTAL SCIENCE & ENGINEERING | L | T | P | Credits | Total Marks |
|----------|-------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 3 | - | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To introduce the the basics of ecosystems & biodiversity, causes, effects of environment pollution etc.

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES**12 hrs.**

Definition, scope and importance – need for public awareness – forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their ground water, floods, drought, conflicts over water, dams-benefits and problems – mineral resources: use effects on forests and tribal people – water resources: use and over-utilization of surface and exploitation, environmental effects of extracting and using mineral resources, case studies – food resources: world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy sources.

UNIT II ECOSYSTEMS AND BIODIVERSITY**10 hrs.**

Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – introduction to biodiversity – definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: in-situ and exsitu conservation of biodiversity.

UNIT III ENVIRONMENTAL POLLUTION**10 hrs.**

Definition – causes, effects and control measures of: (a) air pollution (b) water pollution (c) soil pollution (d) marine pollution (e) noise pollution (f) thermal pollution (g) nuclear hazards – solid waste management: causes, effects and control measures of urban and industrial wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT**8 hrs.**

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – environmental ethics: issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – air (prevention and control of pollution) act – water (prevention and control of pollution) act – wildlife protection act – forest conservation act – issues involved in enforcement of environmental legislation – public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT**8 hrs.**

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – hiv / aids – women and child welfare – role of information technology in environment and human health – case studies.

Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain. Visit to a local polluted site-urban/rural/ industrial/agricultural-study of common plants, insects, birds-study of simple ecosystems-pond, river, hill slopes etc.

REFERENCES:

1. Meenakshi.P, Elements of Environmental Science and Engineering, 1st Edition, PHI, Learning Ltd, New Delhi, 2005.
2. Ravikrishnan. A, Environmental Science & Engineering, Sri Krishna Publications, 2005.
3. Wrigh.T & Nebel B.J, Environmental science-towards a sustainable future by Richard 8th Edition, prentice hall of India, Newdelhi, 2010.
4. ErachBharucha ,Text Book of Environmental Studies,University Press, Chennai,2005
5. Anjanayelu.Y, Introduction to Environmental Engineering- -B.S.Publications,2010

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Part A: 2 questions from each unit, each carrying 2 marks.

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

Exam Duration: 3 hrs.

10 × 2 = 20 marks

5 × 12 = 60 marks

| SARX3001 | CLIMATIC FACTORS | L | T | P | Credits | Total Marks |
|----------|------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVES:

To introduce the concepts of climatic design, aspects of climate which are of relevance to designers, concepts of heat and heat flow, solar control and movement of air in and through buildings.

UNIT I THE CLIMATE**12 hrs.**

Factors that determine climate - Components of climate – Site Climate - Characteristics of different climates-Methods of measurement and recording of climatic data.

UNIT II THERMAL SENSATION**12 hrs.**

Body heat balance - Introduction to Effective temperature & Comfort zone, Thermal comfort factors and indices.

UNIT III HEAT FLOW IN BUILDINGS**12 hrs.**

Transfer of heat- definitions- Periodic heat flow in building elements- Introduction to Time-Lag and Decrement factor- Heat flow through materials.

UNIT IV AIR MOVEMENT**12 hrs.**

Stack effect - Air movement through buildings - Air movement around buildings – Layout planning for air movement – Wind rose- Wind shadow- Ventilation controls and their applications in buildings- Thermally induced air currents.

Total: 48 hrs.**Studio Work**

- Study of Atkinson climatic classification for tropics
- Constructing climate characteristics on a psychometric Chart
- Computing effective temperature for given environmental configurations
- Evaluation of the heat flow rate through various building sections
- Measurement of air flow around different planning layouts
- Assessment of air flow rate across different configurations of window openings

REFERENCES:

1. Otto Koenigsberger & others – Manual of Tropical Housing and Building Part 1 – Climatic Design. Longmans, London – 1980.
2. Martin Evans – Housing, Climate and Comfort. Architectural Press, London – 1980.
3. Edited By Arvind Krishnan, Nick Baker, Simons Yannas & S V Szokolay "Climatic Responsive Architecture- A 4. Design Handbook For Energy Efficient Buildings", Tata Mc Grill Publishing Company Ltd, 2001
4. Bureau of Indian Standards Codes

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3002 | BUILDING CONSTRUCTION I | L | T | P | Credits | Total Marks |
|----------|-------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVES:

To expose the student with construction practices of stone, clay products and rural materials.

UNIT I INTRODUCTION**12 hrs.**

Purpose of Construction drawing, Drafting Exercises on Representation of different types of Building Materials in sections and Symbols of different types of doors and windows in plan. Sanitary Fitments, Kitchen sinks and other related Accessories in Plan, Sections and Elevations.

Components of Building – Sub structure and Super structure, Structural and Aesthetic components and its functions. Drafting Exercises on Simple, cross section of walls showing various building components in plan and section and structural components in detail.

UNIT II FOUNDATION**12 hrs.**

Foundation-Function, Different types of Foundations, Excavation techniques. Drafting exercise on simple shallow foundation footings using stone and brick, stepped footing, Raft foundation.

UNIT III STONE AND BRICK MASONRY**12 hrs.**

Drafting Exercises on foundation, types of masonry – random rubble masonry/ Ashlar Masonry-Types of bricks, Brick Masonry work using different bonds, rat trap bond Junctions – T-Junction (1 and 1 ½ bricks), L – Junction (1 and 1 ½ bricks), Cross junction (2 bricks). Brick paving, Reinforced Brick Masonry, Cavity wall, Composite Masonry and arches.

UNIT IV CLAY PRODUCTS AND RURAL MATERIALS**12 hrs.**

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

Total: 48 hrs.**REFERENCES:**

1. Arora.S.P&Bindra S.R " A text Book of Building Construction" DhanpatRai& Sons, New Delhi 1994.
2. McKay W.B., Building Constructon, Vol 1, Longmans, U.K 1981.
3. Popposwamy, Rural India – Village Houses in Rammed Earth, Sri Aurobindo Ashram Press, Pondicherry, 1984.
4. Use of Bamboo and REED in Construction – UNO Publications.
5. Rangwal S.C, Engineering Materials, Charotar Publishing House, Anand, 1982.
6. HUDCO – All you wanted to know about soil stabilized mud blocks – HUDCO, New Delhi, 1989.
7. Sushil Kumar -Building Construction- Standard publishers and Distributors-2010
8. Chudley- Constrution Technology (Vol 1)-Longman publications 3rd Edition - 1999

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

(50% Drafting, 50% Theory)

| SARX4004 | DESIGN STUDIO II | L | T | P | Credits | Total Marks |
|----------|------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 9 | 5 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

OBJECTIVES:

To introduce to the students the basic principles of space design and to realize the same in three dimensional models. The thrust for the design is on the spatial organization with respect to anthropological space standards including physically challenged.

DESIGN STUDIO II**Architectural Design**

Study of space standards and anthropometrics.

Anthropometrics as related to physically handicapped and elderly.

Simple space organization starting with single space single use.

Design of Hostel room, Bed room, Kitchen, Toilet. Toilet for physically handicapped persons. Shop, Pavilion, Snack bar. Residence, Cottages etc

Workshop

Elementary models indicating wall surfaces, floral designs, ceilings, glass areas, lawn, water bodies etc.

Block models of small campuses using wood, thermocol, mount board, soap, corkboard etc.

Detailed model of a small building and the landscape details.

Site model of a park.

Model of a measured Building.

Total: 120 hrs.

REFERENCES:

1. De Chiara, Micheal J Crosbie, Time saver standards for Building types, McGraw Hill Co: New York, 2001.
2. Sid del mar Leach, Techniques of interior design, Rendering and presentation, McGraw Hill Co: New York- 2008.
3. Mark Karhen, Space planning basics, John Wiley & son- 2004.

| SARX4005 | ARCHITECTURAL DESIGN EXAMINATION I | L | T | P | Credits | Total Marks |
|----------|------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | - | 100 | - | 50 | 50 |

COURSE OBJECTIVE:

To understand the process of designing buildings within given time frame

To improve the drafting skills of the candidate

UNIVERSITY PRACTICAL EXAM QUESTION PAPER PATTERN

Max. Marks:100

Exam Duration: 6 hrs.

One question with an internal choice on designing Simple space organization like Design of Hostel room, kiosk, weekend cottage, Pavilion, Snack bar, Residence, architect's office etc.

| SARX4006 | GRAPHICS STUDIO II | L | T | P | Credits | Total Marks |
|----------|--------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 5 | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 100 | - | 50 | - | 50 |

OBJECTIVES:

To introduce to the students the basics of architectural graphics in terms of both two dimensional and three dimensional drawing.

UNIT I MEASURED DRAWING**20 hrs.**

Drawing of simple objects to scale. Measured drawing of furniture, door, window, class room, single storey building etc.

UNIT II PERSPECTIVE**20 hrs.**

Characteristics of perspective drawings, Perspective systems & methods, one and Two point perspective of simple objects, outdoor and indoor view of a building, etc. perspective of interiors.

UNIT III SCIOGRAPHY OF SIMPLE OBJECTS**20 hrs.**

Principles of shades & shadows, Shadows of point, line, circle, sphere, cone, pyramids etc..

Shadows of architectural elements.

UNIT IV SCIOGRAPHY IN VIEWS**20 hrs.**

Shades and shadows in Isometric and perspective views.

Total: 80 hrs.**REFERENCES:**

1. Edward J Muller, James G Fausett, Philip A Grau, Architectural Drawing & Light Construction – Preutice-Hall Inc.,-1993
2. Bhatt N.D, Engineering drawing Charotar publishing house, Anand, India, 1990.
3. Robert W Gill, Creative Perspective, Thames & Hudson Ltd, London- 1975.
4. Robert W Gill, Basic Perspectives, Thames & Hudson Ltd, London- 1994.

| SCIX1016 | ANALYSIS AND DESIGN OF STRUCTURES II | L | T | P | Credits | Total Marks |
|----------|--------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To introduce the properties and behavior of steel and timber sections, beams, columns.

UNIT I STEEL SECTIONS(CONNECTIONS)**12 hrs.**

Properties of Rolled Sections – Analysis and Design of Riveted Joints (Excluding Eccentric Connections) Types of Welding – Permissible Stresses – Design of Fillet Welds (Excluding Eccentric Connections)

UNIT II STEEL BEAMS**12 hrs.**

Allowable Stresses – General Specifications – Design of Laterally Supported Beams

UNIT III STEEL COLUMNS**12 hrs.**

Allowable Stresses – Various Sections Built up Sections – Design of Columns

UNIT IV TIMBER**12 hrs.**

Design Requirements from National Building Code – Design of Timber Beams and Columns

Total: 48 hrs.**REFERENCES:**

1. Ramachandra, Design of Steel Structures Vol – I, Standard Book House Private Limited, New Delhi, 1984.
2. Arya, Structural Design in Steel, Masonry and Timber Nem Chand and Bros, Roorkee, 1971
3. National Building Code of India, part IV, Structural Design, 1983.
4. Gurucharan Singh, Design of Steel structures, Standard Publishers, New Delhi, 1982.
5. Negi, Design of Steel Structures, Tata Mc Graw-Hill Book Company, New Delhi, 1997.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

$8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$4 \times 12 = 48$ marks

(80% problem, 20% theory)

| SARX1006 | HISTORY OF ARCHITECTURE III | L | T | P | Credits | Total Marks |
|----------|-----------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVES:

To study the influences of events which have led to the outcome of styles such as Romanesque, Gothic & Renaissance and their architects in Italy, France and Britain. Comprehending the rich vocabulary of forms & shapes and structural systems. Analyzing built forms and the limitations of the building process.

UNIT I ROMANESQUE**8 hrs.**

In Italy, France & Britain. Learning in the monasteries, evolution of the guilds. Architectural character, Building examples - PISA group Italy; Abbaye Aux Hommes, Caen; Tower of London.

UNIT II GOTHIC**8 hrs.**

In Italy, France & Britain. Development of structural systems, Evolution of vaulting. Architectural character, examples - Notre Dame, Paris; Reims Cathedral; Westminster Abbey; Hampton Court Palace; Doges palace; Milan cathedral.

UNIT III ITALIAN RENAISSANCE**8 hrs.**

The Idea of rebirth and revival of Art, Architectural character during Early & High renaissance, Baroque, Rococo and Neo-Classical Hrs. Building examples - St. Peters, Rome; Palazzo Ricarri, Florence-Study of the life and contribution of the following Architects in brief - Brunelleschi - 'The Dome' of Florence Cathedral; St. Lorenzo, (Florence)-Andrea Palladio - The Basilica (Vicenza); Villa Capra (Vicenza)-Michael Angelo - Laurentian Library (St Lorenzo, Florence); St. Peter's, Rome.

UNIT IV FRENCH & ENGLISH RENAISSANCE**8 hrs.**

Outline the architectural character of French & English Renaissance - St. Paul's Cathedral; Chateau De Chambord; The Louvre, Paris-Study of the life and contribution of the following Architects in brief:-

Sir Christopher Wren - The Sheldonian Theatre (Oxford); St. Paul's Cathedral (London)-Inigo Jones - Queen's House (Greenwich)

Total: 32 hrs.**REFERENCES:**

1. Sir Bannister Fletcher, A History of Architecture, University of London, The Antholone Press - 1986.
2. Pier Luigi Nervi, History of World Architecture series, Hary.N.Abraham Inc. Publication New York - 1972
3. Lloyd S, Miller H.W, History of world Architecture series, Faber Ltd, London -1986.
4. Spiro Kostof, A history of Architecture - settings and Rituals, Oxford University Press London 1985.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX3003 | CLIMATIC DESIGN | L | T | P | Credits | Total Marks |
|----------|-----------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVES:

To introduce the detailed process of climatic design.

To design various elements of a building to counter the constraints of climate – walls, roofs, opening, shading devices. To introduce the concepts of Solar energy – passive and active.

UNIT I THE CLIMATIC DESIGN PROCESS**12 hrs.**

Design for Climatic Types - Layout and Building design, Planning considerations for Warm-humid climate, Hot-dry climate, Composite climate and Tropical upland climate. Impact of rainfall on design of buildings- Built environment, conditions, impact and issues of climate balance in traditional and contemporary built environment.

UNIT II DESIGN OF SOLAR SHADING DEVICES**12 hrs.**

Introduction to Sun path diagrams – Angles of Incidence – Horizontal and Vertical Shadow angles – Shadow Mask-Exercises on plotting shadow angles on sun-path diagrams, Design of solar shading devices for different orientations.

UNIT III DESIGN OF WALLS AND ROOFS**12 hrs.**

Design of walls and roofs-Exercises on heat gain and heat loss in buildings and study of radiation component, Design for appropriate materials and Insulation.

UNIT IV SOLAR ENERGY**12 hrs.**

Passive Heating - Direct gain - components (glazed windows, thermal storage mass) - indirect gain - thermal storage wall - Trombe wall - water wall - trans wall - roof radiation trap - isolated gain - solarium - passive cooling - ventilation cooling - cross ventilation - wind tower - induced ventilation - nocturnal cooling - evaporative cooling - roof surface evaporative cooling.

Total: 48 hrs.**Studio Work**

- Computation of design aids for a particular geographical location using the meteorological data
- Plotting of overheated period in the sun path diagram
- Computation of shadow angles using the sun path diagram
- Design of solar shading devices for different orientations
- Calculation of heat gain and heat loss in a given enclosure

REFERENCES:

1. Otto Koenigsberger & others – Manual of Tropical Housing and Building Part 1–Climatic Design. Longmans, London – 1980.
2. Martin Evans – Housing, Climate and Comfort, Architectural Press, London – 1980.
3. Vinod Gupta (Editor) – Energy and Habitat, Wiley Eastern Limited, India – 1984.
4. David Wright & Dennis A. Andrejko - Passive Solar Architecture, Van Nostrand Reinhold Company, U.S.A. – 1982.
5. Arvind Krishna & others – Climate responsive Architecture, Tata McGraw Hill- 2004.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3004 | SITE PLANNING | L | T | P | Credits | Total Marks |
|----------|---------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVES:

To establish the process involved in analyzing the given site and its parameters and help students in evolving a design solution which responds to any given environment.

UNIT I INTRODUCTION**12 hrs.**

Importance of site analysis onsite and off site factors, Analysis of natural - cultural - aesthetic factors and visual characteristics. Topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available – sources of water supply and means of disposal system. Definition of plot, site, land and region, units of measurements, reconnaissance, and need for surveying – chain survey and compass survey - Plane Table and Theodolite surveys - various equipments used - theory only.

UNIT II DETAILED ANALYSIS AND TECHNIQUES**12 hrs.**

Detailed analysis and Techniques-Preparation of site analysis diagram, preparation of maps of matrix analysis, composite analysis-Site selection criteria for housing development, commercial and institutional projects - Grading Contours slope Analysis, grading process, grading criteria, functional and aesthetic considerations.

UNIT III CLIMATE**12 hrs.**

Study of micro climate: vegetation and landforms as modifier of microclimate. Influence of water bodies.

UNIT IV SITE PLANNING PRINCIPLES**12 hrs.**

Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, patterns, road widths, turning radii, street intersections, parking regulations.

Total: 48 hrs.**Studio Work:**

- Documenting on-site and off site factors
- Contour analysis and grading
- Microclimate considerations
- Types of roads and Parking
- Preparation of site analysis diagram (Housing development, Commercial and Institutional projects)

REFERENCES:

1. Kevin Lynch, Site planning, MIT Press, Cambridge, MA - 1967
2. Edward .T. White, Site Analysis –Diagramming information for Architectural design- 1983.
3. Charles W. Harris, Nicholas T. Dines, Time Savers standards for Landscape Architecture - 1997.
4. Punmia B.C, Surveying Vol 1, Standard Book house, New Delhi, 1983.
5. Joseph De Chiarra and Lee Copleman, Planning Design Criteria-Van Nostrand Reinhold Co Newyork, 1968.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3005 | BUILDING SERVICES I | L | T | P | Credits | Total Marks |
|----------|---------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVES:

To develop an awareness about the environment to which we belong. To understand the importance and functioning of rural and urban drainage systems. An overview of various treatment processes that are available and introduce the students to sustainability. Plumbing details of complex buildings and site drainage systems. To describe the various types of water sources with an analysis of the quality and quantity of water and then proceeding on to the treatment of water which is ultimately distributed through various systems of supply.

UNIT I WATER SUPPLY ENGINEERING**12 hrs.**

Water sources - surface & ground water sources, Quantity and quality of water - demand projection, per capita consumption of water, Nature of impurities, tests-Water Distribution - Methods Of Distribution, Systems Of Supply Of Water, Layout Of Distribution Pipes-Internal water supply in Buildings- Types of Pipes, Laying of pipes-Above & Below Ground, Jointing, Testing - Prevention of Water Wastage - Preparing Water Supply Schemes

UNIT II ENVIRONMENTAL SANITATION**12 hrs.**

Environmental sanitation-the importance of sanitation classification of waste, disposal of refuse, composition, collection, conveyance of refuse refuse disposalsystems in towns & recovery of refuse Sewerage system-sewage-definitions and importance of quantity of sewage, storm water and design of sewers-systems of sewerage -dry & water carriage system, patterns of collection, sewers -materials used, shapes of sewers, construction & maintenance of sewers, sewer joints, sewer appurtenances

UNIT III PLUMBING**12 hrs.**

House Drainage, Domestic Sanitary Installations, traps & Systems of House Plumbing, Drainage of Rain water from building & compounds, Drainage of Sub-soil water, Layout of Drainage system, connection to sewers, Indian Standards for Sanitary Conveniences

UNIT IV SEWAGE TREATMENT**12 hrs.**

Primary treatment- Screens, Grit Chambers, Plain Sedimentation tanks or Skimming Tanks & Settling Tanks or Clarifiers ,Secondary treatment- Filtration - Contact Beds, Intermittent & Trickling Filters and Activated Sludge Process, Disinfection, Disposal Of Sewage - Disposal of sewage from isolated buildings- Septic Tanks, Disposal of sewage in Villages

Total: 48 hrs.**Studio Work:**

Detail of a Septic tank and sump, Rain water harvesting, Toilet detail, Kitchen plumbing details Terrace drainage, Drainage layout of a building.

REFERENCES:

1. Fair GM Geyer JC and Okun DA, Water and Waste Engineering, Vol. I ,John Wiley and sons, IncNewyork, 1968.
2. Manual on water and treatment, 2nd Edition, published by CPHEEO, Ministry of works and Housing, New Delhi - 1980.
3. Manual on sewerage and sewage treatment, published by CPHEEO, Ministry of ' works and Housing, New Delhi - 1980
4. Rangwala SC, water supply and sanitary engineering, Charotar publishing house Anand - 38801. - 1981.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3006 | BUILDING CONSTRUCTION II | L | T | P | Credits | Total Marks |
|----------|--------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVES:

To teach the students the construction techniques, detailing of timber products and their applications in the buildings.

UNIT I TIMBER AND ALLIED PRODUCTS**12 hrs.**

Industrial Timbers - plywood, particle board, fibre boards etc-Drafting Exercises of timber joinery – windows (Casement, corner and Bay window), doors (Ledge, braced, battened and framed door, paneled door- double leaf, panelled and glazed door, solid flush door, Hollow core flush door), ventilators.

UNIT II TIMBER TRUSSES**12 hrs.**

Definition, technical terms, Classification of timber roofs-Drafting Exercises on different types of pitched roofs using various types of roofing tiles – lean –to-roof, coupled roof, couple-close roof, collar roof, king post truss, queen post truss, roofing with mangalore and pan tiles

UNIT III TIMBER STAIRCASES**12 hrs.**

Definition, technical terms, requirements of a good stair, classification of stairs-Factors involving staircase design - Drafting Exercises on different types of timber staircases like straight flight, dog-legged, spiral etc. - detailing of handrails balusters, nosing.

UNIT IV TIMBER PARTITIONS AND PANELLING**12 hrs.**

Drafting Exercises on different types of timber wall paneling, flooring and timber false ceiling.

Total: 48 hrs.**REFERENCES:**

1. Arora.S.P&Bindra S.R " A text Book of Building Construction" DhanpatRai& Sons, New Delhi 1994.
2. McKay W.B., Building Constructon, Vol 1,2,3 Longmans, U.K 1981.
3. Rangwala S.C, Engineering Materials, Charotar Publishing House, Anand, 1982.
4. Shah, A text book of Civil Engineering, New student text books publishing- 2006.
5. Bayliss R., Carpentry and Joinery, Vol 1, Hutchinson Technical Education Pub.,1969.
6. Sushil Kumar -Building Construction- Standard publishers and Distributors-2010
7. Chudley- Constrution Technology (Vol 1)-Longman publications 3rd Edition - 1999

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

 $5 \times 2 = 10$ marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

 $4 \times 10 = 40$ marks**(50% Drafting, 50% Theory)**

| SARX4007 | DESIGN STUDIO III | L | T | P | Credits | Total Marks |
|----------|-------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 9 | 5 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

OBJECTIVES:

To introduce the physical, technical and visual characteristics of a settlements at micro level. The thrust area for specialization in design shall be on cost effective / vernacular / eco / green / sustainable technologies.

DESIGN STUDIO III:

Problems related to rural housing - visits to selected villages - surveys on visual, socioeconomic - Physical & technical aspects of rural design elements & Planning methods - study existing conditions - analysis of survey data - preparation of report preparation of design solution for housing & community facilities Single level planning in small scale data collection & analysis - presentation of report & design.

Total: 120 hrs.

REFERENCES:

1. De Chiara and Callender, Time Saver Standard for building types, McGRAW Hill CO., 2nd Edition, 1980.
2. Edward D. Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in publication Data, 1985.
3. Wakita / Linde, The Professional practice of Architectural working drawing, Jhon Wiley & sons, 1984.
4. Andrew Alpern, Handbook of speciality Elements in Architecture, McGraw Hill Book CO., 1982.

| SARX4008 | COMPUTER STUDIO | L | T | P | Credits | Total Marks |
|----------|-----------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 4 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 100 | - | 50 | - | 50 |

OBJECTIVES:

To assist the students in the drafting skills by using AutoCAD and help in preparing working and presentation drawings.

UNIT I INTRODUCTION AND DRAWING CONSTRUCTION TECHNIQUES

15 hrs.

Introduction to CAD packages. Setting up a Drawing, limits, Base drawing commands, Edit and Modify commands.

UNIT II PRODUCTIVE TECHNIQUES & DRAWING OUTPUT

15 hrs.

Creating Blocks, Layers, Line Type, Dimensioning.

File management, retrieving data, attributes, Layout and plotting.

UNIT III 3D MODELING

15 hrs.

Introduction, Extruding, generating 3D drawings/ modeling. and generation of simple images in the same, Rendering

UNIT IV REVIT

15 hrs.

Introduction to REVIT ARCHITECTURE, - understanding the various interfaces and its working. Introduction to SKETCH UP.

Total: 60 hrs.

REFERENCES:

1. Kolareric Branko, Architectural Rendering and Modellingwith AutoCAD, John Wiely, New York, 1998.
2. Synder James, Architectural Construction Drawings with AutoCAD, John Wiely, NewYork, 1998.
3. Eddy. Krygiel, Mastering Autodesk Revit Architecture 2011- Wiky Publishing 2010.

| SCIX1051 | ANALYSIS AND DESIGN OF STRUCTURES III | L | T | P | Credits | Total Marks |
|----------|---------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVE:

Understanding the behaviour and properties of concrete. Understanding the basic theories & Principles - Design of Reinforced Concrete Structures viz. Beams, Slabs, Arches, Shells & Folded plates.

UNIT I CONCRETE TECHNOLOGY**12 hrs.**

Properties of Fresh Concrete- Water Cement Ratio and its Influence- Workability- Factors Affecting Workability- Tests for Workability- Segregation, Bleeding- Mixing, Compaction & Curing of Concrete.

Structural Properties of Hardened Concrete -Structural Properties of Concrete, Grades of Concrete- Structural Properties of Steel – Grades of Steel -Design Curves for Steel and Concrete.

UNIT II LIMIT STATE METHOD OF DESIGN OF BEAMS**12 hrs.**

Introduction to Limit State Method-Variation Limit States-Characteristic Load & Characteristic Strength of Materials – Partial Safety Factors Safety & Serviceability Requirements-Analysis & Design of Beams – Rectangular Sections -Singly Reinforced, Doubly Reinforced & Flanged Sections.

UNIT III LIMIT STATE DESIGN OF SLABS**12 hrs.**

Design of One Way, Two Way Slabs using IS Code Coefficients for Various Edge Conditions

Design Of Continuous Beams & Slabs-Limit State Design of Continuous Beams & Slabs using IS Code Coefficients.

UNIT IV R.C.C ARCHES**12 hrs.**

R.C.C Arches – Introduction, Types & Analysis of Two & Three Hinged Arches-Shells & Folded Plates-Introduction to Shells & Folded Plates -Structural Action – Classification of Shells.

Total: 48 hrs.**REFERENCES:**

1. Shetty M.S., Concrete Technology, S.Chand Publications Private Limited, New Delhi, 2008
2. Pillai&Menon, Reinforced Concrete Design, TMH Limited, New Delhi, 2010.
3. Varghese P.C., Limit State Design of Reinforced Concrete Structures, TMH Limited, New Delhi, 2004.
4. Sinha N.C and.Roy S.K, Fundamentals of Reinforced Concrete, S.Chand& Co, New Delhi, 1983.
5. Khurmi R.S, Theory of Structures, Standard Publishing Co, New Delhi, 2008.
6. Stephen Timoshenko, Theory of Plates & Shells, McGraw Hill, New York, 1959.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks**(80% problem, 20% theory)**

| SARX1007 | HISTORY OF ARCHITECTURE IV | L | T | P | Credits | Total Marks |
|----------|-------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVE:

To study about the growth of Islam in India and the world-and its effort on art and architecture of India and the different provinces developed, with selected Islamic monuments like mosques, tombs and forts of each period.

UNIT I ISLAMIC CULTURE**8 hrs.**

Introduction to world Islamic architecture - Advent of Islam in India, Its influence and Sources of Islamic art and Architecture. Evolution of mosque and tombs.

UNIT II DELHI OR IMPERIAL STYLE**8 hrs.**

The development of Architectural style during the rule of slave, Khilji, Tughlaq, Sayyid and Lodi dynasties - Examples:-Quwwat-ul-islam, mosque, Ajmer, mosque, QutbMinar, Sultanghari, itutmish's mausoleum, alai Darwaza, gyiyas-ud-din's mausoleum, barakumbha, dautalabad, begampuri mosque, khirki masjid, khan -i-jahanthilangari, sikandarlodi

UNIT III PROVINCIAL PATTERN – NORTHERN INDIA**8 hrs.**

Factors responsible for the development of the provincial style of Punjab, Jaunpur, Bengal, Gujarat, Malwa Deccan and Bijapur - Important examples from each period - Examples:-shah-rukni-alam, adina mosque, ek-lakhitomb, Dakhildarwaza, atalamasjid, jamimasjid-Jaunpur, cambay, ahmedabad, champaner, mandu, gulbarga and bijapur teen darwaza, stepwells, sarkhej, hoshang's tomb, hindola and jahazmahal, qutbshahitombs, ibrahimrauza, golgumbaz ,charminar

UNIT IV MUGHAL PERIOD**8 hrs.**

Study of the Architectural character of important buildings during the rule of emperors - Babur, Humayun, Akbar Jahangir and Shahjahan-Examples:-Humayun's tomb,tajmahal,redfort,tomb of akbar at sikandra,Kashmirgardens,jami masjid delhi,Fatehpursikri

Total: 32 hrs.**REFERENCES:**

1. Brown Percy, Indian Architecture (Islamic Period) Taraporevala and Sons, Bombay, 1983.
2. Sathish Grover, The Architecture of India (Islamic), Vikas Publishing House Pvt., Ltd., New Delhi, 1981.
3. Christopher Tadgell - The History of Architecture in India - Penguin Books (India) Ltd., New Delhi, Phaidon 1990.
4. Nath R. - History of Mughul Architecture - Abhinav Publications - New Delhi, 1985

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1008 | SPECIFICATION AND ESTIMATION | L | T | P | Credits | Total Marks |
|----------|------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVE:

To make students familiar with the making and purpose of estimation and train them in tender preparations, students skill in the calculation of the quantities of various materials used in the construction of building and to develop comprehensive knowledge of valuation of various buildings.

UNIT I INTRODUCTION TO ESTIMATION AND SPECIFICATION**8 hrs.**

Need for estimation, Tender-types of tender, Contract-types of contract, Invitation of tender and preparation of tender notice, EMD, Security Deposit, Mobilization Fund. Introduction, importance of specifications, methods of preparing detailed and general specifications for different items of work.

UNIT II BUILDING ESTIMATES**8 hrs.**

Introduction, types of estimates, Rough and detailed estimates, units of measurements, calculation of quantities, methods of calculation of building estimate, thumb rules involved, Bill of quantities.

UNIT III ANALYSIS OF RATES**8 hrs.**

Analysis of rates for main items of work using current market rates for materials, labour, plants, tools and equipment, transportation, handling, storage and contractor's profit.

UNIT IV VALUATION**8 hrs.**

Introduction, Gross income, Net income; outgoings; scrap value, salvage value etc., obsolescence; annuity; capitalized value; year's purchase; sinking fund; depreciation; valuation of building; determination of depreciation; method of valuation, life of various items of works; examples of valuation.

Total: 32 hrs.**REFERENCES:**

1. Dutta. B.N., Estimation and Costing Civil Engineering (Theory & Practice), UBS Publishers, 2004
2. Rangwala, Estimating, Costing & Valuation, Charotar Publishing House, 2001.
3. Birdie, Text Book of Estimation & Costing, Dhanpat Rai & Sons, 1996
4. Arulmanickam, Estimating & Costing, Pradeepa Publishers, 2004
5. Chakraborti, Estimating, Costing, Specification & Valuation in Civil engineering, Chakraborti, 2002
6. T.N Building Practice, Vol.I, civil Govt. Publication.
7. P.W.D Standard Specifications, Govt Publication.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks**(50% problem, 50% theory)**

| SARX3007 | INTERIOR DESIGN | L | T | P | Credits | Total Marks |
|----------|-----------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVE:

To explore the ways & means of developing interior spaces proceeding from a general discussion of architectural space to the particular characteristics of interior space in 3 dimensions. To explore the fundamental elements & principles of visual design and applies each of them to the unique field of interior design. To depicts the history of interior design through the ages. To describe the major categories of interior elements and environmental control systems

UNIT I INTERIOR SPACE, INTERIOR DESIGN AND DESIGN VOCABULARY**12 hrs.**

Definition of interior design-interior design process- Introduction to the design of interior spaces as related to typologies and functions, themes and concepts- study and design. Vocabulary of design in terms of principles and elements.

UNIT II HISTORY OF INTERIOR DESIGN**12 hrs.**

Brief study of the history of interior design through the ages relating to historical context, design movements and ideas etc. - Brief study of folk arts and crafts, vernacular design in India with reference to interior design and decoration.

UNIT III ELEMENTS OF INTERIOR DESIGN ENCLOSING ELEMENTS**12 hrs.**

Introduction to various elements in interiors like floors, ceilings, walls, staircases, openings, incidental elements. Decorative finishes for walls, floors & ceiling :Paints- Enamels, distempers, plastic emulsions, cement based paints - properties, uses and applications - Painting on different surfaces - defects in painting. Clear coatings and strains – types, properties, uses and applications. Special purpose paints – types, properties, uses and applications, wall paper

UNIT IV ELEMENTS OF INTERIOR DESIGN**12 hrs.**

Lighting, Accessories & Interior Landscaping

Study of interior lighting-different types of lighting, their effects, types of lighting fixtures- Other elements of interiors Like accessories used for enhancement of interiors- paintings, objects de art, etc. Interior landscaping- elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values. Elements Of Interior Design- Furniture Design -Study of relationship of furniture to spaces and human movements furniture design as related to human comfort, function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas- study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. - projects on furniture design. Interior Environmental systems (Interior Service Elements)-HVAC, Water supply & Sanitation, Electric power & lighting and Acoustic

Total: 48 hrs.**Studio Work:**

Exercises involving the interior design for the following spaces with a discussion on the design aspects, suggesting a preliminary scheme, working out the nature of the finishes, layout and details of furniture, service requirements, display design, colour scheme, lighting, details of construction and any other details giving plans, elevations, etc and a perspective (interior) view. Bookshop, Music shop, Children's room, Jewellery shop, Readymade garments shop, Mega store, Computer centre of an architecture department, Ladies beauty parlor, 5 star hotel interiors, An Architect's office.

REFERENCES:

1. Francis D.K.Ching, Interior Design Illustrated, V.N.R.Pub. NY1987
2. Steport-De-Van Kness, Logan, Introduction to Interior Design Macmillan Publishing Co., NY 1980
3. Kathryn B.Hiesinger, H.Marcus, Landmarks of twentieth Century Design; Abbey Ville Press, 1993
4. SyanneSlesin and Stafford Ceiff- Indian Style, Clarkson N.Potter, New york, 1990.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3008 | BUILDING SERVICES II | L | T | P | Credits | Total Marks |
|----------|----------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVE:

To get the students acquainted with behavior of sound in outdoor, indoor space and the measures for controlling it; elevators, escalators & service cores.

UNIT I INTRODUCTION TO ACOUSTICS**12 hrs.**

Characteristics of sound – reflection, transmission, diffraction, absorption coefficient, reverberation time, geometric acoustics, free field, octave band, Sabine's formula, reverberation time calculation

Sound Absorption: acoustic materials & their properties, variable sound absorbers, prefabricated sound absorbing panels, suspended sound absorbers

UNIT II ACOUSTICS**12 hrs.**

Outdoor noise – built form, orientation, earth berms, sound shadow region-Indoor noise- measures to prevent sound transmission, leak, impact noise, false ceiling integrated systems & sound isolation

UNIT III DESIGN OF PERFORMING SPACES**12 hrs.**

Design of auditoriums: placing auditorium floors and balcony, stage house details, rear wall treatment, orchestra pit, acoustical defects, sound amplifying systems. Design of Concert halls, open air theatre and Broadcasting studios

UNIT IV ELEVATORS & ESCALATORS**12 hrs.**

Types of Lifts – Basic dimension, Traffic analysis, Round trip time, lift pit, machine room, types, lift operation, arrangement of lifts, quality & quantity of service-Escalators – basic dimension, Characteristics, arrangement and disposition-Conveyors and Walkways.

Total: 48 hrs.**Studio work:**

The relevant portions of National Building Code & Indian Standard Codes to be studied and drafting detail sections of Auditoriums, Mechanical services like elevators and escalators, Acoustic construction details etc. Practical work: Visits to auditoriums, commercial buildings to be arranged to make the students aware of acoustics, lifts and escalators practically along with the preparation of drawings for the same. Details on false ceiling and paneling.

REFERENCES:

1. WillaimJ.Cavanaugh, Tocci, Joseph A Wikes, Architectural acoustics, principles & practice, John Wiley & Sons, 2009
2. Marshall Long, Architectural acoustics, Elsevier Academic press New York, 2006
3. National building code 2006

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3009 | BUILDING CONSTRUCTION III | L | T | P | Credits | Total Marks |
|----------|---------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

OBJECTIVE:

To expose the students with construction practices pertaining to RCC structures, insulation, damp and water proofing.

UNIT I CONCRETE AND ITS APPLICATIONS**12 hrs.**

Suitability requirements for aggregates, grading of aggregates, reinforcement, admixture. Mix proportioning, batching, mixing, transporting, placing, compaction, curing formwork. Quality control, tests for concrete, joints in concrete including expansion joint, concrete finishes. Centering, Scaffolding, centering, formwork-Drafting Exercises on different types of footings – deep foundation. Concrete floors, walls and partitions. Concrete lintels, arches, sunshades. Different types of concrete slabs – one way slab, two way slab, flat slab, coffer slab, concrete beams and columns.

UNIT II CONCRETE STAIRCASES**12 hrs.**

Drafting Exercises on different types of staircases like straight flight, doglegged, quarter turn, bifurcated, helical - detailing out of handrails, balusters and nosings.

UNIT III SPECIAL CONCRETE AND CONCRETING METHODS**12 hrs.**

Different types of Special Concrete like Ferrocement, Lightweight, high density, fibre reinforced, polymer concrete and their manufacturing properties and uses, ready mixed concrete, precast concrete, guniting, cold weather and underwater concreting, method of concreting-Drafting Exercises – Application of Light Weight concrete in building walls, roof, foundations and ornamental, Ferrocement water tanks, toilet units, slabs cupboard, waffle slab, filler slab, rat trap bond, funicular shell, and other precast systems,

UNIT IV THERMAL INSULATION, DAMP AND WATER PROOFING**12 hrs.**

Thermal Insulation- Heat transfer and heat gain by materials -vapour barriers and rigid insulation. Blanket, poured and reflective insulation - properties and uses of spun glass, foamed glass, cork, vegetable fibres, mineral fibres, foamed plastics, vermiculite and glass fibres. Gypsum - manufacture, properties and uses, plaster of paris and a hydride gypsum. Drafting Exercises on the thermal insulation details of various parts of a cold storage.

Damp proofing- hot applied and cold applied - Emulsified asphalt, Bentonite clays, butyl rubber, silicones, vinyls, Epoxy resins and metallic water proofing materials - properties, uses. (Water proofing membranes such as rag, asbestos, glass, felt - plastic and synthetic rubber -vinyls, butyl rubber, neoprene polyvinyl chloride (PVC) - prefabricated membranes - sheet lead, asphalt - properties and uses.

Total: 48 hrs.**REFERENCES:**

1. Arora.S.P & Bindra S.R " A text Book of Building Construction" DhanpatRai& Sons, New Delhi 1994.
2. McKay W.B., Building Construction, Vol 1,2,3 Longmans, U.K 1981.
3. Rangwala S.C, Engineering Materials, Charotar Publishing House, Anand, 1982.
4. Shetty M.S, ' Concrete Technology', S.Chand&Co.Ltd, Ram Nagar, New Delhi, 1986.
5. Shah, A text book of Civil Engineering, New student text books publishing- 2006.
6. Sushil Kumar -Building Construction- Standard publishers and Distributors-2010
7. Chudley- Construction Technology (Vol 1)-Longman publications 3rd Edition - 1999

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

 $5 \times 2 = 10$ marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

 $4 \times 10 = 40$ marks**(50% Drafting, 50% Theory)**

| SARX4009 | DESIGN STUDIO IV | L | T | P | Credits | Total Marks |
|----------|------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 14 | 7 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

Objective:

To explore the spatial organization related multi room single use, small span multi storey buildings. The thrust area for the design shall be on the principles of climatic responsive architecture.

Design Studio IV

Problems related to Multi room single use - Small Span - Multiple storey - vertical movement –Design of Primary school, Youth hostel, Library, Departmental Stores, Bank, Post Office, primary health centers etc.

Total: 200 hrs.

REFERENCES:

1. De Chiara and Callender, Time Saver Standard for building types, McGRAW Hill CO., 2nd Edition, 1980.
2. Edward D. Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in publication Data, 1985.
3. Wakita / Linde, The Professional practice of Architectural working drawing, Jhon Wiley & sons, 1984.
4. Andrew Alpern, Handbook of speciality Elements in Architecture, McGraw Hill Book CO., 1982.
5. Julius Panero & Martin Zelnik, Human Dimension and Interior space. Whitney Library of Design Publication, 1979.
6. Ernst and Peter, Neufert's Architect's Data, Blackwell publishing professional, 2002.

| SARX4010 | ARCHITECTURAL DESIGN EXAMINATION II | L | T | P | Credits | Total Marks |
|----------|-------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | - | 100 | - | 50 | 50 |

Course Objective:

To understand the process of designing buildings within given time frame and to improve the drafting skills of the candidate

UNIVERSITY PRACTICAL EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 12 hrs.

One question with an internal choice on designing Multi room single uses like Design of Primary school, Youth hostel, Library, Departmental Stores, Bank, Post Office, primary health centre, clinic, art centre etc.

| SCIX1052 | ANALYSIS AND DESIGN OF STRUCTURES IV | L | T | P | Credits | Total Marks |
|----------|--------------------------------------|----------------|----------------|--------------------|-------------------|----------------|
| | | 2 | 1 | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass External | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To introduce the design of concrete columns, foundations, staircases and retaining walls.

UNIT I DESIGN OF COLUMNS (R.C.C)**12 hrs.**

Limit State Design of Columns (R.C.C) – Coal Provisions - Design of Axially Loaded Short Columns with Rectangular and Circular Sections – (Ties and Spirals)

UNIT II LIMIT STATE DESIGN OF FOUNDATION**12 hrs.**

Introduction - Types - Design of Isolated – Square – Rectangular – Sloped Footing Design of Combined Rectangular Footing -Introduction to Pile and Raft Foundations

UNIT IV DESIGN OF STAIRCASE & RETAINING WALLS**12 hrs.**

Limit State Design of Dog Legged Stair Case -Landing Supported Parallel to Risers and Landing Supported Perpendicular to Risers. Types of Retaining Walls and their Behaviour- Proportioning and Designing of Cantilever Type Retaining Walls- without and with Surcharge

UNIT IV PRE-STRESSED CONCRETE**12 hrs.**

Principle of Pre-stressing-Methods of Pre-stressing -Advantages & Disadvantages.Analysis of PSC Beams by Stress Concept, Strength Concept & Load Bearing Concept.

Total: 48 hrs.**REFERENCES:**

1. Pillai & Menon, Reinforced Concrete Design, TMH Limited, New Delhi,2010.
2. P.C. Varghese, Limit State Design of Reinforced Concrete Structures, TMH Limited, New Delhi, 2004.
3. N.C.Sinha and S.K.Roy, Fundamentals of Reinforced Concrete, S.Chand& Co, New Delhi, 1983.
4. N. Krishnaraju, Pre-stressed Concrete, Tata Mc Graw-Hill Education, 2006.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

$8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$4 \times 12 = 48$ marks

(80% problem, 20% theory)

| SARX1009 | HISTORY OF ARCHITECTURE V | L | T | P | Credits | Total Marks |
|----------|---------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To introduce the various movements and philosophies which shaped the early contemporary architecture and to expose the students to various concepts of architects and evolution of building typologies after industrial revolution.

UNIT I THE BEGINNING OF A NEW ARCHITECTURE**8 hrs.**

Historical Overview – Origins of Neo-classicism - Architects: Boullee and Ledoux - Industrial Revolution and its Impact – Inventions: lift, - Materials and technologies: History of Steel, Concrete and Glass – Architecture and the Great Industrial Exhibitions – Building examples – crystal palace, Eiffel tower, Galleries des machines (Paris & London), Chicago fire and Chicago school.

UNIT II ISSUES OF ORNAMENTATION AND AESTHETICS**8 hrs.**

Arts and Crafts Movement - Art Nouveau and the works of Gaudi, Horta, Guimard, Macintosh - Early works of F.L.Wright - Adolf Loos and the Arguments on Ornamentation - Futurist Movement Manifestos and the works of Sant'Elia - Expressionism and the works of Menelson, Taut, Polzeig - Cubism and Constructivism and its influence on Architecture - Destijl: Ideas and works.

UNIT III INSTITUTIONS, PHILOSOPHIES & THE MASTERS**8 hrs.**

Werkbund and Bauhaus - Works of Behrens and Gropius - Canonising Modernism - International Style - CIAM Congresses and Declarations - Works and Ideas of: Le Corbusier, Sullivan, Miesvanderrohe, later works of Wright, Alvar Alto, Niemeyer, Eero Saarinen, KenzoTange, Paul Rudolph, Minoru Yamasaki, SOM, Taliesin Foundation.

UNIT IV ARCHITECTURE IN COLONIAL INDIA**8 hrs.**

Colonialism and its impact - Early British Neo-classical Architecture - Indo-Saracenic Architecture and the works of Chisholm -Senate House, Chennai, Victoria Public hall – Chennai, Napier Museum- Trivandrum - Edwin Lutyens' – Planning of New Delhi and Rashtrapathibhavan.

Total: 32 hrs.**REFERENCES:**

1. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London, 1994.
2. Leonardo Benevelo, History of Modern Architecture, 2 Vols. Routledge and Kegan Paul, London, 1971.
3. Manfred Taferi / Francesco dal co., Modern Architecture, Faber and Faber/ Electa, 1980.
4. Siegfried Gideon, Space, Time and Architecture: The Growth of a New Tradition, Harvard University Press, 1978.
5. Thomas Metcalf, An Imperial Vision, Faber and Faber, London, 1989.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1010 | URBAN HOUSING | L | T | P | Credits | Total Marks |
|----------|---------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To make the students familiar with housing policies, issues, process and the method and need of formulating housing design standards.

UNIT II HOUSING ISSUES – INDIAN CONTEXT**8 hrs.**

Need and Demand, Quality & quantitative aspects – National Housing Policy – Housing Agencies, Financing Institutions and their role in housing development – case studies of housing in UK,USA,China, Singapore, Hongkong

UNIT II SOCIO – ECONOMIC ASPECTS & HOUSING STANDARDS**8 hrs.**

Social factors influencing Housing Design, affordability, economic factors and Housing concepts. Slum Up-gradation and Sites and Services. Standards and Regulations for different types of housing – DR relevant to Housing – Methodology of formulating standards – Performance standards, Case studies of various schemes of TNSCB

UNIT III HOUSING DESIGN**8 hrs.**

Traditional patterns – Different forms, housing patterns from tradition to modern times, Row Housing, Cluster Housing etc. Layout concepts – Use of open spaces – Utilities and common facilities – studies – High Rise Housing, Cost effective & sustainable housing, A critical study on housing by Charles Correa, Raj Rewal, Doshi

UNIT IV HOUSING PROCESS**8 hrs.**

Different Surveys, Sources and collection of data, Analysis of data, Formulation of the goals, objectives and standards, Various steps, stages and tasks in Project Development – Housing Management– Community participation – Environmental aspects – Technology- with examples incorporating the modern trends.

Total: 32 hrs.**REFERENCES:**

1. Richard Untermyer & Robert Small, Site Planning for Cluster Housing, Van Nostrand Reinhold Company, London/New York, 1977
2. Joseph de Chiara & Others – Time Saver Standards for Housing and Residential development, McGraw Hill Co., New York, 1955
3. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983
4. Christopher Alexander, a Pattern Language, Oxford University Press, New York – 1977.
5. Jain A K – Buildings systems for the Low income Housing- Management publishing Co., - 1992.
6. James Steele, An architecture for people- the complete works of Hasan Fathy- Thames and Hudson, London – 1997.
7. Allen, A Global Strategy for housing in third Millennium E & FN Spon, London, 1992.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1011 | THEORY OF DESIGN | L | T | P | Credits | Total Marks |
|----------|------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To provide a strong knowledge base on design process which could inspire the design project through exposure on definition, purpose, nature and types of design. To expose students to design process ,various stages and the methodology. To introduce to students on the design solution based on intuition, creativity and goals. To make students to understand the various theories of thinking, and to expose them how architectural design solutions are linked to philosophies, strategies that lead to creativity in architecture.

UNIT I INTRODUCTION TO DESIGN**8 hrs.**

Definition of Design, Understanding of Design, Purpose and nature of good design, evaluation of design, types of Design classification, role of designer, Context for Architectural design problems, design process, stages in the design processes from different considerations – Broadbent, Christopher Alexander, Wade

UNIT II DESIGN PROBLEMS & SOLUTIONS**8 hrs.**

Different approaches in design, problem solving or intuitive, formulation of problems, nature of creative design problems, goals in design, different types of designs and the thrust given to the various solutions.

UNIT III DESIGN THINKING**8 hrs.**

Understanding the terms creativity, imagination etc. Theories on thinking, convergent & divergent thinking, lateral & vertical thinking, six hat thinking by Edward de Bono. Creative techniques like checklists, brainstorming, synectics etc, design puzzles & traps, blocks in creative thinking. Introduction to various theories in Architecture such as aesthetic theory, proxemic theory. Theory related to human behaviour and environmental design.

UNIT IV DESIGN CONCEPTS, PHILOSOPHIES & STRATEGIES**8 hrs.**

Various approaches to generate ideas for architectural design- types of concepts, personal philosophies and strategies of individual designers, channels to creativity in architecture.

Total: 32 hrs.**REFERENCES:**

1. Geoffrey Broadbent – Design in Architecture – Architecture & Human Sciences, John Wiley & sons, New York -1973.
2. Tom Heath – Method in Architecture, John Wiley & sons, New York- 1984.
3. Christopher Alexander – Pattern Language, Oxford University Press- 1977.
4. James C Synder, Anthony J Catanese – Introduction to Architecture, McGraw Hill Inc.19798
5. Edward De Bono – Lateral Thinking- Creative step by step- Harper & Row- 1970.
6. Mark Karhen, Space planning basics, John Wiley & son- 2004.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX3010 | BUILDING SERVICES III | L | T | P | Credits | Total Marks |
|----------|-----------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

COURSE OBJECTIVE:

To introduce the basics of lighting, electricity, to work on various lighting schemes along with electrical network for it.

UNIT I INTRODUCTION TO LIGHTING**12 hrs.**

Characteristics of light, visual task, factors affecting visual task, synthesis of light, sources Measurements of lighting, Intensity, flux, Work surface, laws of illumination, MSCP, MHCP, colour temperature, colour rendering, space height ratio, depreciation factor, utilization factor, daylight factor, Natural lighting in architecture

UNIT II LIGHTING**12 hrs.**

Artificial Lighting: Requirements & design, type of lamps, fixtures, preparing a lighting scheme with legend, glare, lighting schemes, types of lighting arrangements, Lumen's method of lighting, luminaire arrangement-Specific Lighting: Flood Lighting, concealed lighting, outdoor lighting, mood lighting, accent lighting, LEDs-Lighting for stores, offices, residences, minimum level of illumination required for physically challenged AND visually challenged.

UNIT II INTRODUCTION TO ELECTRICITY**12 hrs.**

Introduction – electrical supply system, Supply voltages & classification, voltage tolerance, cables, voltage drop-Electric installations: Relationship between phase & line, voltage and currents-Electrical installation: Principles & practices, Distribution, circuits, building Wiring, use of single phase, Two phase, Three phase etc. System of connection of appliances & accessories, service connections, invertors.

Case studies on electric core

UNIT IV ELECTRICITY IN BUILDINGS**12 hrs.**

Main Boards & sub distribution boards for multistoried buildings, Standby power supply distribution, transformers, safety methods, principles and practices-Earthing: definition, types, lighting arrestor and I.S.I specifications-Planning electrical layout and wiring for buildings. Communication networking and electrical layout for special buildings like Exhibitions, theatres and stadiums.-Designing the electrical layout for a building, layout, factors and constraints

Case studies: Lighting for different types of stores, offices, residential buildings-Electrical layout for different types of buildings.

Total: 48 hrs.**Studio work**

The relevant portions of National Building Code & Indian Standard Codes to be studied

Practical work: Simple lay out diagrams for house wiring, location of points, switches, fittings, ornamental lighting etc. Visits to large buildings to study lighting arrangements & schemes to be arranged

REFERENCES:

1. Pritchard, D.C., "LIGHTING", Longman scientific & Technical, Harlow, 1995.
2. Hopkinson, R.G., " Architectural Physics – Lighting", London. 1963.
3. Benjamin Evans, " Daylight in Architecture", McGraw – Hill Book Company, New York, 1981.
4. Tregenza, Peter & Loe, David, " The Design Of Lighting", E & FN Spon, London, 1998.
5. Millet Marietta, "Light Reaviling Architecture", Van Nostrand Reinhold, London, 1996.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

$5 \times 2 = 10$ marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

$4 \times 10 = 40$ marks

| SARX3011 | BUILDING CONSTRUCTION IV | L | T | P | Credits | Total Marks |
|----------|--------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

COURSE OBJECTIVE:

To develop knowledge to the students of steel and their wider application in the building industry.

UNIT I INTRODUCTION STEEL STRUCTURES**12 hrs.**

Understanding types of joints in steel structures, riveted, welded and bolted- Joints - types of steel sections and their properties - types of connections - criteria for selection of steel sections for design

steel structure design and detailing of any small building - visit to steel structure fabrication site.

UNIT II CONSTRUCTION DETAILS IN STEEL**12 hrs.**

Drafting Exercises on Structural steel sections- types of connections - steel in foundations, columns/stanchion and beams, Steel staircases. Drafting Exercises on different types of steel roof trusses including north light truss - materials for roof covering - Steel doors and windows -openable, sliding - collapsible gates - rolling shutters- Case Studies

UNIT III CONSTRUCTION DETAILS IN STAINLESS STEEL**12 hrs.**

Drafting exercises on Stainless steel – Balusters, False ceiling, Wall paneling, Doors. Various joinery details with Stainless steel sections - Case Studies

UNIT IV APPLICATIONS & INNOVATIVE TECHNOLOGIES IN STEEL**12 hrs.**

General application–roof and columns - Structural Elements – Innovative Technology - Construction Methods & Techniques – Case Studies – Documentation of Industrial Buildings

Total: 48 hrs.**REFERENCES:**

1. Arora.S.P&Bindra S.R "A text Book of Building Construction" Dhanpat Rai & Sons, New Delhi 1994.
2. McKay. W.B., Building Construction, Vol 1,2,3 Longmans, U.K 1981.
3. Rangwala S.C, Engineering Materials, Charotar Publishing House, Anand, 1982.
4. Sushil Kumar -Building Construction- Standard publishers and Distributors-2010
5. Chudley- Construction Technology (Vol 1)-Longman publications 3rd Edition - 1999

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

$5 \times 2 = 10$ marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

$4 \times 10 = 40$ marks

(50% Drafting, 50% Theory)

| SARX4011 | DESIGN STUDIO V | L | T | P | Credits | Total Marks |
|----------|-----------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 15 | 8 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

COURSE OBJECTIVE:

To understand the process of designing for public, involving multiple activities.

The thrust area shall be on structural grid, development regulations, bye-laws and services.

Design Studio V

Studio on creating environments for apartments, commercial complex, auditorium etc, using programmed needs criticism and evaluation of alternative concept

- Use of computers as an aid to Design.

Total: 120 hrs.

REFERENCES:

1. De Chiara and Callender, Time Saver Standard for building types, McGRAW Hill CO., 2nd Edition, 1980.
2. Edward D. Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in publication Data, 1985.
3. Wakita / Linde, The Professional practice of Architectural working drawing, Jhon Wiley & sons, 1984.
4. Andrew Alpern, Handbook of speciality Elements in Architecture, McGraw Hill Book CO., 1982.
5. Julius Panero & Martin Zelnik, Human Dimension and Interior space. Whitney Library of Design Publication, 1979.
6. Ernst and Peter, Neufert's Architect's Data, Blackwell publishing professional, 2002.

| SCIX1053 | ANALYSIS AND DESIGN OF STRUCTURES V | L | T | P | Credits | Total Marks |
|----------|-------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To understand the structural design of flat slab and to introduce the construction of tall and earthquake resistance structures.

UNIT I FLAT SLAB & CIRCULAR SLAB**12 hrs.**

Working Stress Design of Flat Slabs – Direct Design Method Equivalent and Fixed End Conditions Working Stress Design of Circular Slabs- Simply Supported and Fixed End Conditions-Uniformly Distributed Load

UNIT II TALL BUILDINGS**12 hrs.**

Behaviour of Various Structural System – Factors affecting growth, height and structural form – High rise behaviour, rigid frames – braced forms – in filled frames – shear walls, coupled shear walls, wall frames, tubulars, cores, outrigger – braced and hybrid mega systems.

UNIT III EARTHQUAKE ENGINEERING & DISASTER MANAGEMENT**12 hrs.**

Introduction – Terminology – Causes and consequences of Earthquakes – Magnitude & Intensity of Earthquake – Earthquake zones in India - Codal provisions (IS 1893) – Seismic Co-efficient Method & Response Spectrum method of analysis – Response of RCC buildings to seismic loads. Definition – Natural and Man made disasters – Causes and consequences of natural disaster viz. flood, cyclone, volcanic eruption, etc. – Man made disasters.

UNIT IV REPAIR AND REHABILITATION OF RC STRUCTURES**12 hrs.**

Definition – Repair, Rehabilitation & Maintenance – Causes of Deterioration – Evaluation of Damage – Study on Cracks - Non Destructive Techniques – Methods and materials for repair.

Total: 48 hrs.**REFERENCES:**

1. Pillai & Menon, Reinforced Concrete Design, TMH Limited, New Delhi, 2010
2. Maintenance and Rehabilitation of RC Structures by Denison Allen, Longman Publication Limited, 2001.
3. Bryan Stafford Smith & Alex Coull, Tall Building Structures-Analysis and Design, Wiley-Inter science, 1991.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks**(80% problem, 20% theory)**

| SARX1012 | CONTEMPORARY ARCHITECTURE | L | T | P | Credits | Total Marks |
|----------|------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To introduce the various theories and philosophies which characterize the work of contemporary masters.

UNIT I CRITIQUING MODERNISM**8 hrs.**

Challenging CIAM declarations: Team \times and Brutalism - Writings of Jane Jacobs - Robert Venturi - Christopher Alexander.

UNIT II MODERNISM & AFTER**8 hrs.**

Post modernism - Cesar Pelli, Mario Botta, Frank Gehry, Santiago Calatrava Historic revivalism - Hassan Fathy - Laurie Baker- Critical Regionalism - Geoffrey Bawa – Kenneth Yeang.Tadao Ando

Deconstructivism - ZahaHadid, Daniel Libeskind, Peter Eisenman - Modern and High tech – Richard Rogers, Renzo Piano, Norman Foster, Rem Koolhaas, Richard Meier - Pop architecture and Utopian ideas of Paulo Soleri

UNIT III WORKS OF THE INDIAN MASTERS**8 hrs.**

Chandigarh and Bhubaneshwar experiments - Influence of Le Corbusier, Louis Khan, Koenigsberger - Works and ideas: Nari Gandhi – B.V.Doshi – AchyutKanvinde – Charles Correa – AnantRaje – Uttam Jain – Joseph Allen Stein – Raj Rewal – Hasmukh Patel – Bimal Patel.

UNIT IV CONTEMPORARY TRENDS IN INDIAN ARCHITECTURE**8 hrs.**

Works and ideas: CNT, Karan Grover, SenKapadia, Gerard da Cunha, Mistry, Sanjay Mohe, Rahul Mehrotra, Nimishpatel, Hafeez Contractor

Total: 32 hrs.**REFERENCES:**

1. Charles Jencks, The Language of Post-Modern Architecture, 1984.
2. Christopher Alexander, Pattern Language, Oxford University Press, Oxford- 1977.
3. Diane Ghirardo, Architecture after Modernism, Thames and Hudson, London, 1990.
4. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London, 1994.
5. Robert Venturi, Complexity and Contradiction in Architecture, The Architectural Press, London, 1977.
6. Vikram Adhitya Praksh, Chandigarh's Le corbusier, The Struggle for Modernity in Post colonial India, Mapir Publishing, 2002
7. Jane Jacobs, The Death & Life of Great American cities, Random House Inc, 1961

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1013 | INTRODUCTION TO HUMAN SETTLEMENTS | L | T | P | Credits | Total Marks |
|----------|-----------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

The aim of the course is to expose students to the origin, growth and development of human settlements from ancient times to the present context and to understand Human Settlements as an expression of Civilization and Culture.

UNIT I INTRODUCTION TO HUMAN SETTLEMENTS**8 hrs.**

Elements & Types of Human Settlement – Human Settlements as expression of Civilization, Physical form, nucleus of settlement growth during different periods up to the industrial revolution. Socio-Political context and their effect on settlement development during medieval and renaissance periods. Role of man and society for the growth & decay of human settlements.

UNIT II HISTORY OF HUMAN SETTLEMENTS - INDUSTRIAL REVOLUTION**8 hrs.**

Change in mode of Production. Shift of population and the concentration of activities. Impact of industrialization and urbanization. A synopsis of settlement development from prehistoric period to Modern times. Greek, Roman, Egypt and Medieval settlements.

UNIT III HISTORY OF HUMAN SETTLEMENTS- INDIA**8 hrs.**

Principles of ancient town planning in India. Evolution of settlements, their planning and building during the early, Medieval, Moghul and colonial periods. Study of spatial components of settlements. Growth of cities in colonial period-examples.

UNIT IV PLANNING CONCEPTS**8 hrs.**

Modern Contribution to planning thought – Patrick Geddes, Ebenezer Howard, C.A. Perry, Le Corbusier, C.A. Doxiadis, F.L.Wright, Lewis Mumford, With examples - Indian Planning Practice.

Total : 32 hrs.**REFERENCES:**

1. Paul Zucker 'Town and the square, Columbia University Press, New York, 1966.
2. AbirBandyopadhyay: Text book of Town Planning, Arunabha Sen, 2000
3. Keeble Lewis, "Principles and Practice of Town and Country Planning", 1969.
4. Gallion, A. and Esnlr, S. "The Urban Pattern", Wiley 1993.
5. Doxiadis, C.A: "Ekistics-An Introduction to Human Settlement", Hutchinson of London, 1969.
6. Benevolo Leonardo, "The history of The City", Scholar Press, London, 1980.
7. Rob Krier, "The Making of a Town", Berlin, 1997.
8. Pratap Rao, Urban Planning theory & Practice, CBS Publishers, 2001
9. Rangwala, Town Planning, Charotar Publishing House, 1999
10. Sathish Chandra Agarwala, Architecture & Town planning, Dhanpat Rai & Co, 1977
11. Hiroskar, Fundamentals of Town planning, Dhanpat Rai & Co,2003

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX3012 | BUILDING SERVICES IV | L | T | P | Credits | Total Marks |
|----------|----------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

COURSE OBJECTIVE:

To introduce air conditioning and firefighting& enabling its application in the design and detailing of buildings.

UNIT I INTRODUCTION**12 hrs.**

Introduction to A/C conditions, basic of refrigeration systems, components of refrigeration system, compressor, condenser, control devices, evaporator, filters cooling tower. Vapour compression cycle. Concepts of cooling load, calculation of cooling load – conductivity, transmission heat load, internal heat gain, concepts of zoning, room air distribution – types of outlets.

UNIT II A/C SYSTEMS**12 hrs.**

Types of Window and split A/c. Package units, Factory made and split units, Centralized plants and Chilled water plants, Comparison of various systems - Space requirements for A/c units, AHU's & a/c plant, ducting, testing and maintenance on ducts and pipes.-Designing the Built Environment and selecting the materials and elements for energy efficient Air Conditioning, Protection of Ozone Layer.

UNIT III INTRODUCTION TO FIRE**12 hrs.**

Introduction, fire triangle, methods of fighting fire, Classifying fire, objectives of fire safety, Fire Hazards, fire load, Fire resistance grading, Grading for buildings, fire safety decision tree, Protection for structural components -Fire fightingEquipments – alarms, detectors, suppression systems, fire point, hydrant& hoses - Fire fighting services - Site planning, Fire protection concepts in buildings, design of fire escape routes, design of egress, Requirements for fighting fire in high rise buildings - staircase enclosure, lifts & lifts enclosures, fire lift, basements, air conditioning, dampers

UNIT IV SERVICE CORES**12 hrs.**

Definition, design approach, functions of service core, service core types and placements - Service cores - toilets, elevator, electrical, air conditioning, staircases, exits & life safety considerations.

Case studies-Air conditioning for different types of buildings-Fire protection concepts in various buildings-Service core on multistoried buildings

Studio Work

Visits to large buildings to study the air conditioning systems, firefighting modes to be arranged along with the preparation of working drawings.

Total: 48 hrs.**REFERENCES:**

1. Arora C.P, Refrigeration and Air Conditioning, Tata Mcgraw Hill, 2000.
2. National Building Code – Bureau of Indian Standards
3. Eastop T.D. Mechanical Services for Buildings, Longman Saiutific & Technical publisher, 1992.
4. Air conditioning for student of architecture – M.H. Lullah
5. Paul Lang, Principles of air conditioning, Delmar Publisher, 1995.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

5 × 2 = 10 marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

4 × 10 = 40 marks

| SARX3013 | BUILDING CONSTRUCTION V | L | T | P | Credits | Total Marks |
|----------|-------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 1 | - | 2 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

COURSE OBJECTIVE:

To expose the students to the new emerging materials like special glasses, Aluminum, plastics etc. and make them aware of advanced techniques

UNIT I GLASS AND PLASTICS**12 hrs.**

Glass - special types of glass – sheet glass, plate glass, safety glass, tinted coated glass. Glass blocks, curtain walling - properties and applications in the building industry. Plastics - Classification of Plastics (Thermo plastic and Thermo sets) –Cellular plastics – Different types, properties and their uses in buildings - Drafting Exercises on Glass blocks, curtain wall, FRP roofing techniques.

UNIT II CONSTRUCTION DETAILS IN ALUMINIUM**12 hrs.**

Aluminium partitions, false ceiling, shopfront handrails- Aluminium doors - open able, sliding, pivoted. Aluminium windows -openable, sliding, fixed, pivoted. Aluminium ventilators – louvred, pivoted and fixed - Aluminium roofing -northlight glazing bar, aluminium roofing sheets. Drafting Exercises

UNIT III CURTAIN WALLS**12 hrs.**

Drafting Exercises on curtain walls with glass, aluminum composite panels, stainless steel.

UNIT IV ADVANCED FRAMED STRUCTURE**12 hrs.**

Drafting Exercises on Shell structures, domes, shell barred vault, folded plate structures, tensile and pneumatic structures, different types of long span roofs using different materials used in stadiums and auditoriums.

Total: 48 hrs.**REFERENCES:**

1. Huntington W.C. And Robert E. Mickadert, Building Construction, Materials and types of construction: John Wiley and Son, New York, USA, 1981.
2. Michael Devarean, Architects working details revised, Architectural press, London, 1964.
3. Boyne, Architects working details, Vol. I, II, III, IV, & V, The Architectural Press, London, 1959.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks:50

Exam Duration: 3 hrs.

Part A: 5 questions from the FOUR units, each carrying 2 marks.

 $5 \times 2 = 10$ marks

Part B: 1 question from each unit with an internal choice, each carrying 10 marks

 $4 \times 10 = 40$ marks**(50% Drafting, 50% Theory)**

| SARX4012 | DESIGN STUDIO VI | L | T | P | Credits | Total Marks |
|----------|------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 15 | 8 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

COURSE OBJECTIVE:

To understand the process of designing buildings involving multiple layers

To innovate the use of materials, intense building services and large span structural systems.

The thrust area shall be on the integration of intelligent service systems in to the design of the building.

DESIGN STUDIO VI

Design problem shall consider the above and planning shall deal with the masses in relation to conservation of spaces, transportation and multiple activities such as regional bus terminal, domestic air- port, 3 star hotel, multi-storied office building, Hospitals, resorts, museum etc.

Total: 120 hrs.

REFERENCES:

1. De Chiara and Callender, Time Saver Standard for building types, McGRAW Hill CO., 2nd Edition, 1980.
2. Edward D. Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in publication Data, 1985.
3. Wakita / Linde, The Professional practice of Architectural working drawing, Jhon Wiley & sons, 1984.
4. Andrew Alpern, Handbook of speciality Elements in Architecture, McGraw Hill Book CO., 1982.
5. Julius Panero & Martin Zelnik, Human Dimension and Interior space. Whitney Library of Design Publication, 1979.
6. Neufert's Architect's Data, Rudolfherg, Crosby Lockwood and Sons Ltd.,

| SARX4013 | ARCHITECTURAL DESIGN EXAMINATION III | L | T | P | Credits | Total Marks |
|----------|--------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | - | 100 | - | 50 | 50 |

COURSE OBJECTIVE:

To understand the process of designing buildings with in given time frame

UNIVERSITY PRACTICAL EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 18 hrs.

One question with an internal choice on designing public use buildings like Design of shopping mall, nursing homes, office buildings etc.

| SARX1014 | STEEL IN ARCHITECTURAL DESIGN | L | T | P | Credits | Total Marks |
|----------|-------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | 1 | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To understand the use of steel in large span structures and to develop the sense of structural aesthetics.

UNIT I STEEL STRUCTURE**12 hrs.**

Standard structural steel – thermal properties – Fireproofing- Long span structures using steel - Steel Roofing namely Cable suspended roof, Hyperbolic paraboloid roof, Catenary, Pneumatic & Membrane roof – Vertical, Horizontal & Hexagonal joints.

UNIT II COMPOSITE CONSTRUCTION USING STRUCTURAL STEEL**12 hrs.**

Concept of Composite materials – structural engineering & Material properties – Flitch Beam – Lightweight construction – Other composite construction materials.

UNIT III DESIGN & CONSTRUCTION OF STEEL BUILDINGS**12 hrs.**

Steel buildings design - manufacture and assemble steel framed buildings - factories - multi-storey buildings and car parks - commercial buildings - Industrial and agricultural buildings - Bridges and multi-storey steel framed structures – Case Studies.

UNIT IV APPLICATIONS & INNOVATIVE TECHNOLOGIES**12 hrs.**

General application– Structural Elements – Innovative Technology - Construction Methods & Techniques – Case Studies.

Total: 48 hrs.**REFERENCES:**

1. Stanley W. Crawley, Robert M. Dillon, Steel Buildings: Analysis and Design, John Wiley & Sons, Inc.,1993
2. Roger Brockenbrough, Frederick Merritt, Merritt Frederick, Structural Steel Designer's Handbook, McGraw-Hill Companies, Inc, 1999
3. Michael Barnes, Michael Dickson, Widespan roof structures, Thomas Telford, 2000

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1015 | URBAN DESIGN | L | T | P | Credits | Total Marks |
|----------|--------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To expose the students the basics of urban design and to gain understanding of the urban spaces, designing of public areas and theories, solutions and policies related to the urban design principles.

UNIT I INTRODUCTION: CITY FORM AND PATTERN & TOWNSCAPE ELEMENTS**8 hrs.**

Relation ship between Architecture, Urban Design and Town planning. Cities & their evolution. Need for urban design as a separate stream of subject. Raw materials in urban design. Townscape elements based on Optics, Place & Content. City - forms and patterns. Elements of the physical urban environment – streets, city centres, open spaces. Factors deciding city form & pattern – size, density, grain, accessibility, imageability, elements of design

UNIT II THEORIES AND SOLUTIONS IN URBAN DESIGN**8 hrs.**

Concepts brought out in developing different theories in the formation of urban areas and different solutions for the urban problems in context. Examples from contemporary projects in India. Urban design and conservation. Urban renewal- scope need and challenges.

UNIT III ROLE OF SPACE IN HISTORY**8 hrs.**

Comparative analysis of public spaces, their organization, location, distribution in towns Pre historic – Egypt, Sumeria, & Greece. Early - Greek & Roman; Agora, Forum. Medieval - Italy, Renaissance period, Comparative analysis of public spaces, their organization, location, distribution in modern towns. Examples from India- Vedic times to Colonial period.

UNIT IV URBAN ENVIRONMENT&TOOLS**8 hrs.**

Problems, existing legal framework and their limitations. Organization of space: Understanding, organizing and articulation of space for residential, commercial, industrial and recreational areas. Public involvement and townscape policies. Importance of public participation in urban design. Need for new bye – laws and regulations. New urbanism concepts.

Total: 32 hrs.**REFERENCES:**

1. Spreiregen Paul, D. "Urban Design-The Architecture of Towns and Cities", McGraw-Hill Book Company, Newyork, 1965.
2. Gordon Cullen, "The Concise Townscape" Van Nostrand Reinhold, New York, 1961.
3. Lynch Kevin, "Image of the City", MIT Press, 1960.
4. Gosling David, "Concepts of Urban Design", Academy Editions, St. Martins Press, New York, 1994.
5. Bacon Edmund, N. "Design of Cities" Thames and Hudson, London, 1967.
6. Gallion, A. and Esnier, S. "The Urban Pattern", Wiley 1993.
7. Barnett Jonathan, "An Introduction to Urban design", Harper and Row, New York, 1982.
8. Barnett Jonathan, "Urban Design As Public Policy- Practical Methods For Improving Cities", Mc Graw-Hill Publications, 1974.
9. Alexander, R.C. "Designing Cities-Critical readings in Urban design", Blackwell Publishers Ltd, 2003.
10. Rob Krier, "Urban Space", Academy Editions, New York, 1979.
11. Cliff Moughtin, "Urban Design-Street And Square", Architectural Press, Oxford, 2005.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Part A: 2 questions from each unit, each carrying 4 marks.

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

Exam Duration: 3 hrs.

8 × 4 = 32 marks

4 × 12 = 48 marks

| SARX1016 | PROJECT MANAGEMENT | L | T | P | Credits | Total Marks |
|----------|--------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To understand traditional management system, management skills, project programming, network techniques and to establish relationship between the project cost and project planning. Application of softwares in planning of simple projects

UNIT I RADITIONAL APPROACH AND NETWORK ANALYSIS**8 hrs.**

Traditional Management System - Gantt's approach - load, progress and bar charts - limitations & overcoming - Project programming - work breakdown structure. Introduction to PERT & CPM - Introduction to network concepts, network elements and inter-relationships-Network techniques - Network logic - activity interrelationships - development of CPM network - Identification of critical path - Different float computations – Early start, early finish, late start, and late finish- worked out examples-Network control (updating): Introduction, process of updating, data required for updating, when to update, method of updating, examples.

UNIT II PROBABILITY ANALYSIS**8 hrs.**

PERT Network - Introduction to theory of probability and statistics - Probabilistic time estimates of activities -Analysis of PERT Network.

UNIT III PROJECT COST & RESOURCE ALLOCATION**8 hrs.**

Introduction to two-dimensional network analysis - activity cost information - cost time relationship – crashed estimates for activities - compression potential-cost slope - Project direct cost and indirect cost- crashed program, Network compression - least cost, least time, optimum solutions. Resource allocation - Resource leveling and smoothing - Simple examples.

UNIT IV PROJECT COST & RESOURCE ALLOCATION**8 hrs.**

Introduction to Project Management softwares – Applications – detailed planning of a simple project – scheduling using primavera.

Total: 32 hrs.**REFERENCES:**

1. Jerome D. Wiest and Forinord K. Levy, 'A Management Guide to PERT/CPM', Prentice Hall of India Pub. Ltd., New Delhi, 1982.
2. Mukhopadhyay S.P., 'Project Management for Architects and Civil Engineers', IIT, Kharagpur, 1974.
3. Burgess R.A. and White G., 'Building Production and Project Management', The Construction Press, London, 1979.
4. Punmiya B.C. and K.K. Khandelwal, 'Project Planning and Control with PERT/CPM', Laxmi Publications, New Delhi, 1989.
5. Harris F.C. and R. McCaffer, 'Modern Construction Management', Crosby Lockwood Staples, 1977.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks**(50% Theory and 50% Problems)**

| SARX4014 | DESIGN STUDIO VII | L | T | P | Credits | Total Marks |
|----------|-------------------|----------------|----------------|--------------------|-------------------|----------------|
| | | - | - | 15 | 8 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass External | Min Pass Marks |
| | | 200 | - | 100 | - | 100 |

COURSE OBJECTIVE:

To understand the role of architects in creating a sustainable urban environment.

DESIGN STUDIO VII

Study of an urban environment - Urban activities, services and construction methods, social utilization, growth and change shall be the focus of the study centered in a medium sized town poised for major changes in the near

Design program involving the creation of large span structures such as bus terminus, pavilions, conventional center, stadiums etc.

Design problems on housing, campus planning etc.

- Use of computers as an aid to Design.

Total: 120 hrs.

REFERENCES:

1. De Chiara and Callender, Time Saver Standard for building types, McGRAW Hill CO., 2nd Edition, 1980.
2. Edward D. Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in publication Data, 1985.
3. Wakita / Linde, The Professional practice of Architectural working drawing, Jhon Wiley & sons, 1984.
4. Andrew Alpern, Handbook of speciality Elements in Architecture, McGraw Hill Book CO., 1982.
5. Julius Panero & Martin Zelnik, Human Dimension and Interior space. Whitney Library of Design Publication, 1979.
6. Neufert's Architect's Data, Rudoifherg, Croby Lockwood and Sons Ltd.,

| SARX4015 | WORKING DRAWING STUDIO | L | T | P | Credits | Total Marks |
|----------|------------------------|----------------|----------------|--------------------|-------------------|----------------|
| | | - | - | 4 | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass External | Min Pass Marks |
| | | 100 | - | 50 | - | 50 |

OBJECTIVES:

Introduction to need and relevance of Working Drawing set and municipal drawings and their comparison to presentation drawing. Preparation of corporation drawing: Check list as a guide for information in a municipal drawing.

Introduction to various components and their precise function in a set of working drawing, Preparation of check list as guide for list of working drawing, Method of representing various contents and specific information in working drawing, Preparation of details for various building units. Time problem for specified building units (manually or on computer).

| | | | | | | |
|-----------------|---------------------------|-----------------------|-----------------------|---------------------------|---------------------------|-----------------------|
| SARX4016 | DESIGN STUDIO VIII | L | T | P | Credits | Total Marks |
| | | - | - | - | 10 | 300 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | 100 | 100 | 50 | 150 |

As per the norms laid by the Council of Architecture, India, a candidate has to undergo practical training for one year in an approved architectural firm established not less than five years. The practical training consists of two stages; however each stage (VIII & IX semester) should have a minimum of ninety working days. In addition to the training in architectural firms, the stage I also includes the critical analysis and documentation of a building (Historic or Vernacular) reflecting the regional context or a contemporary building designed by an eminent architect.

| | | | | | | |
|-----------------|-------------------------|-----------------------|-----------------------|---------------------------|---------------------------|-----------------------|
| SARX4017 | EDUCATIONAL TOUR | L | T | P | Credits | Total Marks |
| | | - | - | - | 3 | 200 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 150 | 50 | 75 | 25 | 100 |

An educational tour to the places of architectural interest / building appraisal shall be organized as per the itinerary approved by the department. The documentation shall be done in the form of photographs / slides and sketches, presented in the form of a seminar and written report immediately after the tour / building appraisal.

| | | | | | | |
|-----------------|-----------------|-----------------------|-----------------------|---------------------------|---------------------------|-----------------------|
| SARX4018 | SYNOPSIS | L | T | P | Credits | Total Marks |
| | | - | - | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 50 | 50 | 25 | 25 | 50 |

The intent of synopsis is to initiate the selection of Thesis topic in the beginning of the eighth semester itself. The students should work on three alternative topics of which one will be assigned to him/her to proceed to the next phase.

| | | | | | | |
|-----------------|-------------------------|-----------------------|-----------------------|---------------------------|---------------------------|-----------------------|
| SARX4019 | DESIGN STUDIO IX | L | T | P | Credits | Total Marks |
| | | - | - | - | 10 | 300 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 200 | 100 | 100 | 50 | 150 |

As per the norms laid by the Council of Architecture, India, a candidate has to undergo practical training for one year in an approved architectural firm established not less than five years. The practical training consists of two stages; however each stage (VIII & IX semester) should have a minimum of ninety working days.

| | | | | | | |
|-----------------|-------------------------|-----------------------|-----------------------|---------------------------|---------------------------|-----------------------|
| SARX4020 | PRE-THESIS STUDY | L | T | P | Credits | Total Marks |
| | | - | - | - | 3 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 100 | 100 | 50 | 50 | 100 |

The students will proceed for case studies and data collection of their approved synopsis in consultation with their respective supervisor and Head of Department. The findings and outcome of this study will be reviewed and evaluated by examiners appointed by the University

| SARX1017 | PROFESSIONAL PRACTICE | L | T | P | Credits | Total Marks |
|----------|-----------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVES:

To introduce the issues relating to the architectural profession in India. To understand the Architects Act and COA's regulations. To focus on the issues relating to office management. To understand the implications of various Acts and Regulations.

UNIT I LAWS RELATING TO ARCHITECTURAL PRACTICE**8 hrs.**

The Architects Act – 1972, Council of Architecture's Rules and Regulations. Important Acts and Regulations governing buildings (in detail) Urban Land Ceiling Act, Land Acquisition Act, Town Planning Act. Urban Art Commission. Consumer Protection Act, Copyright Act.

UNIT II ARCHITECTURAL COMPETITIONS & PROFESSIONAL ORGANIZATIONS**8 hrs.**

Types of Competitions, Promotion and Conduct of Competitions, Role of the Assessor, Award of Prizes.

Professional Organizations -IIA, UIA, CAA, ARCASIA, SAARCH, ITP, IID, IV. Globalization, GATS and the Indian Architectural scenari.

UNIT III CONTRACTS, EASEMENTS & ARBITRATION**8 hrs.**

Classification of Building Contracts, Defects Liability Period, Clerk of Works, Sub-Contractors, Liquidated Damages, Breach of Contract and Damages, Interim and Final Certificates. Definition, Types of Easements, Creation, Prevention and Extinction of Easements. Introduction, Arbitration Agreement, Role of Arbitrators and Umpire, Arbitration Award.

UNIT IV LIABILITY OF ARCHITECTS**8 hrs.**

Types of Liabilities, Professional Duties and Conduct of Architects, Professional Negligence, Deficient Service and Exceptions, Insurance, Examples of Cases.

Total: 32 hrs.**REFERENCES:**

1. Roshan H Namavathy, Professional Practice, Anup Lakhani, 1997
2. Gopinath Rao, Manual on Building contracts, 1991
3. Gopinath Rao, Professional Practice for Architects, Consultancy & Engineers, Chennai, 1996
4. Krishnamoorthy K.G., Ravindra S.V., Professional Practice, K.G. Krishnamoorthy, S.V. Ravindra, 2004

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| S21XPROJ | DESIGN STUDIO X (THESIS) | L | T | P | Credits | Total Marks |
|----------|--------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | - | - | 24 | 12 | 600 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 300 | 300 | 150 | 150 | 300 |

OBJECTIVE

The objective of the thesis project is to make use of the knowledge gained by the student at various stages of the degree course. Students shall be permitted to undertake any live/ competition/ Government projects, which was approved in the previous year.

There shall be five continuous assessments during the semester by the review committee comprising of The Head of the Department, Internal Supervisor and External Supervisor. The Architectural Thesis/Project sheets and report shall be prepared under the guidance of an experienced teacher/ qualified professional.

The review marks obtained in the five assessments shall be taken into account for the internal marks. A jury comprising of internal and external examiners shall conduct the final Viva-Voce examination of the Architectural Thesis/Project in the institution at the end of the Tenth semester as a University Viva Voice. The total marks scored shall be the sum of marks secured in the continuous assessments and the final university viva-voce examination.

Each student is required to submit two hard copies of the report along with a soft copy of the report and sheets. The report shall be based on the literature review, Case Study analysis and inferences, Standards, Site Analysis, Requirements and area statements along with the concepts, design processes and the final design.

| SARX1018 | INDIAN VERNACULAR ARCHITECTURE | L | T | P | Credits | Total Marks |
|----------|--------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To study the approaches, definitions, concepts and typologies of the vernacular architecture. To understand the climatic, regional expressions in the architecture of northern and southern India through case studies. To understand the elements and character of vernacular architecture in the public and royal buildings.

UNIT I INTRODUCTION**8 hrs.**

Approaches and concepts to the study of vernacular architecture, aesthetic- architectural – anthropology, Traditional Principles of Planning-Primitive forms, symbolism, colour, Folk Art, etc. in the Architecture of Rural and Tribal India.

UNIT II VERNACULAR ARCHITECTURE OF NORTH INDIA**8 hrs.**

Deserts of Kutch and Gujarat State-Subterranean Architecture.Wooden Houses and Mansions (Havelis), Gujarat and Rajasthan, Houseboats (Dhungas) of Kashmir, Materials and construction detail –houses in North eastern state, Bungalows and bungalows

UNIT III VERNACULAR ARCHITECTURE OF SOUTH INDIA**8 hrs.**

Wooden Houses, palaces and Theatres in Kerala,Tamilhouse,Chettinad houses and Palaces in Tamil Nadu-Principles of planning, proportion, and religious practices and beliefs, Colonial Influences on Traditional Christian Houses, Goa, construction details

Planning principle and vernacular architecture of Pondicherry- French &tamil settlements, Frankotamil houses - settlement details and houses of Mattancherry,

UNIT IV TRADITIONAL SETTLEMENTS**8 hrs.**

Hassan Fathy, Laurie Baker, Geoffrey Bawa, Tadao Ando, B.V.Doshi, Dean D Cruz, Nimish Patel

Total: 32 hrs.**REFERENCES:**

1. Carmen K'agal, 'VISTARA-The Architecture of India', Published by The Festival of India, 1986.
2. Prammar V.S., 'Haveli-Wooden Houses and Mansions of Gujarat', Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
3. Kulbhustan Jain and Minakshi Jain, 'Mud Architecture of the Indian Desert', Aadi Centre, Ahmedabad, 1992.
4. Tillotsun G.H.R., 'The Tradition of Indian Architecture Continuity, Controversy and change since 1850', Oxford University Press, Delhi, 1989.
5. Suzane E. Slesin and Stafford Cliff, 'Indian Style', Clarkson N. Potter Inc., New York, 1990.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1019 | ENVIRONMENT AND BEHAVIOUR | L | T | P | Credits | Total Marks |
|----------|---------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To expose the students to the relationship between man and his larger environment, with special emphasis on aspects that are likely to affect intervention in or creation of, the built environment. The objectives of the course are to familiarize the students with basic concepts/ theories of psychology as relevant to architecture.

UNIT I INTRODUCTION**8 hrs.**

Introduction to the discipline environmental psychology, its importance in the field of architecture, understanding the principles of psychology, the roots and Edges of environmental psychology- Theories and approaches in Environmental Psychology.

UNIT II CREATIVITY**8 hrs.**

Process of creativity, Visual and creative thinking. Types of thinking. Memory and built environment- theories on different types of memories, articulation of masses and spaces, sense and sensation modalities- language of architecture and its role in creativity.

UNIT III PERCEPTION**8 hrs.**

Concept of perception, visual perception, theories on environmental perception- environmental perception and design. Concepts of cognition. Environmental cognition and design. Environment and human response in relation to different environmental variables.

UNIT IV SPACE AND HUMAN BEHAVIOR**8 hrs.**

Concept of personal spaces, personal space and human behavior. Personal space and environmental design. Concept of territoriality, territoriality and human behavior & territoriality and environmental design.

Residential environment- Concept of Home. Neighborhood concept & Neighborhood satisfaction. Place attachment theory, Work place environment and behavior. Application of the knowledge in design of a residence, community neighborhood and other built environments.

Total: 32 hrs.**REFERENCES:**

1. Morgan, T., & Clifford, " Introduction to Psychology", Tata McGraw-Hill Publications, New York, 2001
2. Gifford, Robert. Environmental Psychology: Principles and Practice, Optimal books, 2002.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1020 | SUSTAINABLE ARCHITECTURE | L | T | P | Credits | Total Marks |
|----------|--------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

OBJECTIVE:

To understand the importance environmentally and ecologically sensitive architecture

To integrate Sustainable planning and building principles in architectural design.

UNIT I INTRODUCTION TO SUSTAINABILITY**8 hrs.**

Concepts of sustainability Sustainable Development, Concept of Sustainability - Principles of conservation - synergy with nature, Energy use and Climate change – Its impact. 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, Intro to Environmental Design & Planning

UNIT II SUSTAINABLE BUILDING MATERIALS & CONSTRUCTION**8 hrs.**

Sustainable Construction, Three Dimensions. Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Techniques of sustainable construction – technologies and design synthesis and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials

UNIT III RECYCLING AND REUSE**8 hrs.**

Architectural Reuse- Waste prevention, Pre building, Building, Post building stages, Construction and Demolition recycling- Conservation of natural and building resources- types of wastes - Elimination of waste and minimize pollution- various Decomposing methods –environmental monitoring and testing during construction- Design facility within social and environmental thresholds.

UNIT II CASE STUDIES & RATING SYSTEMS**8 hrs.**

Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green architecture and various international rating systems for sustainability- LEED, BREEAM, Green Star, HQE Rating system, IGBC, GRIHA

Total: 32 hrs.**REFERENCES:**

1. Bose B.C., "Integrated approach to sustainable Development". Publishers: Rajat Publications, Delhi, 2007
2. Laurie Baker's, "Chamoli Earthquake hand book", Publishers: Costford, centre of science and technology for rural development, 2000
3. Fuller Moore, "Environmental control systems Heating, Cooling, Lighting". Publisher MC.Graw Hill, Newyork, 1992
4. Caring A.Langston Grace K.C.Ding, "Sustainable practices in built environment", 2nd Edition, Publishers: Butterworth-Heinmann Linacre House Jordanhill Oxford, 2001
5. Trivedi.R.N. Environmental Sciences, Publishers:Anmol Publications Pvt Ltd, New Delhi, 1997

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

$8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$4 \times 12 = 48$ marks

| SARX1021 | FACILITIES MANAGEMENT | L | T | P | Credits | Total Marks |
|----------|-----------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To understand the various processes involved in an architectural project formulation.

UNIT I INTRODUCTION, BACKGROUND INFORMATION, DATA, GOAL AND OBJECTIVES. 8 hrs.

Difference between primary data & Secondary data, various stages involved in planning viz., goal/objective setting, surveys & Studies, analysis, findings & recommendations, implementation, monitoring & evaluation and feedback. Difference between goal and objective. Statement of goals and objectives for an architectural programme. Various sources of information – such as literature, performers, organizers, users/audience, technical persons, public authorities & clients. Studio exercise on preparation of programme for a given project.

UNIT II ENVIRONMENTAL CONTEXT ANALYSIS/SITE ANALYSIS. 8 hrs.

Study of design sources – viz, site & purpose, objective of site analysis, qualitative goals/direct functional goals and objectives, general factors & conflicting factors, affecting and influencing the site. Site topography, site drainage, site vegetation, microclimate, site acoustics etc., Process of site analysis. (i) Reconnaissance surveys, (ii) Preparation of base map etc., & (iii) Graphical and verbal presentation. An example site analysis for a given context from real life situations.

UNIT III ACTIVITY ANALYSIS, SPACE SUMMARY AND ALLOCATION, ESTIMATING SPATIAL NEEDS. 8 hrs.

Difference between net useable space, gross usable space, services and circulation space, net area & gross area. Method of analyzing the efficiency factor and index figure. Studio exercise related to the space analysis and allocation for any building –such as –apartment, library etc.

UNIT IV BUDGET ANALYSIS AND SYSTEMS PERFORMANCE CRITERIA 8 hrs.

Real estate values, feasibility studies, sale price, fixed budget, inflation, time-management, off-site utilities, land value and material cost. Items of work/ items of development budget. Land cost, on-site and off-site development, building cost predevelopment cost, cost of financing etc. Architect's budget overlay construction cost : site development, building material, labour, on-site work etc. Studio exercise of cost analysis.

CASE STUDIES, DETAIL STUDY AND FUTURE PROSPECTS

Preplanning & Proposal phase, programming phase, Schematic design Phase, Design development phase & introduction to project scheduling and phasing.

Total: 32 hrs.

REFERENCES:

1. Keith Alexander, Facilities Management: Theory and Practice Taylor & Francis, 2004
2. Frank Booty, Facilities Management Handbook, Heild Schwartz, Elsevier 2009
3. Brian Atkinand Adrian Brooks, Total Facilities Management, Angus & Robertson 2009

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

$8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$4 \times 12 = 48$ marks

| SARX1022 | INTRODUCTION TO GIS AND REMOTE SENSING | L | T | P | Credits | Total Marks |
|----------|--|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE

To introduce the basics of geographic formation and remote sensing and their applications in various fields.

UNIT I REMOTE SENSING**8 hrs.**

Definition – Advantage - Components of Remote Sensing – Electro Magnetic Radiation (EMR) - EMR spectrum – Black body Radiation – Planck's law – Stefan Boltzman law - EMR interaction with atmosphere and various Earth Surface Features – Spectral Reflectance of Earth Surface Features in different wavelength in EMR – Aircraft & Satellite – Classification (based on orbits & purpose) – Synoptivity&Reptivity - Satellite Sensors - Active & Passive remote sensing – Platforms – Resolution – Scanners – Thermal and Microwave Remote Sensing.

UNIT II IMAGE PROCESSING AND VISUAL INTERPRETATION**8 hrs.**

Digital Image Processing – Digital image formats – Image Rectification and Restoration – Image Enhancement – Image Classification – Data Merging and GIS integration – Hyperspectral image analysis. Fundamentals of Visual Image Interpretation – Elements of Image Interpretation – Geomorphic elements - Imagery interpretation.

UNIT III PRINCIPLES OF GEOGRAPHICAL INFORMATION SYSTEM**8 hrs.**

Introduction to GIS - components of GIS - Definition – Data Structure in GIS – Data Structure Types – Spatial elements - Data Encoding and Storage – data manipulation – Data analysis (spatial, simple, recode overlay, vector data analysis) & Modeling in GIS, Digital Elevation Model - Models of natural, scale analogue, conceptual, mathematical, physical, human and environmental processes – Digital Cartography – Data quality and

UNIT IV APPLICATION OF REMOTE SENSING AND GIS**8 hrs.**

Applications of Remote sensing – Agriculture – Geology – Geomorphology – Natural Resource Management – Environmental Impact Assessment – Urban, transport, municipal and regional Planning – Water Resource – Forestry.

Total: 32 hrs.**REFERENCES:**

1. Anji Reddy, Remote Sensing and Geographical Information Systems, BS Publications 2001
2. Srinivas M.G., Remote Sensing Applications, Narosa Publishing House, 2001
3. Lillesand T.M. and Kiefer R.W. Remote Sensing & Image Interpretation, John Wiley & Sons, New York, 1987.
4. Burrough P A 2000 P A McDonnell [2000] Principles of Geographical Information systems, London: Oxford University Press.
5. Haywood.L, Comelius.S and S. Carver (1988) A Introduction to Geographical Information Systems, Addison Wiley Longmont, New York.
6. Misra P. and P.Enge, Global positioning System, signals, Measurements and Performance, Ganga-Jamuna Press, 2001.
7. Kumar. S., Basics of Remote Sensing and GIS, University science press, 2010.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

8 × 4 = 32 marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

4 × 12 = 48 marks

| SARX1023 | URBAN AND REGIONAL PLANNING | L | T | P | Credits | Total Marks |
|----------|-----------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To understand the concepts of planning at regional level, city level. Planning and managing infrastructure with different schemes and case studies.

UNIT I REGIONAL PLANNING**8 hrs.**

Types of Region – Regional Policies - Principles & Methodologies of Regional Planning - Constraints & factors for consideration for regional plans.

UNIT II URBAN PLANNING**8 hrs.**

Types of Plans – Perspective Plan, Structure Plan, Master plan, Comprehensive Plan, Detailed Development Plan, City Corporate Plan, Business Plan - Its Scope & Contents - Data Collection – Future proposals & Policies – Land Use Maps – Development Regulations & Bye laws – Limitations

UNIT III URBAN PLANNING**8 hrs.**

Need and significance of Infrastructure as related to design of buildings - Design, Planning & Application of management systems for infrastructure development – Monitoring & Implementations (BOOT, PPP, BOT, etc)

UNIT IV URBAN RENEWAL**8 hrs.**

Urban Renewal, Its components – Conservation – Rehabilitation & Redevelopment – Types of Urban Renewal Projects – Reasons for Urban Renewal – Benefits of Renewal - Case studies of Urban Renewal Project in India- Community Participation & Involvement in Planning

Total: 32 hrs.**REFERENCES:**

1. Anthony James Catanese, James C. Snyder, Urban Planning, McGraw-Hill, 1988
2. Peter Hall, Urban & Regional Planning, Routledge, Taylor & Francis Group, London, 2002
3. RameGowde K.S., Urban & Regional Planning, Prasara University of Mysore, 1972

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1024 | LANDSCAPE DESIGN | L | T | P | Credits | Total Marks |
|----------|------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To enlighten the students about the components of landscape features and the construction of the same.

Knowledge of the various features of innovative and modern landscape design application of innovative detailing and appropriate technologies to further better landscape planning.

UNIT I INTRODUCTION TO LANDSCAPE**8 hrs.**

Landscape interpretation- Landscape as nature, habitat, artifact, system, problem, wealth, ideology, history, place and aesthetic.- Introduction to Landscape architecture- its scope and role in architecture and planning- Landscape design process. Hard and soft landscape elements - Landscape Planning, Landscape Conservation, Urban Landscape.

UNIT II LANDSCAPE ARCHITECTURE**8 hrs.**

India, Japanese gardens and Italian gardens.

UNIT III URBAN LANDSCAPE**8 hrs.**

Landscaping for Residential areas, Childrens parks and Institutional building- Landscape design for waterfront areas, road landscaping-avenues, Roof gardens.

UNIT IV LANDSCAPE DESIGN**8 hrs.**

Plant selection, Functional and aesthetic consideration in design- Structural characteristics of plants, Creating spaces with plants, Basic principles of landscape design and the Visual composition - Landscape design of small project including paving and street furniture design.

Total: 32 hrs.**REFERENCES:**

1. Nick Robinson, The planting Design handbook, Gower publishing company limited 1998.
2. John L Motloch, Introduction to Landscape Design, John Wiley&Sons, 2001.
3. John Ormsbee Simonds, Landscape Architecture- A manual of site planning and design, McGraw Hill, 1983
4. Geoffrey and Susan Jellicoe, The landscape of Man, Thames and Hudson, 1987

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1025 | ENVIRONMENTAL PLANNING AND DESIGN | L | T | P | Credits | Total Marks |
|----------|--------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To introduce the students to environmental impact assessment and legislation, planning and evaluation techniques and indoor environmental design

UNIT I INTRODUCTION**8 hrs.**

Introduction to Ecology; Ecosystem, Ecological balance, Biospheres, renewable energy and non renewable energy, resource identification and its implications for development – soil, water, land, plants.

UNIT II ENVIRONMENTAL IMPACT ASSESSMENT AND LEGISLATION**8 hrs.**

Environmental impact assessment Methodologies and Techniques, Issues in EIA- Evolution of planning legislation, National environmental policy, significance of law and its relationship to development.

UNIT III PLANNING AND EVALUATION TECHNIQUES**8 hrs.**

Essence of good planning, integration of environmental assessment and planning options, priorities and strategies for development on urban, coastal and hilly ecosystem- Cost benefit analysis, planning balance sheet and goal achievement matrix.

UNIT IV INDOOR ENVIRONMENTAL DESIGN**8 hrs.**

Parameters for indoor environmental design- indoor air quality, lighting for Residential spaces

Total: 32 hrs.**REFERENCES:**

1. Earthscape- Manual of Environmental Planning and Design, John OrmsbeeSimond, Van Nostrand Reinhold Company,1978.
2. Richard P Dober-Environmental Design – VNR company, Newyork.1969.
3. Albert J Rutledge- Anatomy of park-McGraw Hill book co., USA 1971
4. Harvey M Rubenstein – A guide to site and environment planning, 3rd vol., John Wiley & Sons- New York 1987.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1026 | ARCHITECTURAL CONSERVATION | L | T | P | Credits | Total Marks |
|----------|-------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To understand the values and ethics of conservation. To expose students to conservation process and methodology, Need for them in Indian context. To expose students on the various conservation techniques through case studies..

UNIT I INTRODUCTION TO CONSERVATION**8 hrs.**

Definitions of conservation, preservation, rehabilitation, reproduction, restoration, reuse – Need for them –Indian context - Role of Conservation architect, ethics and values of Conservation, Evolution of Conservation charters – Venice, Florence, etc...

UNIT II CONSERVATION OF HISTORIC BUILDINGS**8 hrs.**

Criteria for identifying historic buildings, guidelines for conservation, Socio-cultural and economic aspects, Methodology & implementation, Role of ASI & INTACH.

UNIT III CONSERVATION TECHNIQUES**8 hrs.**

Documenting the Materials- Lime, Timber, Stone, Wood & Glass – Methods to conserve timber structures – repairing and replacing lime plaster – conserving stone structures etc...

UNIT IV CASE STUDIES**8 hrs.**

Indian Case studies - analysis, methodology and proposals – Tajmahal, Agra, Senate House, Chennai, Ruins of Hampi, Conservation methods adopted in Mamallapuram- International Case studies: - Conservation methods adopted for leaning tower of Pisa, World Heritage sites - UNESCO etc- Case studies in urban settings- mills in Mumbai and Cochin.

Total: 32 hrs.**REFERENCES:**

1. Bernard Fieldcen, 'Guidelines for Conservation, a Technical Manual', INTACH, New Delhi, 1989.
2. Gordon Cullen, 'The Concise Townscape', Architectural Press, 1978.
3. Edmund N. Bacon, 'Design of Cities', Thomas & Hudson, London, 1977.
4. 'Bath, a Study in Conservation', HMSO Publication, London, 1977.
5. Conservation and Development in Historic Towns and Cities – Pamela Ward _ Orid Press. Ltd., 1968
6. Character of towns an Approach to conservation – Worskett Roy, Architectural Press – London, 1979

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1027 | CONSTRUCTION MANAGEMENT | L | T | P | Credits | Total Marks |
|----------|-------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To introduce the various issues related to construction management planning and safety planning.

UNIT I CONSTRUCTION MANAGEMENT**8 hrs.**

Definition-Objectives & Scope of Construction Management- Responsibilities of a Construction Manager, Work scheduling - Infrastructure detailing and management, construction work scheduling - construction documents.

UNIT II CONSTRUCTION PLANNING**8 hrs.**

Project work break down – development – time control tools and techniques- CPM, PERT network analysis – precedence network analysis – line of balance – computer based planning

UNIT III CONSTRUCTION ACCIDENTS**8 hrs.**

Accidents and their causes-Human factors in construction safety- common hazards-safety check list at construction site, alteration and demolition works-life saving equipments

UNIT IV SAFETY PLANNING**8 hrs.**

Meaning and objective of safety planning, Safety culture- Job site Safety -Role of supervisors in safety measures-Safety and Middle Managers- Project Coordination and Safety Procedures and training –material and machinery handling safety - Workers Compensation

Total: 32 hrs.**REFERENCES:**

1. Chitkara. K.K. 'Construction Project Management' Tata Mc Graw Hill Publishing Company, 2004.
2. Joy. P.K. 'Total Project Management- The Indian Context' Macmillan Publications.1991
3. Jimmy W.Hinze, 'Construction Safety, Prentice Hall Inc., 1997.
4. Richard J. Coble, Jimmie Hinze and Theo C. Haupt, "Construction Safety and Health Management ", Prentice Hall Inc., 2001.
5. Tamilnadu Factory Act.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1028 | ADVANCED CONSTRUCTION TECHNIQUES | L | T | P | Credits | Total Marks |
|----------|----------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To introduce modular and fabricated systems, green technology and new innovative materials.

UNIT I CONSTRUCTON SYSTEMS**8 hrs.**

Planning – Cast in situ construction (ready mixed pumped etc.) – Reinforcement concrete and pre-stressed concrete constructions pre-cast concrete– Structural schemes.

UNIT II REFABRICATION AND SYSTEMS BUILDING**8 hrs.**

Offsite and onsite conditions for prefabricated construction. Different types of precast elements, modular coordination, typification, finishes. Equipment for materials handling, transportation and erection. Uses of the following: Tractors, bulldozers, shovels drag lings, cableways and belt conveyors, batching plants – Transit mixers and agitator trucks used for ready mix concrete pumps. Guniting equipments – Air compressors – welding equipment – cranes and other lifting devices Choice of construction equipment for different types of works

UNIT III GREEN BUILDING MATERIALS AND TECHNOLOGY**8 hrs.**

Introduction, green building product and materials, product selection criteria. Concrete, Eco block, Insulated concrete forms(ISF), hydra form, prefabs/Structural insulating panels, Cellulose insulation, adobe, rammed earth, earth sheltered and recycled materials. Bio materials from Industrial waste, mining waste, mineral waste, agricultural waste.

UNIT IV NEW EMERGING MATERIALS**8 hrs.**

Properties, Application, specification and standards(Indian and International)Teflon, special glasses, aluminum composite panel etc - Nano technology applications in construction.

Total: 32 hrs.**REFERENCES:**

1. "Innovative Constructional Materials", proceedings of seminar on Innovative Construction Materials, Veeramata Jeejabai Technical Institute, Mathuga Mumbai, Jan 20-21, 2001
2. Directory of Indian Building Materials Products Building materials and Technology Promotion Council and Centre for Symbiosis of Technology, Environment Management, Bangalore, 2000-2001,
3. Henrik Missen, "Industrialized Building and Modular Design", C&CA UK, 1972.
4. Konz T, "Manual of Precast concrete Construction", Vol, I, II, III Banverlag GMBH, 1971.
5. William P. Spence, Construction Materials, Methods, and Techniques ,2006

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1029 | DESIGN FOR DISASTER MANAGEMENT | L | T | P | Credits | Total Marks |
|----------|-----------------------------------|-------------------|-------------------|-----------------------|-----------------------|-------------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To create an awareness of all types of disaster resistant building designs and management systems. To expose the students to the different types of natural and man made disasters and the various methods of managing them. To make them aware of the disaster resistant construction techniques.

UNIT I INTRODUCTION**8 hrs.**

Basic understanding on fragile eco-system, physiographic and geo chemical data mapping, soil and topography, hydrological factors, inclement climatic conditions like thunderstorm, cyclone, sea surge and flooding, reclamation of land.

UNIT II OVERVIEW OF DISASTER**8 hrs.**

Disaster management, mitigation, and preparedness, Strategies for disaster prevention and mitigation - pre disaster, emergency, transition, recovery. Disaster management plan, National Crisis Management Committee (NCCM), State Crisis Management Group (SCMG).

UNIT III INTRODUCTION DESIGN GUIDELINES**8 hrs.**

Design guidelines in disaster proofing construction at appropriate situation. Engineering, Architectural, Landscaping and Planning solution for different type of calamities. Vulnerability Atlas. Norms, standards and practice procedures for shelter and settlement. Seismic repairs and retrofitting of damaged buildings.

UNIT IV REHABILITATION**8 hrs.**

Natural disasters in India- Earthquakes at bhuj, Latur etc, Cyclones in coastal Andhra Pradesh and Orissa, Land slides, Rehabilitation and re settlement concepts process and design.

Total: 32 hrs.**REFERENCES:**

1. Earthquake Resistant Design for Built Environment. Compiled notes by Department of Architecture and Planning, IIT-Roorkee. December 2003.
2. Das P.K, A.R.Ramanathan, An Introduction to Seismic Safety in Architecture, 2007
3. Paul D.K. Singh, Yogendra, Short Term Training Course on Earthquake Resistant Design of Buildings, ADPC, IIT Roorkee & DMMC Dehradun, 2002

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SARX1030 | ARCHITECTURAL JOURNALISM | L | T | P | Credits | Total Marks |
|----------|--------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

It provides basic introduction to the skills and knowledge relevant to the practice of professional journalism. It introduces students to the fundamentals of writing, explaining of various strategies and their criticism. It outlines the professional function of Architects and describes the range of professional contexts in the industry. This course gives some critical thinking skills and tools so that the student will be in a position to think and talk as a peer to publishers, editors, computer scientists, marketing personnel, company accountants and a new profession, the information architects.

UNIT I INTRODUCTION**8 hrs.**

Introduction to journalism, Subfields within Journalism, Key concepts and objectives of Journalism-Introduction to architectural journalism, skills needed, reporting, writing, editing, photography, columnists, public relationships, criticism.

UNIT II TECHNOLOGIES IN JOURNALS**8 hrs.**

Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. theories of journalism, Introduction to architectural softwares needed in journalism and photography, Video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

UNIT III PRESENTATION TECHNIQUES**8 hrs.**

Text preparations, Mode of presentation, Standards and Guidelines for documentation, Code of ethics, Basic knowledge on Press laws, Press Council of India, Public Debate, Navigating Information Networks for Mass Media with relevance to searches on Architectural topics, User generated contents for analysis of various issues on Architecture, creating an online forum and platform for exchange of ideas and information, to critically contrast outputs of selected individual pieces of journalism.

UNIT IV DISCUSSIONS AND ISSUES**8 hrs.**

Regional, National and International discussion forums, Changes in contemporary and historical design practices. Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists, Public Discourse on the Internet, Mass Media and Public Opinion critically appraise selected individual pieces of journalism.

Total: 32 hrs.**REFERENCES:**

1. Somerset Maugham, Summing up-Penguin Books, 1992
2. Daphne Du Maurier, The Rebecca Note book- Times warner books, UK, 2006
3. John Steinbeck, working days-Penguin books, 1992
4. Stephen Leacock, How to write-Dodd Newyork, 1943.
5. Dalphnedu Marcrier, Myself when young, Macmillan publications, 1987.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

8 × 4 = 32 marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

4 × 12 = 48 marks

| SARX1031 | ARCHITECTURAL ANTHROPOLOGY | L | T | P | Credits | Total Marks |
|----------|-------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVES:

To understand the scientific interpretations of a systematically reconstructed continuum of constructive behavior, Architectural form and passive and active space conceptions which parallel the whole of human and cultural evolution.

UNIT I ORIGINS OF ARCHITECTURAL RESEARCH**8 hrs.**

Origins of Architectural Research-relatively recent origins of Architectural research, breakdown of accepted 'theories' and programs of modernism in Architecture and urbanism at the end of the 60's through the critical writings of Jane Jacobs, Alexander Mitscherlich, Charles Jencks, Amos Rapoport and others. The present state of research - Scope and fields of research in Architectural anthropology based on its scientific interpretations. The five aspects of evolutionary approach in Architecture-outline of a constructive human past. Global anthropology.

UNIT II FIVE ASPECTS OF EVOLUTIONARY APPROACH : SUBHUMAN, DOMESTIC, SEMANTIC**8 hrs.**

Subhuman : nest building behavior of the great apes. Japanese and African examples. Domestic : structures which provide internal space and protection - Polar asymmetry, vernacular architecture. - Critical review of conventional theories regarding the origin of huts, houses and buildings. - Indian, Chinese and Japanese examples. Semantic : non domestic structures with the function of territorial, social and symbolic signs. Man marking his dwelling and settlement territory with built signs and symbols. Cosmos and cosmetics, 'Implosion' and 'Harmony of Opposites', The importance of research into the locality of space - Indian, Chinese and Japanese examples.

UNIT III FIVE ASPECTS OF EVOLUTIONARY APPROACH : SEDENTARY, URBAN ARCHITECTURE**8 hrs.**

Sedentary Architecture : higher, specifically conceived unit, combining several semantic and domestic elements., settlement core complex, Indian, Chinese and Japanese examples. Urban Architecture: early city states, hierarchical social structure and monumentalisation.

UNIT IV IMPLICATIONS FOR ARCHITECTURAL DESIGN**8 hrs.**

Synthetic Approach: Elements of a new theory of design: Categorical polarity in religious, cosmological, social, behavioral, spatial and architectural categories. On non-homogeneous human space concepts. Optical stability and its psychological impacts. Critical Approach: Review of Western theories of the Architect and their Designs, Defining Anthropological art.

Total: 32 hrs.**REFERENCES:**

1. Jane Jacobs: Death and Life of great American cities, random House, Newyork, 1961.
2. Christian Norberg-Schulz : Architecture, Space, Existence, Littlehamton Book Sources Ltd, 1997.
3. Robert Venturi's : Complexity And Contradiction in Architecture, Mesum of Modern Art, Newyork, 1977,
4. Charles Jenck's : Postmodernism, John Benjamin Publishing Co, 1997.
5. Amos Rapoport: House Form and Culture Research, Foundation of cultural geography furies, 1969.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

8 × 4 = 32 marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

4 × 12 = 48 marks

| SARX1032 | CONTEMPORARY PROCESS IN ARCHITECTURE | L | T | P | Credits | Total Marks |
|----------|--------------------------------------|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

COURSE OBJECTIVE:

To expose the students to the new processes in the development of concept and design.

UNIT I BIOMIMICRY**8 hrs.**

Nature as a model, measure and mentor, changing metaphor and approach, organic architecture, Living building – emerging biomimetic technologies, zero carbon buildings, nanotechnology in architecture.

UNIT II SHAPE GRAMMAR**8 hrs.**

Shape rules, shape grammar and form properties, form generation with Islamic patterns, Palladian villas, Victorian windows, Works of Alvar Siza

UNIT III FRACTALS IN ARCHITECTURE**8 hrs.**

Self-similarity, little scale and large scale analysis, principles in architecture, Fractals in Indian and European architecture

UNIT IV FOLDS IN ARCHITECTURE**8 hrs.**

Meaning of fold, birth of blob, blobitecture, new tools and works of Greg Lynn, Gehry, Hadid, Himmelblau, Fuksas, Totyo Ito, Jean Nouvel, Diller Scofidio + Renfro, Morphosis

Total: 32 hrs.**REFERENCES:**

1. Peter Szalapaz, Contemporary Architecture & The Digital Design Process, Elsevier, 2005.
2. David Pearson, The New Organic Architecture, Gia Books Ltd, UK, 2001.
3. John K Waters, Blobitecture, Rock fort publications, 2003.
4. Ivan Margolius, Architects+ Engineers= Structures, Wiley Academy, 2002.
5. Clovis Heimsath, Maryann Heimsath, Lisa Hardaway, Geometry in architecture: Texas buildings yesterday and today, University of Texas Press, 2002.
6. Carl Bovill, Fractal geometry in architecture and design, Birkhäuser, 1996.

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 4 marks.

 $8 \times 4 = 32$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

 $4 \times 12 = 48$ marks

| SCIX1054 | STRUCTURAL SYSTEMS (Common to Civil & Arch.) | L | T | P | Credits | Total Marks |
|----------|---|----------------|----------------|--------------------|--------------------|----------------|
| | | 2 | - | - | 2 | 100 |
| | | Internal Marks | External Marks | Min Pass Internals | Min Pass Externals | Min Pass Marks |
| | | 20 | 80 | - | 35 | 50 |

UNIT I CONSTRUCTION AND FORM**10 hrs.**

Structure and Form Equilibrium under simple tension or compression- the catenary and the arch-the simply supported beam- the domical shell. Structural elements: Beams and slabs Arches and catenaries; vaults, domes and curved membranes; Trusses, Portal frames and space frames.

UNIT II STRUCTURE AND ARCHITECTURE**10 hrs.**

Relation between structure and architecture- Geometry of form and structural function- Aesthetic theories of the expression of structural function in architectural form.

UNIT III STRUCTURAL SYSTEMS**10 hrs.**

Structural Systems: single and double layer grids; braced domes, ribbed domes, plate type domes, Network domes, Lamella domes, Geodesic domes, Grid domes. Braced and folded structures.

UNIT IV SPACE FRAMES AND CABLE STRUCTURES**10 hrs.**

Space frames: Folded plates, shells, cyclonical shells, Hyperbolic paraboloids, free forms.

Cable structures: Simply curved suspended roofs, combination of cables and struts.

UNIT V CURTAIN WALLS**10 hrs.**

Curtain Walls: Types of Curtain Walls and their Components Structural problems, construction and erection.

REFERENCES:

1. Lane, Allen. Developments in Structural Form. Penguin Books Ltd, London, 1975.
2. Macdonald, J. Angus. Structure and Architecture, 2nd ed. Architectural Press, Oxford, 2003.
3. Michaels, Leonard. Contemporary Structures in Architecture. Reinhold Publishing Corporation, 1950.
4. Schall, Rolf. Curtain Walls: Design Manual. Reinhold Pub., New York, 1962.
5. Siegel, Curt. Structure and Form in Modern Architecture. Crosby Lockwood and son Ltd., London, 1962.
6. Subramanian, N. Principles of Space structures. Wheeler and Co., Allahabad, 1983.
7. Zannos, Alexander. Form and Structure in Architecture: The role of statical function. Van
8. Nostrand Reinhold Co., New York, 1987

UNIVERSITY THEORY EXAM QUESTION PAPER PATTERN

(To be distributed uniformly among all the units)

Max. Marks: 80

Exam Duration: 3 hrs.

Part A: 2 questions from each unit, each carrying 2 marks.

$10 \times 2 = 20$ marks

Part B: 1 question from each unit with an internal choice, each carrying 12 marks.

$5 \times 12 = 60$ marks

