Study & Evaluation Scheme

of

Bachelor of Architecture
(B. Arch.)

[Proposed Reformed Syllabus for Session 2016-17 onwards]
Study & Evaluation Scheme
Of
Bachelor of Architecture (B.Arch.)

SUMMARY

Programme : Bachelor of Architecture (B.Arch.)
Duration   : Five years full time (Ten Semesters)
Medium     : English
Minimum Required Attendance : 75 %
Maximum Credits : 314
Minimum credits required for the degree : 304

Introduction to the Reformed B. Arch. Syllabus

Objective of the Syllabus

Considering the specific socio-economic conditions and location of the University in a region under the shadow of highly developed metropolis of Delhi, the objective of the syllabus is to produce, within the span of the B. Arch. Course of five years, Architects who would acquire comprehensive abilities to analyze, conceive a design, draw a project correctly and deliver it on the ground.

Concept

Architecture is all about shaping the built environment where maximum amount of materials are consumed by the mankind. This has a direct correlation to the global warming and climate change. The Architect therefore has to know art, science and technology of shaping the built environment. In that sense the Architect is a jack of all trades and master of creating the built environment proving the common adage wrong. In order to learn Architectural Design, an Architect has to learn something
from every discipline like Art, Civil Engineering (structure, survey, water supply, drainage etc. including fittings and fixtures), Electrical Engineering (energy in buildings, lighting including fittings, fixtures and wiring), Mechanical Engineering (air conditioning, elevators, fire fighting etc.), Electronics (building intelligence and automation, digital presentation etc.), Ecology (green building, sustainable technology etc) and the like besides many other subjects. Architectural Design is a creative subject which needs to be perceived and experienced. Hence the duration of the course is longer than other disciplines and the method of imparting Architectural education is different.

Transfer of knowledge has been conceived in two axes namely, horizontal and vertical denoting diversification and growth respectively. While the exposure to different areas of knowledge will spread horizontally, new knowledge and experience of the students will grow vertically over the Semesters. In the initial Semesters the accent is given to the basic and grammatical knowledge and skill acquisition. Vertically the accent changes from simple designs to design with complexities with considerations like higher structural principles, building services, sustainability, energy efficiency, barrier freedom, cost efficiency and scale of functions.

Subjects have been incorporated in a particular Semester keeping parity with the mental growth of the students and coordinating with the other subjects in that Semester.

**Structure of the Subject Syllabus**

Contents of each subject syllabus except subjects like Architectural Design, Design Presentation, Construction Practice etc. have been divided in five Units not necessarily equal in terms of engagement time.

**Study and Evaluation Scheme**

The Scheme has been prepared in a self explanatory manner so that all information on Contact Periods, Internal Assessment system with allocation of marks, External Assessment System with allocation of marks, duration of theory examination and Credit allocated to a subject is readily accessed.

**Rules for Assessment**

To qualify the course of B. Arch. a student is required to secure a minimum of 45% marks in aggregate including the Semester end examination and continuous evaluation.(i.e. both internal and external) of teachers. A candidate securing less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 50% marks in aggregate to pass the Semester. In case a student secures less than 50% overall marks in a Semester, he/she shall re-appear in the courses where the marks secured are less than 50% to secure the required aggregate percentage of 50% in the semester.

Candidates who have passed in the internal assessment (minimum 23 marks out of 50) shall only be permitted to appear in the end Semester examination. Students who have failed in internal assessment will have to attend the summer classes as per the details finalized by the Director of the College and will be evaluated at the end of the summer classes. The student will be allowed to appear in the
internal evaluation only after the certification of successful conduct of classes and fulfilment of the assessment criteria during the summer classes given by the faculty concerned. The certificate along with the revised internal marks of successful candidates shall be sent to the Controller of Examination by the Director of the College. Only after the student has cleared the internal examination will she/he be allowed to appear in the end semester examination.

Power to modify and introduce new Rules

The University Academic Council has the right to modify any of the present rules or introduce any new rule from time to time.

General Guidelines on Setting of Question Papers, Examination Pattern, Teaching Methodology and Suggested References

Methodology of Presentation of General Guidelines:

Most of the main subjects in Architecture continue through several Semesters. There are a few standalone subjects for which such guidelines are given under the subject syllabus unless given here. The Guidelines are presented in five heads as given below:

A. Setting of Question Papers and Examination Pattern
B. Suggested methodologies to teach.
C. Suggested References.

The subjects continuing over two or more Semesters are grouped together in their common names like History of Architecture, Architectural Geometry and Drawing, Architectural Design etc. so as to furnish the guideline applicable to the group.

A. Setting of Question Papers and Examination Pattern

A1 Theory and Practical Examinations - External Assessment

1.1 Common Guidelines for all Subjects:

1.1.1 The question papers for all the Theory subjects including History of Architecture shall be set on the basis of the Units of the respective subject syllabi.

1.1.2 For all Theory subjects except for Architectural Geometry and Drawing, Architectural Design and Interior Design, the question paper shall consist of seven questions. Students shall be required to attempt any five questions. There will be minimum one and maximum two questions from each unit of the syllabus. All questions shall carry equal marks.

1.1.3 For all Theory examinations except for Architectural Geometry and Drawing, Architectural Design and Interior Design, the duration of examination shall be for 3 hours.

1.2 Architectural Geometry and Drawing Examination:
1.2.1 From Units I, II and III there shall be three drawing based questions of 10 marks each out of which only two shall be answered. Out of Units IV and V there shall be two questions of 30 marks each out of which only one question shall be answered. All answers shall be in the language of drawing.

1.3 Architectural Design Examination:
1.3.1 For Semesters I & II of the First Year, the question paper shall consist of three questions. The Design-based Question No.1 bearing 40 marks shall be compulsory. Out of the other two Theory-based questions bearing 10 marks each only one has to be answered. The duration of the Architectural Design Examination is 6 hours for the First Year.

1.3.2 For Semesters III to VIII, the question paper shall consist of only one Architectural Design based question of 50 marks. The duration of the Architectural Design Examination is 12 hours for the Second and the Third Year and 18 hours for the Fourth Year.

1.3.3 Question paper for Semester III to VIII shall clearly define design proposal and provide site details and user requirements.

1.3.4 The Paper – setters / examiners are required to prescribe any special stationery to be issued to the students for the examination of this subject besides cartridge sheets and butter papers.

1.3.5 Accordingly, the duration of the Architectural Design Examination may vary from one to three days in two shifts of three hours per day for the First Year to the Fourth Year students.

1.3.6 Except for the First Year examination, at the end of 1st day, the students shall submit their 1st day sketch which will be clubbed with the final submission on the last day of the Architectural Design Examination. The students may make a duplicate or take a photograph of the submission made on the 1st day for reference on the subsequent days. This does not restrict them to start the final work on the first day itself.

1.4 Design Presentation Examination:
1.4.1 There will be an external Viva Voce Examination of 50 marks with at least one examiner from the field with good standing. The portfolio of the Architectural Design including models etc. and other works done in this class will be evaluated by the expert.

1.5 Architectural Structures Examination:
1.5.1 Refer para A1.1 and Study and Evaluation Scheme

1.6 Building Materials and Construction Examination:
1.6.1 Refer para A1.1 and Study and Evaluation Scheme

1.7 Other Group / Generic Subjects
1.7.1 Art and Craft Examination
   There is no theory examination for this subject. There will be a Viva examination where one or two external expert artists shall examine the portfolio of the students’ works done throughout the Semester. The experts may ask the students to demonstrate their skills on the spot, if necessary.

1.7.2 Spoken English Examination
   Refer para A1.1 and Study and Evaluation Scheme

1.7.3 Building Services Examination
   Refer para A1.1 and Study and Evaluation Scheme

1.8 Examinations for Standalone subjects
1.8.1 Interior Design Examination:
For Interior Design Examination in the Semester VI, the question paper shall consist of only one question on Interior Design of 50 marks. The duration of the Interior Design examination is 6 hours in two shifts of 3 hours each.

1.8.2 Practical Training Examination in the Semester IX:
The Examination Pattern has been furnished in the subject syllabus and Study and Evaluation Scheme.

1.8.3 Thesis Examination in the Semester X:
The Examination Pattern has been furnished in the subject syllabus and Study and Evaluation Scheme.

1.8.4 All other subjects:
Refer para A1.1 and Study and Evaluation Scheme.

1.9 Paper setters:
1.12.1 The paper setters and the external examiners shall be appointed by the University from a panel of experts in the concerned areas.
1.12.2 Special care may be taken by the paper setter to formulate questions without any ambiguity and ensure that the question paper is not too lengthy to answer within the time allocated.

A2. Viva Voce Examinations - External Assessment
2.1 For all the subjects having no Theory or Practical Examination, external Viva Voce Examination of 50 marks shall be held where external experts shall act as examiners.
2.2 The external examiners shall be appointed by the University from a panel of experts in the concerned areas to be forwarded by the Head of the Department.

A3 Examination Pattern: Internal Assessment
3.1 Each and every subject shall be internally assessed out of 50 marks by the concerned teachers teaching the subjects except in a few cases where Class Tests are not required. The breakup of marks for internal assessment is given below:
   a) Class Test: Marks allocated = 15
   b) Progressive Evaluation = 25
   c) Attendance = 10
3.2 For the subjects where Class Tests are not required such as Design Presentation, Construction Practice, Surveying and Levelling, and Computer application in Architecture, breakup of marks for internal assessment is given below:
   a) Progressive Evaluation = 20
   b) Attendance = 10
   c) Internal Viva Voce = 20
3.3 Internal evaluation shall be participatory in nature as far as possible where each student shall display works and explain it to the whole class, class-teachers and other teachers who may like to attend it.
3.4 In case of more than one teacher in a class, all students are to be evaluated by all the design teachers through an open internal jury. Students may be equally distributed among them and it may be rotated among them in the succeeding design projects.
3.5 At the end of the day's works in the studio, the teachers shall cursorily assess and record their evaluation on the works of each student with signature and advise the students to present the sheets in a portfolio during Viva Voce examination.
B. Suggested teaching methodologies

B1 History of Architecture
1.1 Lectures may be conducted with the visual aids, charts, maps etc. It may be made participatory in nature by involving students in literature scanning and presentations by them on various topics.
1.2 Students may be encouraged to make written assignments and seminar presentations on architectural characteristics that identify the building types and the intentions of the period in responses to context and time.
1.3 Students may be encouraged to make free-hand sketches of important buildings to get familiarized with the architectural character that identifies them with a period.

B2 Architectural Geometry and Drawing
2.1 Students may be encouraged to work in the studio in order to understand whether they have grasped the lessons. Their drawing sheets may be displayed and appraised for all other students to listen and comprehend the rights and wrongs done in a sheet.
2.2 Efforts may be made to make teaching and learning a participatory process.
2.3 Quality of drafting and lettering may be emphasized.

B3. Architectural Design:
3.1 The teachers of Architectural Design may guide and encourage the students in the areas detailed below:
3.1.1 Visit Library to study/understand the basic functions of building, codes, byelaws, norms, standards, anthropometric aspects etc.
3.1.2 Refer NBC, Time Savers Standard, Graphic Standards etc.
3.1.3 Search relevant Web sites to access latest information on the concerned subjects.
3.1.4 Integrate knowledge of anthropometrics and standards.
3.2 They may organize prototype case-studies and field surveys in groups of 3 to 5 students for better understanding of the subject and strengthening of visual perception of the students.
3.3 They may deliver lectures via presentations and arrange field visit on similar design problems.
3.4 The teachers may plan annual major and minor educational tours to various parts of the country in advance to study / conduct measured drawings in groups of a historical or modern building - their styles, forms, materials, technology and other ramifications. They may ensure contribution of each student in such group works for proper assessment.
3.5 They may make arrangements to preserve good architectural models in the Architecture museum with proper entry records for posterity and as a testimony of good works done in the College.
3.6 They may teach the students techniques of Model making, Pasting, Cutting, soldering as a part of the Design Presentation class.
3.7 They may give emphasis to methodological approach to design viz. a) Site analysis, b) Data collection and analysis, c) possible impact of climatic conditions and socio-economic factors on building, d) formulation of user requirements, e) philosophy-based concept development, f) final design (Plans, elevations, Sections, views, 3-Dimensional physical model, perspectives etc), and g) model making.
3.8 They may ensure that all final submissions of Plan, Elevation, Sections and at least one full perspective drawing in Architectural Designs for all the Semesters are made manually except for the final submission of the Thesis in the 5th Year. They may not restrict in using digital drawings for any additional perspective drawings for any Semester.

3.9 Students may be sensitize to the requirements of the physically challenged in a building or space.

3.10 Learning design may be made a participatory process by organizing presentations of works of the students before fellow students and other teachers and invitees.

**B4 Design Presentations**

4.1 The students may be taught how to make models and render their works done in the Architectural Design class. They may be exposed to good live works. Seminars etc. on design may be organized in this class.

**B5 Architectural Structures**

5.1 Special care may be to ensure that the students grasp the fundamentals of structure so that they may apply it in their architectural Design

**B6. Building Materials & Construction**

6.1 Course should be covered through lectures, digital presentations, literature survey, market survey, presentations etc.

6.2 At the end of each studio class, the works done by the students may be assessed and recorded on the drawing sheet.

6.3 Site visits as related to the assignments may be organized under relevant units of the course. Such visits may be clubbed with Construction Practice class.

6.4 Emphasis should be on construction details as applicable to Indian conditions.

6.5 Market surveys and sampling may be conducted to acquaint students with prevalent construction technology & materials.

6.6 Literature and catalogue surveys may be conducted to acquaint students with the latest materials. technology

**B7 Construction Practice**

7.1 Refer subject syllabus.

**B8 Building Services**

8.1 The teachers may plan in advance to invite experts from the field for greater exposure of the subjects.

8.2 Exercises on preparation of services layout for buildings may be assigned to the students.

8.3 Exercises on the BS may be suitably integrated with the Projects done in the Architectural Design Class.

8.4 One design project done in AD class may be got analyzed and evaluated according to the lessons of BS.

**B9 Art and Craft**

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8.1 The subject shall be taught by hands-on demonstration by the teacher; audiovisual presentations may be an added advantage.
8.2 Studio exercises shall be in the form of drawings, sketching, collages and models.
8.3 The teachers may invariably demonstrate the techniques to handle various mediums and equipments to the students and ask them to do the exercises in the studio to develop their skills in art and graphics.
8.1 There is no theory examination for this subject. There will be a Viva examination where one or two external expert artists shall examine the port folio of the works done by the students throughout the Semester. The experts may ask the students to demonstrate their skills on the spot, if necessary.

B10 Other Subjects
10.1 Emphasis may be given in making teaching and learning a participatory process by involving students in discussions and presentations of their works or on a topic from the syllabus.
10.2 Innovative techniques in teaching will help in getting better results.

C. Suggested References.

C1 History of Architecture
i) Burns, E. M., Ralph, P.L., Learner, R. E. & Meacham, S., World Civilizations-Their History and their culture
ii) Fletcher, Banister Sir, History of Architecture
iii) Sanjeev & Garg, Rajeev, Ancient Indian Architecture (From Blossom to Boom)

C2 Architectural Geometry and Drawing
i) Bhatt, N. D., Engineering Drawing
ii) Ching, Francis D. K, Design Drawing
iii) Ching, Francis D. K., Architectural Graphics
iv) Gill, Robert W., Rendering with Pen & Ink
v) Reekie, Fraser Reekie’s Architectural Drawing

C3 Architectural Design:
   ii) Ching, Francis D.K., Architecture Form, Space and Order
   iii) Gideon, Space Time and Architecture
   iv) Pierre, Von Meiss, Elements of Architecture from Form to place
   v) Pramar, V.S., Design Fundamentals in Architecture
   vi) E&OE Architects Hand Book and Planning
   vii) Scott, Van Dyke, Form, Line to Design
   viii) Norberg-Schulz, C., “Principles of Modern Architecture”
   ix) E&OE Architects Hand Book and Planning

C4 Design Presentation


C5 Architectural structures


iv) Senol Utku, “Elementary Structural Analysis”.

v) Rama Armarutham S., “Strength of Materials”.

vi) Duggal S. K., -Limit State Design of Steel Structure (TMH).

vii) Punmia B.C.- Theory of Steel Structure.

viii) K S Sai Ram-Design of Steel Structures - Pearson Education, India


ii) Duggal, S. K., Building Materials

iii) Ghosh, D. N., Materials of Construction


v) Rangwala, S. C., Building Construction


vii) Mitchell, Building Construction (Elementary and Advanced)

viii) Bindra & Arora, Building Construction


xiii) National Building Code of India (Latest Edition), Bureau of Indian Standards

xiv) Deshpande, Engineering Materials-

xv) Roy Chowdary, Engineering Material-

C7 Construction Practice

Refer C6 above..

C8 Other Group Subjects

8.1 Art and Craft


iii) Asher, F. M., Art in India
iv) Cleaver, D. G., Art an Introduction
v) Gill, R.W., Rendering with Pen & Ink
vi) Mumford, L., Art & Techniques
vii) Rawat, B. S., Mural Art in Architecture
viii) Visual Design in Islamic Architecture

8.2 Spoken English
Refer Subject syllabus.

8.3 Building Services
Refer Subject syllabus.

C9 Standalone Subjects
Refer individual Subject syllabus.
REFORMED SYLLABUS OF 2016- Study & Evaluation Scheme

Abbreviations: L-Lecture, T-Tutorial, SP -Studio/Practical, CT-Class Test, PE - Progressive Evaluation, Att-Attendance, V-Viva voci, Th - Theory, Ext - External

There will be a compulsory minor educational tour of 2 to 3 days as part of an Architectural Design problem in the odd Semester every year except in the 7th Semester when a compulsory major Educational Tour of 7 to 10 days shall be organized as a part of Architectural design.

Total Credit = 33x8 +20+30 = 314

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# It includes NSS, Yoga, Sports, hobbies, competitions etc.
# Study & Evaluation Scheme - Semester V

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# It includes NSS, Yoga, Sports, hobbies, competitions etc.

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# Study & Evaluation Scheme - Semester VI

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Abbreviations: L-Lecture, T-Tutorial, SP - Studio/Practical, CT-Class Test, PE - Progressive Evaluation, Att-Attendance, V-Viva Voce, Th/Thesis Presentation, Tota/Total
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There will be a compulsory major educational tour of 7 to 10 days as part of an Architectural Design problem in this Semester.
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**Study & Evaluation Scheme - Semester IX**

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Course Code: ARC – 101
Duration of Exam: 3 hrs
Contact periods/week: 3
Credit: 3
Internal Assessment: 50
External Assessment: 50
Objectives:
Understanding the architecture and human settlements of the earliest civilizations in the context of location, climate, socio-cultural, historical, economical and political developments of the time; study of the building ‘types’ and the development of architectural form and character and technology.

Course Contents

Unit I – Introduction 12 Periods / 4 weeks
Appearance of man - migration to continents; origin of Architecture and human settlements in the early periods of civilization e.g. Catal Huyuk, Jericho; tomb architecture and artifacts - megaliths, dolmens etc. e.g. Stone henge etc.;

Unit II - Ancient Egyptian Architecture 9 Periods / 3 weeks
Early tomb architecture (Mastabas) and later temple architecture e.g. Great pyramids of Cheops, temples of Khons, Amun etc.

Unit III - West Asiatic Architecture 9 Periods / 3 weeks
Mesopotamian Civilization, development of architecture in different periods – Sumerian, Babylonyan, Assyrian, Persian. Ziggurat, palaces with the examples of Ziggurat at Ur, Palace of Nimruds, Palace of Persepolis etc.

Unit IV - Indus Valley Civilization 9 Periods / 3 weeks
Town planning and buildings of Mohen-jo-daro and Harappa viz. great bath, granary, drainage and water management system.

Unit V - Ancient Crete and Mycene 9 Periods / 3 weeks
Art, culture and architecture of Crete and Mycenae (which formed the basis of later Greek civilization).

Suggested Books:
1. Burns, E. M., Ralph, P.L., Learner, R. E. & Meacham, S., World Civilizations-Their History and their culture
2. Fletcher, Banister Sir, History of Architecture
3. Maheshwari, Sanjeev & Garg, Rajeev, Ancient Indian Architecture (From Blossom to Boom)

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- I
ARCHITECTURAL GEOMETRY & DRAWING- I

Course Code: ARC 102
Contact periods/week: 6
Credit: 4
Duration of Exam: 3Hrs
Internal Assessment: 50
External Assessment: 50

Objectives:
To develop the requisite level of proficiency in drawing, as a primary communication tool in architecture; to familiarize drafting tools and accessories; to learn drafting, lettering and rendering techniques; to comprehend and visualize geometrical shapes and forms.

Contents:

Unit I - Lines, Lettering and Dimensioning  18 Periods / 3 weeks
Drawing instruments and their uses, Types of lines, Lettering, Dimensioning, Unit of Dimensioning. Exercises: 1. lettering in different fonts; 2. Placing of Dimensions.

Unit II - Basic geometrical construction  18 Periods / 3 weeks
Exercises: 1. Dividing and bisecting methods for line, arc, angle etc; 2. Drafting methods for parallel and perpendicular lines; 3. Drafting of regular polygons; 4. Inscribing & circumscribing circles in polygon.etc. 5. Concentric circles.

Unit III - Scales  12 Periods / 2 weeks

Unit IV - Orthographic projections-I  24 Periods / 4 weeks
Definition, meaning & basic concept, Planes of projection, Four Quadrants, First angle projection & third angle projection. Exercises: 1. Point & Line: contained by one or both planes or at a distance from both planes. 2. Line: parallel to one or both planes, perpendicular / inclined to one plane and parallel to other, inclined to both planes, 3. Planes: perpendicular to both planes, perpendicular to one plane and parallel to other, perpendicular to one plane and inclined to other plane and inclined to both planes. Calculation of true length.

Unit V - Orthographic projections-II  24 Periods / 4 weeks
Drawing of Solids. Exercises: Projections of regular rectilinear & circular solids (Prism, Pyramid, Cone, Cylinder etc) in different Position viz. 1. Axis perpendicular to H.P.; 2. Axis perpendicular to V.P.; 3. Axis parallel to both H.P. & V.P.; 4. Axis inclined to V.P. and parallel to H.P.; 5. Axis inclined to H.P. and parallel to V.P.; 6. Axis inclined to both H.P. and V.P.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - I
ARCHITECTURAL DESIGN – I

Course Code: ARC 103
Contact periods/week: 6
Credit: 5
Duration of Exam: 6 Hrs
Internal Assessment: 50
External Assessment: 50

Objective: Learning grammar of design aesthetics & acquiring basic skills to express it; acquainting with the basic design principles of visual perception and aesthetics; understanding line, space, shape, form, colour, value, texture, scale, and proportion; learning compositions in colour; learning form and shape availing inherent qualities of various local materials. (Accent on: ‘space and form’ and formal transformations).

Contents:
Unit I - Introduction to Architecture & Warming up
Architecture as a profession; services provided by the Architects; architecture compared to visual art, craft, science and technology; relevance of points and lines; how patterns are formed by lines - op art, involutes etc.
Suggested Exercises: 1. Gaming with blocks and Jigsaw puzzle units; 2. Draw points and lines of different types; 3. Draw lines to create patterns. (suggestion: use half imperial and Imperial sheets with 6B pencils)

Unit II - Aesthetics and visual perception
Concepts of aesthetics; its subjective and objective aspects; difference in perception of aesthetics due to social, regional and temporal variations; basic principles of visual perception; symmetry & asymmetry; colour, value and texture; focus and balance in compositions; form and its visual properties; visual qualities of geometrical forms; additive and subtractive forms. Suggested Exercises: 1. Organize geometrical shapes to obtain symmetrical and asymmetrical patterns; 2. Compose various types of geometrical shapes; 3. Compose shapes using texture, colour and value..

Unit III - Scale and Proportion
Proportion in architecture; visual proportion; order, golden section and modular. Scale in architecture; human scale and generic scale; examples of proportion and scale from History of Architecture. Suggested Exercises: 1. Draw free hand lines in proportion of 1:1, 1:1.5, 1:2 etc. 2. Draw different geometrical shapes in different proportions; 3. Draw abstract human figure showing proportion of head, torso etc with reference to whole body; 4. Draw golden sections in different sizes; 5. Measure a familiar space viz. self Bed Room and draw plan showing all furniture etc. and rearrange them.

Unit IV - Ordering and colouring
Principles of order in architecture; Principles of colouring and its application. Suggested Exercises: 1. Develop geometrical patterns by division, subtraction, addition or overlapping and express them in colours; 2. Organize different geometric shapes in bigger and larger shapes; 3. develop geometric patterns by repetition of geometric forms/ shapes and colour and express in a design or pattern.

Unit V - Form, Mass, Space and Surface
Concept of form and space; relationship between man and space; defining space and degree of enclosure; organization of spaces in two and three dimensions; enclosure and internal/external spaces; solid and void, fenestration and articulation of form. Suggested Exercises: 1. Additive models with
similar and dissimilar forms using different materials; 2. Subtractive model out of a geometric form; 3. Model structures using paper, match sticks, reeds, bamboo sticks etc. to understand inherent qualities of form. 4. Posters with a theme; 5. Collage with a theme.

Suggested Books:
2. Space Time and Architecture/ Gideon
3. Elements of Architecture from Form to place/ Von Meiss Pierre
5. V.S. Pramar, Design Fundamentals in Architecture
6. Francis D.K. Ching, Architecture Form, Space and Order.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester I
DESIGN PRESENTATION

Course Code: ARC - 104  
Duration of Exam: Nil
Contact periods/week: 3  
Internal Assessment: 50
Credit: 3  
External Assessment (Viva): 50

Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models  
Teachers may assign time as necessary
Unit II – Rendering of designs  
Teachers may assign time as necessary
Unit III – Preparation of Competition Designs  
Teachers may assign time as necessary
Unit IV – Study of Buildings  
Teachers may assign time as necessary
Unit V – Preparation of Design Port folio  
Teachers may assign time as necessary

Note: I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: To understand concepts of force, equilibrium, moment of inertia etc. and properties of solids.

Course Contents

Unit I – Elements of Statistics
12 Periods / 3 weeks
Force: Concepts of force and force systems; Resultant of force systems; Determination of Resultant of coplanar, concurrent force system; Resolution and composition of forces; Resultant of coplanar and non-concurrent force. Equilibrium: Concepts of equilibrium; Equations of equilibrium for coplanar force system; Types of loads and supports ,free body diagrams; Reactions; Moments of a force; Moment and arm of a couple

Unit II – Properties of Section
9 Periods / 3 weeks
Centroid: Centre of gravity and centroid; Centroid of plain areas; centroid of Composite areas; some cases of centroid of common areas.
Moment of Inertia: Parallel axis theorem; Polar moment of inertia; Moment of inertia of composite section; Moment of inertia of simple common sections; Radius of gyration; Perpendicular axes theorem

Unit III – Plane Trusses
9 Periods / 3 weeks
Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilever trusses by method of joints.

Unit IV – Elastic Properties of Solids
9 Periods / 3 weeks
Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and Volumetric stresses and strains. (Excluding composite bar)

Unit V – Elastic Constants
9 Periods / 3 weeks
Elastic constants - Relation between elastic constants - Application to problems

Reference Books
4. Senol Utku, “Elementary Structural Analysis”.

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Note I. Latest editions of the suggested books and relevant websites are recommended

Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: To introduce the students to building materials, their properties and application in building construction, along with the construction of some basic components of a building.

Contents

Unit I - Soil, Clay & Lime 12 Periods/ 3 Weeks
Soil: Contents and characteristics; types of soil like clayey, black cotton, red soil, deltaic etc., and there properties. Clay: Mud including stabilized earth, burnt bricks, tiles, terracotta, brick ballast, surkhi etc; their manufacturing and uses. Lime: Classification, Characteristics, use in construction industry.

Unit II - Brick Masonry 20 Periods/ 5 Weeks
Terminology; bonding and types of bonds viz. English, Flemish, Rat Trap and other bonds; quoins - right angled and angular quoins; wall junctions for various thicknesses; brick piers, Coping, Corbelling, String courses and decorative brickwork.

Unit III – Stone and Stone Work 12 Periods/ 3 Weeks
Stone: Types, uses & characteristics of stone; stone ballast and its characteristics and uses; Stone masonry - random rubble, coursed rubble and ashlars, dressing of stones.

Unit IV - Cement, Mortars and Concrete 12 Periods/ 3 Weeks

Unit V - Elements of Building 12 Periods/ 3 Weeks

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Hand-on practice in the construction yard on the subjects taught in the theory class of Building Materials and Construction; undertaking visits to construction site.

Course Contents

Unit I – Soil, Clay & Lime Products
Actual acquaintance with different types of soil, stabilized mud bricks, burnt bricks, tiles, terracotta etc; identifying various features of bricks at site.

Unit II – Brick bonding
Making of English, Flemish and Rat Trap bonds at the Construction Yard of the Department.

Unit III – Stone and Stone Work
Introducing types of stones, ballasts etc; making of stone masonry (set dry) at the construction yard or any actual site.

Unit IV – Cement, Mortars and Concrete
Mixing of mortars in construction yard; demonstration of ingredients and mixing of concrete at the Construction Yard of the Department or at any construction site.

Unit V – Elements of a Building
Introducing elements of a building at any site and explain their variants / types.

Note I. The timings of this class may be suitably clubbed with the Building Materials and Construction class for organizing market and site visits effectively.

Note II. The teacher may arrange market surveys and site visits to help students experience the actual materials, elements and techniques taught under the theory subject.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Evaluation System and Examination Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- I
ART AND CRAFT - I

Course Code: ARC 108
Contact periods/week: 5
Credit: 3
Duration of Exam: Nil
Internal Assessment: 50
External Assessment (Viva): 50

Objectives: To impart knowledge in principles and techniques of drawing in pencil, ink and colour; to acquire sketching, painting and rendering skill through study of still life, nature etc; to acquire sensitivity to art and to its appreciation; to understand relevance of art in architecture; to develop skill in craft work to innovate three dimensional artifacts by using common and waste materials.

Course Content

Unit I – Tools and techniques of drawing 20 Hrs / 4 Weeks
Psychological, emotional and functional aspects of creativity, arts and aesthetics; Familiarization with drawing tools and accessories, learning techniques of sketching by pencil, ink and colour; to study of shade, shadow, texture, tones etc.; different rendering techniques by dry brush, airbrush, spray brush, line-stroke, etc.; rendering in different mediums viz. oil pastels, pastels, water colours, poster colours, charcoal, pencil colors etc. Suggested exercises: Draw freehand lines and curves; join points; practice brush strokes.

Unit II – Drawing still life and natural elements 20 Hrs / 4 Weeks
Drawing and rendering of still life and natural elements such as, trees, plants, creepers, rockery, water bodies, pathways, sky and reflection in water; learning techniques of rendering elements in different planes. Suggested exercises: Draw steel life freehand sketches; draw from nature.

Unit III - Sketching human figures and activities 10 Hrs / 2 Weeks
Sketching human figures in various forms and postures; sketching scenes of human activities from memory and observation; sketching buildings with human activities. Suggested exercises: Draw human figures in different postures; sketch a scene with building and activities.

Unit IV - Creativity through crafts 15 Hrs / 3 Weeks
Craft as an expression of innovation from observation of nature and human activities; tools and techniques of crafts. Suggested exercises: Make objects using match sticks, papers, mud, wires, reeds, mat, metal etc.

Unit V – Creation of objects through craft 15 Hrs / 3 Weeks
Crafting of forms and features using local materials and waste materials like twigs, cloth, mat, reeds, metal pieces, tapes, card boards, wood etc. Suggested exercises: Make objects using common and waste materials.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – I
SPOKEN ENGLISH – I

Course Code: ARC – 109
Contact periods/Week: 3
Credit: 3

Duration of Exam: 3 hrs
Internal assessment: 50

Objectives: To make the students aware about correct construction of sentences and teaching them professional ethics as well as bringing positive changes in their behavior.

Course Contents

Unit I - English Communication and Functional Grammar
Meaning, definition and process of communication; barriers to communication; parts of speech; tenses and modals; concord. Types of sentences: affirmative, negative, interrogative, imperative & exclamatory.

Unit II - Vocabulary Building
Abbreviations and technical terms; word formation and homophones and their uses. Suggested Exercises: Use of vocabulary in sentences; involving students in scrabble.

Unit III - Mechanics of Writing
Tips for writing a good paragraph; composition on narrative, descriptive and factual topics; art of condensation; Suggested Exercises: Writing paragraph on given factual topic; writing Summary.

Unit IV - Behavioral Skills, Ethics and Etiquettes
Elements of professional behavior and expectations; ethical dilemma and decision making; Suggested Exercises: Creating pseudo situations and observing reactions; analysis of results.

Unit V – Team Building and leadership
Team building and leadership; qualities of a good leader; motivation and positive Attitude; SWOT analysis.
Suggested Exercises: Discussing real life scenarios and problems faced by group leaders and members; self analysis (SWOT).

Reference Books:
1. Remedial English Language by Malti Agarwal, Krishna Prakashan Media (P) Ltd., Meerut.
2. English Grammar, Composition & Usage by J.C. Nesfield, Macmillan Publishers
3. Communication Skills by Sanjay Kumar & Pushp Lata, Oxford University Press
5. The Functional Aspects of Communication Skills – Dr. P. Prasad
8. Organizational Behaviour by Luthans Fred – Tata Mcgraw Hill
9. Engineering Ethics by Govindarajan, Prentice hall (India), New Delhi

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – II
HISTORY OF ARCHITECTURE – II

Course Code: ARC 201
Contact periods/week: 3
Credit: 3

Duration of Exam: 3 hrs
Internal Assessment: 50
External Assessment: 50

Objectives: Understanding the architecture of classical, Early Christian, Byzantine, Romanesque and Gothic periods in terms of its location, climate, socio-cultural, historical, economic and political influences of the time; study of the building types and the development of architectural form and character based on the prevailing materials and technology; understanding styles and orders taking shape in the respective periods.

Course Contents

Unit I – Classic Greek Architecture  
Classical Orders and constituent elements of Architecture; Geometry of buildings based on different principles; Exercises: study of Acropolis, Agora, Temple, houses etc.

Unit II - Classic Roman Architecture  
9 periods / 3 weeks
Multiple building types like Theatres, Amphitheatres, Triumphal Arches, palaces, houses corresponding to complex social functions and structure; concrete as construction material for walls, vaults and domes; Exercises: study of Basilicas, Pantheon etc.

Unit III – Early Christian Architecture  
9 periods / 3 weeks
Evolution of church architecture from Roman basilica; concept of centralized and longitudinal church; articulation of interiors to create spiritualized spaces. Exercises: study of Basilica St. Peter’s, Rome.

Unit IV – Byzantine Architecture  
12 periods / 4 weeks
Centralization in Byzantine churches; indistinct exteriors of churches and the domed ‘heavenly’ interior; construction of dome over polygonal compartments using pendentives; Exercises: study of church of Sancta Sophia; Romanesque Architecture: Massiveness and verticality of medieval churches. Combination of the towered structures and longitudinal basilica; integration of centralized and longitudinal plans; Exercise: Study of Cathedral and tower of Pisa, Italy.

Unit V - Gothic Architecture  
9 periods / 3 weeks
Integration of centralized and longitudinal plans. spatial and formal integration of Romanesque churches; integration of wall and vault; ribbed vault, flying buttress and dissolution of external wall; sensitivity to light and use of stained glass for mysterious interior. Exercises: Study Church of Notre Dame in Paris.

Suggested Books:
1. Burns, E. M., Ralph, P.L., Learner, R. E. & Meacham, S., World Civilizations-Their History and their Culture
2. Fletcher, Banister Sir, History of Architecture

Note I. Latest editions of the suggested books and relevant websites are recommended

Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- II
ARCHITECTURAL GEOMETRY & DRAWING- II

Course Code: ARC-202  
Duration of Exam: 3Hrs
Contact periods/week: 5  
Internal Assessment: 50
Credit: 4  
External Assessment: 50

Objectives:
To familiarize the student with theoretical, practical and pictorial aspects of architectural drawing; to comprehend and visualize geometrical forms; to introduce the students to graphic treatment of two dimensional drawings; to develop perception and presentation of simple architectural forms/buildings.

Contents:

Unit I - Section of Solids  
weeks
Section planes, sections, true shape of a section. Exercises: Section of solids (prisms, pyramids, cylinders, cones) in varying conditions of sectional plane.

Unit II - Development of Surfaces  
15 Hrs / 3 weeks
Methods of surface development. Exercises: Development of lateral surfaces of right solids like cubes, prisms, cylinders, pyramids, cone. Preparing model through developed surface.

Unit III - Intersection of Surfaces  
20 Hrs / 4 weeks
Line of intersection, Interpenetration of solids. Exercise: Intersection of two prisms, Intersection of cylinder and cylinder, Intersection of cylinder and prism etc in various positions.

Unit IV - Metric Drawings  
15 Hrs / 3 weeks
Types, uses and advantages. Isometric, axonometric and pictorial view. Metric Drawing and projection and their dimensioning.  
Exercise: Metric of plane figures composed of straight lines. Metric of circles. Metric of simple and complex blocks. Isometric & axonometric view of simple building.

Unit V – Measure Drawing  
10 Hrs / 2 weeks
Learning how to measure and draw accurately an object in a given scale. Exercise: Measuring simple furniture, then drawing in appropriate scale its plan, elevation and a view.

Suggested Books:
1. Bhatt, N. D., Engineering Drawing
2. Ching, Francis D. K, Design Drawing
4. Gill, Robert W., Rendering with Pen & Ink
5. Reekie, Fraser Reekie’s Architectural Drawing

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester II
ARCHITECTURAL DESIGN – II


Course Code: ARC 203
Contact periods / week: 6
Credit: 5
Duration of Exam: 6 Hrs
Internal Assessment: 50
External assessment: 50

Objectives: to develop graphic skills and presentation techniques viz. sketching, rendering, modeling etc.; understanding elements of design arising from functions in nature and man-made realms; studying human activities in space; developing ability to translate abstract principles into architectural solutions; to stimulate creative thinking.

Course Contents
Unit I - Warm up session: Form and Function 30 periods / 5 weeks
Relationship between form and function in nature and built environment; functions leading to forms in nature and man-made artifacts; human activities in space; elements organizing human activities and defining spaces; natural and man-made objects evolving from needs. Suggested Exercises: 1. Time problem - Depict relationship between function and form in nature and in day to day artifacts; 2. Study and analysis of a few utility artifacts; 3. Design of an utility object like clothe rack, book rack, table cabinet, lamp shade, kitchen shelf etc.

Unit II - Anthropometrics & circulation 18 periods / 3 weeks
Anthropometrics w.r.t. gender and age; standards and their application; circulation pattern and space taken by circulation routes within defined spaces like rooms, between rooms etc.; different types of circulation pattern and path-space relationship. Suggested Exercises: 1. Exercise on application of anthropometric information; 2. Draw circulation pattern of a small room and group of rooms; 3. Draw relationship between functional spaces in one's own house or any small house and analyze activity spaces, circulation pattern, location of furniture and equipments reestablishing an improved relationship.

Unit III - Impact of Climate and site on the form 12 periods / 2 weeks
Impact of Climate and site on the form: Basic principles of climatic comfort influencing built form; specific site conditions and surroundings influencing the built form. Suggested Exercises: 1. Study examples of built forms evolved in various climatic regions dictated by site and surroundings.

Unit IV - Introduction to building Materials, technology and Structure 18 periods / 3 weeks
Elements contributing to architectural form and character: Relationship between materials, technology and structure in the evolution of built form and aesthetics. Suggested Exercises: 1. Study of form of a mud cottage or a small building made of local indigenous materials; 2. study of form of a overhead water tank or any utility building; analyze how material, structure, colour and other features characterized it.

Unit V - Introduction to Culture, Style, time and location 18 hours / 3 weeks
Relationship of space with faith, values, aspirations, personal needs and territoriality of the user; influence of current trends and styles on built form; how taste of users for built form varies with time and location viz. rural, urban etc. Suggested Exercises: 1. Study of own house identifying special built elements related to faith, occupation etc. 2. Design a community hall or a similar community activity space.

Suggested References:
2. Space Time and Architecture/ Gideon
3. Elements of Architecture from Form to place/ Von Meiss Pierre
5. V.S.Pramar, Design Fundamentals in Architecture
7. Gill, R.W., Rendering with Pen & Ink

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models
Teachers may assign time as necessary

Unit II – Rendering of designs
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs
Teachers may assign time as necessary

Unit IV – Study of Buildings
Teachers may assign time as necessary

Unit V – Preparation of Design Port folio
Teachers may assign time as necessary

Note: I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester II
ARCHITECTURAL STRUCTURES II

Course Code: ARC 205
Duration of Exam: 3 hrs
Contact periods / week: 3
Internal Assessment: 50
Credit: 3
External assessment: 50

Objectives: To understand concept of shear force, bending moment, stresses, deflection and torsion in structure.

Course Contents

Unit I – Shear Force and Bending Moment 9 Periods / 3 weeks
Basic concepts – shear force and bending moment diagrams for cantilever and simply supported beams subjected to various types of loadings (Point loads, uniformly distributed loads) – over hanging simply supported beams – Point of contra flexure

Unit II – Stresses in Beams 9 Periods / 3 weeks
Theory of simple bending – Bending stress distribution – Assumptions in theory of bending, Section modulus– Beams of composite sections (flitched beams) – Shearing stress distribution in beam sections

Unit III – Deflection of Beams 9 Periods / 3 weeks
Slope and deflection at a point–Double Integration method and Macaulay’s method for simply Supported and cantilever beams

Unit IV – Columns and Struts 9 Periods / 3 weeks
Short and long columns –Euler’s theory – Assumptions and Load carrying capacity of Columns with different end conditions – Concept of Effective length – Slenderness ratio, Limitations of Euler’s theory

Unit V – Torsion of Shafts 9 Periods / 3 weeks
Introduction; Torsion of Circular Bars or Shafts; Assumptions; Polar modulus, power transmitted by circular shaft (simple cases)

Reference Books

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: To acquaint the students to building materials such as Timber, Bamboo, Damp proofing materials .To familiarize the students with construction techniques for making arches, wooden joints & doors & construction techniques for use of Timber in building works.

Contents

Unit I – Timber and Bamboo
Timber: Classification, characteristics, defects and preservation. Indigenous local materials: Bamboo and thatch; use of bamboo for building components; Composites: manmade and natural fibre based composites.

Unit II – Surface finishing & D.P.C.

Unit III - Arches
Terminology and definition; types of arches; elementary principles of arch construction; construction of brick and stone arches, piers, buttress, flying buttress.

Unit IV - Woodwork
Types of joints used in timber construction / carpentry. Types of Doors - ledged, braced & batten door.

Unit V - Temporary Timber Construction
Timbering of shallow trenches; shoring: raking, flying and needle; temporary construction; centring for arches; shuttering, scaffolding, underpinning.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Experiencing materials and fabrication of elements and making of brick arches etc.

Course Contents

Unit I – Timber and Bamboo 15 Periods / 3 weeks
Visit timber factories and, markets of bamboo product and other local materials.

Unit II – Surface finishing & D.P.C. 15 Periods / 3 weeks
Visit sites to see D.P.C., plastering, jointing etc. and demonstrate some of them at the Construction Yard.

Unit III – Arches 15 Periods / 3 weeks
Make and practice arches at the Construction Yard of the Department.

Unit IV – Woodwork 15 Periods / 3 weeks
Visit door factories / shops / construction at sites fabricating doors; demonstrate timber joineries.

Unit V - Temporary Timber Construction 15 Periods / 3 weeks
Visit sites to demonstrate topics taught in the theory classes under this Unit.

Note I. The timings of this class may be suitably clubbed with the Building Materials and Construction class for organizing market and site visits effectively.

Note II. The teacher may arrange market surveys and site visits to help students experience the actual materials, elements and techniques taught under the theory subject.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Introduction to Arts and appreciation of art and its philosophies; Familiarization with principles and theories of graphics and architectural composition; development of Art and Graphic skills.

Course Contents

Unit I - Free hand drawing  
15 Periods / 3 weeks  
Free hand drawing of still life with pencil; shades and shadows; drawing nature, people, furniture etc.; transport from imagination, observation and recapitulation. Suggested exercises: As decided by the teacher.

Unit II - Rendering techniques  
15 Periods / 3 weeks  
Rendering techniques for textures of materials and finishes; use of brushes and equipments like transfers, airbrush etc.; rendering of architectural drawings. Suggested exercises: As decided by the teacher.

Unit III – Rendering with Colour  
15 Periods / 3 weeks  
Colour rendering of nature, buildings, people and life. Suggested exercises: As decided by the teacher.

Unit IV - Philosophy of Art and great art works  
20 Periods / 4 weeks  
Introduction to great Masters and Modern, Art Movements like dynamism and systemization, realism impressionism, cubism expressionism, surrealism etc.; introduction to works of great masters like Leonardo Da Vinci, Michael Angelo, Raudin, Manet, Ranoir, Gauguin, Van Gogh, Matisse, Picasso, Henry Moore, Paul Klee, Dali etc. Suggested exercises: Study of the works of the stated great artists.

Unit V – Craft work  
15 Periods / 3 weeks  
Innovation of forms using metal, wood, bamboo, straw, mud, wire, reeds, mat and other materials including left-over and waste materials. Suggested exercises: As decided by the teacher.

Reference Books
2. Asher, F. M., Art in India
3. Cleaver, D. G., Art an Introduction
4. Gill, R.W., Rendering with Pen & Ink
5. Mumford, L., Art & Techniques

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The teacher shall set class exercises for students to produce Drawing Plates.
Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B, Suggested methodologies to teach and C. Suggested References.
Note IV. Evaluation System and Examination Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: To enhance the oral as well as written communication skills of the students and to make them professionally well versed.

Course Contents
Unit I - Sentence Construction
3 weeks   Clauses: Noun, adjective, and adverb; conditional sentences; active and passive voice.

Unit II - Comprehension skills
3 weeks   Comprehension of given passages and audio-visual content. Suggested Exercises: Answering the question from given paragraphs or Audio Visual content.

Unit III - Writing Skills
9 periods / 3 weeks   Techniques of writing; writing of reports, formal letters, applications and proposals. Suggested Exercises: Writing an application of leave, a proposal for a short group visit to Delhi to see historical buildings etc.

Unit IV - Presentation Techniques
9 periods / 3 weeks   Audience & locale; importance of audio-visual aids; organizing contents; voice dynamics, and body language. Suggested Exercises: Presentations by the students on topic related to professional classes like Architectural Design, History of Architecture etc. or any topic decided by the teacher.

Unit V – Speech Delivery 12 periods / 4 weeks   Nuance of speech delivery, types of speeches: welcome Speech, vote of thanks, farewell speech, etc. Suggested Exercises: Speech delivery, debates and extempore speech on various topics.

Reference Books:
1. Remedial English Language by Malti Agarwal, Krishna Prakashan Media (P) Ltd., Meerut.
2. English Grammar, Composition & Usage by J.C. Nesfield, Macmillan Publishers
3. The Business letters by Madan Sood, Goodwill Publishing House, New Delhi
5. Living English Structure by W.S. Allen, Pearson Publication, New Delhi
9. Organizational Behaviour by Luthans Fred – Tata Mecgraw Hill
10. Engineering Ethics by Govindarajan, Prentice hall (India), New Delhi.

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – III
HISTORY OF ARCHITECTURE III

Course Code: ARC 301

Duration of Exam: 3Hrs
Contact periods/week: 3
Credit: 3
Internal Assessment: 50
External Assessment: 50

Objectives: Understanding Indian Architecture from the early days of Aryan civilization to understanding architecture of Vedic and Jain and Buddhist periods.

Course Contents

Unit I - The Aryan civilization
Vedic architecture and town planning, its motifs and patterns. Exercises: Vedic house.

Unit II - Jain Architecture:

Unit III – Buddhist Architecture
Buddhism and Buddhist architecture; Viharas and Chaityas; Buddhist rock-cut architecture. Exercises: Study of Sanchi Stupa, Ajanta caves and Ellora caves.

Unit IV - Hindu Architecture-Dravidian
Temple architecture of Dravidian and the contributions of the Pallavas, the Pandyas and Cholas as well as the contributions of the Nayaks to the temple architecture. Exercises: Temples at Madurai, Srirangam and Rameswaram; study of Gopuram and other elements.

Unit V - Hindu Architecture

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Course Code: ARC-302
Contact periods/week: 5
Credit: 4
Duration of Exam: 3Hrs
Internal Assessment: 50
External Assessment: 50

Objectives: To develop greater perception of complex Architectural forms and buildings; to develop skills for presenting Architectural Drawings (like plan, elevation etc.) through pencil & ink; to develop the skill of making perspectives of complex and simple buildings and rendering them in different media.

Course Contents

Unit I - Introduction of Anatomy and perspective
Anatomy of perspective - Station point, Eye level, Cone of Vision, Picture plane, Horizon line, Ground line, Vanishing point; type of perspectives - one point, two points, three points; perspective by approximate method, diagonal method, grid method; shortcut methods in perspective drawing.
Exercise: Free hand sketch using shortcut methods.

Unit II - Perspective Drawing
Learning one and two point perspectives. Exercises: 1. One point perspective of interiors and simple household furniture items. 2. Perspectives of simple and complex blocks; perspectives of simple and medium size buildings isolated or in groups.

Unit III - Sciography

Unit IV - Shades and Shadows
Values in Shades and shadows. Exercises: Constructing shadows of complex structures and buildings in plan and elevation; short-cut methods for constructing shadows; presentation techniques in Sciography.

Unit V - Presentation Techniques
Technique - I: Introduction to representation of different textures and finishes in plan and elevation. Exercises: Representation of furniture, equipments, human figures, etc. in plans, elevations and sections. Techniques- II: Preparing comprehensive presentation drawings. Exercises: Drawings of small buildings showing plans, elevations, site plans etc. using various rendering techniques and medium, incorporating sciography creating three dimensional effects.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – III
ARCHITECTURAL DESIGN III

Semester Objective: Consolidation of grammar of Design and related subjects and its application.

Course Code: ARC 303
Duration of Exam: 12 Hrs
Contact periods/week: 6
Internal Assessment: 50
Credit: 5
External assessment: 50

Objectives: To consolidate grammar of Architecture and presentation skills; To understand relationship of human scale, activities and form; to learn space programming, and site analysis; to apply appropriate graphic presentation techniques and explain design by proper drawings, models, rendering and oral presentation; understanding use of indigenous, conventional and innovative building materials. (Accent on: Space, function, materials, technology and structure).

Contents:
Unit I - Warming up Session: Human scale, activity, space and form 28 periods / 4 weeks
Understanding relationship of human scale, activity, space and form in mono-functional buildings, to take inspiration from History of Architecture in design; understanding conventional materials and technology.

Suggested Exercises: 1. Time problem - Activity and space analysis of a small house or any elementary building as per teacher's choice; 2. Design of a small house of one bed room and living room with kitchen and toilet or a small rural house using local materials and techniques.

Unit II - Conventional approach to evolve forms in design. 42 periods/ 6 weeks.
Application of conventional materials, technology and structure to evolve forms in design. Suggested Exercises: 1. Study and analysis of space, materials, technology, structure and form of an urban health centre/ Nursery school/ or any other interesting small building; 2. Design a medium sized community hall/ health centre/Nursery school/ Fuel Station in an rural/ urban area and evaluate quality of space and form.

Unit III - Design as a function of specific agenda 42 periods/ 6 weeks.
To understand importance of space programming, case studies and site analysis in architectural design and design as a function of specific agenda, site conditions and orientation; to design with conventional or innovative materials and technology influencing form, aesthetics and quality of space. Suggested Exercises: Design a primary school/ fire station/ school hostel/ guest house / Badminton Halls, Exhibition pavilions, evaluating functional and other parameters

Note A. Detail guidelines given in the General Notes at the initial pages may be seen for the matters viz. 1. Examination Pattern, 2. Setting of Question Papers, 3. Internal Assessment, 4. Suggested methodologies to teach and 5. Suggested References.

Note B. Evaluation System and Examination Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester III
DESIGN PRESENTATION - III

Course Code: ARC - 304  
Duration of Exam: Nil
Course Code: ARC - 304  
Internal Assessment: 50  
Contact periods/week: 3  
External Assessment (Viva): 50  
Credit: 3

Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models  
Teachers may assign time as necessary

Unit II – Rendering of designs  
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs  
Teachers may assign time as necessary

Unit IV – Study of Buildings  
Teachers may assign time as necessary

Unit V – Preparation of Design Port folio  
Teachers may assign time as necessary

Note: I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - III
ARCHITECTURAL STRUCTURES - III

Course Code: ARC 305  
Duration of Exam: 3 hrs  
Contact periods / week: 3  
Internal Assessment: 50  
Credit: 3  
External assessment: 50

Objectives: To Understand the analysis of indeterminate structures and their application in structural design and analysis

Unit I – Statistically Indeterminate Beams  
9 Periods / 3 weeks  
Introduction – Determination of degree of statically indeterminacy for beams and frames –  
Concept of Analysis (No Problems)

Unit II – Fixed end beams-  
9 Periods / 3 weeks  
Introduction, Area moment method, Analysis of fixed beam by using Area moment method for UDL, point load,. Slope and deflection at a point by using Area moment method.

Unit III – Continuous Beams-  
9 Periods / 3 weeks  
Introduction, analysis of continuous beam by using Three moment equation for different load conditions and different end conditions.

Unit IV – Strain Energy Methods I  
9 Periods / 3 weeks  
Introduction-strain energy stored due to bending, general principles. First theorem of Castigliano. Virtual work, analysis of structural members by Unit load method .

Unit V- Strain Energy Methods II  
9 Periods / 3 weeks  
Introduction, law of reciprocal theorem, Maxwell’s reciprocal theorem, Betti’s Theorem, applications of theorem on structural members.

Note I.  The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- III  
BUILDING MATERIALS & CONSTRUCTION –III

Course Code: ARC-306  
Duration of exam: 3 Hrs  
Contact periods/week: 5  
Credit: 3  
Internal Assessment 50  
Internal Assessment: 50

Objectives: Acquainting students with the contemporary building materials such as concrete, ceramics and timber & by-products; familiarizing the students with construction techniques of door and Staircase.

Unit I – Lime and Concrete  
15 Periods/ 3 Weeks
General introduction to lime as an indigenous local age old material; introduction to concrete and its use; ingredients of concrete; quality of ingredients; quality check of concrete - mixing, water –cement ratio, properties, slump test; application in construction – transportation, placing and curing.

Unit II – Clay products and Ceramics materials  
10 Periods/ 2 Weeks
Clay Products: Terracotta, faience, fire brick, earthenware etc. Vitreous materials – Porcelain, floor and wall tiles etc.; Glazed products viz. Tiles for wall and floor.

Unit III – By-products of timber  
20 Periods/ 4 Weeks
Plywood - decorative and commercial ply-board, block boards etc; Zero wood products - particle board, wood wool cement board, fibre board (MDF)etc.; other products - insulation board, compressed straw board, Laminates and veneers, architraves.

Unit IV – Simple Timber Doors  
15 Periods/ 3 Weeks
Simple panelled and glazed doors with mouldings, Flush doors, Mosquito-proof shutters and doors with fanlight.

Unit V - Timber doors, windows and partition wall  
20 Periods/4 Weeks
Types and details of doors - sliding door, sliding-folding door and revolving door; windows in timber frames; fixed shutters and mosquito-proof shutters; wooden partition walls.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Practical experience of contemporary building materials such as concrete, ceramics and timber & by-products; familiarizing the students with actual construction techniques of door and Staircase.

Course Contents

Survey of market and building sites to actually experience and feel the materials, elements and techniques taught under the subject Building Materials and Construction III; to prepare drawings for the Building Materials and Construction class and make port folio for the same; survey literature, catalogues etc. to know about the latest materials, elements and techniques in vogue.

Note I. The timings of this class may be suitably clubbed with the Building Materials and Construction class for organizing market and site visits effectively.

Note II. The teacher may arrange market surveys and site visits to help students experience the actual materials, elements and techniques taught under the theory subject.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: To develop an appreciation of Arts & Crafts among the students and skills to design murals, fountains, wall panels, pavements etc. for buildings; to strengthen the skill of rendering...

Course Contents

Unit I – Design and Drawing Architectural Features 12 Periods / 3 weeks
Learning to design, draw and render pavements of various types, tree guards, flower beds, shrubberies etc. Suggested exercises: Design, draw and render the stated elements.

Unit I - Design and Drawing of Murals and Motifs 12 Periods / 3 weeks
Learning to design, draw and render murals and motifs. Suggested exercises: Design, draw and render the stated elements.

Unit III - Design and Drawing of Fountains etc. 12 Periods / 3 weeks
Learning to design, draw and render Fountain and the surrounding elements. Suggested exercises: Design, draw, render and make models of the stated elements.

Unit IV - Design and Drawing Building Elements 12 Periods / 3 weeks
Learning to design, draw and render window grills, and railings in steel and jalis, balustrades etc. in wood and concrete. Suggested exercises: Design, draw, render and make models of the stated elements.

Unit V – Clay Modeling and sculptures 16 Periods / 4 weeks
Design abstract forms and sculptures by clay, plasctine, wood, stone, brass, wires, reeds etc. Suggested exercises: Make abstract sculptures using various materials as stated or any other material.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: Familiarizing the principles and techniques of Surveying and Leveling in Architecture; interpretation and preparation of contour maps; understanding the fundamental concepts and methods of surveying using basic & advanced instruments for surveying and leveling.

Course Contents

Unit I - Introduction
Importance of surveying - types, levels and classification of surveys; plane and geodetic surveying; control points; method of location of points; surveying instruments - functions, use and adjustments, principle of working from whole to part; principles of chain survey - equipment required; selection of station; methods of offsets; obstacles and errors in chaining.

Unit II - Plane Table & Compass Surveying
Equipment and methods of plane tabling; the prismatic compass and its use; whole circle bearing; quadrant bearing; magnetic declination; effects of local attraction; traverse and balancing closing error.

Unit III - Leveling and Contouring
Different types of levels; temporary and permanent adjustment; leveling staff; reduction of levels; errors in leveling; curvature & refraction; reciprocal leveling; profile leveling; cross sectioning; characteristics of contour lines; direct and indirect methods of contouring; interpolation of contours; preparation of maps.

Unit IV - Advanced Instruments/Technology
Introduction to the usage of Theodolite, temporary adjustments, measurement of horizontal & vertical angles, sources of errors; Total Station surveying instrument, its functions and uses.

Unit V - Practical layout
On site lay out of a small residential unit as per map and plan.

Methodology:
Practical exercises of chain and compass surveys and plane tabling of a small area and preparation of survey plan, leveling and actual layout of a building on an open plot including site modeling.

Suggested References:
1. Basak, N. N., Surveying & Levelling
2. Punmia, B. C., Surveying
3. Chandra, A.M., Higher Surveying
4. Alakde, Plane Surveying

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding Indo-Islamic architecture as related to the socio-cultural, historical, economic and political scenario of the time; understanding the architectural styles, form and character of the Pathan and Mughal periods and subsequent developments of regional styles.

Course Contents

Unit I – Introduction to Indo-Islamic Architecture 12 Periods / 4 weeks
Introduction and understanding of Islam’s philosophy and its interpretation in building type e.g. mosque, tomb. Forts and their elements like domes, minarets, arch etc. Exercises: Study of Fateh Pur Sikri.

Unit II - The Sultanate Style 9 Periods / 3 weeks
Understanding the architectural styles of the Pathan rulers of Khaljís, Tughlaqs, Sayyids, Lodhis and Shershah who ruled from Delhi. Exercises: Study of tomb of Sher Shah etc.

Unit III - Mughal Architecture 9 Periods / 3 weeks
Understanding the architecture of the Mughals coming from Samarkhand; architectural styles created during the reigns of different Mughal emperors. Exercises: Study of Humayun’s tomb, Taj Mahal etc.

Unit IV - Provincial Architecture 9 Periods / 3 weeks
Development of Provincial styles in various provinces of India like Punjab, jaunpur, Gujarat, Bengal, Bijapur, Bihar and Deccan. Exercises: Study of a few examples of Provincial styles.

Unit V - Provincial Architecture of Uttar Pradesh 9 Periods / 3 weeks

Suggested References:
1. Fletcher, Banister Sir, History of Architecture
2. Grover, Satish, Islamic Architecture in India

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- IV
COMPUTER APPLICATIONS IN ARCHITECTURE-I

Course Code: ARC 402
Duration of Exam: Nil
Contact
periods / week: 4
Internal Assessment: 50
Credit: 3
External assessment (Viva): 50

Objectives: Understanding versatile application of computer and digital graphics in Architecture; learning the techniques and methods of use of computer and various software digital drafting and presentations.

Unit I - Basic Computer Skills
weeks 16 Periods / 4
Introduction to computers hardware and software components; operating systems of Windows. Usage of Internet and Intranet; protocols and their importance; networking.

Unit II - Learning M. S. Office
weeks 12 Periods / 3
Basic commands to operate the components of M.S. Word; knowledge about DTP (Desktop Publishing); techniques in M.S. Word; use of various commands to make charts, graphs, tables etc. to prepare reports in M.S. Word; exporting & importing such works done in other software; using of Clip Art and making elementary shapes in M.S. Word; use of Mail Merge in M.S. Word. Making work sheets and inserting bar charts, pie charts etc. in M.S. Excel; learning basic calculation formulae like SUM, MAX, MIN, AVG, Percentage, etc.

Unit III - MS PowerPoint
12 Periods / 3 weeks
Presentation in M.S. Power point in making slides etc. using various slide layouts, design themes and inserting animations.

Unit IV - Understanding AutoCAD
12 Periods / 3 weeks
Learning various 2D commands their function and application; understanding coordinate systems; working on layers and colors; drawing plans, elevations, sections using AutoCAD; dimensioning drawings; connecting from one file format to another; various File Formats and their usefulness.

Unit V - Use of Photo editing Software
12 Periods / 3 weeks
Introduction to application of software and graphic system; use of printers, scanner, plotter; understanding Bitmap images and Vector Graphics; image size and Resolution; using Photo editing software such as Adobe Photoshop, Photo editor etc.; basic tools for Editing and Creating Graphics.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester Objective: Learning related support subjects and techniques of architectural design. Accent on: 'space, materials, technology and structure;'

Course Code: ARC 403
Duration of Exam: 12 hrs
Contact periods / week: 8
Credit: 6

Objectives: to understand architecture as an outcome of space, materials, technology and structure; to expose the students to the built environment in rural and urban setting with its various influencing factors like socioeconomic conditions, local building materials, local construction technology/practices etc.

Course Contents

Unit I - Warming up session: Indigenous materials and technology
32 periods / 4 weeks
Understanding indigenous materials and technology in a rural setting and evaluation of quality of space.
Suggested exercises: Time problem - 1. Study of a rural house or a Baithak; 2. Design of a simple building using indigenous materials and technology, such as a rural Baithak, rural school etc. or any rural building as per teacher's choice.

Unit II - Functional, Geometric and visual order in design
42 periods / 6 weeks
Understanding functional, geometric and visual order of repetitive units; understanding of site elements.
Suggested Exercises: Design of buildings having primarily horizontal circulation and repetitive units such as nursery and primary school. Motels, way-side tourist arcades and kiosks, Haat market, hostel for destitute children, highway side Dhaba etc.

Unit III - Designing Non-residential buildings
54 periods / 6 weeks
Understanding designing of public spaces in a semi-urban area. Suggested Exercises: Design of a medium size building for public activities in a semi-urban setting or a small town incorporating various structural forms viz. a Middle School, a small Shopping Arcade in a Bus Station, Multi Purpose Hall for games; Temporary Exhibition Pavilions etc.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester IV
DESIGN PRESENTATION - IV

Course Code: ARC - 404
Duration of Exam: Nil
Contact periods/week: 3
Internal Assessment: 50
Credit: 3
External Assessment (Viva): 50

Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models
Teachers may assign time as necessary

Unit II – Rendering of designs
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs
Teachers may assign time as necessary

Unit IV – Study of Buildings
Teachers may assign time as necessary

Unit V – Preparation of Design Port folio
Teachers may assign time as necessary

Note I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: Learning principle and methods of designing of different types of beams, arches, frames and bridges.

Course Contents

Unit 1 - Slope Deflection Method
Introduction, analysis of Indeterminate beam, continuous beam and portal frame; sinking effect of supports.

Unit II - Moment Distribution Method
Introduction, relative stiffness, analysis of indeterminate beams, continuous beam and portal frame(Without sway); sinking effect of supports.

Unit III – Arches
Introduction, three hinge arches subjected to general loading system, two hinged arches subjected to general loading system, temperature effect on two hinge and three hinge arches.

Unit IV - Redundant frame
Statically indeterminate structures-the second theorem of Castigliano; externally Redundant Trusses; degree of redundancy; stresses due to errors in length, portal frames.

Unit V - Cable and Suspension Bridge
Introduction, Equilibrium of a loaded chord, Cable carrying a uniformly distributed load, Suspension Bridge with three hinged stiffing girder,
Objectives: To acquaint the students with building materials such as metals, adhesives etc. and with construction techniques of roof truss, roof coverings, doors, windows and cavity wall.

Course Content:

Unit I – Wooden trusses & roof coverings 20 Periods/5 Weeks
Roof Trusses in Timber: Terminology; trussed rafter and framed roofs. Roof coverings: Clay tiles, corrugated sheets and other commonly used roofing materials.

Unit II – Adhesives 12 Periods/3 Weeks
Types of adhesives, characteristics and uses; natural adhesives; thermoplastic adhesives – polyvinyl acetate.

Unit III - Metals 08 Periods/2 Weeks
Ferrous: Iron (pig, cast and wrought), structural steel, sheet and alloys, Stainless steel. Non Ferrous: Aluminium, copper and copper based alloys (brass and bronze), tin, lead, nickel and chromium their properties & uses.

Unit IV – Metal joinery 12 Periods/3 Weeks
Typical metal joinery: riveted and bolted, soldering, brazing and welding. Detailing of structural steel work: beam to column joint, beam to beam joint, column splice, column base and roof truss to column joints. Study of roof truss (steel)

Unit V – Metal Doors, Windows & Partitions 16 Periods/4 Weeks
Different mild steel sections, pressed steel sections and aluminium sections; rolling shutter and collapsible shutter; metal doors & windows; metal grills.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: Field and market survey to experience building materials such as metals, joineries, adhesives etc. and study construction techniques of roof truss, roof coverings, doors, windows and cavity wall.

Course Contents

Survey of market and building sites to actually experience and feel the materials, elements and techniques taught under the subject Building Materials and Construction IV; to prepare drawings for the Building Materials and Construction class and make portfolio for the same; survey literature, catalogues etc. to know about the latest materials, elements and techniques in vogue.

Note I. The timings of this class may be suitably clubbed with the Building Materials and Construction class for organizing market and site visits effectively.

Note II. The teacher may arrange market surveys and site visits to help students experience the actual materials, elements and techniques taught under the theory subject.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester-IV
BUILDING SERVICES: WATER SUPPLY & DRAINAGE

Course Code: ARC 408  Duration of Exam: 3 hrs
Contact periods/week: 3  Internal Assessment: 50
Credit: 3  External assessment: 50

Objectives: Understanding building services with respect to water supply, drainage and Sanitation; understanding water supply, drainage and sanitation systems, treatment, conveyance and distribution; fittings and fixtures.

Course Contents:

Unit I – Water Supply - Sources, Treatment and Conveyance  9 periods / 3 Weeks
Sources of water supply, quality and quantity, treatment, conveyance, distribution and storage.

Unit II - Water Supply - Pipes and Fittings  9 periods / 3 Weeks
Materials, types of pipes, sizes and their joining details; Fittings like ferrule, stopcocks, bib cocks, meters, pressure pumps etc.

Unit III - Water Supply Systems  12 periods / 4 Weeks
Domestic hot and cold water supply systems, solar water heating and supply systems; Planning and implementation of water supply systems in buildings; rain water harvesting - types and methods. Exercises: Layout of water supply system for a building designed in the Architectural Design class.

Unit IV - Drainage systems  12 periods / 4 Weeks
Separate, combined and partially combined systems, single stack system, dry and wet carriage systems; one pipe and two pipe systems; laying of drains; self-cleansing velocity for drain pipes; materials and sizes of drainpipes. Exercises: Layout of drainage systems for the above stated building.

Unit V - Sanitation, sanitary fittings, fixtures and joints  9 periods / 3 Weeks
Basic principles of sanitation; collection and conveyance of waste matter from buildings; quantity and quality of refuse; laying, working and installation of sewers and sewer appurtenances; self-cleansing and non-scouring velocities for sewer pipes; fixtures viz. washbasins, WC’s, bathtubs, sink, urinals, flushing cistern etc.; various types of joints, manholes and septic tanks;

Suggested References:
2. Shah, Charanjeet S., Water Supply & Sanitation

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- IV
ENVIROMENT STUDIES AND CILAMATOLOGY

Course Code: ARC-409
Contact periods/week: 4
Credit: 3
Duration of Exam: 3 hrs
Internal Assessment: 50
External assessment: 50

Objectives:
Understanding the science of ecosystem and the laws of nature; understanding environmental threats, their causes and mitigation measures; understanding nature and climate as the basic parameters to formulate design strategies; developing environment and climate responsive sustainable design of habitats.

Course Contents

Unit I - Introduction to ecology 12 Periods / 3 weeks
Definition, concepts and divisions of ecology; ecosystem and environment; interaction among ecological factors - natural and artificial, structure, function and energy flow of ecosystem; global warming & climate change, loss of bio-diversity, desertification, deforestation; prevention/control, conservation and environmental management.

Unit II - Pollution of soil, water and air 12 Periods / 3 weeks
Soil - formation, profile, classification. Water - water balance, surface and ground water. Air - composition, biosphere etc.; pollution of soil, water and air. Sources and types of pollution - ground water and marine pollution, soil depletion and degradation, depletion of ozone layer, acid rain, noise pollution in urban areas.

Unit III - Elements of Climate 16 Periods / 3 weeks
Types of climates; temperature, humidity, wind, precipitation and radiation; effects of light, temperature, precipitation, humidity, gases/wind, topography on life and built forms; principles of design with climate; considerations for climate-responsive design - orientation, fenestration, materials, form and greeneries.

Unit IV - Solar control for human comfort 12 Periods / 3 weeks
Understanding the solar position of a place, azimuth, altitude, incidence, shadow angle etc. for designing shading devices; methods to quantify human comfort and devices to achieve it in buildings; controlling direct sun, solar radiation etc. in design using solar geometry, solar chart, shadow angles and various shading devices.

Unit V - Daylight, Ventilation and Air Movement 12 Periods / 3 weeks
Nature of light and its properties, sources of light, daylight factor and glare; effect of size and shape of openings in different planes in buildings; design for daylight; requirement and function of ventilation; stack effect; airflow pattern inside and outside buildings.

Suggested References:

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – V  
HISTORY OF ARCHITECTURE -V

Course Code: ARC - 501  
Duration of Exam: 3 hrs
Contact periods/week: 3  
Internal assessment: 50
Credit: 3  
External assessment: 50

Objectives:
Understanding the Renaissance, Baroque, neo-classical and modern architecture as related to the socio-cultural, historical, economic, political and technological scenario of the time; understanding the architectural styles, form and character of the respective periods.

Course Contents

Unit I - Renaissance Architecture in Europe  
12 Periods / 43 weeks
Breaking from medieval church architecture and resourcing from Roman antiquity (Vitruvius); spatial centralization through simple addition of independent spatial elements; use of elementary geometrical forms like symmetry and simple mathematical ratios; reintroduction of anthropomorphic Classical Orders and formality. Exercises: palazzos; viz. Study of St. Peter’s Church, Rome (Michelangelo) (AD 1546)

Unit II – Baroque Architecture  
9 Periods / 3 weeks
Conflict and tension in Mannerism in place of harmony and order of Renaissance; dynamic interplay of contrasting elements as against static addition of independent units of Renaissance; interplay between manmade and natural spatial elements; dynamism of urban spaces; centralized longitudinal and the elongated church plans; vitality and spatial richness with systematic organization of space; sensitivity to effects of texture, colour, light and water. Exercises: Piazza of St. Peter’s Church, Rome (AD 1656).

Unit III - Picturesque and Neo-Classical Architecture  
9 Periods / 3 weeks
Purity and structural honesty of antiquity preferred over ornamentation and exaggeration of Baroque. Representation of ancient Roman monuments in imaginary compositions. Archaeological purism and importance of pictorial values in historical settings. Recreation of antique Roman simplicity and splendour for modern living. Study of important palaces and public buildings in Britain and France.

Unit IV - Colonial Architecture  
9 Periods / 3 weeks
The British architecture of the colonial days in India the capital at Delhi and the residency at Lucknow emphasizing on their planning criteria and architectural features.

Unit V - Enlightenment and beginnings of Modern  
9 Periods / 3 weeks
Belief in creation of ‘new’ and ‘ideal’ world through return to fundamentals, ‘true’ and ‘original’ values. Romanticizing elementary geometrical forms with undecorated surfaces; iron and glass construction for openness and lightness; Art Nouveau; repetitive, orthogonal, skeletal systems for horizontal and vertical expansion; later attempts to dissociate reference to past styles.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- V
COMPUTER APPLICATION IN ARCHITECTURE-II

Course Code: ARC 502  
Contact periods / week: 4  
Credit: 3  
Duration of Exam: Nil  
Internal Assessment: 50  
External assessment (Viva): 50

Objectives: To develop an understanding of the design based software like Auto Cad, Google Sketch up and Autodesk Revit. Learning the application of these software in design exercises to avail maximum commands.

Course Contents

Unit I - Advanced AUTOCAD drafting techniques  
12 Periods / 3 weeks
Concept of blocks and object grouping; styles; organizing objects in layers; hatching techniques; introduction to symbol libraries.

Unit II - 3D drafting and modeling  
12 Periods / 3 weeks
Different types of 3d modeling techniques; solid creation; editing; creating complex solids; Boolean operations on solids. Concept of shading; rendering; material mapping; environment attributes

Unit III - Using Google Sketch Up  
12 Periods / 3 weeks
Creating 3D conceptual massing and building models, rendering them with materials, adding sciography, generating perspective views by using camera and linking other drawing formats

Unit IV - Using REVIT  
16 Periods / 3 weeks
Developing exterior and interior surfaces and spaces like walls, floors and roofs, adding doors and windows; assigning material; creating transparencies; mapping co–ordinates; lighting effects; shadow maps. Rendering using active shades and depth of field. Creating walkthroughs using camera, light and assigning materials.

Unit V – Application of software in Design  
12 Periods / 3 weeks
Drawing of an already designed residence using AutoCAD and other architectural software, to develop an understanding of software assisting in 3-Dimensional design.

Suggested Books:
1. Sinha, Richard Computer Fundamentals
2. Rutkosky, Lotia, Heathcote MS. Office 2007
3. Alexisleon, Excel 2000 for Beginners
4. Alexisleon, Power Point 2000 for Beginners
5. Adobe Adobe Photoshop Element 4.0
6. Romaniello, Steve Photoshop 7.0
7. Omura, George, Understanding Autocad

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – V
ARCHITECTURAL DESIGN – V

Semester Objective: Learning more of related support subjects and techniques of architectural design

Course Code: ARC 503
Exam: 12 Hrs
Contact periods/week: 8
Credit: 3

Duration of Exam: 12 Hrs
Internal assessment: 50
External assessment: 50

Objectives: to learn the art of collecting data and to analyze for evolving design; understanding site planning: organization, scale, hierarchy, orientation, climate, circulation and essential services with reference to small individual buildings; application of knowledge gained in other subjects. (Accent on: Application of knowledge and techniques learnt in design).

Contents:

Unit I - Warming up session: Designing Residential Buildings 36 periods/ 4 weeks
To learn designing clustre of residential buildings for unknown individual clients and requirements framed for specific plot/ land in urban context. Introduction to concepts of shared open spaces and clustering of units. Suggested exercise: Time problem - Design a clustre of detached and semi-detached houses, or a clustre of houses for a specific socio-economic group, or low-rise houses / patio houses or any building as per teacher's choice

Unit II - Designing of Non-Residential Building 54 periods/ 6 weeks.
To design non-residential buildings for unidentified users with a specified site and location. Suggested Exercise: Neighbourhood shopping centre, polyclinic/ diagnostic centre, Nursing home, branch of a commercial bank, Senior Secondary School, Swimming Pool etc.

Unit III - Designing with Site constraints 54 periods/ 6 weeks.
Introduction to design of buildings with site limitation like sloping terrain, specific orientation and views and optimum space requirements; to apply knowledge in building services; to work out architectural details. Suggested Exercise: Design of Tourist Resorts on a hilly site, Sea Resort, Hotel, Large Market etc.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester V
DESIGN PRESENTATION - V

Course Code: ARC - 504  
Duration of Exam: Nil  
Contact periods/week: 3  
Internal assessment: 50  
Credit:  
Internal assessment (Viva): 50

Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models  
Teachers may assign time as necessary

Unit II – Rendering of designs  
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs  
Teachers may assign time as necessary

Unit IV – Study of Buildings  
Teachers may assign time as necessary

Unit V – Preparation of Design Port folio  
Teachers may assign time as necessary

Note: I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - V  
ARCHITECTURAL STRUCTURES – V

Course Code: ARC 505  
Duration of Exam: 3 hrs
Contact periods / week: 3  
Internal Assessment: 50
Credit: 3  
External assessment: 50

Objectives: To learn about concrete and steel and various design methods of beams; to learn about pre-stressed concrete.

Course Contents

Unit I - Concrete and Steel - Design Methods  
9 Periods / 3 weeks
Properties: Constituents of Concrete; properties of concrete in plastic and hardened state; properties of steel;
Design: Objectives; design for Flexure – fundamentals, review of theory of simple bending; practical requirements of an RCC beam - beam size, cover and spacing of bars, design requirements, strength and serviceability requirements; classification of beams. Design Philosophies: Working stress method, ultimate load method and limit state design method. Design for flexure - Working stress method: Permissible stresses, modular ratio, assumptions; analysis and design of singly and doubly reinforced rectangular beams.

Unit II - Design for flexure-Limit State Method  
9 Periods / 3 weeks
Inelastic behavior of materials, limit state of collapse, limit state of serviceability, characteristics and design values and partial safety factors, assumptions. Analysis and design of singly reinforced and doubly reinforced rectangular beams.

Unit III - Shear, Bond, Anchorage, Development length  
9 Periods / 3 weeks
Limit state of collapse in shear: Shear in homogeneous beam, shear in RC beam, diagonal tension, and diagonal compression; design of beam in shear by limit state method. Bond, Anchorage, Development length and Splicing: Nature of bond between steel and concrete, development of bond stress in reinforcement, concept of development length and anchorage; splicing of reinforcement; design examples. Deflection: Span / effective depth ratio, calculation of short term and long term deflection. Cracking: Bar spacing controls.

Unit IV - Design of T Beams and L Beams  
9 Periods / 3 weeks
T Beams: Terms used in T Beams; Analysis and Design of T Beams. Design for Torsion: IS Code Approach; Design Procedure; Design of L Beams.

Unit V - Pre-stressed Concrete  
9 Periods / 3 weeks
Introduction; concept of pre-stressing; materials used in pre-stressed Concrete; advantages and disadvantages of pre-stressed concrete; pre-stressing methods; pre-stressing systems - pre-tensioning and post-tensioning system; losses of pre-stress; analysis of simple rectangular section.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester-V
BUILDING MATERIALS AND CONSTRUCTION - V

Course Code: ARC-506
Duration of exam: 3 hrs
Contact periods/week: 5
Exam. Marks: 50
Credit: 3
Progressive marks: 50

Objectives: To acquaint the students with building materials such as Gypsum board, plastics and construction techniques of metal doors, rolling shutter & collapsible shutter, metal partitions, suspended ceilings including metal joinery; learning construction techniques of R.C.C. in building works.

Course Content:

Unit I - Glass
Composition of glass, Types of glass, glass as a building material, Insulation glass, glass tiles, mirrors, glass blocks & Glass Fibre.

Unit II – Gypsum
Gypsum: About the material, its properties, characteristics and usage; construction techniques of partition wall by gypsum board and suspended ceiling (boards and tiles); gypsum plaster, jointing and finishing.

Unit III - Plastics
Thermoplastics: Polythene, Polyvinyl chloride, polyvinyl acetate, polypropylene, polymethyl methacrylate, polystyrene, butadiene styrene, nylon, polycarbonate. Thermosetting plastics: Polyester resin, polyurethane etc.; synthetic resin and rubber.

Unit V – Details of important parts of buildings
Staircase: Terminology; types and parts of staircases; functional requirements; staircases made of timber, brick etc. Cavity walls: Types, characteristics and construction of Cavity walls. Partitions: Details of partition walls (timber/glass/gypsum etc.). False Ceilings: suspended ceilings.

Unit V – Reinforced Cement Concrete
Foundations: isolated, combined, cantilever eccentric footing, grillage and raft foundation. Pile foundations: details of pile, varieties of piles, pile caps; Beams and Columns: column grid and frame construction, space frame. Slabs: Simply supported and cantilevered slabs. Other elements: simple staircases, retaining wall etc.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Course Code: ARC 507
Contact periods/week: 3
Credit: 3
Duration of exam: N.A.
Internal Assessment: 5
External assessment (Viva): 50

Objectives: To conduct market / site survey and experience building materials such as Gypsum board, plastics and building elements like metal doors, rolling shutter, collapsible shutter, metal partitions, suspended ceilings etc. including metal joinery; experiencing construction techniques of R.C.C. in actual building works.

Course Contents

Survey of market and building sites to actually experience and feel the materials, elements and techniques taught under the subject Building Materials and Construction V; to prepare drawings for the Building Materials and Construction class and make portfolio for the same; survey literature, catalogues etc. to know about the latest materials, elements and techniques in vogue.

Note I. The timings of this class may be suitably clubbed with the Building Materials and Construction class for organizing market and site visits effectively.

Note II. The teacher may arrange market surveys and site visits to help students experience the actual materials, elements and techniques taught under the theory subject.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester-V
BUILDING SERVICES: ELECTRICAL

Course Code: ARC 508
Duration of Exam: 3Hrs
Contact periods/week: 3
Internal Assessment: 50
Credit: 3
External assessment: 50

Objectives:
Understanding technology of electricity used in buildings; understanding importance of lighting and illumination in architecture.

Contents

Unit I - Introduction 9 periods / 3 Weeks
Terminology and symbols as per NBC/NEC for electrical installations; transmission and distribution of electricity; types of domestic power supply - single and three phase; familiarization to various lighting accessories, wires and cables, metering, distribution panels / boards etc.; guidelines to install fittings.

Unit II - Wiring Systems 12 periods / 4 Weeks
Principles of electric circuitry; definitions and units; system of domestic supply & distribution, techniques of wiring; wire laying systems - on batten, capping and casing, open and concealed conduits; circuits - series and parallel; calculation of load and estimates for domestic wiring; wiring diagram; protection against overloading, short-circuit, lightning; types of fuses. Exercises: Plan electrical layout for a building or a part thereof designed in the Architectural Design class. (Teachers of both the subjects to coordinate)

Unit III – Materials, accessories and fixtures 6 periods / 2 Weeks
Wires and Cables: materials, types, sizes, specifications, and main switch, M.C.B., distribution boards, meters, electrical fixtures and accessories.

Unit IV – Lighting and Illumination 9 periods / 3 Weeks
Terminologies; units of measurements; guidelines for installation of lighting in domestic building; general lighting and specific purpose lighting; special lighting fittings and fixtures.

Unit V – Importance of lighting in Architecture 12 periods / 4 Weeks
Natural and artificial lighting; lighting for special effects; principles of lighting for various building uses viz. residential, commercial, educational sports (stadium), theatres, garden, museum etc. Exercises: Study of lighting of an important building and its documentation.

Suggested Books:

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objective: Understanding the basics of sociology and socio-economics, demography and quantitative techniques in Planning and design; understanding development and its impact in living conditions and role of Architects and Planners to address such changes.

Course Contents

Unit I – Introduction
Sociological concepts; relationship between human and environment; Socio-cultural profile of Indian society; how knowledge in Sociology may be utilized in planning and designing of habitat and buildings.

Unit II Community and Settlement
Population explosion and its effects in the society and habitat; proliferation of poverty, growth of slums and squatters communities; social transformation and their impact on life, safety, security.

Unit III - Growth and Development
Development economics; lessons from Indian experiences; advent of technology, economic growth and development influencing quality of life; HDI, poverty, income distribution, employment and livelihood.

Unit IV – Demography
Fundamental concepts of demography and its elements for planning; analytical and quantitative techniques of demography and its application in housing and town planning.

Unit V – Application of Sociological knowledge
Rapid increase in population, advent of science and technology and growth in economy changed the living conditions especially in the urban areas; high-rise housing and its impact in family and society; role of Architects and Planners to seek a balanced living condition.

Suggested Books:
4. Vidya Bhusan An Introduction to Sociology

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding of the period in terms of its location, climate as well as the socio -cultural, historical, economic and political influences of the time and developments in construction and technology; understanding the works and thoughts of the architects to respond to the need or demands of the period.

Course Contents

Unit I - Modern Architecture

Weeks
Social intentions and search for ideal world; pluralism in place of past unity of styles; search for paradigms in historical sources; return to fundamentals and origins in geometry; nature and paradigms of technology; expressions of construction and technology; equating technology and progress with present functionalism.

Unit II – Thoughts and works of great Architects

Works of Frank Lloyd Wright, Walter Gropius, Le Corbusier, Mies Vander Rohe, Alvar Aalto, Louis Kahn, Dutch De Stiji, Italian Futurists and Russian Constructivists; international style; oversimplification of the Modern Movement into functional, steel and glass cubes; monotonous functionalist abstractions and Modernism as a style; disenchantment with modern cities and fall of Modern Movement.

Unit III - Post Modern Architecture

Post Modern Architecture as a revision of Modern Architecture and resistance to functional containers of 60’s; objective, representational and emphasis on content; pluralistic and differing trends. Post Modern Historicism: Rooted to place and history; regard for expression: ornament, symbolism

Unit IV - Neo-Modern Architecture and Deconstruction

Disregard historical imagery to recapture ideals of Modern architecture of 20’s; hi-Tech metal abstractions of Ricard Rogers, Norman Foster and others showing structure and equipment as implied ornament; the early works of New York Five; revival of the modern grid and Corbusier’s geometry.

Unit V Modern Architects and Architecture of India

Diploma and science based Degree Architectural education in India; planning of Chandigarh by Le Corbusier as a landmark inspiration for Architects; Design of IIM, Ahmedabad by Louis Kahn; emergence of Indian Architects like B. V. Doshi, Charles Korrea, and Habib Rahaman; contribution of Stien and Lorry Baker; modern Indian Architects – Raj Rewal, Hafiz Contractor, Prabir Mitra, Dulal Mukherjee, etc.

Suggested Books:
1. 20th Century Architecture.
2. Ching, D. K., Architecture – Form, Space and Order.
3. The complete Architecture of B.V.Doshi. Taylor

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.

Semester – VI

ARCHITECTURAL DESIGN – VI

Semester Objective: Learning technology and support subjects and their application. Accent on: Application of knowledge and techniques learnt in design.

Course Code: ARC 603
Contact periods / week: 8
Credit: 6
Duration of Exam: 12 hrs
Internal Assessment: 50
External assessment: 50

Objectives - Understanding design as a function of specific agenda of user requirements, site conditions and climate and as a process of problem identification, space analysis, formulation of requirements and evolution of design criteria; Incorporating elements of services; designing for multi-use spaces in single or multi-floors with parameters of structure for community use with limited land and other constraints.

Course Contents

Unit I - Warming up session: Designing with climate
Understanding the user-specific requirements. Suggested exercise: Design house for an Artist / Architect / Writer / Poet / Sculptor or as may be decided by the teacher.

Unit II - Designing Recreational and Social Buildings:
Introduction to concepts of shared open spaces; understanding design requirements of multi-use and multi-functional buildings with specific agenda of viz. climate, hot and dry, hot and humid, cold and/or very cold conditions. Suggested exercise: Recreational buildings, Convention centre, Hotel etc

Unit III - Designing Special purpose buildings:
To understand requirements of special purpose buildings for physically challenged, behaviorally challenged and rehabilitation of recovered drug addicts, HIV/leprosy patients etc. Suggested Exercises: Design of buildings for physically challenged, behaviorally challenged, rehabilitation of recovered drug addicts etc.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester VI
DESIGN PRESENTATION - VI

Course Code: ARC - 604
Contact periods/week: 3
Credit: 3

Duration of Exam: Nil
Internal Assessment: 50
Internal Assessment (Viva): 50

Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models  
Teachers may assign time as necessary

Unit II – Rendering of designs  
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs  
Teachers may assign time as necessary

Unit IV – Study of Buildings  
Teachers may assign time as necessary

Unit V – Preparation of Design Port folio  
Teachers may assign time as necessary

Note: I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Course Code: ARC 605  
Contact periods / week: 3  
Credit: 3  
Duration of Exam: 3Hrs  
Internal Assessment: 50  
External assessment: 50

Objectives: Learning design of one way and two way slabs, columns, footings and staircases.

Course Contents

Unit I: Design of One-Way Slab:  
Introduction; difference between one-way and two-way slabs; load distribution; review of Code requirements for design; Design of one-way slab, cantilever slab or Chajja/balcony, continuous slab.  
9 Periods / 3 Weeks

Unit I - Design of Two-way Slab  
Simply Supported Two Way Slab (Rankine - Grahoff theory); shear force; two way slab with corners held down (Marcus theory); two way slab : IS Code Method; introduction to flat slab.  
9 Periods / 3 Weeks

Unit III - Design of Columns  
Types; related definitions; difference between short and long columns; reinforcements; codal specifications; limit state of collapse; compression; design of axially loaded short columns; short column with rectangular ties and with helical reinforcement; columns subjected to axial compression and bending; design of columns subjected to compression and uniaxial bending; design of columns subjected to combined axial load and biaxial bending moments; design of long columns.  
9 Periods / 3 Weeks

Unit IV - Design of Footings  
Classification of footings; design of pad footings; design of isolated sloped footings; Theory of combined footings; strap footings. (No numerical)  
9 Periods / 3 Weeks

Unit V - Design of Staircases  
Proportioning of staircase; structural behavior of a staircase; design of stair slab spanning horizontally; design of stair slab spanning longitudinally.  
9 Periods / 3 Weeks

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References.  
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - VI
BUILDING MATERIALS AND CONSTRUCTION - VI

Course Code: ARC-606
Duration of exam: 3 Hrs
Contact periods/week: 4
Credit: 3
Internal Assessment: 50
External Assessment: 50

Objectives: To introduce and familiarize the students with the materials used in interior works; understanding advance construction techniques and industrialized building systems; understanding defects in the buildings and removing them.

Contents:

Unit I - Materials with special reference to interiors 12 Periods/3 Weeks
Floor coverings, wall finishes, ceiling finishes, window dressings, fabrics / upholstery and hardware, aluminium composite panels, glass and glass blocks.

Unit II - Joints in buildings 12 Periods/3 Weeks
Contraction joints, construction joints, expansion joints

Unit III – Prefabrication & pre-stressed concrete 12 Periods/3 Weeks
Prefabrication: Components prefabrication, open and closed building systems, mechanization and automation in construction; pre-casting methods - on-site and off-site prefabrication. Pre-stressed Concrete: Methods of pre-stressing and their application to large-span structures.

Unit IV - Innovative Construction Techniques 16 Periods/4 Weeks
Roof and floor construction: waffle grid slab, drop beam and slab, flush slab and lift slab etc.; sheer wall, cross wall and box frame construction.

Unit IV - Defects and Remedies 12 Periods/3 Weeks
Common defects in buildings - defects due to poor or bad materials and construction, due to negligence, due to aging, due to weathering etc.; study of various defects in buildings; techniques of attending and removing the defects.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - VI
CONSTRUCTION PRACTICE - VI

Course Code: ARC 607
Contact periods/week: 2
Credit: 1
Duration of exam: N.A.
Internal Assessment: 50
External assessment (Viva): 50

Objectives: To conduct field studies and surveys of market, literature and catalogue to know and experience modern building materials and techniques used in interior works and industrialized building systems; to gather experience on defects in the buildings and techniques to remove them.

Course Contents

Survey of market and building sites to actually experience and feel the materials, elements and techniques taught under the subject Building Materials and Construction VI; to prepare drawings for the Building Materials and Construction class and make portfolio for the same; survey literature, catalogues etc. to know about the latest materials, elements and techniques in vogue.

Note I. The timings of this class may be suitably clubbed with the Building Materials and Construction class for organizing market and site visits effectively.

Note II. The teacher may arrange market surveys and site visits to help students experience the actual materials, elements and techniques taught under the theory subject.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester-VI
BUILDING SERVICES: MECHANICAL

Course Code: ARC 608
Contact periods/week: 3
Credit: 3
Duration of Exam: 3Hrs
Internal assessment: 50
External Assessment: 50

Objectives: Understanding natural and mechanical ventilation and their application; making students aware about fire-fighting methods, rules, regulations and equipments; to understand mechanical and fire fighting Services in buildings; to learn to prepare layout and details of building services.

Contents

Unit I - Heating Ventilation and Air conditioning (HVAC) 9 periods / 3 Weeks
Heating: heating of spaces – local and central heating, heating equipments; Ventilation: natural ventilation; rate of ventilation; mechanical ventilation in buildings; plenum system, exhaust system, plenum and exhaust system; Fans, blowers and air filters.

Unit II - Heating Ventilation and Air conditioning (HVAC) 9 periods / 3 Weeks
Air Conditioning: Principles of Air-conditioning; comfort conditions - temperature control, humidity control, air filtration; refrigeration cycle and air cycle; working of window air conditioners and central air-conditioning; air distribution systems: fans, filters, ductwork, outlets, and dampers; norms for air-conditioning and cooling load.

Unit III - Lifts and Escalators 9 periods / 3 Weeks
Lifts: terminology; types of lifts, parts, working, average travel speed; carrying capacity, rated load, rated speed, RTT etc.; lift control systems; requirements for installation of lifts. grouping of lifts and design standards of a lift lobby. Escalators: parts, function and working; design standards of a escalator lobby.

Unit IV - Fire Safety Systems and Equipments 9 periods / 3 Weeks
Causes and spread of fire; fire rating; fire alarm and detection system; fire protection systems and equipments; fire fighting equipments; hydrant systems; fire extinguishers- gas taps, foam, portable equipments.

Unit V - Application of HVAC in Design 12 periods / 4 Weeks
Application of the HVAC techniques in a high-rise Architectural Design problem and preparation of design layout and details. The exercise may be conducted in tandem with the Architectural Design class. The teachers of both the classes may coordinate to derive the best results.

Suggested References:
1. Jain, V. K., Fire Safety in Buildings
2. Jain, V. K., Handbook of Designing and Installation of Services in Building Complex

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References. Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- IV
BUILDING ECONOMICS

Course Code: ARC 609  Duration of Exam: 3Hrs
Contact periods/week: 3  Internal Assessment: 50
Credit: 3  External assessment: 50

Objectives: To develop an understanding among the students regarding management of physical and human resources including evaluation techniques pertaining to a business organization in general and specific to construction industry.

Course Contents

Unit I – Introduction - elementary concepts of economics  12 Periods / 3 weeks

Unit II - Relation to architecture, engineering and other sciences  9 Periods / 3 weeks
Meaning and scope of building economics, Issues and challenges associated with building projects. Building Efficiency, Building Life-cycle. Costs and Benefits of Building – Monetary and Non Monetary

Unit III - Project Financing  9 Periods / 3 weeks

Unit IV - Economic performance of building  9 Periods / 3 weeks
Decision Making by using techniques of economic performance to measure tangible and non-tangible issues - Cost-Benefit Analysis, Incremental Analysis and Multi-criteria Analysis.

Unit V - Value Engineering  9 Periods / 3 weeks
Concept, its application to Architectural Projects, Real Estate Pro-Form analysis. Feasibility Analysis: Concept and Types of Feasibility, Feasibility Analysis.

Suggested Books:

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- VI
INTERIOR DESIGN

Course Code: ARC 610  
Contact periods/week: 4  
Credit: 3  
Duration of Exam: 6Hrs.  
Internal Assessment: 50  
External Assessment: 50

Objectives: Understanding theory and practice of Interior Design; familiarizing with modern materials and techniques useful to interior design; appreciating early interventions in design of furniture and equipments.

Course Contents:

Unit I - Introduction to Interior Design  
12 Periods / 3 weeks
Definitions; role and importance of Interior Design; difference between Interior Designer and Decorator; review of enclosing elements like walls, floors, ceilings, openings, staircases, furniture. Exercises: study of the stated elements from a live example.

Unit II - Elements of Interior Design  
8 Periods / 2 weeks
Space, line, form, light, color texture, pattern; principles of Interior Design such as unity, balance, contrast, rhythm, emphasis, scale & proportion.

Unit III - Materials, Finishes & their applications  
12 Periods / 3 weeks
Understanding characteristics and workability of various materials used in interiors; their classification based on elements of usage viz. floor, ceiling, wall, door, window and fabric/upholstery or based on materials like wood, metal plastics etc. Exercises: Study of the stated elements through live examples, site visit, market surveys etc.

Unit IV - Innovation in Interior Design  
16 Periods / 4 weeks
Understanding modern materials, modular furniture, interior landscaping, fittings & fixtures, screening, electrical fixtures etc.; analyzing existing designs of selected furniture on the basis of ergonomics, user type, economics, material, joinery and maintenance; designing furniture for specific use and design criteria. Exercises: Make scaled models of the designed furniture.

Unit V - Design of small Interior spaces  
16 Periods / 4 weeks
Analyzing small selected interiors of study, bedroom, executive or Architect’s office, retail outlet, conference, reception & waiting lobby including toilets and kitchens considering function, ergonomics, materials and establish design criteria. Exercises: Design of a small interior space in detail based on a set of design criteria.

Suggested Books:
1. Interior Design and Beyond (Art. Science Industry)-Mary V. Knarkstedt.
4. Litchfield, Fredrick. Illustrated History of Furniture from the earliest to the present time.

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding specifications as an integral part of contract document; acquiring skill of writing specifications with reference to building trades, materials, workmanship and performance of different items of works; understanding methods of estimating and quantity surveying for Architectural Projects.

Course Contents

Unit I - Specification
Importance and scope of the subject; form of writing specification avoiding ambiguity and conflicting statements; form and sequence of clauses; study and use of standard specification of CPWD and PWD.

Unit II - Specification writing of materials and works
Methods of writing specifications of materials and works in foundation and superstructure e.g. RCC works, brickworks, woodworks, metal works like steel, aluminium etc, glazing, DPC, expansion joint etc. by their thickness, weight, gauge, running length, area, volume, trade names, manufacturer’s specifications etc.

Unit III - Specifications of items of services and finishes
Specifications for services viz. plumbing, water supply, sewerage and drainage, including fittings, fixtures; lightning arrestor, wiring, fittings, fixtures etc.; lifts, air conditioning and related parts; hydrants, rising main, sprinklers, alarm etc.; internal and external wall finishes; painting works viz. lime/white wash, distemper and various internal and external paints.

Unit IV – Methods of Estimating
Definition, aim and objective; scope and importance of the subject, types of estimates; approximate and detailed methods vis-a-vis plinth area method, carpet/floor area method, cubic content method, approximate quantity method and number system.

Unit V – Bills of quantities, estimation and costing
Calculation of quantities based on specifications, designs and drawing; earthwork in excavation and filling; analysis of rates of labour and materials to calculate cost. Exercises: a) Rate analysis of building works viz. earthwork in foundations, flooring, woodwork etc. b) Estimate a small building including plumbing works, electrical installations etc. with different methods; c) Costing of the same.

Suggested Books:
1. Dutta, B. N., Estimating and Costing in Civil Engineering
2. Schedule of Rates of Delhi (D.S.R.) and CPWD
3. Indian Standard Specifications
4. I.S.I. Handbook of measurements of building works.

Note I. Latest editions of the suggested books and relevant websites are recommended.
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References. Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – VII
ARCHITECTURAL DESIGN – VII

Semester Objective: Integration and application of knowledge of technology, specialization and techniques

Course Code: ARC 703
Hrs
Contact periods/week: 9
Credit: 8

Duration of Exam: 18
Internal Assessment: 50
External assessment: 50

Objectives - To develop critical awareness and a deeper understanding of architecture in its wider socio-cultural context; to introduce project briefs which are in themselves complex involving design of spaces of varying volumes and functions, large span, complex environmental conditions and by implication, complex servicing and structural requirements. (Accent on: Comprehensive complex Architectural Design)

Course Contents:

Unit I - Warming up session
weeks
16 Periods/ 2
Any pertinent issue in design education perceived by the teacher concerned preferably within the ambit of the above objectives. Suggested exercise: Time problem - Subject of choice of the teacher.

Unit II - Design of a Housing Complex
weeks
72 Periods / 9
To understand the difference in housing as a process and product and role of architect to design the product to facilitate that process in an urban context; understanding requirements of high volume multifunctional activities ensuring safety, security and comfort of users.

Exercises: 1. Group study of an existing high-rise high density housing complex with low ground coverage (not exceeding 25%) or a low rise high density housing complex with high ground coverage or a building performing high volume activities including their structure, services, amenities, facilities etc. and maintenance system; 2. Design of a housing complex with modern community facilities or a large Sports Complex or a Bus terminal/ Rail station dealing with high volume of users highlighting structural system, services, facilities, amenities and other design elements including landscape.

Unit III - Documentation of existing buildings and its appraisal
weeks
40 periods / 5
To study a building /a building group of importance of any age located at any part of the country, document and appraise quality of space, materials, structure, form and all other ramifications. This will be facilitated by a compulsory study tour for 7 to 10 days preferably overlapping with holidays to a pre-selected place.

Exercises: Study and documentation of a historic or modern building or a civic / cultural space anywhere in India. The students shall prepare study reports with drawings, sketches, photographs and audio-visuals. The concerned teacher shall assign specific works to a group of 3 to 5 students assigning measurable tasks to each student. The students shall present their works before a jury to be organized by the design teacher.
Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Course Code: ARC - 704
Contact periods/week: 3
Credit: 3

Duration of Exam: Nil
Internal Assessment: 50
External Assessment (Viva): 50

Objectives - Preparing sketches, models, port folio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class.

Course Contents

Unit I - Preparation of models
Teachers may assign time as necessary

Unit II – Rendering of designs
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs
Teachers may assign time as necessary

Unit IV – Study of Buildings
Teachers may assign time as necessary

Unit V – Preparation of Design Port folio
Teachers may assign time as necessary

Note I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - VII
ARCHITECTURAL STRUCTURES –VII

Course Code: ARC 705
Contact periods / week: 3
Credit: 3
Duration of Exam: 3Hrs
Internal Assessment: 50
External assessment: 50

Objectives: Understanding soil, earth pressure, bearing capacity etc; to learn about structural steel; to learn about loading.

Course Contents

Unit I - Basic Characteristics and Properties of Soil 9 Periods / 3 weeks
Introduction of soil mechanics, Soil formation, transport and deposit, Soil composition, Basic definitions, Clay minerals, Index properties, Particle size analysis, soil classification.

Unit II - Earth Pressure 9 Periods / 3 weeks
Earth pressure theories, Active Earth Pressure, Passive Earth Pressure, Coulomb and Rankine approaches and their assumptions, smooth and rough walls, inclined backfill.

Unit III - Bearing Capacity of Shallow and Deep Footings 12 Periods / 4weeks
Types of foundations shallow / deep, isolated, combined, mat etc., definitions, bearing capacity of shallow foundations (Terzaghi analysis), general, water table effect; bearing capacity by consolidation method, insitu bearing capacity determination, bearing Capacity by IS code method, selection of depth of footing.

Unit IV - Steel properties 9 Periods / 3 weeks
Properties of structural steel; stress-strain graph; fire protection; fatigue effect; corrosion protection; Structural elements beam, girders, ties, struts, column, trusses and lattice girders, purlins, bracings.

Unit-V - loading Patterns 9 Periods / 3 weeks
Introduction; types – dead, live, Impact, wind load and seismic loads; introduction of base isolation, base shear.

Reference Book
2. Venkatramaih, Geotechnical Engineering
3. Duggal S. K., Limit State Design of Steel Structure (TMH)

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding modular coordination and industrialization in building production; familiarization with various construction equipments required for speedy and effective construction; to introduce advanced building materials.

Contents:

Unit I - Modular Coordination 15 Periods/3 Weeks
Advantages of planning and designing with dimensional coordination; assembly of components; planning and design modules; tolerance, reference system, grids, positioning of functional elements. standardization in building design and their components.

Unit II - Industrialized Construction 12 Periods/3 Weeks
Mechanized manufacturing of large prefabricated elements, mechanized manufacturing of medium and small prefabricated elements, automation; applicability of industrialized production of buildings in India due to availability of cheap labour.

Unit III - Construction equipments 15 Periods/3 Weeks
Electric hand tools, vibrators, power floats, pumps and rollers. earth movers and excavators, bulldozers, scrapers, graders, shovels, skimmers, dragline and trenchers. concrete mixers etc.

Unit IV - Transportation equipments 15 Periods/3 Weeks
Lorries, trucks, dumpers, elevators, conveyors, hoist, and cranes (mobile, static, tower).

Unit V - Advanced building materials 15 Periods/3 Week
Translucent concrete, kinetic glass, self repairing cement, bendable concrete, fire proof building materials, foam concrete, cellular concrete, re-bar, torque steel etc.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- VII
STATUTORY AND WORKING DRAWING

Course Code: ARC 707
Duration of Exam: Nil
Contact periods/week: 4
Internal Assessment: 50
Credit: 3
External assessment (VIVA): 50

Objectives: Understanding requirements of building approval by the civic authorities and delivery of drawings for execution at the site; preparing municipal drawing conforming to the building bye-laws for statutory approval; preparing working drawing documents as per the approved municipal drawings for execution; understanding development control rules, building bye laws and codes of practices / acts.

Course Contents

Unit I - Municipal Drawings for Civic Authorities
24 periods / 6 weeks
Qualifications and competence of professionals; knowledge of local building bye laws; submission of Municipal drawings consisting of sub division/ layout plan, key plan, column layout plan if applicable, setting out plan, site plan, floor plans, elevations, sections, structural drawings of foundation & superstructure, services plans, details of septic tank if applicable, specifications, structural sufficiency certificate, scale, & coloring; signing of plans; fees for Municipal approval; deviations, violations and penalties; compounding; Completion Certificate etc. Exercises: prepare a complete set of Submission (Municipal) Drawings for a small project (to be hand-drafted); visits to a Plan Sanctioning Authority for having a first-hand experience of plan approval process.

Unit II - Working Drawings
40 periods / 10 weeks
Working drawing as a part of contract for execution of the building as approved by the local authorities; detail drawings in larger scale showing sill details, expansion joint and other details; need of correct drawings to avoid charges for violation of bye laws, faulty execution etc..
Exercises: prepare a complete set of hand-drafted Working Drawings for a small project incorporating all services with schedule and specifications. The drawings and details shall include : Site plan, Foundation layout, plans of all Ground, First and typical floors, and Terrace, Sections through staircase and toilets, Elevations, Door and Window Schedule and Details, layouts - Electrical, Plumbing; Toilet and kitchen details with fixtures and specifications; details of flooring, staircase, balustrade, grills, parapet and/or railings etc; typical wall section showing foundation, D.P.C., skirting, sill, lintel, slab and terraces.

Suggested References:
1. Bhawan Nirman Avam Vikas Upvidhi, Lucknow Development Authority, Lucknow
3. The Uttar Pradesh (Regulations and Building operations) Act 1958
5. IS Code- 8888
6. The U.P. Urban Planning and Development Act 1973
7. Environmental Protection Act 1986

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester-VII
BUILDING SERVICES: ACOUSTICS

Course Code: ARC 708
Contact periods/week: 3
Credit: 3
Duration of Exam: 3Hrs
Internal Assessment: 50
External Assessment: 50

Objectives: To understand theory and practice of acoustics and their application in architecture; to design acoustics solutions for an architectural project.

Course Contents

Unit I - Introduction & terminology
9 periods / 3 Weeks
Properties of audible sound, intensity & loudness, frequency & pitch, quality of sound.

Unit II - Behavior of audible sound and common acoustical defects
9 periods / 3 Weeks
Reflection, absorption and transmission of sound; echo, sound foci, dead spots, sound shadows, resonance, insufficient loudness, external noise.

Unit III - Noise control
9 periods / 3 Weeks
Indoor noise, planning against indoor noise, outdoor noise (traffic & buildings in built – up area), planning against outdoor noise.

Unit IV - Sound insulation of buildings
9 periods / 3 Weeks
Materials, insulation by hollow & composite wall construction, rat trap bond etc; insulation of flooring & ceiling.

Unit V - Sound systems and Acoustic design
12 periods / 4 Weeks
Principles of acoustic design; sound reinforcement system and public address system; sound system equipments; specification. Exercises: Acoustic design of Auditorium / Conference Halls.

Suggested Books:
4. National Building Code of India
5. Catalogues of leading ASudio Equipment producers viz. Philips, Ahujs etc.

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester-VII
HOUSING

Course Code: ARC 709

Duration of Exam:
Internal Assessment: 50
External Assessment: 50

Contact periods/week: 4
Credit: 4

Objectives: To understand housing problems, need and demand and address them for probable solutions.

Course Contents

Unit I - Definition and introduction to the subject
Define home, house, shelter, housing; Type of housing by physical, architectural, planning, socio-economical angles; Housing norms and standards; Stakeholders and Actors.

Unit II - Housing shortage, its causes and consequences
Housing shortage - national and state level scenario with special reference to the Uttar Pradesh and causes thereof; Population explosion- pressure on land– migration– short supply of shelter and service land– low affordability to acquire shelter- inadequate shelter- origin of slums.

Unit III - Slums
A global review; Genesis of slums in cities; Living condition in slums; Slum up-gradation – Some example of successful up-gradation.

Unit IV - Public efforts to address shortage
Responsibilities in supply of shelter; Role of Governments; Various efforts and schemes made by the Governments to address housing problems; current GOI Housing schemes.

Unit V - Response to the problem through Planning and Design
Reducing cost to suit affordability; cost reduction by using innovative materials, technology, planning and designing and management against cost reduction by space surgery, low specification etc; role of Architects to address the problem.

Suggested References:

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks
Objectives: Understanding resources within and without the site to analyze development potentials and decide strategies of planning and concepts of layouts of buildings.

Course Contents

Unit I – Introduction 12 Periods / 4 weeks
The lie of the land; definition of plot / site and the surrounding land and the region; unit of measurements; reconnaissance survey; detail survey using chain, compass, plane table and theodolite showing contours, watershed, surface drainage, irrigation lands, vegetation etc.; Check soil and water table. Legal status of land viz. approved land use, ownership status, encumbrances; checking bye-laws and other statutory requirements.

Unit II – Study of Environmental Factors 9 Periods / 3 weeks
Considerations of man-made structures, sensuous qualities, cultural data, images and data correlation; vegetation, plant association and distribution; preparation of ecological profile of the area.

Unit III – Site Studies and Feasibility 12 Periods / 3 weeks
Importance; site resources within and without viz. shape and size of the plot, access and surrounding street pattern, wind direction, orientation / sun path, topography / landform and physical features, availability of service infrastructure including disposal systems, surrounding land-uses and physical features; consideration of environment and climate; observations on architectural, environmental and visual aspects; check feasibility of development; analytical diagrams..

Unit IV – Documentation of Studies 6 Periods / 2 weeks
Preparation of maps of matrix analysis, composite analysis, locality plans and topographical analysis.

Unit V – Analysis of resources and strategy of developing Site 12 Periods / 4 weeks
Analysis of the positive and negative resources within and without; conversion of negative resources to positive; slope analysis and identification of buildable and non-buildable land (in case of hilly sites); preparation of alternative site planning strategies utilizing resources to the best performance of functions.

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- VII
ELECTIVE I - SUSTAINABLE ARCHITECTURE

Course Code: ARCE 702  Duration of Exam: 3 hrs
Contact periods/week: 3  Internal Assessment: 50
Credit: 3  External Assessment: 50

Objectives: Understanding the importance of sustainable architecture in the backdrop of global environment; to effectively apply environmentally sustainable techniques and knowledge in building design.

Course Contents:

Unit I - Introduction to environmental sustainability 9 periods / 3 weeks
Understanding eco-system and the issues of global environmental sustainability highlighting its relation to built environment; the ideas, issues and concepts of sustainable Architecture; principles of environmentally and ecologically supportive architecture. Exercises: On the issues dealt in the class.

Unit II - Study of sustainable architecture 9 periods / 3 weeks
Indiscriminate use of energy and carbon emission in production of building materials and construction; pollution; threat to safe living and health; global environment as related to the construction and operation of buildings. Exercise on materials using low energy and low carbon emission.

Unit III – Management of resources for sustainability 9 periods / 3 weeks
Economics and management of natural and man-made resources; approach of conservation in consumption of resources; innovations in sewerage treatment and waste treatment to turn wastes into wealth; recyclability and renewability of resources. Exercise on conservative consumption of resources.

Unit IV – Sustainable building materials, design and construction 9 periods / 3 weeks
Sustainable building materials using less energy and materials; recyclable and renewable materials; innovative design reducing material and energy requirements; innovative construction practices using less resources like water and energy. Exercise on recyclable and renewable building materials.

Unit IV - Low energy design 9 periods / 3 weeks
Hybrid systems; modeling and simulation of energy systems; integration of PV and wind systems in the building; wind, solar and other non conventional energy systems; solar thermal applications for heating and cooling, electricity generation in buildings; solar passive architecture. Exercise on low energy design

Suggested books:
1. Sustainable Residential Architecture Hardcover – Import, 27 Nov 2014 by Ana Maria Alvarez

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – VIII
ARCHITECTURAL DESIGN – VIII

Semester Objective: Integration and application of knowledge of technology, specialization and techniques. Accent on Comprehensive Architectural Design.

Course Code: ARC 803
Contact periods / week: 10
Credit: 8
Duration of Exam: 18 hrs
Internal Assessment: 50
External assessment(Viva): 50

Objectives: Understanding formulation of space standards and requirements, circulation and movement patterns, hierarchy of functions and spaces leading to evolution of a design idea in an urban context; understanding requirements of high volume congregation spaces and site planning, landscape and indoor – outdoor space relationships; applying knowledge gained in building services, and elective subjects for comprehensive design solutions; understanding idea of urban space and the role of Architect in shaping it.

Course Contents
Unit I - Warming up session 24 Periods/ 3 weeks
Any pertinent issue in design education perceived by the teacher concerned preferably within the ambit of the above objectives. Suggested exercise: Time problem - Subject of choice of the teacher.

Unit II - Housing design 48 Periods/ 6 weeks
To understand the difference in housing as a process and product and role of architect to design the product to facilitate that process. Suggested Exercises: 1. Group study of an existing housing complex including its amenities, facilities, services and infrastructure provisions and its maintenance system; 2. Design a housing complex for a mixed group of LIG, MIG and HIG users with community facilities, amenities and services with an accent on structure, vertical circulation, sustainability, landscape and services..

Unit III - Design of multi functional intense activities. 56 Periods/ 7 weeks
To understand high volume multifunctional congregation activities in an urban context as an important urban function and need to preserve safety, security and comfort of users with an accent on structure ans infra-structure. Suggested Exercises: 1. Group study of domains of spaces in public infrastructure buildings like rail/ Bus Stations, Stadium, Market places, etc. and documentation thereof with specific inputs from each student. 2. Design a Stadium / Railway Station/ Interstate Bus Terminal / Multiplex / Indoor Stadium and the like..

Note I. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note II. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives - Preparing sketches, models, portfolio etc. related to the Architectural Design class; preparing competition designs like NASA, ZONASA etc. and undertaking site visits, studies and documentation of buildings clubbing time with the Architectural Design class; orienting students to select their subject for Thesis Project Design to be done in the tenth Semester; imparting knowledge and techniques in report writing.

Course Contents

Unit I - Preparation of models
Teachers may assign time as necessary

Unit II – Rendering of designs
Teachers may assign time as necessary

Unit III – Preparation of Competition Designs
Teachers may assign time as necessary

Unit IV – Orientation to Thesis Design
Teachers may assign time as necessary

Unit V – Preparation of Design Portfolio
Teachers may assign time as necessary

Note: I. Teachers may arrange schedule for conducting these classes and guide the students in each area of activities.

Note II. The timings of this class may be suitably clubbed with the Architectural Design class for organizing site visits effectively.

Note III. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note IV. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding steel as a Structural Material; learning design of steel structures; to learn about steel girders and trusses.

Course Contents

**Unit-1 – Considerations of steel as a Structural Material**
9 Periods / 3 weeks
Introduction, advantages and disadvantages of steel as a structural material; structural steel; stress strain curve for mild steel; rolled steel sections; convention for member axes; types of loads - environmental, snow, rain and erection loads; basis for design; design philosophies; local buckling of plate elements; limit state design – introduction, steel design; limit states of strength and serviceability; probabilistic basis of design, design criteria.

**Unit II - Analysis & Design of Steel Structure (Limit State Method)**
9 Periods / 3 weeks

**Unit III - Tension Members**
9 Periods / 3 weeks
Introduction; types of tension members; section properties, net section area, numerical on angle section and plate; design of tension members by using IS-800:2007.

**Unit IV - Compression members**
9 Periods / 3 weeks
Introduction; types of compression members; sectional properties, Chanel section, I-section; design of compression members by using IS-800:2007. Column Splices, theory of battens and lattices (no designing).

**Unit V Beams and Other Steel Structures**
9 Periods / 3 weeks
Understanding of Miscellaneous Structural Elements; design of laterally supported beams; introducing theory (no designing) of plate girder & its use in industrial buildings; Grillage foundation, its component & use in industrial building; types of roof trusses and nomenclature of its members. (no designing).

**Suggested References:**
1. Duggal S. K., -Limit State Design of Steel Structure (TMH).
2. Punmia B.C.- Theory of Steel Structure.
3. K S Sai Ram-Design of Steel Structures - Pearson Education, India

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - VIII
CONSTRUCTION MANAGEMENT

Course Code: ARC-806
Contact periods/week: 3
Credit: 3
Duration of Exam: 3 Hrs
Internal Assessment: 50
External assessment: 50

Objectives: Learning construction management techniques by various networking methods considering work activities, labour, materials, equipments and costs to deliver construction projects without time and cost over-run.

Course Contents

Unit I – Introduction 6 Periods / 3 Week
To understand need of scientific management of construction activities at the site so as to ensure timely completion of works with optimum use of men, materials & money; role of construction manager at site.

Unit II - Construction Planning 9 Periods / 3 Weeks
Construction planning, scheduling, and controlling for optimum use of resources and time; determining number of working days considering climate, holidays etc; exploring prefabrication of elements to reduce construction time by overlapping activities and maximise resources.

Unit III - Management Techniques 15 Periods / 5 Weeks
Techniques of preparing Bar Chart, Mile stone chart; PERT & CPM, Precedence Networks; Serial effects in mass construction. Exercises: Draw CPM network of a simple construction works.

Unit IV - Construction Equipments 6 Periods / 2 Weeks
Role of equipments and machineries in construction management, factors affecting selection of machineries; standards versus special equipments; understanding issues involved in owning, leasing, operating, and maintaining equipments; economic life of machineries.

Unit V – Pollution control at Site 9 Periods / 3 Weeks
Storage of materials, optimum use of resources including water, observation of pollution control rules; observation of labour laws; waste disposal arrangement during construction.

Suggested References:
1. Antill and Woodhead, Critical Path Methods in Construction Practice (John Wiley and Sons, Inc. 1965)

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References. Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: To understand new challenges to safety, security, comfort and economy arising from complex urban living styles and need to address them by introducing intelligence in buildings by automation; understanding concepts and techniques of intelligence in buildings.

Course Contents

Unit I – Need of intelligence in buildings 9 Periods / 3 weeks
Population explosion, advent of technology, scarcity of resources, complex styles of living; new challenges in human safety, security and comfort; need for economic use of resources; need to meet these challenges by introduction of intelligence in buildings.

Unit II Challenge to safety by fire 9 Periods / 3 weeks
Automation in fire fighting, auto detection of fire by using sensors, controllers, Actuators and activating sprinklers.

Unit III - Challenge to security by theft etc. 9 Periods / 3 weeks
Building intelligence against burglary, theft, homicide etc. by ; introducing CC TV, cameras, audio-visual equipments etc. to control intruders at home or at a business place; facilitating reconstruction of crimes.

Unit IV - Developments in Service Control Systems for economy 9 Periods / 3 weeks
Types of control system required for various building Services viz. HVAC, lighting, shading, security, intercoms and other systems like home appliances, etc.; their concept & working; auto control devices in lighting, air-conditioning etc. for economy.

Unit V Building Automation and cost 9 Periods / 3 weeks
Principles of building automation systems, cost of installation, running & maintenance of intelligent buildings vs. ordinary building; case study of performance of intelligent buildings vs ordinary buildings.

Suggested References:
1. Intelligent Buildings: An Introduction by Derek Clements-Croome
2. Intelligent Buildings: Design, Management and Operation BY Professor Derek Clements-Croome

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach, and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester- VIII
TOWN PLANNING

Course Code: ARC 809
Contact periods/week: 4
Credit: 4

Duration of Exam: 3 Hrs
Internal Assessment: 50
External Assessment: 50

Objectives
Introduction to elementary art and science of town planning including traffic and transportation planning.
Introduction to evolution and development of planning thought through history.

Contents

Unit I - Introduction to the subject
Definitions; terminology viz. Master Plan, Zonal Plan etc; role of a town planner; land use, F.A.R. density, zoning and subdivision regulations.

Unit II - Evolution of Planning Thought
Philosophies of pioneers of modern Town Planning; Beginning of modern movement in town planning - Garden cities, radiant city and linear city concepts; Contribution by Sir Ebenezer Howard, Le Corbusier, Tony Garnier etc.; Development of new towns and cities viz. New Delhi, Chandigarh, Brasilia, Gandhinagar, Navi Mumbai.

Unit III - Planning Principles and Techniques
Planning Surveys; Planning Standards; preparation of Master plans - zoning and development controls.

Unit IV - Planning Legislation
Introduction to the Land Acquisition Act - introduction to a Development / Planning Act like Delhi Development Act or U P Government Act; introduction to laws on Conservation etc.

Unit V - Traffic and Transportation Planning
Traffic characteristics: composition, speed, volume and direction of movement – urban road systems and road geometrics - capacity of roads - design of intersections.

Exercises: Drawing sketches of towns from various periods under each unit as decided by the class teacher.

Suggested Books:
1. Gallion.B., Urban Pattern
2. Hiraskar, G.K., Fundamentals of Town Planning
3. Mumford, Lewis., City in History
4. Korn, Auther., History Builds the Town
5. Rangwala, S.C., Town Planning

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.
Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: To recognize landforms, plantation, water bodies and structures as major landscape elements; to analyze the site elements as potentials and constraints of development and synthesize them to evolve simple landscape schemes.

Course Contents

Unit I - Introduction and History
Meaning, definitions, objective scope, and its relevance to Architecture; landscape styles - formal and informal; types of Gardens - Egyptian, Roman, Chinese, Hindu-Buddhist, Mughal, Japanese etc.

Unit II - Landscape elements, Site Analysis and Planting
Visual, physical, environmental elements - landform, rocks, plantation, water bodies and fountains - their synthesis; site planning with reference to Green Architecture in a landscape design exercise incorporating various elements.

Unit III - Plant identification and Suitability
Botanical and common names, form, texture, salient properties and their appropriate use; effects of trees and plants on microclimate.

Unit IV - Landscape Graphics
Conventional symbols in presentation drawings, e.g.: trees, shrubs, ground cover, hedges, edges etc; concept drawings, preliminary landscape plans, planting plans and drawings.

Unit V - Landscape Design and Construction Techniques
Site preparation, grading, site drainage and erosion protection; landscape--retaining wall and stairs; landscape paving, fences and freestanding walls, grass laying, wooden decks, outdoor furniture and lighting.

Exercisers: Visit to good landscape sites may be undertaken in coordination with Architectural Design class; students may draw sketches based on the techniques learnt in the class.

Suggested Books:
1. Simonds, J.O., Landscape Architecture
2. Bose, T.K., & Chowdhary, B.S., Tropical Garden Plants
3. Randhawa, M.S., Flowering Trees
4. Little Wood, Michael, Landscape Detailing (Surfaces)
5. Santapan, H., Common Trees.

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester - VIII
ELECTIVE III - COST EFFECTIVE CONSTRUCTION

Course Code: ARCE 802
Contact periods/week: 3
Credit: 3

Duration of Exam: 3Hrs
Internal Assessment: 50
External Assessment: 50

Objectives: To understand the cost implications of all components of building from planning and designing to implementation on the ground including its transformability and maintenance in order to make the building cost effective without compromising with essential requirements and quality.

Course Contents:

Unit I - Introduction to cost effective construction 9 Periods / 3 weeks
Understanding the difference between Low Cost and Cost Effective building; understanding lowering cost by way of space surgery, sub standard specifications, compromising with quality etc. against cost effective construction by way of availing innovative building materials and technology, efficient planning and implementation etc.

Unit II - Cost efficiency by using Innovative Materials 9 Periods / 3 weeks
Understanding various innovative nonconventional materials like Stabilized Mud blocks, hollow bricks and concrete blocks, Ferro Cement, Foam Concrete etc.

Unit III - Cost efficiency by innovative Technology 9 Periods / 3 weeks
Understanding innovative construction techniques like Rat-Trap bond, Cavity walls, Ferro cement walls, prefabrication like hollow concrete wall and roofing Panels etc; limited mechanization for quality and speedy construction;

Unit IV - Cost efficiency by efficient planning and design 9 Periods / 3 weeks
Designing buildings with maximum space efficiency; multiuse of space by using innovative furniture and fixtures without sacrificing quality and standard of building.

Unit V - Cost efficiency by construction management techniques 9 Periods / 3 weeks
Application of construction management techniques to reduce time of construction by efficient deployment of labour and resources thus saving costs of time; understanding of Critical Path Method.

Suggested books:
1. Hand Book of Low Cost Housing by A. K. Lal; New age international publisher
2. Appropriate Building Materials for Low Cost Housing; International council for Building research, studies and documentation
3. Elpel, Thomas J., Building a House on Limited Means: The Elimination of all that is unnecessary to achieve a Dream.

Note I. Latest editions of the suggested books and relevant websites are recommended

Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding about natural disasters, factors causing them, and to foster knowledge to prevent loss of life and properties by taking measures at the design stage and manage the aftermaths of disaster; case studies of natural disasters to plan and design better to reduce risks of losses.

Course Contents

Unit I - Introduction to Hazards & Disasters
Understanding disaster - Indian scenario; various types of disasters; hazard and its classification; vulnerability, capacity, risk; to understand the causes, adverse effects, distribution patterns; mitigation measures of earthquake, tsunami, cyclone, flood, lighting and landslide; disaster management cycle.

Unit II – Study of Disasters
Studies to understand various types of disasters (National as well as International) occurred in the past and their inferences.

Unit III - Disaster Resistant Construction Techniques
Risk reduction measures through land use control, site planning and land management; risk reduction of loss of life and material by proper design and construction of buildings to withstand various types of disasters.

Unit IV - Disaster Mitigation
Pre-disaster actions, emergency response, transitional arrangements, and recovery measures; disaster management plan; Natural Crisis Management Committee and State Crisis Management Group; role of Architects in preparing rehabilitation plans and designing fast erectable and reusable shelters.

Unit V - Disaster Preparedness & response
Disaster Management Act, Guidelines, NDMA; vulnerability assessment & warning systems for above said disaster types; programmes and strategies for disaster reduction; effective communication.

Suggested Books:
1. Arnold, Christopher, Building Configuration and Seismic Design.
2. Schild, Frich & Others, Structural failures in Residential Buildings-
Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References. Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Semester – IX
PRACTICAL TRAINING

Course Code: ARC 903
Contact periods/week: As per office norms
Credit: 20

Duration of Exam: Nil
Internal Assessment (Viva): 50
External assessment (Pract): 50

Introduction to Practical Training: Students are required to go on field/ practical training for six months in a professional Architect’s office/ organization. Architecture. Each student shall be issued an authority letter by the head of the institutions for practical professional training with the specified organization. The candidate shall report immediately in the given Performa duly signed about the date of joining of training. Each candidate shall be provided a log book containing the Performa one for every week’s work. The students shall take full initiative at their own responsibility in making the best use of their training opportunities and try their best to gather experience in works and procedures of building trade.

Objectives: Exposing students to the professional field, apply the theoretical knowledge learnt, experience nuances of the professional practice and readjust their knowledge base; gathering real life experience of the profession and resolve questions which remained unanswered; to equip them to take up their likely responsibilities immediately after graduation; to take the advantage of self-orienting and preparing themselves to deal with thesis project to be dealt in the next Semester.

A. Rules of Practical Training during Semester IX

1. Introduction
   1.1 Each student is required to proceed on ‘Practical Training’ to a pre-selected professional office duly approved by the Training Coordinator of College of Architecture.
   1.2 The marks for ‘Practical Training’ will be awarded to each student in accordance with the Regulations and Guidelines issued separately by the University.

2. Criteria for selection of a Training Office
   2.1 In case of proprietorship firm, the proprietor shall be an architect and the firm shall have at least two or more architects as employee/associates.
   2.2 The employing Architect / Firm must have complied the rules and regulations of the Council of Architecture.
   2.3 In case of ‘Public-sector’, ‘State / Central Government office, Academic Institution, Multinational Organization”, there shall be a separate wing for architectural consultancy headed by an Architect.
   2.4 The said Architect (Proprietor/Partner/Director/Head of Department/Chief Architect etc.) shall have at least 5 years of working experience and the organization should have a variety of projects.
   2.5 The training may be permitted in an Architect’s office outside India also, provided the office meets the above criteria.
   2.6 The office offering training shall have enough projects in hand for the student to work at least on residential and/or commercial projects.

3. Working Relationship between the Architect and the Trainee
   3.1 The Architect shall provide enough works to the trainee to keep him/her professionally occupied.
3.2 The Architect shall expose the trainee to different aspects of professional practice. The tasks given to the trainee shall include the following - Preparation of:

a). Preparation of major jobs:
- Sketch designs, presentation drawings etc.
- Municipal drawings according to the byelaws.
- Workings drawings and details.
- Estimates, bill of quantities & specifications.

b) Discussions, interactions etc.:
- Discussions with Clients,
- Structural Consultants,
- Services Consultants and field crew.

c) Inspection and management of site & Preparation of:
- Models, perspectives and photographs
- Reports, progress charts etc.

3.3 Other administrative works

4. Honorarium/Stipend

4.1 The Architects usually pay some amount as honorarium /stipend to meet the pocket expenses of the trainee based upon a mutual agreement between the employing architect and the trainee. The University has no objection if the trainees accept/receive such honorarium/stipend.

4.2 Though such an honorarium /stipend shall neither be a claim of the trainee nor a binding on the Architect engaging the trainee, in order to maintain professionalism and the dignity of profession, the training office may pay a respectable amount as stipend/honorarium.

4.3 The University /Training and Placement Cell of the Institute shall not in any way be responsible for any payment whatsoever against any claim or demand by the office of the Architect / employer.

5. Code of conduct for the trainee

5.1 He/she shall inform the Institute/Training & Placement Cell about joining the training office, its address and contact numbers along with the address of accommodation during the training period instantly

5.2 He/she shall abide by the rules, regulations, general instructions and discipline of the office/firm.

5.3 He/she shall remain punctual and regular in attendance.

5.4 He/she shall make all efforts to learn the work involved in the profession, and put additional time for work if so required.

5.5 He/she shall respect and obey the senior members of the office/firm.

5.6 He/she shall take up the job with full responsibility and show utmost interest in the work allotted.

5.7 He/she shall keep the Training and Placement Cell fully informed about his/her progress in the training office and shall remain in regular touch with it.

5.8 In case of any complaint or misconduct reported by the office of the Architect or comes to the notice of the University/Training & Placement Cell, strict action against the student shall be initiated.

5. Arranging/Fixing-up the Training office

5.1 The College of Architecture, Teerthanker Mahaveer University, directly or through the ‘Training and Placement Cell’ of the University may provide a list of offices, along with their addresses of some
well-established and recognized Architects. Addition, alteration and deletion in such a list may be made from time to time in conformity to ‘Criteria’ as laid down for selection of a training office.

5.2 After seeking advice from the ‘Training and Placement Cell’, the student shall make his/her options available to the Training and Placement Cell.

5.3 With the help of ‘Training and Placement Cell’, the student shall make all efforts to settle his/her appointment as trainee with an established and recognized architect.

6. Joining and Leaving the Training Office

6.1 The trainee is expected to join the training office on the scheduled date, and submit his ‘Joining Report’ on the letterhead of the office duly signed by employer Architect or the Head of Training of his office to the University/Training & Placement Cell in the ‘Proforma’ prescribed for the purpose and contained in the Log Book.

6.2 The trainee must obtain a ‘No Dues Certificate’ and get officially relived from the Architect’s office at the end of the training period or before changing the ‘Training Office’. The trainee must submit this ‘No Dues Certificate’ to the University / College along with the Log Book.

7. Change of Training Office

7.1 In case of any emergency, a trainee may be permitted to change the training office/place of training once only during the entire period of training. He/she shall seek prior permission for such a change from the designated Officer in-charge of the University / ‘Training and Placement Cell’.

7.2 Training Office can’t be changed before three Months of Practical Training.

7.3 The total duration of the practical training shall be the sum of the period of stay in different offices. It shall be in conformity with the ‘Duration of Training’ as prescribed in the ‘Ordinances, Scheme of Examination & Syllabus’ of the University.

8. Final Submissions

8.1 After completion of practical training, the trainee is required to submit the documents to the University as listed below:

8.2 ‘Certificate’ of successful completion of the practical training mentioning the attendance in percentage, from the employer’s office/ Architect.

8.3 ‘Daily Diary’ with details of the day to day work record, which will be returned to the student after assessment and viva voce examination. The suggested ‘Proforma’ of the page of the daily diary is available in the prescribed ‘Log-Book’.

8.4 ‘Training report’ supplemented with the prints and documents of work done during practical training. The prints and documents shall be obtained with the permission of the Architect’s office and shall be duly signed by the ‘Supervisor’.

8.5 Training report shall be submitted in three copies. First copy shall be returned to the student after assessment of Sessional marks and Viva Voce examination. The second copy shall be submitted to the Guide for examination and the third copy shall be retained by the Training and Placement Cell / library. These shall be presented in A-4 size with ring binding or any other binding prescribed by the University.

9. Failures:

9.1 In case the student/trainee remains unsuccessful or fails in completing his/her practical training or viva-voce examination, the matter shall be dealt with in accordance with the relevant ‘Rules and Regulations’ of the University.

B. Conduct and Record of Training
1. **Training Supervisor:**
   While receiving practical training in an architect’s office, each trainee must work under the directions of a ‘Training Supervisor’ who shall bear a special responsibility for training. The ‘Training Supervisor’ shall forward a report on the performance of the trainee, confidentially directly to the University / College during the period of training and, authenticate the information recorded on the ‘Log-sheets’ and the ‘Daily Diary’ maintained by the trainee, by affixing his signature thereon, so that the information could form the basis for Internal Evaluation (Viva Voce examination) later for awarding the marks for training.

2. **Daily Diary:**
   The trainee should maintain a ‘Daily Diary’ during his/ her practical training to supplement the information kept in the Log-Sheets. The diary should contain enough details to refresh his memories after long interval of time. It should have the record of work done during the office period and overtime. It is also the place to record the decisions made regarding various projects and reasons behind them. He is also expected to make his own notes on various decisions/discussions etc. taken for each project on what he has learnt from particular job under the subheads of “comments” and “observations.”

3. **Log-Book:**
   3.1 This ‘Log-Book’ contains an ‘Index Sheet’ marked as PT-2 and a set of ‘Log-Sheets’ marked as PT-3A/ through PT-3C/ in which you are expected to summarize and record the information of work done by you during the training period. Following is the procedure that is to be adopted for filling up information. (Page number in serial order is to be written after (/) the slash.) (A set of sample log sheets has been attached at the end of log book marked as PT-2/S (Sample), PT-3A/S (sample), PT-3B/S (sample) and PT -3 C/S (sample).
   3.2 In the Index Sheet PT-2, the student shall record the details of training office/s in the Table:1/PT-2 which is titled as ‘Index of Training Office’, while the contents of next ‘Log-Sheets’ are summarized in the Table: 2/PT-2, which is titled as ‘Table of Contents’.
   3.3 You should supply the ‘Work information’ on the set of log sheets PT-3A, PT-3 B and PT-3C. One such set is to be used for one month. The table 1/PT-3A __, seeks information regarding the projects handled by him with the time (in hours) devoted to each project in a particular week. In the first column a project serial number for each project is already printed. This serial number is referred to in tables 2/PT-3 B & 3/ PT-3C. In the next column ‘Office Job No.’ the number of job as allocated by the training office may be noted down for their records. In the next column the number of hours spent by the student during office hours/certified overtime may be written for the particular project in the first calendar week (beginning with 1st Monday of the calendar month), second week (beginning with 2nd Monday) and so on. The column of remarks should carry brief note, if required.

4. **Methods of furnishing information on jobs done**
   The Table 2/PT-3B seeks to elaborate the information given in Table 1/PT-3A by expanding to the number of hours put in different types of work done in different projects. In the first major column is listed the types of work that might have been done by the student while on training. The second major column provides 8 sub-columns which serialize the projects as indicated in Table 1/PT -3A. In each cell below various sub-columns, the student should record the number of hours spent for different types of work in the respective row. For example- Number of hours spent by the student on preparing, say, presentation drawing for project no. 2, 3, & 6 etc. should be recorded in the cell located at the intersection of the row of presentation drawing and column of project serial no. 2, 3, & 6, and appropriate brief notes may be recorded in the column of remarks. The brief descriptive details of the work done for the particular project should be recorded in the Table 3/PT-3C which is indicated by project serial number. For example- If the student has
prepared, the foundation plan for a project among the working drawings, it should be detailed in the Table in brief. The student may make detailed supplementary notes in the daily diary.

5. Verification of Information
The information recorded on every log sheet should be verified by the supervisor of the student in the space provided on each ‘Log-Sheet’.

6 Important Notes:
If one log sheet no. PT-3A/__ falls short to record the number of projects dealt by the student in one month, copies may be made and used in continuation adding (2), (3) etc after PT-3A__ to make it PT-3A__ (2), PT -3A__ (3) etc.; likewise additional copies for log sheet PT-3B__ or PT-3C__ may be used.

7. Monthly Performance Report
The student shall send monthly progress report duly signed by the training office by 5th of every month.

8. Academic Requirement during Training Period
8.1 In order to ensure that a student perform satisfactorily and undertake the jobs as per the requirements of curriculum, it is necessary that a student gets chance to prepare jobs as listed below:
   i) Site Measurement Drawings;
   ii) Layout Plans
   iii) Foundation Drawings (related with structural drawings)
   iv) Grid Plans
   v) Floor working Drawings
   vi) Elevation, Sections & Details
   vii) Staircase Sections and details
   viii) Toilet Details
   ix) Kitchen Details
   x) Furniture Layouts
   xi) Electrical drawings
   xii) Door window schedule
   xiii) Plumbing Drawings
   xiv) Municipal Drawings

8.2 Other jobs that may be undertaken during training:
   i) Planning Work
   ii) Landscape Details
   iii) Elevations
   iv) Presentations
   v) Estimation
   vi) Bill Checking
   vii) Coordination with other Consultants
   viii) Views making (not full time)

8.3 Some more jobs that is important which may be undertaken during training:
   i) Presentation to client
   ii) Coordination with the contractor
   iii) Site coordination
   iv) Some office administrative work
9. Mandatory work
   9.1 Different Types of site visit
   9.2 Live site visit at different working levels

The trainee student must expose himself to a variety of jobs and not only on just drafting works or on preparation of views and presentation drawings. He/She may also ensure by dint of merit that he/she is not dumped in the office doing or learning nothing.

The above-mentioned points should be reflected in the final compilation of work and the report of the student.

C. Conduct of Examination / Evaluation of Practical Training:

1. Evaluation by the Office of the Architect: The office of the Architect imparting training to the student shall evaluate performance of the student out of 50 marks at the end of the training period based on the parameters set in the preceding text.

   Total … 50 marks

2. Evaluation by internal viva-voce examination: An internal viva voce examination shall also be conducted on the basis of the drawings, report, log books and all other documents prepared by the student during training. A panel of three examiners consisting of the Head of the Department or a senior Faculty nominated by him, a practicing Architect of good standing and a senior academician preferably from outside shall be formed to conduct the viva voce. The Training Coordinator shall convene the examination. The Panel will examine the students works as per the norms prescribed below:

   a. Drawings and assignments done during training … … 20 marks
   b. Log Book and proforma presentation … … 10 marks
   c. Report … … … … 10 marks
   d. Interaction with and Presentation to the examiners … 10 marks

   Total … 50 marks

Grand Total Marks for Training = 100 marks

Note I. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
EVALUATION SUMMARY OF THE TRAINEE

Name of Trainee
Course – B.Arch.
Institute – Teerthanker Mahaveer College of Architecture
Address- Teerthanker Mahaveer University, Delhi Road, NH-24, Moradabad, 244001, Uttar Pradesh

<table>
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<tr>
<th>S No.</th>
<th>Criteria of evaluation</th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
<th>Outstanding</th>
<th>Exceptional</th>
<th>Marks Obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Experimental Skill / Research Aptitude</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
<td>100%</td>
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<tr>
<td>2</td>
<td>Creative Ability &amp; Imagination</td>
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<td>Ability to Analyze &amp; resolve problems</td>
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<td>4</td>
<td>Initiative to learn</td>
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<td>5</td>
<td>Perseverance/Commitment</td>
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<td>6</td>
<td>Clarity in thoughts</td>
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<td>7</td>
<td>Ability to organize &amp; Work in a group</td>
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<td>8</td>
<td>Command in Computer presentation</td>
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<td>9</td>
<td>Graphic Communication Skill</td>
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<td>10</td>
<td>Oral Communication Skill</td>
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<td>Written Communicational Skill</td>
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<td>12</td>
<td>Knowledge in other Subjects &amp; its application</td>
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<tr>
<td>13</td>
<td>Interest for visit to sites during construction</td>
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<tr>
<td>14</td>
<td>Overall development &amp; behaviour during training</td>
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<td></td>
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<tr>
<td>15</td>
<td>Attendance &amp; punctuality in the office</td>
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</tbody>
</table>

*For University use only*

Remarks of the Architect Supervisor/Head of the Office-

Place- ____________________________
Date- ____________________________

Signature of Architect
With office Seal
COA No.
JOINING REPORT

Mr. /Ms. ________________________________________, a student of Bachelor of Architecture (VTH YEAR) of the College of Architecture, Teerthanker Mahaveer University, Moradabad has joined our office, as a trainee, in the forenoon/afternoon on ________________, as a part of the compulsory Six Month practical training During Vth Year of the B. Arch programme under the Teerthanker Mahaveer University, Moradabad

____________________
Signature of Architect  
With office Seal

COA No._________________

Place----------------------

Date----------------------
NO DUES & RELIEVING CERTIFICATE

This is to certify that Mr./Ms.-----------------------------, a Student of the Vth Year B. Arch. of the College of Architecture, Teerthanker Mahaveer University, Moradabad has Completed his/her compulsory Six Month Practical training as stipulated by the Teerthanker Mahaveer University, Moradabad, in our office. He worked under the supervision of _________________________. From _______________ to _______________ and is being relieved from this office. This forenoon / afternoon of _________________. It is further certified that, he has handed over the charge of materials/books etc. Which were in his custody and no outstanding dues are pending against him/her.

_________________________________ Seal &
Signature of Architect

COARegistration No._________________________

Place-----------------------------

Date-----------------------------
Teerthanker Mahaveer College of Architecture
Moradabad-244001

Index of Training Office
Table: 1/PT - 2

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Training Office</th>
<th>Staff Strength (Expect Trainees)</th>
<th>Date of Joining</th>
<th>Date of Leaving</th>
<th>Stipend Received</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

TABLE OF CONTENTS
Table: 2/PT – 2
Teerthanker Mahaveer College of Architecture  
Moradabad-244001

<table>
<thead>
<tr>
<th>Student’s Name : ...........................................</th>
<th>Month : .............................................</th>
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</thead>
<tbody>
<tr>
<td>Class &amp; Session : ...........................................</td>
<td>No of Weeks in Training : ........................</td>
</tr>
</tbody>
</table>

Name & Address Of Training Office :
....................................................................................................................................................................
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Supervisor’s Name :
....................................................................................................................................................................

Qualifications:
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Entries on this Log Sheet are verified
....................................................................................................................................................................

Signature of Supervisor

WORK INFORMATION:
Table: 1/PT -3A/

<table>
<thead>
<tr>
<th>Project’s Name &amp; it’s location</th>
<th>Office Jo No.</th>
<th>No. of hours put into the project during the calendar week starting with DATES</th>
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<tbody>
<tr>
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</tbody>
</table>
MONTHLY PROGRESS REPORT FOR PRACTICAL TRAINING
SESSION:-

Name of Trainee:

Month of Report:

No. of Project Handled:

Nature of Work Done: (Tick the Options as under)

- Measurement Drawings
- Working Drawing
- Planning
- Presentations
- 3d Views
- Detail Drawings
- Conceptual
- Site Visits
- Market Surveys
- Estimation
- Client Presentation
- Interior Drawings
- Models
- Specifications
- Any Other Please specify

Trainee Name/ Signature Date:

It is to certify that the information given by Mr/ Ms ............................... is correct. Further I want to bring to your notice my observation about students’ performance of the month.

(Remark of the training Supervisor)

Architect Name/Signature Office Seal

To be sent in scan copy to college by the 1st week of every month dully signed & filled
**WORK INFORMATION:**

Entries Herein verified

...........................

Signature of Supervisor

Month ..................................

Table 2/PT-3B

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Type of Work done for projects</th>
<th>Project No.</th>
<th>No. Of Hours put in Project S. No. From Table: 1/PT-3A/______</th>
<th>Remark</th>
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<tr>
<td>1</td>
<td>Municipal Drawings</td>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10</td>
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<tr>
<td>2</td>
<td>Presentation Drawings</td>
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<td>3</td>
<td>Working Drawings</td>
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<tr>
<td>4</td>
<td>Construction Details</td>
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<tr>
<td>5</td>
<td>Structural Analysis/Design</td>
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<td>6</td>
<td>Structural Drawing</td>
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<tr>
<td>7</td>
<td>Services Design/details</td>
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<tr>
<td>8</td>
<td>Planning &amp; Design</td>
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<tr>
<td>9</td>
<td>Interiors</td>
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<tr>
<td>10</td>
<td>Models</td>
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<tr>
<td>11</td>
<td>Site Supervision/Visit</td>
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<tr>
<td>12</td>
<td>Estimate &amp; Costing</td>
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<td>13</td>
<td>Specification etc.</td>
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<td>20</td>
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</tbody>
</table>
Table 3/PT-3C

**WORK INFORMATION:**
Details of work done as informed through Tables- 1/PT-3A/ ____ & 2/PT-3B/ ____
(Use Additional sheets if need be)

<table>
<thead>
<tr>
<th>Projects S. No.</th>
<th>Details</th>
</tr>
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<tbody>
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</tbody>
</table>
Objectives: understanding the role and duties of an Architect in society and conduct in Architectural Practice; familiarizing with process of appointment of a contractor through tenders; introducing requirements of Architectural Competitions and need to participate in it for establishing practice.

Course Contents

Unit I - Council of Architecture and Professional Bodies 12 Periods / 3 weeks
Architects’ Act 1972 creating Council of Architecture (CoA) to protect the profession; procedures of registration of the graduate Architects with the Council; The Indian Institute of Architects (IIA) - its working constitution and byelaws, categories of membership, election procedures etc.; the State Chapter of IIA.

Unit II - Conditions of engagement of an Architect 12 Periods / 3 weeks
Duties, responsibilities and liabilities of a professional Architects; scale of fees, mode of payment etc.; code of professional conduct and clauses governing conduct of professional architect in the Architects Act.

Unit III – Building Tender and Contract 12 Periods / 3 weeks

Unit IV - Architectural Competitions 12 Periods / 3 weeks
Types of competitions, composition of jury, procedures of conducting such competitions. Need of competitions.

Unit V - Office organization & Administration 12 Periods / 3 weeks
Private professional organization; setting of practice. Salaried, appointments – jobs in government, public sector, private sector; procedure of operation in government organizations.

Exercises: The teacher may conduct exercisers on various aspects of the Units.

Suggested References:
1. C.O.A., Handbook of Professional Documents
2. I.I.A., Handbook of Professional Practice
3. Namavati, R.H., Professional Practice
4. Namavati, R.H., Theory of Practice Valuation
5. Symes, Martin, Architects & their Practices

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: To independently handle a full-fledged Project of approved subject and size and present all aspects of an architectural design from its analysis and concept stage to a final solution in totality; to understand the design process and techniques required for a successful presentation of an architectural design; to be able to handle specific aspects of the project design.

Thesis Programme
Selection of the Thesis Topic and Guide:
This stage started in the preceding two Semesters when students were exposed to Thesis orientation and professional training. The topic of the Thesis Project should result in tangible ‘built environment’ solution for a ‘live design programmers’; however, hypothetical and research-oriented topics shall also be permitted as long as it satisfies the requirements of contents and purpose with clarity. The inherent potentials and aptitude of the student shall be given importance while approving a topic to him/her.

The students shall be required to submit the synopsis of at least two design-oriented topics latest within the second week of the tenth Semester of which one shall be approved. Those who have already finalized the topics during the Semester VIII under the subject Design Presentation and Thesis Orientation and got it approved by the Head of the Department, they need not submit the same again.

Upon finalization of the thesis topic, each student shall be attached to a Guide for day to day supervision of the thesis. Students may be asked to submit three options of guides to guide. Though it is not a binding on the Department to allot guide as per his or her choice.

Methodology:
Structure of topic: A thesis topic shall have a context of place, people and time; the context of place means the context of location, the context of people relates to its users and stakeholders; and the context of time commits itself to the period a building is to serve; change or modify itself.

The thesis methodology: It consists of problem identification, case studies, formulation of requirements, evolution of design criteria, and submission of the design proposals
Components of Thesis Project: 1. The design proposals shall be submitted complete with plans, elevations, sections, details and views. The details shall include structure, services, and special features, if any. 2. The thesis shall include a Report explaining the design considerations, sketches explaining concept, provisions, and other notes. 3. The thesis shall also include models of the site, layout, and the buildings to explain the project better.

Thesis Report:
The thesis report shall normally have chapters such as objectives and goals, scope, methodology, literature studies, case studies, climatic data, site analysis, formulation of requirements, design criteria, special design considerations such as measures taken to make it sustainable, an idea of cost and a conclusion highlighting how it succeeds to achieve its goals. The thesis report shall also contain photographs of models and prints of the sheets prepared at the design stage. The report shall be submitted in one soft copy and three hard copies.

The Design Proposals:
The design proposal shall be in the form of sheets and models and may be explained through oral or audio-visual presentations. Besides developing design solutions within the identified scope, the students are required to deal with one specific aspect of the design in complete detail. The choice of the specific elective
shall be decided by the student in consultation with his Guide. There shall be separate marks reserved for the special elective so chosen.

**Return of Thesis Submission:**
The original drawings, models and one copy of the thesis report shall be returned to the student after the final assessment in due course of time.

**Evaluation of Thesis Project Design**
Evaluation of Thesis will be done in five stages as stated below:

**Evaluation Stage I – Pre-Design Studies**  
10 marks

1.1. Case Studies & Literature Studies
- Study of various buildings (minimum 2 live and 2 virtual studies) of similar nature & magnitude under the following heads:
  - Form of the building, skeletal, plastic, & planner and image of the building.
  - Plan Form.
  - Geometry & Structure of the buildings.
  - Section studies.
  - Circulation, Vehicular, Pedestrian, & No. of parking.

1.2. Study of the Site & Analysis
- Location & Key Plan (City Map Showing the site).
- Local building bye-laws & area of site, volumetric studies based on Ground Coverage, FAR, setbacks, height restrictions & parking norms.
- North Point, wind directions & preferred views.
- Study of shape, size, orientation (sun path), wind pattern and street pattern around the site.
- Topography of the site, site section & infrastructure available in & around the site.
- Climate study
- Slope analysis showing buildable & non buildable areas for undulating sites
- Relief Plan for undulating sites.
- Site Model

1.3. Surrounding Area Study
- Study of resources of the surrounding areas
- Study of activities of the surrounding areas

1.4. Study of buildings in the area
- Materials & fenestration;
- Study of building skins with as related to climate

1.5. Understanding the functional aspects of the topic and relate it to site resources.

**Evaluation Stage II – Concept Design**  
10 marks

2.1. Synthesis of pre-design studies.

2.2. Development of design strategies.

2.3. Drawing inspiration from the pre design studies and evolving concept

2.4. Concept stage shall consist of sheets showing / explaining activities as given below:
- Zoning layouts showing development strategy locating various activities with justification.
- Bubble diagrams to explain strategy - the size of bubbles may relate to the building bulk inter-relationship of various activities
- Various building blocks & their relationship
- Deposition of the primary indoor areas
- Deposition of Secondary indoor areas
- Internal & external circulation – both vehicular & pedestrian
- Adherence to Building bye laws
2.5. This stage shall highlight considerations made for design, climate as also site & topic related aspects.
2.6. Conceptual Block model may also be prepared.

**Evaluation Stage III – Preliminary Design**

<table>
<thead>
<tr>
<th>Marking</th>
<th>Details</th>
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<tbody>
<tr>
<td>3.1.</td>
<td>Accent on Structure as a compulsory elective</td>
</tr>
<tr>
<td></td>
<td>- Structural System</td>
</tr>
<tr>
<td></td>
<td>- Structural concept &amp; justification of structural grid size</td>
</tr>
<tr>
<td></td>
<td>- Size of Column or any other structural elements used</td>
</tr>
<tr>
<td>3.2.</td>
<td>Site Plan showing adjoining sites &amp; buildings, positioning of the building in relation to access</td>
</tr>
<tr>
<td>3.3.</td>
<td>Building Plans at Various levels</td>
</tr>
<tr>
<td>3.4.</td>
<td>Detailed part elevations &amp; sections showing proposed architectural expression</td>
</tr>
<tr>
<td>3.5.</td>
<td>Model showing different design elements to explain the design.</td>
</tr>
<tr>
<td>3.6.</td>
<td>Design provisions as per the chosen special area from the list services or electives of the syllabus.</td>
</tr>
</tbody>
</table>

**Evaluation Stage IV - Pre Final Design**

<table>
<thead>
<tr>
<th>Marking</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.</td>
<td>Detailed Floor Plans</td>
</tr>
<tr>
<td>4.2.</td>
<td>Detailed Elevations &amp; Detailed Sections</td>
</tr>
<tr>
<td>4.3.</td>
<td>Conceptual views &amp; considerations</td>
</tr>
<tr>
<td>4.4.</td>
<td>Any other details showing the architectural features</td>
</tr>
<tr>
<td>4.5.</td>
<td>Details Showing the structure elements and grid plan</td>
</tr>
<tr>
<td>4.6.</td>
<td>Site Plan &amp; Area Analysis</td>
</tr>
<tr>
<td>4.7.</td>
<td>Views</td>
</tr>
<tr>
<td>4.8.</td>
<td>Details of subject chosen Services or Electives viz. Water Supply and Drainage / Electrical / Mechanical / Acoustics. Intelligent Building / Sustainable Architecture / Cost Effective Architecture, Disaster Resistant Architecture etc.</td>
</tr>
</tbody>
</table>

**Evaluation Stage V - Final Design and Report**

Students are required to incorporate all the suggestions made in the Evaluation Stage IV and submit drawings in appropriate scales listed below:

<table>
<thead>
<tr>
<th>Marking</th>
<th>Details</th>
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<tbody>
<tr>
<td>5.1.</td>
<td>Complete Area Analysis</td>
</tr>
<tr>
<td>5.2.</td>
<td>All Plans, Elevations, Sections and Detailed Drawings</td>
</tr>
<tr>
<td>5.3.</td>
<td>Structural Analysis Data</td>
</tr>
<tr>
<td>5.4.</td>
<td>Elective Details</td>
</tr>
<tr>
<td>5.5.</td>
<td>Any other details relevant to Design</td>
</tr>
<tr>
<td>5.8.</td>
<td>Views and Presentation drawings.</td>
</tr>
<tr>
<td>5.7.</td>
<td>Detailed Model</td>
</tr>
<tr>
<td>5.8.</td>
<td>Complete Compiled Report</td>
</tr>
</tbody>
</table>

**General rules to be observed:**

1. The Department shall identify a senior Faculty or an external expert to act as the Thesis Advisor over and above the Guide, if necessary.
2. The Head of the Department shall identify an experienced Faculty member as Thesis Coordinator to communicate, organize Jury meetings, receive submissions from the students and any other works assigned to him / her by the former.
3. The Thesis Advisor may act as the Thesis Coordinator and vice versa if so decided.
4. The students are required to present their works for a each Stage of Jury by display of their works drafted in scale properly and explain the same to the Jury members.
5. The students are required to submit their works to the Thesis Coordinator for every Stage of submission by 4 P.M. on the day preceding the commencement date of the Jury meeting.
6. The students are required to get each sheet of their works signed by their respective Guides at every Stage before submission and presentation before the Jury.
7. The students shall display their works for presentation to the Jury for a particular Stage along with their preceding works.
8. No unsigned drawing shall be accepted during presentations to the Jury.
Conduct of Examination:

Internal assessment = 50 marks

For internal assessment of the works of students submitted during the first four stages of Thesis submissions a panel of Jury of three members headed by the Head of the Department shall be formed by the latter as per the following composition:

1. Head of the department
2. The Thesis Guide of the concerned student
3. The Thesis Advisor or an experienced practicing Architect from the field as may be decided.

**Internal Evaluation for stages:**

<table>
<thead>
<tr>
<th>S no.</th>
<th>Evaluation Stages</th>
<th>Marks</th>
<th>Method of marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I - Pre-Design Studies</td>
<td>10</td>
<td>Each Jury member shall evaluate and mark independently in each Stage which will be averaged as final.</td>
</tr>
<tr>
<td>2.</td>
<td>II - Concept Design</td>
<td>10</td>
<td>Marks may be given as per the attributes set for external evaluation. below</td>
</tr>
<tr>
<td>3.</td>
<td>III - Preliminary Design</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>IV - Pre-Final Design</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>V - Final Design and Report</td>
<td>10</td>
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<td></td>
<td>TOTAL</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

External Assessment (Viva-Voce) = 50 marks

**Thesis Jury:** The final assessment of the thesis shall be done by an external Jury of minimum two members of very good standing. Minimum one of them must be from the field with good professional standing. Only one Jury member may be from the academics. The Head of the Department will approve the names of the Jury.

**Evaluation method by the External Jury:**

Evaluation for Model = 10 marks
Evaluation for ability to draw correctly in sections, plans and elevations = 15 marks
Evaluation for Design idea and concept = 15 marks
Evaluation for Presentation = 10 marks
**Total** = 50 marks
Semester - X
ELECTIVE V - ENERGY EFFICIENT ARCHITECTURE

Course Code: ARCE 002
Contact periods/week: 3
Credit: 3
Duration of Exam: 3Hrs.
Internal Assessment: 50
External assessment: 50

Objectives: Understanding global energy crisis caused by excessive demands of development and fast depletion of fuel calling for ways to use energy efficiently in buildings and alternative sources of energy; understanding the need of availing sustainable natural energy sources options like sun, wind, waves etc. for building services.

Course Contents

Unit I - Passive Design 9 Periods / 3 weeks
3 weeks Introduction; significance of energy efficiency in the contemporary context; simple passive design considerations involving site conditions, building orientation, plan form and building envelope; heat transfer and thermal performance of walls and roofs.

Unit II - Advanced Passive Architecture- Passive Heating 9 Periods / 3 weeks
Direct gain thermal storage of wall and roof; roof radiation trap - solarium - isolated gain.

Unit III - Passive Cooling 9 Periods / 3 weeks
Evaporative cooling - nocturnal radiation cooling, passive desiccant cooling; induced ventilation; earth sheltering; wind tower; earth air tunnels.

Unit IV - Day Lighting and Natural Ventilation 9 Periods / 3 weeks
Daylight: Daylight factor, analysis, shading devices. Types of ventilation; ventilation and building design.

Unit V - Contemporary and Future Trends 9 Periods / 3 weeks
Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and reusable building materials, Nanotechnology, smart materials etc. Future of built environment, Energy Conservation Building code.

Suggested References:
Note I. Latest editions of the suggested books and relevant websites are recommended

Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
Objectives: Understanding design considerations for persons with different abilities; designing barrier free environment with special design features for them for easy access to the buildings and built environment facilities and movement within to avail services in education, training, official works etc.

Course Contents:

Unit I- Introduction to the subject and legal provisions
9 Periods / 3 weeks
Introduction; Disabilities (Equal opportunities, Protection of Rights & Full Participation) Act, 1995; types of disabilities - orthopedic, hearing, visual impairments, national policy for elderly persons; concept of equal opportunity, human rights, social justice and empowerment of physically challenged persons.

Unit II – International awareness and role
9 Periods / 3 weeks
International efforts to address the issue; various types of national Institutions, agencies and professional bodies involved in the welfare of the disabled; role of State, NGO’s, professionals and others.

Unit-III – Building Design considerations
9 Periods / 3 weeks
Considerations for designing user-friendly barrier free environment for differently able persons in educational institutions, hospitals, transport terminals (bus, railway stations, airports etc); standards given in TSS, TCPO, CPWD, ADA, etc; design provisions in public buildings viz. ramps, guide rails, lifts, space for wheel chairs, easy accessibility, signage, audio-visual facilities etc.

Unit-IV – Design considerations for open spaces and roads
9 Periods / 3 weeks
Provisions in public spaces and site planning – parks, play grounds, public transportation, parking lots, Details of sidewalks, road intersections, access to public toilets, etc

Unit-V – Design considerations for interior spaces and services
12 Periods / 3 weeks
Design considerations for interiors spaces at home and office work places including toilets, kitchens for use of the physically challenged. Exercises: Design of user friendly spaces like toilet, kitchen, bed room, office work station, library, railway platform etc. for differently able persons.

Suggested References:

Note I. Latest editions of the suggested books and relevant websites are recommended
Note II. The “General Guidelines” given in this document provides detail guidance on A. Setting of Question Papers and Examination Pattern, B. Suggested methodologies to teach and C. Suggested References.

Note III. Study and Evaluation Scheme Tables given for each Semester may be seen for detail information on Examination and Internal and External Assessment marks.
### ELECTIVE SUBJECTS - SYLLABUS

<table>
<thead>
<tr>
<th>ARCE-701</th>
<th>Architectural Illumination</th>
<th>Elective I -</th>
<th>Semester VII</th>
<th>To be developed later</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCE-702</td>
<td>Site Planning</td>
<td>-do-</td>
<td>-do-</td>
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</tr>
<tr>
<td>ARCE-703</td>
<td>Modular Coordination</td>
<td>-do-</td>
<td>-do-</td>
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<td>ARCE-704</td>
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<td>Elective II -</td>
<td>Semester VII</td>
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<td>ARCE-705</td>
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<td>-do-</td>
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<tr>
<td>ARCE-706</td>
<td>Vernacular Architecture</td>
<td>-do-</td>
<td>-do-</td>
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<tr>
<td>ARCE-801</td>
<td>Advanced Computer Graphics</td>
<td>Elective III -</td>
<td>Semester VIII</td>
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<td>ARCE-802</td>
<td>Cost Effective Construction</td>
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<td>-do-</td>
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<tr>
<td>ARCE-803</td>
<td>Industrialized Building Systems</td>
<td>-do-</td>
<td>-do-</td>
<td>To be developed later</td>
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<tr>
<td>ARCE-804</td>
<td>Architectural Conservation</td>
<td>Elective IV -</td>
<td>Semester VIII</td>
<td>To be developed later</td>
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<tr>
<td>ARCE-805</td>
<td>Building Maintenance &amp; Retrofitting</td>
<td>-do-</td>
<td>-do-</td>
<td>To be developed later</td>
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<tr>
<td>ARCE-806</td>
<td>Disaster Resistant Architecture</td>
<td>-do-</td>
<td>-do-</td>
<td>Incorporated above</td>
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<tr>
<td>ARCE-001</td>
<td>Architectural Journalism</td>
<td>Elective V -</td>
<td>Semester X</td>
<td>To be developed later</td>
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<tr>
<td>ARCE-002</td>
<td>Energy Efficient Architecture</td>
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<td>-do-</td>
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<tr>
<td>ARCE-003</td>
<td>Valuation &amp; Arbitration</td>
<td>-do-</td>
<td>-do-</td>
<td>To be developed later</td>
</tr>
<tr>
<td>ARCE-004</td>
<td>Barrier Free Architecture</td>
<td>Elective VI -</td>
<td>Semester X</td>
<td>Incorporated above</td>
</tr>
<tr>
<td>ARCE-005</td>
<td>Critical Appreciation &amp; Research</td>
<td>-do-</td>
<td>-do-</td>
<td>To be developed later</td>
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<tr>
<td>ARCE-006</td>
<td>Solar Passive Architecture</td>
<td>-do-</td>
<td>-do-</td>
<td>To be developed later</td>
</tr>
</tbody>
</table>

**Note:** The subject Syllabus of the Electives to be taught for the next three years have been already incorporated above. The rest of the Electives shall be developed when the same will be opened for offer.
Elective – I Semester - VII
ARCE701 - Architectural Illumination
ARCE 703 - Modulor Coordination

Elective – II Semester - VII
ARCE-704 Furniture & Product Design
ARCE-706 Vernacular Architecture

Elective – III Semester – VIII
ARCE-801 Advanced Computer Graphics
ARCE-803 Industrialized Building Systems

Elective – IV Semester – VIII
ARCE-804 Architectural Conservation
ARCE-805 Building Maintenance & Retrofitting

Elective – V Semester – X
ARCE-001 Architectural Journalism
ARCE-003 Valuation & Arbitration

Elective – VI Semester – X
ARCE-005 Critical Appreciation & Research
ARCE-006 Solar Passive Architecture