# PANJAB UNIVERSITY CHANDIGARH

# PROPOSED SYLLABUS

for

# Bachelor of Architecture

(Ten Semesters)

Effective from Academic Session 2020-2021

Applicable to B.Arch. students for the Session 2021-22.

**PANJAB UNIVERSITY**
**SYLLABUS FOR B.ARCHITECTURE COURSE**
**(Effective from academic session 2021-2022)**

Philosophical Background: In simple terms, training of an architect deals with the complex relationship of Art, Daily Life and Techniques and the interpretation of this relationship in spatial and physical terms. Thus the aim of architectural education is to train the mind and develop skills to perceive the context of man and society. Today, the teaching of architecture has become a principal way of access to the creative professions, all of which - whether they be the construction of a building or town planning, interior design or landscaping - need professional training of the highest order. Wide horizons need to be covered when training architects. From the history of art (and architecture) to the resistance of material, from computer skills to Project Management, from down-to-earth social issues to intelligent buildings.

The B. Architecture Course is, thus, programmed to give an all-round exposure, with subjects delineated in the four streams of Art, Humanities, Science, and Technology. While the arts stream would train the students in creative thinking and skills through subjects such as Architectural Graphics, Architectural Drawing, etc. the humanities stream covering History of Built Environment, Vernacular Architecture, etc. would acquaint the student with the evolution and philosophy of architecture. Subjects in science and technology such as Building Technology, Structure Systems and Design, Building Construction, etc. are incorporated to give sound theoretical and practical knowledge of technical and constructional aspects of building. This is supplemented by practical application of the acquired theoretical and philosophical information through site visits, tours and practical work. The aim is to develop a holistic approach whereby a student can comprehend problems of architecture in totality of the societal and environmental context.

**The Course Structure**: The Bachelor of Architecture programme has a two tier break-up, with the first tier comprising six semesters and second tier comprising four semesters, making it a ten-semester degree course. The first tier culminates in a degree titled "Bachelor of Building Science". The emphasis here is on giving adequate practice in the basic skills viz. Architectural drafting, Technical detailing, Graphics, Structures and creative expression, culminating in Architectural Design. It is expected that a student, on completion of this stage, would be competent in assisting a qualified architect in running an architectural practice. It is also a foundation for the second tier leading to more advanced courses for the Bachelor's Degree in Architecture. After the first tier, the students are required to undergo one semester’s Practical Training in an established architectural practice to acquaint them of realities of the field. The course culminates in a research-cum-design thesis in the tenth semester when students are required to undertake a topic/project of their choice, conduct research on its various aspects and apply the conclusions for evolving design solutions.

**1ST semester examination scheme and contents of syllabus:**

**FIRST SEMESTER : SCHEME OF TEACHING**

**Duration of Semester : 18 weeks**
**Periods per week 33**
**Duration of each period : 60 minutes**

**Note:** The course work and assignments in each subject must be completed as prescribed.

| Sr. No. | **Subject** | Periods per week | Total periods | Teaching Methodology and Sessional work |
|---|---|---|---|---|
| 1. | Architectural Design-I | 8 | 144 | Design assignments, time problems |
| 2. | Building Construction-I | 4 | 72 | Notes, sketches, drawings, tests, Assignments |
| 3. | Building Material-I | 2 | 36 | Notes, sketches, tests, Assignments |
| 4. | Structure Systems & Design-I | 2 | 36 | Notes & tests, Assignments |
| 5. | Architectural Drawing-I | 4 | 72 | Drawings, tests, Assignments |
| 6. | Architectural Graphics-I | 4 | 72 | Sketches, Assignments, drawings, tests |
| 7. | History of Built Environment-I | 2 | 36 | Notes, sketches, tests, Assignments |
| 8. | Theory of Design-I | 2 | 36 | Assignments & Tests |
| 9. | Workshop-I | 3 | 54 | Theory & Practical |
| 10 | Health Education-I | 2 | 36 | Health and fitness, extra-curricular activities. |
| | Total | 33 | 594 | |

## FIRST SEMESTER : SCHEME OF EXAMINATION

PREPARATORY HOLIDAYS One week
EXAMINATIONS Approximately three weeks

**NOTE** : In addition to the University Studio Examination, the subjects of Architectural Design-I, and Building Construction-I will be assessed through a viva-voce by an external examiner appointed by the Panjab University.

| Sr. No. | Subject | Duration of exam. (in hours) | Max Marks for Exam | Max. Marks for Sessional Work | Total Marks |
|---|---|---|---|---|---|
| 1. | Architectural Design-I | 6 | 200 | 200 | 400 |
| 2. | Building Construction-I | 6 | 100 | 100 | 200 |
| 3. | Building Material-I | 3 | 50 | 50 | 100 |
| 4. | Structure Systems & Design-I | 3 | 50 | 50 | 100 |
| 5. | Architectural Drawing-I | 6 | 100 | 100 | 200 |
| 6. | Architectural Graphics-I | 6 | 100 | 100 | 200 |
| 7. | History of Built Environment-I | 3 | 50 | 50 | 100 |
| 8. | Theory of Design-I | 3 | 50 | 50 | 100 |
| 9. | Workshop -I | - | - | 50 | 50 |
| 10. | Health Education-I | - | - | 50 | 50 |
| | Total | | 700 | 800 | 1500 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-101 | ARCHITECTURAL DESIGN-I | 0-0-8 | | Sessional work: 200<br>Examination : 200 |

Course Objectives: To learn elements and principles of basic design with orientation to architectural design.

**Reference Books :**

- Architecture: Form Space and Order, Francis D.K. Ching; Van N. Reinhold Co.,
- Architectural Graphics by Frank Ching
- Drawing a Creative Process by Francis D. Ching
- Graphic Thinking for Architects and Designers by Paul Laseau
- Time Saver Standards for Building Types, C. D. Joseph and CallenderJohn;
- Time Saver Standards for Architectural Design Data, C. D. Joseph &Callender John;
- Neufert's Architect's Data.
- Structure in Nature – Strategy for Design, Pearce Peter;
- Architectural Design, Pickering, Ernest; John Wiley and Sons Inc., Canada, 1949.
- Elements of Architecture, Von MeissPieree

Course Contents :

**UNIT-1**

- Exercise in two and three dimensional compositions in order to achieve harmony, balance contrast etc. as entities in themselves
- Study of interrelationships, use of scales and proportioning for 3-dimensional forms. Compositions with buildings blocks and other architectural applications can be introduced in order to relate to architecture rather than basic design.
- Anthropometric study of difference postures and activities.

**Mid Semester Test:** To be evaluated by external examiner

**UNIT-2**

- Documentation and drafting of measured drawings of a single UNIT structure.
- Application of Principles of design learned by doing two dimensional as well three dimensional into the mono cellular structure such as kiosk, bus shelter, and entrance design.

**Evaluation System:**

There will be minimum 10 design assignments in this semester. The first stage will comprise of evaluation of architectural design sheets of – Principles of design, Scale & Proportion and Anthropometrics. The end semester design assignment shall be of 05 stages:

- Reference studies & idea exploration.
- Concept formulation.
- Review – I & Review - II

- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team.

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

One/Two design problems are to be formulated which would assess the students on their ability to design a single UNIT structure following the elements and principles of design.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-102 | BUILDING CONSTRUCTION-I | 0-0-4 | | Sessional work : 100 Examination : 100 |

Course Objectives: To educate the students with construction details of various components of a small single storied building.

Outlines of Syllabus :

The course is outlined from introduction of subject to theoretical and site specific practical studies.

Text Books :

- McKay, WB Building Construction
- Rangwala, S.C Engineering Materials
- Punmia, B.C. Building Construction
- Khanna P.N. Oractical Civil Engineer's Handbook

Reference Books

- Ching, Francis D.K. Building Construction Illustrated
- Construction Technology by Chudley
- Construction of Buildings by R.Barry

Course Contents : As Outlined Under

**UNIT-1**

- Introduction to various components of a building (wall, foundation, floor, roof, doors, windows, etc.) and their structural and functional roles.
- Brick Masonry; various types of bonding in walls (English, Flemish & Rat Trap) of varying thickness having various types of junctions.
- Stone masonry of various types.
- Block Masonry (Mud Blocks, Fly Ash Blocks etc)

**UNIT-2**

- Construction of foundations (brick and stone) for load-bearing and toe walls.
- Damp-proof course, detailing of horizontal & vertical DPC.
- Flooring: various types of durable and decorative floor finishes such as P.C.C, terrazzo ( cast in situ and tiles), stones (marble, kota stone, granite, etc.), vitreous tiles, etc

**Mid Semester Test**

**UNIT-3**

- Construction of flat Roof (Tile & Batten, RBC, RCC). Concepts of water proofing and thermal insulation of roofs

**UNIT-4**

- Lintels and arches. Window sills
- Construction of Sunshades, Brise-Soliel, Brick Jali.

**End Semester Examination**

**Note:**. Complete Section through a single storey building covering foundation/DPC/window sill/lintel/roof & wall junction/parapet wall/plinth protection, etc.

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-103 | BUILDING MATERIAL-I | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To make students aware about the importance of Building Science & Materials in Architecture.

Reference Books :

- Engineering Materials by S.C Rangwala
- Civil Engineering Materials by P.D. Kulkarni
- Materials of Construction by R.S. Deshpande
- Construction Material Reference Book – D.K. Doran
- P.C. Varghese, 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005.
- Arthur Lyons – 'Materials for Architects and Builders' - An introduction Arnold, London, 1997.
- Hand book of Timber Engineering – BIS

Course Contents :

**UNIT-1 - STONES**

- Various types of stone and their availability in India.
- Stone quarrying, dressing of stones, deterioration of stone, preservation of stone.
- Sizes, application properties and visual text/check for different types of stone (flooring, cladding, masonry)
- Artificial stone, uses and properties.

**UNIT-2- BRICKS**

- Manufacturing, classification, types, sizes ,properties of brick, visual text/check for different types of brick
- Different types of brick; uses and properties – Fire brick, sand lime brick, coloured brick etc.
- Cost effective brick and their uses in construction industry.
- Bricks tiles-manufacturing & their uses in facades, flooring, terracing etc.

**Mid Semester Test**

**UNIT-3- TIMBER & ITS FINISHES**

- Sources of timber.
- Classification, characteristics, defects in timbers.
- Preservation and treatment of timber.
- Industrial timber products and their applications – plywood, particleboard, laminated board, block board, batten board, multi-layered plywood, MDF,HDF, veneers, hardboards
- White wash, Distemper ,Paints, varnishes and distempers, emulsions, cement base paints.oil paints
- Constituents of all types of paints, BIS specifications
- Characteristics of good paints, types of paints and process of painting different surfaces.
- Applications, covering capacity, Suitability, Advantages and Disadvantages.
- Types of varnish for timber -French polish and melamine finish, PU coating(internal & external), laquered finish, Duco paints & their applications,
- Surface finishes for various types of cladding materials, painting of ironwork
- Manufacturing, types and application
- Current Brands available in market

**UNIT-4- METALS AND METAL PRODUCTS FOR BUILDING**

- Iron: Various types of iron, properties of various types of iron, iron products and their

uses in construction.

- Properties and architectural uses of mild steel and stainless steel, available sections & other products such as hardware etc.
- Aluminium: Different types of section and uses in construction Copper, Zinc Brass, Stainless steel, tin etc.

- Properties uses, treatment.
  - Available Section, Products (Hardware)

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

All questions carry equal marks.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-104 | STRUCTURE SYSTEMS & DESIGN – I | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To understand the basic principles of Structural Mechanics, so that it forms the basis for study of Structural Systems and Design.

Reference Books :

- Mechanics of Structure by Junnarkar
- Building Design And Construction Handbook Sixth Edition

Course Contents :

**UNIT-1**

- Force, UNITs and characteristics of a force, representation of forces, coplanar force systems, resultant force, composition and resolution of force, parallelogram-Triangle – Polygon laws of forces
- Resultant of several coplanar concurrent forces. Lami's theorem.
- Concept of moment, characteristics of a moment, concept of a couple.
- Resultant of several coplanar non-concurrent parallel / non-parallel forces.
- Equilibrium conditions for bodies under coplanar forces.
- Numerical problems based on above topics.

**UNIT-2**

- Types of Loads: Dead load, Live load, Wind Load, Impact and Earthquake load.
- Type of loading: Point load, uniformly distributed load, uniformly varying load.
- Types of supports and their reactions: simple, roller, hinged, fixed supports.
- Types of beams: Simply supported, Cantilever, Over-hanging and Fixed beams.
- Shear force and Bending Moment Diagrams for Simply supported, Cantilever and over hanging beams subjected to Uniformly distributed load and Point loads only.

**Mid Semester Test**

**UNIT-3**

- Concept of centre of gravity and centroid. Determination of centroid of plane geometrical figures by moment method only.
- Concept of Moment of inertia (second moment of area), theorem of parallel axis and theorem of perpendicular axis, radius of gyration. Determination moment of inertia of laminae of square, rectangular, L shape, T shape and I shape cross-sections.
- Types of pin jointed frames. Assumptions in computing the forces in members of a perfect frame. Analysis of perfect frames by method of joints, method of sections and Graphical method.

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

All questions carry equal marks.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-105 | ARCHITECTURAL DRAWING-I | 0-0-4 | | Sessional work : 100 Examination : 100 |

Course Objectives: To familiarise the students with a basic knowledge of good drafting, lettering techniques and visualization of geometrical forms through plan, elevations & sections.

Reference Books :

- Engineering Drawing by N.D Bhatt
- Engineering Drawing, 1994 by Gill, P.S.

Course Contents :

**UNIT-1**

- Scales
- Lettering techniques
- Types of lines used in Architectural Drawing
- Basic Geometrical shapes drawings

**UNIT-2**

- Orthographic projections
- Orthographic projection Definition/meaning
- Planes of projection
- First and third angle projection
- Note: First angle projection to be followed for all exercises.
- Projection of points
- Projection of lines
- Projection of planes
- Projection of solids (Prisms, Pyramids, Cones and Cylinders).

**Mid Semester Test**

**UNIT-3**

- Section of solids (Prisms, Pyramids, cones & cylinders)
- Intersection of solids:
- Development of surfaces:

**UNIT-4**

- Representation of a single room UNIT (one bed/study room with attached toilet & kitchen) in plans, elevations and sections showing the various building elements and furniture layout.

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of four questions, one from each UNIT
- The student is required to attempt any three question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-106 | ARCHITECTURAL GRAPHICS-I | 0-0--4 | | Sessional work : 100 Examination : 100 |

Course Objectives: To learn the techniques of drawing and rendering with pencil in architectural design and graphic composition.

Reference Books :

- Architectural Design by Francis D.K. Ching;

**Course Contents** : Effects created by different pencil grades by varying thickness and pressure in the pencil - understanding the language of lines, freedom of lines for visualising design, drawing lines with the support of wrist and elbow, representation of various textures with thick, thin and flat pencil strokes.

**UNIT-1**

- Exercises with different pencil grades to check varying intensities and create textures with demonstration.
- Composition with coloured paper using the basic principles of design.

**UNIT-2**

- Indoor sketching, rendering of different solids like, sphere, cube, cone, cylinders, etc. with shades and shadows.
- Outdoors sketching to co-relate the shapes in geometry.

**Mid Semester Test**

**UNIT-3**

- Different kinds of trees, foliage of trees and shrubs with proper light and shade.
- Sketching of hut and its surroundings with special emphasis on foreground and background.

**UNIT-4**

- Outdoor sketching of simple buildings
- Rendering of stone and brick wall in pencil.
- Representation of human figures

**Workshop to be organised:**

- To impart the practical aspect of 3-D composition, sculpture workshop in clay modeling will be organised by the concerned teacher.
- Another workshop in pencil rendering will also be organised, highlighting its technique and styles. The workshop can be organised outdoor or indoor.

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

Two/three questions are to be formulated which would assess the students on their ability to sketch and render as per the topics mentioned above.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-107 | HISTORY OF BUILT ENVIRONMENT - I | 2-0-0 | | Internal- 50<br>External- 50 |

**Course Objectives**:

To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form.

To develop a holistic approach to Architecture as an integral component of built environment.

Outlines of Syllabus :

It covers pre-historic, Egyptian, Mesopotamian, Indus Valley civilizations and their building typology.

Reference Books:

- History of Modern Architecture by Kenneth Frampton
- Architecture in India (since 1990) by Rahul Mehrotra
- A Global history of architecture – Ching, Jarzombek, Prakash
- Architecture of the world : Egypt – Henri Steirlin
- Architecture of India: Buddhist and Hindu– Satish Grover
- History of Architecture – Sir Bannister Fletcher
- The rise of Civilization- David and Joan Oates
- World Architecture – Henry Russell Hitchcock

Course Contents:

UNIT – 1

**Pre-historic**

- Man's early/prehistoric attempts to colonise and personalise space. Examples of early shelters and settlements for example, Stonehenge, tumuli, GobekliTepe, CatalHuyuyk, Jericho etc.
- Determinants of Built Form – geo-physical, societal, political and technological, etc. Global examples of vernacular architecture.
- Introduction to the River Valley Civilizations. Comparative study of different manifestations with reference to location, materials and techniques, socio-cultural influences and other contextual factors.

UNIT-2

**Birth of Civilizations**

- **Egyptian Civilization:-**Concept of the Royal Necropolis, locational context and architectural characteristics of public buildings, e.g. mastabas, pyramids and temples(rock-cut & structural)- one example of each type to be chosen, Worker's settlement-city of Kahun.
- **Mesopotamian Civilization**:-The urban context and architecture of public buildings (ziggurats and palaces). Examples of the city and Ziggurat of Ur, city and palace and khorsabad.

**Mid Semester Test**

UNIT-3

**Indus Valley civilization**:-

- Form of the Harappa City, location and role of public buildings.
- Architecture of the typical Harappa dwelling Granary and Bath.
- The Vedic Village, Building typology and construction.

UNIT-4

**Buddhist Architecture:-**

- Asoka and the beginning of the Buddhist school of Architecture in India. Socio-political factors in selection of sites of Buddhist Architecture.
- Building typology-
  Stupas, Chaityas and Viharas. For example, The Great Stupa at Sanchi, Chaitya Hall at Karli, Vihara at Ajanta. Suitable examples from each geographical context to illustrate differences in form, construction methods and ornamentation.

**END SEMESTER EXAMINATION**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-108 | THEORY OF DESIGN- I | 2-0-0 | | Sessional Work : 50 Examination : 50 |

Course Objectives: To enable the student to understand the fundamental concepts and aspects of architectural design so as to equip them to view, understand and analyse a design by using sound and well reasoned judgement.

Reference Books :

- Understanding Architecture: Its Elements, History, and Meaning by Leland M. Roth, Westview Press Place publication.
- Architecture: Form Space and Order; Francis D.K. Ching; Van Nostrand Reinhold Co.,1979.
- "A Visual dictionary of Architecture", F.D.K.Ching, Van Nostrand Reinhold
- The language of Architecture, NeilsPrak, Mounton& Co 1968
- Architect: A Candid Guide to the Profession, by Roger K. Lewis

Course Contents :

**UNIT-1**

- Definition and scope of Architecture. Interdependence of various components of the built environment. Need for a holistic approach
- Design in everyday life, basic art forms, elements of design - space, form, line, texture, color, etc.

**UNIT-2**

- Principles of Design, Scale, Balance, Proportion, Rhythm, etc.

**Mid Semester Examination**

**UNIT-3**

- Objectives of Design, Truth, Beauty order, efficiency and economy.
- Forms and shapes in everyday life

**UNIT-4**

**Visual Perception**

- Methodology of Creative Design.
- Theory of colors (Color wheel),
- Architectural Vocabulary - For example, Façade, Building Envelope, Voids, Fenestrations, Clerestorey, Sight Lines, Rendering, Arch, Brisesoleil, Cantilever,
- Column, Beam, Massing, Curvilinear, Rectilinear, Plan, Section, Elevation, Motifs, Aesthetic, etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

1. The Examiner is required to set six questions in all and minimum of one question from each UNIT.
2. The student is required to attempt any four questions by selecting at least one from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-1-109 | WORKSHOP- I | 0-0-3 | | Sessional Work : 50 |

Course Objectives: To develop skills in understanding the complexities and constraints of brick and stone masonry.

Course Contents

**UNIT-1**

- Introduction to masonry tools, Making proportional sketches of these tools and learning their uses.

**UNIT-2**

- Construction of a low height masonry wall, using either stones or bricks, and,
- Brick wall junctions in English and Flemish bonds to be attempted also.

**UNIT-3**

- Construction of low height brick jalli.

**End Semester Examination - No examination**

| Course No | Course name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| . CCA-1-110 | HEALTH EDUCATION- I | 2-0-0 | | Internal - 50 |

Course objective: To make the students learn the basic concepts related to health education

Reference Books:


- Bucher, C.A.Foundations of Physical Education, St. Louis; C.V. Mosby Co., 1972.
- Shaver, Larry G. Essentials of exercise physiology ,2016
- Hoeger, Werner W.K, Hoegen,Sharon A. Principles and Labs for fitness and wellness.7thed 2004.
- Richardson, Seano, Anderson, Mark B: Overtraining Athletes: Personal Journey in Sports.2008.
- Wilmore, Jack H and Costill, David L. Physiology of Sports and Exercise. Human kinetics. 1994.
- Mathew, D.K and Fox, E.L The Physiological Basis of Physical Education and Athletics. Philadelphia: W.B Saunders Company 1976.


Course Contents:

UNIT -1

- Meaning and definition of health, concept of health education, information about various health hazards. Helath services, Principles of health education, Introduction and Function of Skeletal System, Muscular System, Circulatory System, Respiratory System, Digestive System, Excretory System, Nervous System and Endocrine System.

UNIT-2

- Modern Concept of balanced posture
- Common postural deformities i.e., flat foot, bow legs, knock knees, lordosis, scoliosis, Kyphosis and round shoulders, their causes and remedial measure
- Causes of bad posture
- Common sports injuries- their classification and their care and prevention
- Therapeutic exercises (Active, Passive, Resistive and Stretching and their application for rehabilitation)

UNIT-3 Sports Training, its aims and characteristics

- Principles of sports training
- Need and scope of Sports Training in India

UNIT-4

Components of Physical Fitness

1. Speed
2. Strength
3. Endurance
4. Flexibility
5. Coordinative Abilities

- Means and methods of developing fitness components.

**End Semester Examination - No examination**

**2nd semester examination scheme and contents of syllabus:**
**SECOND SEMESTER : SCHEME OF TEACHING**

**Duration of Semester : 18 weeks**
**Periods per week 33**
**Duration of each period : 60 minutes**

**Note:** 1. The course work and assignments in each subject must be completed as prescribed. All these UNITs will be equally represented in the external examination.

| Sr. No. | Subject | Periods per week | Total periods | Teaching Methodology and Sessional work |
|---|---|---|---|---|
| 1. | Architectural Design-II | 8 | 144 | Design assignments, Time problems |
| 2. | Building Construction-II | 4 | 72 | Notes, sketches, drawings, tests |
| 3. | Building Material-II | 2 | 36 | Notes, sketches, tests |
| 4. | Structure Systems & Design-II | 2 | 36 | Notes & tests, Assignment |
| 5. | Architectural Drawing-II | 4 | 72 | Drawings, tests, Assignment |
| 6. | Architectural Graphics-II | 4 | 72 | Sketches, drawing, Tests, Assignment |
| 7. | History of Built Environment-II | 2 | 36 | Notes, sketches, tests, Assignment |
| 8. | Theory of Design-II | 2 | 36 | Assignments, Tests |
| 9. | Workshop of Model Making-II | 3 | 54 | Theory & Practical |
| 10. | Health Education-II | 2 | 36 | Health and fitness, extra curricular activities |
| | Total | 33 | 594 | |

## SECOND SEMESTER : SCHEME OF EXAMINATION

**PREPARATORY HOLIDAYS** **One week**
**EXAMINATIONS** **Approximately three weeks**

**NOTE:** In addition to the University Studio Examination, the subjects of Architectural Design-II, and Building Construction-II will be assessed through a viva-voce by an external examiner appointed by the Panjab University.

| Sr. No. | Subject | Duration of exam. (in hours) | Max Marks for Exam | Max. Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|
| 1. | Architectural Design-II | 12 | 200 | 200 | 400 |
| 2. | Building Construction-II | 6 | 100 | 100 | 200 |
| 3. | Building Material-II | 3 | 50 | 50 | 100 |
| 4. | Structure System & Design-II | 3 | 50 | 50 | 100 |
| 5. | Architectural Drawing-II | 6 | 100 | 100 | 200 |
| 6. | Architectural Graphics-II | 6 | 100 | 100 | 200 |
| 7. | History of Built Environment-II | 3 | 50 | 50 | 100 |
| 8. | Theory of Design II | 3 | 50 | 50 | 100 |
| 9. | Workshop and Model Making | - | - | 50 | 50 |
| 10. | Health Education-II | - | - | 50 | 50 |
| | Total | - | 700 | 800 | 1500 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-201 | ARCHITECTURAL DESIGN- II | 0-0-8 | | Sessional work : 200 Examination : 200 |

Course Objectives: To learn the interdependence /Interrelationship of Form and Functions.

Reference Books :

1. 100 Ideas that changed Architecture by Richard Weston
2. Landscape Graphics – Grand W.Reid Asla
3. A Comparative analysis of 20th century houses, Hideaki Hareguchi, Academy Editions, 1988
4. Tropical Asian House, Robert Powell, Select Books, 1996
5. The Essential House Book, Terence Conran, Conran Octopus, 1994
6. Time Saver Standards for Building Types, C. D. Joseph and Callender John;
7. Time Saver Standards for Architectural Design Data, C. D. Joseph & Callender John;
8. Neufert's Architect's Data

Course Contents :

- Disposition of function or interrelationship of various functions through diagrams or matrices or flowcharts
- Dispositions of functions on site and scale of building with respect to the site.
- To understand the concept of "Form follows function" and vice versa.
- Understanding the difference of scale in residence and School building.
- Comprehend requirements of the occupants

UNIT-1

- Residence or Nursery school.

**Mid Semester Test**

UNIT-2

Health centre, clinic/dispensary, Post Offices, Mobile homes, children's centre,child care centers etc.

**End Semester Examination**

**Teaching and Learning Methodology:**

1. Case study of own residence of student to understand the various sizes of rooms, anthropometrics learned in 1st semester and functional planning.
2. To understand the light and ventilation concept in rooms.
3. Analysis of various activities in residence by various users, their chart formation.
4. Case study of School to understand the scale of building designed for kids. The furniture and fixtures to be studied as per kids requirements.
5. Major evaluation stages (Concept, PS, and FS) would be assessed in an open viva voce.

**Evaluation System:**

There will be minimum 02 design assignments each semester. Each design assignment shall be of 05 stages:

i. Reference studies & idea exploration
ii. Concept formulation.
iii. Review – I & Review - II

iv. Preliminary Submission
v. Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

i. Idea / concept originality
ii. Presentation of drawings to convey the idea
iii. Graphic presentations
iv. Model / 3D / Animation etc.

**INSTRUCTIONS TO THE PAPER SETTER**

Examiner is required to set one compulsory question from any of the units.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| **CCA-2-202** | BUILDING CONSTRUCTION-II | 0-0-4 | | Sessional work : 100 Examination : 100 |

Course Objectives: To familiarize the students with traditional construction methods of a single storied building in timber with sloping roof.

Content

Reference Books:

- Mckay, WB Building Construction
- Rangwala, S.C Engineering Materials
- Punmia, B.C. Building Construction
- Ching, Francis D.K. Building Construction Illustrated
- Construction Technology by Chudley
- Construction of Buildings by R.Barry

UNIT-1

- Joinery work: Various types of doors in timber.
- Types of doors & Windows. Single & Double leaf panel doors.
- Battened, ledged and braced doors; Battened, braced & framed doors; Flush doors, etc.
- Sliding and sliding folding doors.
- Windows in timber.
- Workshop practice for joints in timber used above.

**UNIT-2**

- Introduction to the nature and characteristics of wood construction, its advantages and limitations.
- Walls in timber: Various types of timber frame walls, with details of joints and cladding, *Dhajji* walls construction. Windows and doors in Frame walls.
- Cladding with Timber and Timber products in Interior and Exterior (Wall paneling, Timber partitions, counters etc.)
- Design, detailing and construction of wardrobes and Shop/Bank counters.
- Foundations of Timber Posts.
-

**Mid Semester Test**

UNIT-3

- Flooring: Various types of timber floors & their construction methods.
- Floor finishes for timber floors.
- Staircases in timber.

UNIT-4

- Roofing: Types of timber roofs
- Introduction to different types of timber Roofs e.g. Flat, Couple, Close Couple, Collar, Lean to roof and Double Lean-to roofs, mansard roof.
- King Post and Queen Post trusses.
- North Light truss in Timber.
- Roof coverings using AC/CGI sheets. Eaves, Gutters, Ridge and Valley detail.

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.
- All questions carry equal marks.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-203 | BUILDING MATERIALS-II | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: Upon completion of the curriculum, the student shall have acquired the concept of various components of buildings & materials used and methods of construction. The student shall acquire knowledge in both conventional as well as contemporary building practices.

**Reference Books :**

- Engineering Materials by S.C Rangwala
- Civil Engineering Materials by P.D.Kulkarni
- Materials of Construction by R.S.Deshpande
- Construction Material Reference Book – D.K. Doran
- Construction Handbook for Civil Engg. And Architecture Volume 1 – M.M.Goyal
- Masonry Design & Detailing for Architects and Contractors – Christine Beall (McGraw Hill)
- Jules J.A. Janssen, Building with Bamboo: A Handbook, 1995.
- GernotMinkev, Building with Bamboo, Birkhauser, 2012.

Course Contents :

UNIT-1**- -CEMENT & CONCRETE**

- Cement, sand aggregates: types, properties and uses.
- Properties and various types of concrete.
- Different Grades and their uses.
- Method of preparation, laying and curing of concrete-Formwork, production of concrete, mix, proportioning, mixing, transporting, placing, compaction, curing of concrete, sampling and testing of concrete. Surface finishes in concrete, chemical admixtures
- Study of advanced concrete- special concretes like light weight ,high density,
- fibre reinforced, polymer concrete - outline of manufacture, properties and uses of the above –
- ready mixed concrete - gUNITing –
- cold weather and underwater concreting –
- Hollow concrete blocks for construction of walls in plains & hilly regions
- Precast pre stressed construction for large span structures
- Current developments in concrete products

UNIT-2**- CLAY & CLAY PRODUCTS,COST EFFECTIVE PRODUCTS**

- Different types of soils and their bearing capacities and their suitability/application with respect to types of foundations
- Mud: Methods of preparation-construction methods and techniques-natural techniques for stabilization of mud,
- soil blocks- S.S. Block - S.S.Cast in situ
- walls - flooring - roofing – plastering
- Terracotta tiles, Pavement tiles, Roofing tiles cladding tiles etc.
- Stoneware, Porcelain, Refractories : applications in construction
- Advances Ceramics: Product and application-Vitrified tiles, Glazed tiles, handmade tiles etc.

**Eco Friendly Materials:**

- Stabilized mud blocks,
- AAC -fly ash Blocks & other latest current trends &their applications in plains and hilly

regions,

- Eco Boards, hard board, bison board,
- carbon products -composite tiles etc
- Bamboo as a building material-types-properties-application-working with bamboo-sizes of members- methods of joining-bamboo and its applications in construction.

**Mid Semester Test**

UNIT-3**- GLASS:**

- Manufacturing process, types, properties and application
- Various products of glass- Float glass wired glass, fiber glass, laminated glass, glass building blocks etc.
- Structural & Non-Structural glazing,
- Current brands in local & international market.
- Comparison of prices

UNIT-4**- PLASTICS, PVC,THERMAL INSULATING & WATER PROOFING MATERIALS**

- Study of plastics –thermosetting and thermoplastics, resins, fabrication of plastics,
- polymerization and condensation –
- Application of plastic in building construction.
- Thermoplastics and thermosets - properties and architectural uses of plastics - structural plastics –
- Reinforced plastics and decorative laminates –
- Plastic coatings, adhesives and sealants - modifiers and plasticizers – fillers and stabilizers - fabrications of plastics.
- PVC –UPVC, Rubber: Products and uses in construction of HDPE and composite material.
- Materials for thermal insulations:
- Properties & uses
- Water Proofing materials (liquid, semi-liquid and solid) – Composition, Properties, Applications
- Different materials, rigid and flexible, used in damp-proofing, including brick on edge,
- Rough Shahabad stone, bitumen sheets, plastic sheets and other proprietary materials

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

All questions carry equal marks.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-204 | STRUCTURE SYSTEMS & DESIGN – II | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To understand the principles of structural design of Steel Structures.

Reference Books :

- Building Systems Reference Guide 1987 by Tyler G. Hicks
- Standard Handbook of Civil Engineering by Gurcharan Singh

Course Contents :

UNIT-1

- Simple bending theory, Section modulus, Radius of gyration
- Principle of superposition
- Determinate and Indeterminate structures
- Basic Data (IS: 800 and Steel tables) for design of steel structures
- Analysis & Design of Simply supported restrained roof steel beams subjected to uniformly distributed load.
- Purlins, Plate girders and Box girders (Descriptive only).

UNIT-2

- Structural steel connections:

**Riveted Connections:** Types of rivets, permissible stresses in rivets, types of riveted Joints, specifications for riveted joints as per IS 800.Failur of a riveted joint. Assumptions in the theory of riveted joints. Strength & efficiency of a riveted joint. Design of riveted joints for axially loaded members. (No Staggered riveting).

**Welded Connections:** Types of welds & welded joints, advantages & dis-advantages of welded joints, design of fillet & butt weld. Plug and slot welds (Descriptive No numerical on Plug & Slot welds).

- Analysis & Design of single/double angle Tension members of a roof truss with riveted and welded connections.
- Analysis & Design of single/double angle Compression members (strut) of a roof truss with riveted and welded connections.

**Mid Semester Test**

UNIT-3

- Analysis & Design of Single section steel column
- Analysis & Design of Built up steel columns with single lacing.
- Types of Column bases (Descriptive only).

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-205 | ARCHITECTURAL DRAWING-II | 0-0-4 | | Sessional work : 100 Examination : 100 |

Course Objectives: To enable the students to have a better understanding of the 3-D through isometric/axonometric views, perspective drawing and sciography.

Reference Books :

- Engineering Drawing, 1994 by P.S Gill
- Engineering Drawing By N.D Bhatt

Course Contents :

UNIT-1

- Axonometric/isometric views of compositions/complex forms
- Conversion of Axonometric/isometric views into orthographic projections.

UNIT-2

- Two point Perspectives of simple and complex objects leading to perspectives of building forms using the conventional plan method.

**Mid Semester Test**

UNIT-3

- One point perspective using plan method of simple and complex objects leading to perspectives of building forms.

UNIT-4

- Sciography
  i. Sciography of points
  ii. Sciography of lines
  iii. Sciography of planes of different shapes on H.P. and V.P. w.r.t. distance from H.P. and V.P.
  iv. Sciography of simple solids
  v. Sciography of building elements like
- Recesses projections of different shapes
- Stairs/ramps
- Colonnades, etc.

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

- The examiner is required to set a total of four questions, one from each UNIT
- The student is required to attempt any three question

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-206 | ARCHITECTURAL GRAPHICS-II | 0-0-4 | | Sessional work : 100 Examination : 100 |

Course Objectives: To appreciate the role of colour in presentation and rendering techniques in architectural design.

Reference Books :

- Drawing A Creative Process calling Francs, D.K Ching
- Francis D.KChing; Architectural Graphics
- Architecture in Water colour by Thomas IN Schaller

Course Contents: Introduction of transparent water colours, poster colours, pastel colours and their tonal values. Study of primary, secondary and intermediate colours in the form of geometric compositions. Introduction to Colour Theory.

UNIT-1

- Outdoor sketching of buildings, huts, group of trees, different kinds of trees and foliage and vegetation in colour.

UNIT-2

- Colour rendering of blocks.
- Use of overlapping effects in water colour and poster colour in mural composition based on geometric elements.

UNIT-3

- Exercises on human figures and vehicles in colour.
- Rendering of stone & brick wall in colour.

**Mid Semester Test**

UNIT-4

- Outdoor sketching with graphite pencil to create monochromatic effect in design.
- Assignments on representation of water bodies, hills, etc

**Workshop to be organised:**

- There will be the sculpture workshops, either in terracotta or the in a separate medium.
- Different techniques in architectural rendering. Rendering of assignments done in the subject of Architectural Design-I

**End Semester Examination**

**INSTRUCTIONS TO THE PAPER SETTER**

Two/three questions are to be formulated which would assess the students on their ability to sketch and render as per the topics mentioned above.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-207 | HISTORY OF BUILT ENVIRONMENT – II | 2-0-0 | | Internal- 50<br>External- 50 |

Course Objectives:

To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form.

To develop a holistic approach to Architecture as an integral component of built environment.

Reference Books:

- A Global history of architecture – Ching, Jarzombek, Prakash
- A History of Western Architecture – David Watkin
- Architecture of World : Greece – Henri Stierlin, Roland Martin
- Architecture of World : – Roman Empire – Henri Stierlin, Gilbert Picard
- Architecture of India : Buddhist and Hindu – Satish Grover
- Classical Architecture –Robert Adam
- History of Architecture – Sir Bannister Fletcher
- Indian Temple Architecture : Form and Transformation – Hardy A
- Indian Architecture : Buddhist and Hindu –Percy Brown
- The History of Architecture in India – Christopher Tadgell
- World Architecture – Henry Russell Hitchcock

Course Contents:

UNIT-1

**Hindu Temple Architecture**:- Northern India

- Role of Hinduism and decline of Buddhism – Geographical/political states and kinds of movements.
- Rise of Brahmanical thinking
- Evolution of temple Form – Rock-cut and structural forms.
- Comparison of temple forms in various regions of India.

UNIT-2

**Hindu Architecture:- Dravidian:-** Southern India

- Various styles of Hindu Temples – Dravidian, Indo-Aryan (Orissa, Khajuraho, Gujrat and West India), Functional components, architectural form, construction and ornamentation.

**Jain Temples:-**

- Architecture of Jain Temples in Gujrat and Rajasthan.
- Temple towns of South India (Madurai, Srirangam) and Rajasthan (Osian, Mt.Abu)

**Mid Semester Test**

UNIT-3

**Greek Civilization**:-

- Historical, geographical, political and cultural context. Characteristics of Greek Architecture such as Materials, construction System, System of Proportioning, Greek Orders, Oprical Corrections, etc. Architecture of Greek temples:-
- Parthenon,
- Athens,
- Acropolis,
- Agora etc.

UNIT-4

**Roman Civilization:-**

- Historical, geographical, political and cultural context.
- Concept of Monumentality, Materials & Construction Systems, Roman Orders. Building analysis – Colosseum, Foruma, Pantheon, Thermae, Basilicas, Aquaducts, The Roman Villa

NOTE: Analysis of architectural style/building typology must include functional, Constructional /Structural and ornamentation aspects.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

1. The Examiner is required to set six questions in all and minimum of one question from each UNIT.
2. The student is required to attempt any four questions by selecting at least one from each UNIT

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-208 | THEORY OF DESIGN-II | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: The concept is to delimit the scope of Theory of Design as it specifically applied to “Architectural Design” and to bring out such elements of “Architectural Design” as distinguish it from other forms of design.

Reference Books :

1) Peter von Meiss -Elements of architecture - from form to place, Spon Press 1992.
2) Architecture: Form Space and Order; Francis D.K. Ching; Van Nostrand Reinhold Co., 1979.
3) Architectural Scale, H Licklidan, The Architectural Press
4) Architecture and Human Dimensions, P.F.Smith, George Baldwin Ltd.
5) Courtyards – Aesthetic Social and Thermal Delight, John S Reynolds
6) Opening Spaces (Design as Landscape Architecture) – Hans Loidl Stefan Bernard
7) Conditional Design: An Introduction to Elemental Architecture, by Anthony Di Mari

Course Contents :

UNIT-1

- Theory of Architecture and principles of planning.
- Analysis and classification: space usage.

UNIT-2

- Inter-relationship of different spaces within a building.
- Inter-dependence of function, structure and form in architectural design.

**Mid Semester Examination**

UNIT-3

- Accommodation and circulation, Wayfinding
- Architectural Vocabulary - Porch, Verandah, Courtyard, Double-height, Triple-height, Corridors, Aisle, Pedestal, Plinth, Threshold, Modular, Walkability, Verticality, Balcony, Terrace, Arcade, Colonnade, Patio, Pergola, Portico, Setback,
- Analysis and classification of the elements of circulation, (horizontal and vertical) such as entrance halls, corridors and stairs, ramps, lifts, escalators in different types of planning.

UNIT-4

- Study of exercises in the relationship of plan, section and elevations of the building.
- Architectural programme: analysis and classifications.
- Architectural scale, Human scale, Monumental scale, true and forced scale.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-209 | WORKSHOP & MODEL MAKING-II | 0-0-3 | | Sessional work : 50 |
| Course Objectives: To understand the constraints and complexities and versatility of joinery in carpentry. | | | | |
| Reference Books : | | | | |
| Course Contents : | | | | |
| UNIT-1<br>• Introduction to carpentry tools.<br>• Sketches of these tools. | | | | |
| UNIT-2<br>• Exercise in sawing, chiseling, planning to learn the use of hand tools joinery.<br>• Construction of half lap, tongue and groove joints. | | | | |
| **Mid Semester Examination** | | | | |
| UNIT-3<br>• Construction of mortice and tenon joint and dovetail joints.<br>• Construction of rafter joints in tension and compression. | | | | |
| UNIT-4<br>• Varnishing exercise. Varnishing of joints made in the class.<br>• Making one wooden item or small furniture e.g. a pencil box, a stool bench, miniature door/windows columns. | | | | |
| **End Semester Examination - No Examination** | | | | |

| Course No. | Course name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-2-210 | HEALTH EDUCATION-II | 2-0-0 | | Internal -50 |

Course objective: To make the students to learn the basic concepts related to fitness

Reference Books:


- Beotra, Alka (2001-02), Drug Education Handbook on Drug Abuse in Sports (Mumbai: Applied Nutrition Sciences).
- Pande, P. K. (1987), Outline of Sports Medicine (New Delhi : Jaypee Brothers).
- Roy, Steven and Richard, Irvin (1983), Sports Medicine (N.J. : Englewood Cliff.).
- Sharma, N.P. (2005), Sharir Rachna Tatha Sharir Kriya Vigyan (New Delhi : Khel Sahitya Kendra).


Course Contents:

UNIT -1

- **Benefits of exercise**
- **Growth and development**
- **Exercise and well-being sex and age characteristics of adolescent**
- **Body types**
- **Sex differences**
- **Individual differences**
- **Use , disuse and overuse phenomenon of exercise**

UNIT-2

- **Nutrition: Meaning of nutrition role of nutrition in daily life , Elements of balanced diet, Carbohydrates, Proteins, Fats, Vitamins, Minerals, Salts and Water.**

UNIT-3

- Aim and objectives of First-Aid
- Importance of First-Aid in Sports Injuries
- Ergogenic Aids in Sports
- Aim and Objectives of Rehabilitation

UNIT-4

- Concept and Role of Athletic Care
- Prevention and Management of Injuries : Factors causing injuries and general principles for safe guarding
- Prevention of injuries
- Common Sports Injuries : Sprain, Strain, Abrasion, Laceration, Haematoma, Fracture, Dislocation

**End Semester Examination - No Examination**

**3rd semester examination scheme and contents of syllabus:**

**THIRD SEMESTER : SCHEME OF TEACHING**

**Duration of Semester : 18 weeks**
**Periods per week : 32**
**Duration of each period : 60 minutes**
**Note**: The course work and assignments in each subject must be completed as prescribed.

| Sr. No. | Subject | Periods per week | Total periods | Teaching Methodology and Sessional Work |
|---|---|---|---|---|
| 1. | Architectural Design-III | 8 | 144 | Design assignments, time problems |
| 2. | Building Construction-III | 4 | 72 | Notes, sketches, drawings, tests |
| 3. | Building Services-III | 2 | 36 | |
| 4. | Structure Systems & Design-III | 2 | 36 | Notes & tests |
| 5. | Theory of Design-III | 2 | 54 | Drawings, tests |
| 6. | Architectural Graphics-III | 4 | 36 | Sketches,drawings, tests |
| 7. | History of Built Environment-III | 2 | 36 | Notes, sketches, tests |
| 8. | Computer Applications in Architecture-III | 3 | 54 | Theory & Practical |
| 9 | Workshops & Model Making-III | 3 | 54 | |
| 10. | Health Education-III | 2 | 36 | Health and fitness, extra curricular activities |
| 11 | Educational Tour | 1 week duration (5 daysx 6 hours=30) | | Tour notes, sketches, drawings, and report |
| | Total | 32 | 588 | |

**THIRD SEMESTER : SCHEME OF EXAMINATION**

PREPARATORY HOLIDAYS One week

EXAMINATIONS Approximately two weeks

NOTE: 1. In addition to the University Studio Examination, the subjects of Architectural Design-III and Building Construction-III will be assessed through a viva-voce by an external examiner appointed by the Panjab University.

The subject of Computer Applications in Architecture-III will be judged through a portfolio containing all the work done by the student during the entire semester. The jury will comprise of studio incharge and one external examiner appointed by the Principal.

| Sr. No. | Subject | Duration of exam. (in hours) | Max Marks for Exam | Marks for portfolio | Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|---|
| 1. | Architectural Design-III | 12 | 200 | | 200 | 400 |
| 2. | Building Construction-III | 6 | 100 | - | 100 | 200 |
| 3. | Building Services-III | 3 | 50 | - | 50 | 100 |
| 4. | Structure System & Design-III | 3 | 50 | - | 50 | 100 |
| 5. | Theory of Design-III | 3 | 50 | - | 50 | 100 |
| 6. | Architectural Graphics-III | 6 | 100 | | 100 | 200 |
| 7. | History of Built Environment-III | 3 | 50 | - | 50 | 100 |
| 8. | Computer Applications in Architecture-III | - | - | 50 | 50 | 100 |
| 9. | Workshops & Model Making-III | - | - | - | 50 | 50 |
| 10. | Health Education-III | - | - | - | 50 | 50 |
| 11. | Educational Tour | - | - | - | - | - |
| | Total | | 600 | 50 | 750 | 1400 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-301 | ARCHITECTURAL DESIGN-III | 0-0-8 | | Sessional work : 200<br>Examination : 200 |

Course Objectives : To learn the site planning principles and concept of vertical circulation.

Reference Books :

- Form Defining Strategies: Experimental Architectural Design - Agkathidis, A.,
- Hudert, M, and Schillig, G.
- 42
- Site planning, Kevin Lynch, MIT Press, Cambridge, 1967
- 10 Principles of Design by Ruth Slavid
- Structure in Nature – Strategy for Design, Pearce Peter;
- Time Saver Standards for Building Types, C. D. Joseph and Callender John;
- Time Saver Standards for Architectural Design Data, C. D. Joseph &
- Callender John;
- Neufert's Architect's Data

Course Contents :

UNIT-1

- Hostel, Neighbourhood shopping or shopping mall

**Mid Semester Test**

UNIT-2

- Motel, Guest House, Embassies, and Club.

**Evaluation System:**

There will be minimum 02 design assignments each semester. Each design assignment shall be of 05 stages:

Reference studies & idea exploration

- Concept formulation.
- Review – I & Review - II
- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

- Idea / concept originality
- Presentation of drawings to convey the idea
- Graphic presentations
- Model / 3D / Animation etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

Examiner is required to set one compulsory question from any of the units.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-302 | BUILDING CONSTRUCTION-III | 0-0-4 | | Sessional work : 100<br>Examination : 100 |

Course Objectives: To introduce working and construction details of 2-4 storied buildings of load-bearing masonry frame construction in RCC.

Content:

Reference Books:

- Mckay, WB Building Construction
- Rangwala, S.C Engineering Materials
- Punmia, B.C. Building Construction
- Khanna P.N. Oractical Civil Engineer's Handbook
- Ching, Francis D.K. Building Construction Illustrated
- Construction Technology by Chudley
- Construction of Buildings by R.Barry

UNIT-1

- Introduction to concept of frame – structures in RCC.
- Foundations in RCC – Various types of constructions
- R.C.C. Construction- Advantages over load bearing construction, study of column grid, detailing of R.C.C. work with reinforcement for slabs, beams, columns, footing, staircases.
- RCC frame structure with infill walls of brick and various cement concrete products, such as hollow blocks, light weight concrete blocks, etc..

UNIT-2

- Introduction to various types and vocabulary related to construction details with special emphasis on Dog logged, Open well Staircase, Spiral and Cantilever Staircase.

**Mid Semester Test**

UNIT-3

- Section through R.C.C. framed double storied building through toilet and staircase showing the details of Foundation, Floor, Window, Lintel, Chajja, Roof, Terrace, Parapet and Coping.
- Laying of floors – Basic preparation for Ground floor and upper floor
- Cantilevered construction in RCC such as canopies, projections etc.

UNIT-4

- Types of formwork (shuttering) for concrete, scaffolding, shoring, etc.
- R.C.C. Form work and Shuttering details for-
  1. Column (square and round)
  2. Slab and Beam
  3. Retaining Wall

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| CCA-3-303 | BUILDING SERVICES –III | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To impart the knowledge and skills required for understanding the Building Services and their application to buildings with focus on Water Supply, Drainage and Sanitation and their integration with architectural design.

Reference Books:

- Sanitary Engineering – (Vol. I and II) by RS Deshpande
- Water supply and Sanitary Engineering by G S Birdi, J S Birdie, Publishers: Dhanapat Rai
- Water supply and sanitation by Charanjit S. Shah
- Architects Handbook, Ready Reckoner by Charanjit S. Shah, Publishers : Galgotia Publishing Company
- Building Services and Equipments by Prof. Ashok L. Chhatre, Publisher: Priyadarshini Institute of Architecture & Design Studies
- National Building Code of India 2016, Volume 2, Bureau of Indian Standard
- Sustainable Solid Waste Management by Jonathan W.C. Wong, Rao Y. Surampalli, Tian C. Zhang, Rajeshwar D. Tyagi, and AmmaiyappanSelvam, Publisher ASCE
- Management of Municipal Solid waste by T.V. Ramachandra, Publishers : TERI
- Municipal Water and wastewater Treatment by Rakesh Kumar, R.N. Singh, Published by TERI

Course Contents :

UNIT-1

**Water Supply**

- Introduction, sources of water supply, qualitative and quantitative aspects, impurities, purification – sedimentation, coagulants, filtration, disinfection, water softening and miscellaneous treatment of water, Sources of water pollution and preventive measures.
- Public water distribution system, methods of layout of distribution pipes (Pipes material, Size and their jointing details), Basic Principles, Systems of Water Supply
- Domestic, hot and cold water supply systems.

UNIT-2

**Sanitation**

- Introduction, importance and purpose of sanitation, definitions – bacteria, invert, sewer, sewerage, types of refuse, collection and disposal of refuse,
- Systems of drainage – separate, combined and partially separate system, advantages and disadvantages of each system. Dry and Wet Carriage Systems.
- Sanitary Fittings-- Wash basins, WC's, Bath Tubs, Sink, Urinals, Bidets, Flushing Cistern, Traps etc .and Various types of joints
- Sanitary requirements for various types of buildings, types of pipes, Man holes – drop manholes, manhole with intercepting trap, inspection chambers, self cleansing velocity, drains on sloping sites, sub soil drainage, storm water disposal – catch basins, inlets, storm water regulators.
- Importance of pumps and sewage pumping stations, septic tanks – soak pit, soak well, design aspects, disposal of effluent.
- Definitions – Siphonage, anti-siphonage pipe, cowl, fresh air inlet, soil and waste pipes, vent Pipe Systems of plumbing – single stack, one pipe, one pipe partially ventilated, two pipe disposal of waste water from buildings
- Natural methods of sewage disposal – by dilution and land treatment, self purification of natural waters, oxidation, sewage treatment, oxidation ponds, aqua privy, garage drainage and layout of simple drainage systems, sewers, materials, laying and testing of sewers, ventilation of sewers, surface drains, sewer, cleaning of sewers, re-cycling of sewage water.
- Rural sanitation, biogas, different methods of collection and disposal of dry refuse and night soil

- Solid waste management-issues and classification of solid waste, various sources of solid waste and methods of collection, disposal and treatment of the waste.

**Mid Semester Test**

UNIT-3

**Storm Water Disposal**

- Types of Roads-WBM (water bound macadam) Road-Tar, Bitumen, Asphalt and RCC roads.
- Pavements- Types (Soil stabilized, Brick and Stone paving), Use, Advantages/Disadvantages
- Drainage- Sub- drains Culverts, Ditches, Gutters, Drop inlets and Catch Basins.
- Rain Water Disposal for individual buildings and Rain Water Harvesting

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-304 | STRUCTURE SYSTEMS & DESIGN – III | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To understand the principles of design of RCC structures.

Reference Books :

- Treasure of R.C.C Design by S.Kumar
- Mechanics of Structure by Junnarkar
- Building Design And Construction Handbook Sixth Edition

Course Contents :

**UNIT-1**

- Concept of RCC and Introduction to IS: 456
- Working stress method of design for RCC structures
- Theory of Singly Reinforced Section – Neutral Axis, Under reinforced section, Over reinforced section and Moment of Resistance
- Shear, Bond and Development length.
- Analysis and Design of singly reinforced rectangular RCC beam.
- Theory and Design of Doubly reinforced rectangular RCC beam

**UNIT-2**

- Theory and Design of: -
  - One way RCC slab
  - Cantilever RCC slab
  - Two way RCC slabs

**Mid Semester Test**

**UNIT-3**

- Theory and Design of Long and Short, Square, Rectangular and circular RCC columns.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-305 | THEORY OF DESIGN-III | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To understand different design processes and strategies that can be applied in architecture

Reference Books :

- Design Methods by John Chris
- Experiencing Architecture by Steen Eliel Rasmussen
- Architecture Design and Ethics: Tools for Survival, T Fisher, Architectural Press
- An Invitation to Design, Helen Marie Evans and Carla David Dunneshil, Macmillan Publishing Co. Inc., New York, 1982.
- Design Process: A Primer for Architectural and Interior Design, Sam F. Miller, Van No strand Reinhold, 1995

Course Contents :

UNIT-1

**Design Process-** Design methodology, Philosophies and approaches to design process, Challenges of designer

UNIT-2

**Selection of Strategies and Design Methods.-** Criteria for choosing design method, input output chart for selecting design methods, Design strategies, Linear strategies, Cyclic Strategies, Branching strategies, adaptive strategies.

**Mid Semester Examination**

UNIT-3

**Collaborative strategy for adaptive architecture-** Enabling everyone concerned with the designing of a building influencing decisions that affect both the adaptability of the building and the compatibility of its components.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-306 | ARCHITECTURAL GRAPHICS –III | 0-0-4 | | Sessional work : 100<br>Examination : 100 |

Course Objectives: To learn and apply various rendering techniques in Architectural Design & visual composition.

Reference Books :

- Manual Graphic Technique by Tom Porter
- Architectural Rendering by Fabio Schillaci

Course Contents: Use of coloured pencils, pen & ink, in Architectural design assignments.

UNIT-1

- Rendering of drawings (plan, elevations, perspectives) in two different medium from a design assignment of previous semester.

UNIT-2

- Simple mural designing.
- Representation of texture (in colour) of ply, stone, marble, glass, etc. in colour.

**Mid Semester Examination**

3

- Simple mural designing.
- Representation of texture (in colour) of ply, stone, marble, glass, etc. in colour.

4

- Black & White rendering of a given sketch in enlarged form. Sketch can be from interior or exterior.

**shop to be organised:**

- A workshop on rendering techniques will be organised.
- A mural or sculpture workshop will be organised in ceramics, plaster of paris, wrought-iron or terracotta.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

Two/three questions are to be formulated which would assess the students on their ability to sketch and render as per the topics mentioned above.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-307 | History of Built Environment – III | 2-0-0 | | Internal- 50<br>External- 50 |

Course Objectives:

To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form.

To develop a holistic approach to Architecture as an integral component of built environment.

Reference Books:

- History of Architecture –Sir Bannister Fletcher
- Islamic Architecture of the Indian Subcontinent – Bianca Maria Alfieri
- India Architecture (Islamic Period 1192-1857)- Dr.SurendraSahai
- India Architecture (Islamic Period) – Percy Brown
- Islamic Architecture in India – Satish Grover
- Mughal Architecture & Gardens – George Michell
- The History of Architecture in India – Christopher Tadgell

Course Contents:

**2**

**c Architecture- Imperial Style and Sayyid Dynasty:-**

- Advent of Islam and its influence in India leading to the Indo- Islamic Style. Beliefs, tenets of Islam and its expression in architecture in India.
- Evolution of the Mosque & the Tomb design, beginning from the earliest examples of such type in the India sub continent.

**Delhi Sultanate:-**

- Mosques, Tombs and secular buildings:
- The Qutb Complex: Quwwat-UI-Islam Mosque, Qutb-Minar, Tomb of Altutmish, extensions and additions by Allaudinkhilji.
- Arhai Din Kajhompra, Khirkee Masjid, Jamaatkhana Masjid, Sultan Ghari, Tombs of GhiyasuddinTughlaq, Firoz Shah Tughlaq, Balban, SikanderLodhi.
- Firoz Shah Kotla
- Tomb of Sher Shah Suri, Sasaram

**UNIT-2**

**rovincial Styles:**

- Evolution and brief history, and study of the following:
- Mandu: All Key buildings
- Jaunpur : Atala Masjid, Jami Masjid
- Gujarat: Jami Masjid &Adalaj, Ahmedabad, Baolis of Ahmedabad, and jami Masjid at Champanir.
- Bijapur: Jami Masjid, Ibrahim Rauza, GolGumbaz, MehtasMahal.
- Hyderabad – Char Minar.

**MID SEMESTER TEST**

**UNIT-3**

**The Mughal Period**:-

- A brief history and study of the following architectural examples:
- Humayun's Tomb
- Fatehpur Sikri
- Akbar's Mausoleum

UNIT-4

**The Mughal period** (continued)

- Red Fort, Jami Masjid, Delhi
- TajMahal
- Landscaping in Mughal Architecture : Babur to Aurangzeb
- A brief study of elements of Indo- Islamic Architecture like Arches, Domes, Squinches, Minarets, Jaalis, Chajjas and other symbolic expressions, and ornamentation patterns.
- Constructional system adopted by the Slave kings, Bijapur rulers and the Mughals.

**END SEMESTER EXAMINIATION**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-308 | COMPUTER APPLICATIONS IN ARCHITECTURE -III | 0-0-3 | | Sessional work : 50<br>Portfolio : 50 |

Course Objectives:

1) To train students to make their presentations and reports on computer.
2) To get familiar with Photoshop which is a standard graphical representation tool used in all designer fields.
3) An Introduction to Computer Aided Designing (CAD). This will enable students to make 2D Architectural Drawings on computer.
4) To make students familiar with the simplest form of 3D modelling to help them visualize and communicate their architectural designs.

Reference Books :

- AutoCad Series by George Omura
- Photoshop 6; The complete Reference by Adele Droblas Greenberg, Seth Greenberg

Course Contents :

UNIT-1 **- Presentation, Report Making and Creating & Editing Raster & Vector Images.**

- Presentation and Report making using **MS Power Point1 and MS Word2**
- Definition of Raster and Vector image formats and their different types.
- Introduction to **Adobe Photoshop3** (for Image editing in raster formats.)
    - Photoshop Interface and tools layout
    - Main tools in Photoshop (selection, brushes, gradient, crop, etc.)
    - Introduction to concept of Layers in Photoshop
    - Image enhancement tools of Photoshop (brightness, levels, hue, exposure etc.)
    - Image Blending Options (shadow, highlight, emboss, glow etc.)
    - Layer Blending (addition, subtraction, difference, multiply, screen, overlay etc.)
    - Introduction to reversible workflow in Photoshop by Staking effects in layer panel.
    - Introduction to Masking in Photoshop and applying stacked effects using masks.
    - Exercise: Enhance a set of architectural or art images taken from a camera and from internet using Photoshop image editing tools and showing before after.
    - Exercise: Create an abstract graphical composition with a supporting concept.
- Basic Introduction to Adobe Illustrator4 (for Image editing in vector formats.)
- Basic Introduction to Adobe Indesign5 (An advanced tool for report making.)

UNIT-2**- Computer Aided Design (CAD) tools for Architecture.**

- Introduction to the concept of a Computer based Architectural Designing and Drafting Tool.
- Drafting on **AutoCAD6**
    - AutoCAD Interface, Work space customizations.
    - Viewport transformations (zoom, pan, orbit, zoom extent etc.) to view drawings.
    - Understanding - Viewports, Coordinate System (project zero), Grids, UNITs setup, Dimensioning Setup and Drawing Limits.
    - Basic transformation and editing commands - move, rotate, scale, mirror, copy etc
    - Snapping Tools – Positional, Angular, Ortho etc.

- Creating a 1:1 scale Drawing in AutoCAD: Drafting Commands, Layers, Blocks, Hatch & Helpers (construction lines, points, markers and measuring tools) and reference images in background.
- Dimensioning and Labelling
- User Coordinate System (UCS)
- Introduction to Paper space and Layout space in CAD
- Creating sheet, formats, composing drawings on required scale and plotting.
- Exercise: Draft current semester or previous semester design in AutoCAD.

- Introduction to different type of Architectural Drawings, Showing students with a complete set of drawings of an architectural project completed in all respect.
  - Presentation Drawings
  - Submission Drawings
  - Working Drawings

**Mid Semester Test**

UNIT-3**- Basic 3D modelling tools for Design visualization**

- Introduction to the concept and advantages of using 3D modelling tools in Designing.
- Free form 3D modelling in **Sketchup7 .**
  - Introduction to Sketch-up Interface and toolbar layout
  - Opening a Sketch-up project downloaded from warehouse and viewing it from different angles using 'viewport transformation tools'.
  - Creating a new file and setting up the UNITs.
  - Understanding coordinate system in a 3D software (getting familiar working with 3 axis unlike 2 axis in 2D).
  - Creating lines, surface, rectangle, arcs and polygons using drawing tool.
  - Draw shapes on edge and utilise sketch-up "sticky" geometry
  - Creating and manipulate 3D solid objects (rectangle, cylinder, cone) using drawing tools and inferences
  - Design complex combined shapes using push/pull and move tools
  - Using different modelling techniques to quickly create complex 3D forms
  - Create concentric surface with the offset tools
  - Arrange an array of duplicated objects
  - Using colour and style to render detailed surfaces
  - Exercise: Create 3D models of complex objects similar to AD exercises and make their isometric and perspective views.
- 3D modelling a Building in **Sketchup.**
  - Importing a simple AutoCAD DWG drawings into Sketchup
  - Placing the AutoCAD plan in relevant position for tracing, snapping
  - Creating solid walls, plinth of building, doors and windows openings
  - Creating basic materials
  - Create outdoor and indoor environment and import models from warehouse to populate scene.
  - Exercise: Create a 3D modelling a Building in Sketchup.
  - Exercise: Create a 3D modelling an interior scene in Sketchup.

**End Semester Examination - Internal Portfolio Viva**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-309 | WORKSHOP & MODEL MAKING-III | 0-0-3 | | Sessional work : 50 |
| Course Objectives: To train the students to prepare building models in various mediums viz. mount board, thermocole and various other materials | | | | |
| Course Contents : | | | | |
| UNIT-1<br>Model making in paper, cardboard and mount board.<br>• To prepare block model of the design problem introduced in the semester along with site plan details such as parking, green area, landscape techniques etc. | | | | |
| UNIT-2<br>• To prepare a detailed model in mixed materials of a major design problem in same semester | | | | |
| **End Semester Examination - No examination** | | | | |

| Course No. | Course name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-3-310 | HEALTH EDUCATION- III | 2-0-0 | | Internal -50 |

Course objective: **To make the students to learn the basic concepts related to physiological and psychological concepts**

Reference Books:


- Bucher, C.A.*Foundations of Physical Education*, St. Louis; C.V. Mosby Co., 1972
- Khan, E.A. *History of Physical Education,* Scientific Book Company. Patna, 1964.
- Beotra, Alka (2001-02), Drug Education Handbook on Drug Abuse in Sports (Mumbai: Applied Nutrition Sciences).
- Pande, P. K. (1987), Outline of Sports Medicine (New Delhi : Jaypee Brothers).
- Roy, Steven and Richard, Irvin (1983), Sports Medicine (N.J. : Englewood Cliff.).
- Sharma, N.P. (2005), Sharir Rachna Tatha Sharir Kriya Vigyan (New Delhi : Khel Sahitya Kendra).


Course Contents:

UNIT -1

- Warming-up, Conditioning, Cooling-down
- Oxygen Debt
- Second Wind

PHYSIOLOGICAL TERMS:

- Vital Capacity
- Stroke Volume
- Cardiac Output

UNIT-2

- Socialization process
- Sports as cultural heritage of mankind
- Competition and cooperation
- Group Dynamics
- Leadership qualities

UNIT-3

- Meaning and General Principles of Growth and development
- Laws of Learning *(laws of readiness, laws of effect, laws exercise)*
- Psychological benefits from Physical Activity

UNIT-4 Components of general motor abilities and health related physical fitness

- Speed test
- Strength test
- Endurance test
- Flexibility

**End Semester Examination - No examination**

**4th semester examination scheme and contents of syllabus:**

**FOURTH SEMESTER : SCHEME OF TEACHING**

**Duration of Semester : 18 weeks**
**Periods per week : 33**
**Duration of each period : 60 minutes**

**Note**: The course work and assignments in each subject must be completed as prescribed.

| Sr. No. | Subject | Periods per week | Total Periods | Teaching Methodology and Sessional work |
|---|---|---|---|---|
| 1. | Architectural Design-IV | 8 | 144 | Design assignments, time problems |
| 2. | Building Construction-IV | 4 | 72 | Notes, sketches, drawings, tests |
| 3. | Building Services-IV | 2 | 36 | Notes, sketches, tests |
| 4. | Structure Systems and Design-IV | 2 | 36 | Notes & tests |
| 5. | Architectural Graphics-IV | 4 | 72 | Sketches, drawings, tests |
| 6. | Building Climatology-IV | 2 | 36 | Drawings, tests |
| 7. | Surveying & Mapping-IV | 2 | 36 | Notes, sketches, tests |
| 8. | History of Built Environment-IV | 2 | 36 | Notes, sketches, tests |
| 9. | Computer Applications in Architecture-IV | 3 | 54 | Theory & Practical |
| 10 | Design and Environmental Psychology-IV | 2 | 36 | |
| 11 | Health Education-IV | 2 | 36 | Health and fitness, extra-curricular activities |
| | Total | 33 | 594 | |

**FOURTH SEMESTER : SCHEME OF EXAMINATION**

PREPARATORY HOLIDAYS : One week

EXAMINATIONS :Approximately two weeks

NOTE: 1. In addition to the Sessional marks, the subjects of Computer Applications in Architecture-IV will be judged through a viva voce and a portfolio containing all the work done by the student during the entire semester. The jury will comprise of the studio incharge and one external examiners appointed by the Principal.

2. In addition to the University Studio Examination, the subjects of Architectural Design-IV, and Building Construction-IV will be assessed through a viva-voce by an external examiner appointed by the Panjab University.

| Sr. No. | Subject | Duration of exam. (in hours) | Max Marks for Exam | Marks for portfolio | Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|---|
| 1. | Architectural Design-IV | 12 | 200 | - | 200 | 400 |
| 2. | Building Construction-IV | 6 | 100 | - | 100 | 200 |
| 3. | Building Services-IV | 3 | 50 | | 50 | 100 |
| 4. | Structure Systems & Design-IV | 3 | 50 | | 50 | 100 |
| 5. | Architectural Graphics-IV | 6 | 100 | | 100 | 200 |
| 6. | Building Climatology-IV | 3 | 50 | | 50 | 100 |
| 7. | Surveying & Mapping-IV | 3 | 50 | | 50 | 100 |
| 8. | History of Built Environment-IV | 3 | 50 | | 50 | 100 |
| 9. | Computer Applications in Architecture-IV | - | - | 50 | 50 | 100 |
| 10. | Design and Environmental Psychology-IV | 3 | 50 | - | 50 | 100 |
| 11. | Health Education-IV | - | - | - | 50 | 50 |
| | Total | | 700 | 50 | 800 | 1550 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-401 | ARCHITECTURAL DESIGN –IV | 0-0-8 | | Sessional work : 200<br>Examination : 200 |

**Course Objective:** To learn the site planning, building services and structure in complex building / group of buildings

Reference Books :

- Campus Planning, Richard P. Dober
- Campus Planning in India, Kanvinde
- Christopher Alexander; A Pattern Language
- Time Saver Standards for Building Types, C. D. Joseph and Callender John;
- Time Saver Standards for Architectural Design Data, C. D. Joseph &
- Callender John;
- Neufert's Architect's Data

Course Contents :

UNIT-1

- Office complex

**Mid Semester Test**

UNIT-2

- Residential school /college, Hotel, medical school, dental school, nursing school.

**End Semester Examination**

**Teaching and Learning Methodology**

- Case study of office complex for site planning, structural system and services.
- Students should be advised to work on structural grid. The building services
- should be marked at the concept stage so that later on it will be easy to
- workout.
- One design project to reflect the learning from Building Climatology IV.
- The climate fundamental should be learned through the making model and
- placed in particular machine in workshop.

**Evaluation System:**

There will be minimum 02 design assignments each semester. Each design assignment shall be of 05 stages:

Reference studies & idea exploration

- Concept formulation.
- Review – I & Review - II
- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

- Idea / concept originality
- Presentation of drawings to convey the idea
- Graphic presentations
- Model / 3D / Animation etc.

INSTRUCTIONS TO THE PAPER SETTER

Examiner is required to set one compulsory question from any of the UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-402 | BUILDING CONSTRUCTION-IV | 0-0-4 | | Sessional work : 100<br>Examination : 100 |

Course Objectives: To make students understand various construction details in metals i.e. Steel, Aluminum.

Content:

Reference Books


- Watson, Don A; "Construction Materials and Processes", McGraw Hill Co., University of Michigan, 1972.
- McKay, W.B. "Building Construction", Vol. 1,2,3,4, Longmans, U.K., 1981.
- Alanwerth, "Materials", The Mitchell Pub. Co., Ltd. London, 1986.
- Chudley, R. "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
- Barry, R. "Building Construction", East West Press, New Delhi, 1999.


UNIT 1

Introduction to framed construction in steel, characteristics of steel sections, methods of jointing. Applications in various types of structures and different parts of buildings components.

- Details of Steel floorings in industrial buildings.
- Mezzanine floors.
- Steel stairs – Dog legged, Straight flight and spiral.

UNIT 2

- Trusses in steel. - Constructional details of Simple Truss, North Light Truss, tubular truss, lattice girder, etc.
- Fixing details of various roof coverings at valleys & gutters etc.

**Mid Semester Test**

UNIT 3

- Construction of various types of doors & windows in Steel & Aluminum.
- Lightweight partitions in Steel and Aluminum. Thermal and Acoustic insulation of spaces and metal cladding for facades.

UNIT 4

- False ceilings, incorporating services such as air conditioning, lighting, etc.
- Metal and gypsum false ceiling.
- Cladding of interior and exterior walls in various metals.
- Non Load bearing partition in metals.
  Paneling in metal.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

| | | | | |
|---|---|---|---|---|
| CCA-4-403 | BUILDING SERVICES-IV | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To make the students aware of various services such as water supply, drainage and electrical required for buildings

Reference Books :

- Water supply and sanitation- G.S. Bindra/J.S. Bin, Barry R, Building Survices, John Wiky and Sons Ltd 1998

Course Contents :

UNIT-1

- Water supply : sources and treatment of water, storage and supply systems for buildings various fittings and material used for water supply sanitation
- Drainage System: Lay out for a small neighbourhood
- Storm water disposal, advantages and disadvantages of various materials for pipes and layout of pipes.
- Waste Water disposal: Various types of systems used in buildings.
- Materials used for pipes, layout and jointing of pipes, sewage treatment systems.
- Solid- waste disposal: chutes, ducts, incinerators etc.

UNIT-2

- Services of single storeyed residential building and multi story structures: Water supply systems: fitting, hot and cold water supply layouts, geysers, boilers. Water storage and supply systems for domestic use.
- Drainage and Sewerage System: Storm water drainage, waste water disposalcarriage systems, sanitary fittings, types of pipes and drains in different materials and usage. Inspection and intercepting chambers and their details. Cess pools and septic tanks.
- Exercise for incorporating layout of services in a project completed in the Architectural Design Studio.

**Mid Semester Test**

UNIT-3

- Electrical Services: types of wires, fittings and conducts
- Various types of wiring systems, advantages and disadvantages, safety and precautions.
- Electrical; equipment used in building; motors, fuses, switchboards etc.
- Introduction to illumination.
- Various types of lamps for artificial lighting – direct and indirect methods of lighting.
- Use of electrical fittings such as MCB's, ELCB's, fuse UNITs,control panels, etc.
- Preparing an electrical layout for a residential Building incorporating above.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-404 | STRUCTURE SYSTEMS AND DESIGN – IV | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To understand the principles of design of RCC structures.

Reference Books :

- Building Systems Reference Guide 1987 by Tyler G. Hicks
- Standard Handbook of Civil Engineering by Gurcharan Singh

Course Contents :

UNIT-1

- Theory and Design of simply supported circular slabs subjected to uniformly distributed load.
- Theory and Design of Dog legged stairs.

UNIT-2

- Fixed Beams: Bending Moment diagrams for a fixed beam subjected to uniformly distributed load and Point Load (Formulate to be stated No derivations).
- Theory and Design of:
    1) Singly and doubly reinforced T beams. Inverted T. Beams and isolated T beams
    2) Singly reinforced L Beams

**Mid Semester Test**

UNIT-3

- Theory and Design of isolated uniform thickness column footings for Square. Rectangular and circular RCC columns subjected to axial loads.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-405 | ARCHITECTURAL GRAPHICS-IV | 0-0-4 | | Sessional : 100<br>Examination : 100 |

Course Objectives: To appreciate the role of presentation techniques in Architecture & Graphics.

Reference Books :

- 64/65 Graphics Annual by Walter Herdeg
- Graphic thinking for Architecture & Designer by Paul Laseau

Course Contents :

Introduction to photo based water colour, markers, mixed media for rendering, charcoal techniques, 3-D composition from waste material, monochromatic colour schemes.

UNIT-1

- Rendering of design assignment from previous or current semester.
- Rendering on the given sketch with specified medium (mix media or pastel shades).

UNIT-2

- Sketching of buildings with human figures, vehicles etc. in colour & black and white.
- Sketching of old buildings (Fort, Havelis, etc).

UNIT-3

- Creation of individual environment around a given building with landscaping and other elements.

UNIT-4

- Mural composition for interior or exterior walls with suggestion of materials.

**Workshop**

- A sculpture or mural workshop using waste material will be organised.
- Workshop on rendering techniques.

**End Semester Examination : No Examination**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-406 | BUILDING CLIMATOLOGY-IV | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives:

- To acquaint students with the concept of climate as a significant determinant of built form.
- Familiarization with climate-controlling devices.

Reference Books :

- Manual of Tropical housing by OH Koenigsberger
- Introduction to building climatology by Antony Sealey
- Design primer for hot climates by Allan Konya
- Tropical climatology by S. Nieuwolt
- CBRI Daylight Distribution Charts

Course Contents :

UNIT-1

- Introduction to climatology, role of climate with respect to shelter, importance of studying Building Climatology.
- Movement of earth around the sun, change of seasons, distribution of global pressure belts and global wind movements, global climatic zones.
- Definition of weather, climate, elements of climate, interrelationship of climatic elements and psychometric chart.
- Study of indigenous shelters in response to the climatic zones in India

UNIT-2

- Definition and explanation of thermal comfort, relationship of climatic, elements with thermal comfort, thermal stress index, bio climatic chart, effective temperature and corrected effective temperature histogram
- Heat exchange between building and environment (qualitative aspect only), thermal properties of materials, thermal properties of building elements, solar gain factor, solair temperature
- Solar chart and its importance ,understanding the movement of sun across the sky, importance of understanding the optimum orientation and building form in different climatic zones, concept of shading devices

**Mid Semester Test**

UNIT-3

- Calculation for the design of horizontal and vertical shading devices.
- Air movement inside buildings and Ventilation systems
- Microclimate.
- Role of landscape and other passive devices for climate control.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-407 | SURVEYING & MAPPING-IV | 2-0-0 | | Sessional work: : 50<br>Examination : 50 |

Course Objectives: To bring about an awareness of role of surveying in architectural and planning projects and to make the students conversant with the commonly used techniques of surveying.

Reference Books :

- Surveying Manual by BC. Punmia
- Surveying and Field Work- BC. Punmia

Course Contents :

UNIT-1

- Objectives, divisions and principles of surveying; scales and measurements; types of instruments and their uses.
- Chain Surveying: Principles and instruments. Methods of chaining, errors in measurements and corrections, recording field notes, obstacles in chain surveying
- Prismatic Compass: Its use in the measurement of angles from bearings.

UNIT-2

- Levelling: Terms used, Dumpy level and 1.0.P level, temporary adjustment of a level, levelling staves, reduction of levels, difficulty in levelling, errors and permissible limits of error, classification of levelling.
- Contouring: Technical terms used in contouring, characteristics of contours, methods of contouring, interpretation of contour, tracing the contour gradient for alignment of a roads and paths, uses of contour.

**Mid Semester Test**

UNIT-3

- Plane Table Surveying: Plane Table and its accessories, setting and orienting the plane table, methods of plane tabling, advantages and disadvantages of Plane table surveying.

UNIT-4

- Theodolite Surveying: Transit vermier, Theodolite, basic definitions, temporary adjustment, fundamental lines of theodolite, measurement of horizontal angle and vertical angle, reading a magnetic bearing of a line, prolonging a straight line, techniques of surveying for a large campus. Methods of Computation of area, methods of setting out of a building.
- Introduction to told station and softwares used in GIS

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-408 | History of Built Environment – IV | 2-0-0 | | Internal- 50<br>External- 50 |

Course Objectives:

To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form.

To develop a holistic approach to Architecture as an integral component of built environment.

Reference Books:

- A Global history of architecture – Ching, Jarzombek, Prakash
- A History of Western Architecture – David Watkin
- Classical Architecture – Robert Adam
- History of Architecture – Sir Bannister fletcher
- The Architecture of the Renaissance Volume I & II by Leonardo Benevolo
- Renaissance Architecture by Bates Lowry
- Renaissance Architecture by J. Quentin Hughes
- World Architecture – Henry Russell Hitchcock

Course Contents:

UNIT-1

**Early Christian period**

- Development of Church plan during the Early Christian period. Functional components, construction and architectural character. Examples of basilican and centralized churches
- Byzantine churches – Greek cross and Latin cross plan. Basis of architectural form, structural systems, techniques of construction and ornamentation. Detailed analysis of Santa Sophia. Byzantine Churches in Greece and Russia.

UNIT-2

**omanesque architecture**

- Evolution of Romanesque architecture. Changes in church plan, elevational feature and structural systems. Development of Romanesque vaulting.
- Characteristics of Romanesque churches in Italy, France and Germany. Comparative analysis of representative examples.
- Civic Architecture of Romanesque England.
- Characteristics of the Gothic cathedral. Changes in functional, visual and structural elements as compared to Romanesque period.

**SEMESTER TEST**

UNIT -3

**Renaissance (New Birth) Movement and Architecture**

- Basis of the Renaissance Movement. Its effect on the built environment.
- Pattern and form of the Renaissance town. Disposition and character of various urban elements.
- Renaissance Architecture- Phases of development, stylistic characteristics, building typology- definition and examples.
- Architects of Early Renaissance, High Renaissance and Mannerism. Principal works of Brunelleschi, Alberti, Bramante, Michelangelo and Palladio.

UNIT-4

**Baroque Architecture**

- Development of Baroque architecture and civic design.
- Elements of the Baroque town. Interrelation between buildings and urban space. Examples of Campidoglio and peters' Piazza, Rome, etc.
- Characteristics of Baroque architecture. Works of Bernini and Borromini.
- Rococo Architecture, Basilica at Ottobeuren, Germany.

**Neo classical:-**

- The origin of Neo classicism (mid. C $18^{th}$ –mid. C $19^{th}$), a new looks of the orders.
- English Neoclassicism: the vocabulary of the Neoclassical house.

NOTE: Analysis of architectural style/building typology must include functional. Constructional/structural and ornamentation aspects.

**END SEMESTER EXAMINIATION**

INSTRUCTIONS TO THE PAPER SETTER

1. The Examiner is required to set six questions in all and minimum of one question from each UNIT.
2. The student is required to attempt any four questions by selecting at least one from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-409 | COMPUTER APPLICATIONS IN ARCHITECTURE-IV | 0-0-3 | | Sessional work : 50<br>Portfolio : 50 |

Course Objectives: The main aim of this course is to enable students to create good quality 2D and 3D graphics for representation of their designs in academics, and to create material for their training reports and various competitions they undertake during this semester.

Reference Books :

- AutoCad Series by George Omura

Course Contents :

UNIT-1**- Image (printed) and Display (monitor) Resolution**

- For creating printable graphics on a computer screen with complete clarity, following topics must be covered first.
    - Features and difference between - CRT, LCD, LED, OLED, IPS, AHIPS panels. Advantages of using an IPS, AH-IPS monitors for all graphical works.
    - Colours in a computer pixel (RGB) and colours in a print (CMYK)
    - Getting aware of various print technologies and their capabilities – Dot matrix, Inkjets, Laser, Press, from a negative, advanced technology printers.
    - Concept of Image resolution (actual pixels/dots in an image)
    - Concept of Pixels per Inch (PPI) (resolution of a screens)
    - Exercise: Prepare a report on different type of display panels and International standard of print sizes.
    - Exercise: Find out PPI resolution of following displays:
        - An old 14”(diagonal dimension) 1024x800 pixels CRT monitor
        - An LCD display of 17” diagonally at 1280x720 resolution
        - A LED panel of 27” diagonally at 1920x1080p
        - A 4K Panel of 32” diagonally at 3840x2160p
        - A 5” FHD panel of mobile
    - Exercise: find out DPI resolution of following images:
        - An 800 x 600 pixels image printed on 8”x6” card
        - An 827 x 1169 pixel image printed on A4 (8.27×11.69 inch or 210 × 297 mm)
        - An 6622 x 4678 pixels image on A1 (23.39 × 33.11 inch or 594 × 841 mm)
        - An 3200 x 2400 pixels image on a sheet of 32”x24”
        - An 6400 x 4800 pixels image on a sheet of 32”x24”
    - Exercise: Create blank Images of A4, A3 & A1 resolution @ 100 & 300 DPI and place content in it in Photoshop

UNIT-2**- Presentation Drawings in 2D**

- Rendering Plans, Elevations and Sections on Adobe Photoshop1 .
    - Export PDF from AutoCAD and Import in Photoshop in required print size, scale and resolution.
    - Importing Walls, Furniture, Exteriors and labelling from AutoCAD in separate layers
    - Using Photoshop selection tools and fill tool to create solid fills.
    - Using Blending options, Feather, Stroke and Pattern overlay to enhance the fills and drop shadows.
    - Organizing a project in groups and layers for large projects with proper nomenclature and grouping.
    - Practice saving in different print size and resolution as taught in UNIT I
    - Exercise: Render current semester or previous semester designs in

Photoshop.

**Mid Semester Test**

UNIT-3**- Fundamentals of 3D Modelling in AutoCAD2**

- Introduction and importance of three-dimensional (3D) Drafting for Architectural Designs.
- Introduction to 3D coordinate system and 3D viewports in AutoCAD.
- **AutoCAD** as a 3D drafting Tool
    - Introduction to Poly lines, 3D extrusion commands and Boolean operations in AutoCAD
    - Exercise: Creating 3D model of A dog-Legged and A spiral staircase
    - Exercise: Create a 3D model of a Small Room (Door/ Window/ Railing, Furniture, walls, slab, roof, parapet, chajja etc.)
    - Exercise: Create an Isometric 3D model of a self-designed building for UNIT V
    - Exercise: Create a 3D model of a complete building (own design) using AutoCAD

UNIT-4**- Fundamentals of 3D Modelling in 3DS MAX3**

- User Interface of 3DS MAX and interface customization.
    - Viewport transformation commands (Pan, Orbit, Zoom)
    - Object transformation tools (Move, Rotate, Scale)
- Creating basic primitive solid objects and shapes from create panel.
    - Adjusting their attributes from modify panel to desired dimensions.
- 3D coordinate system and arranging solid objects in 3D coordinates.
    - Exercise: create a composition in 3D space using solid primitive objects and shapes and place these objects in precise coordinates.
- Introduction to 3D wire mesh model and its sub elements - points, lines, surfaces, solids
    - Comparison of a 3D wire mesh model and its Sub-elements of to the elements of a 3D solid Object as studied in AD
    - Edit mesh and Edit poly modifier.
- Introduction to the concept of Modifier stacking in 3DS MAX and its reversibility.
    - Applying different modifiers to a Solid (Bend, Twist, Skew, Noise, Symmetry)
    - Exercise: Create a sculpture using modifiers stack on standard primitive objects
- Introduction to Different type of Lights in 3DS max (point light, linear, directional, area light, skylight etc.) and their Attributes (Intensity, inverse square decay, shadow casting etc.)
- Introduction to types of cameras and their attributes (position, direction, target, focal length)
- Introduction to Basic Standard Materials using Compact Material Editor
- Introduction to Basic Render Setting in Scanline rendering (resolution, file format,
    - Exercise: Create a small setup of 3ds max objects, apply materials and cameras and

UNIT-5**-: 3D Axonometric rendering** of Plans (horizontal cut) and sections (vertical cut) in **MAX**

- Importin a 3D model from **AutoCAD** or Sketchup into 3ds max without roof.
- How to apply materials to main surfaces – walls, glass, joinery, floor etc.
- How to put basic furniture, imported from internet libraries (archive3d.com), and scaled properly
- Setting up basic lighting and render output.

**End Semester Examination - Internal Portfolio Viva**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-410 | DESIGN AND ENVIRONMENTAL PSYCHOLOGY-IV | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To understand how psychological factors affect human perception and subsequent use of space, which shall assist in a better designed built environment

Reference Books :

- Handbook of Environmental Psychology, Robert. Bechtel and Chruchman, John Wiley and Sons
- House Form and Culture, Amos Rapoport, Milawaukee: University of Wisconsin,1969
- Environmental Psychology: Principles and Practice, by Robert Gifford

Course Contents :

UNIT-1

- Introductory: Nature of relationship between psychology and spatial behaviour with special reference to built environment.
- Space perception with respect to - Three Major Types of territorial space: Micro Space, Meso-Space and Macro-space.
- Personal Space: (Micro-Space) Variation in personal space behaviour due to social Psychological Environmental and Cultural factors; Stages in life. Satisfaction with the home environment through Architectural Design, Design flexibility for residential rented spaces

UNIT-2

- Home Base (MesoSpace) Psychological Functions of Home; Determinates of Housing preference; Concept of Neighbouhood as UNIT of Physical Panning, Subjective definition of Neighbourhood and the related Hierarchy in terms of Interpersonal relationships; Critique of Planners Ideological construction of the meaning and purpose of neighbourhood.
- Home Range (Macro Space) Hierarchy of Social Spaces: Home Base and range; Spatial pattern of activity System- Time Budgets. Origin and Destination Survey, Orbits of activity and social factors of Class and Sender.

**Mid Semester Test**

UNIT-3

- **Phenomenal Environment:** Physical Various types of environment and related patterns of behavior: Work Place, School, Prison, Recreational Spaces,

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-4-411 | HEALTH EDUCATION- IV | 2-0-0 | | Internal -50 |

Course objective: To make the students to learn the basic issues related to psycho-somatic equilibrium

Reference Books:


- Appenzeller Otto :Sport Medicine Urban & Schwarzenberg. Munich 1989.
- Williams JGP and S:Sports Medicine, Edward Arnold: London 1982
- Huston M.A. : Sports injuries. Oxford University Press: New York 1996.
- Sharma. O.P. :Athletic injuries Khel Sahitya Kendra: New Delhi 1999.
- P.K.Pande: Sports Medicine Khel Sahitya Kendra: New Delhi 1d998.
- Me Ardle Willam D.: Exercise Physiology Lea and Febiger: Philadelphia 1991.
- Facts about Yoga By Shri Jogindera, The Yoga Institute, Sania Cruj. Bombay-55.1975.
- The complete book of Yoga :By Shri Anand, Publisher-Orient paper back Delhi (1980)


Course Contents:

UNIT -1

- Meaning of term ' Drugs' and its harmful effect on human body:- Anabolic steroids, blood doping alkalis, amphetamines, Alcohol etc
- Exercise energy and Metabolism.
- Source of energy, anaerobic metabolism, aerobic metabolism.
- Climate & Exercise

UNIT-2

- Regulation of body temperature
- Heat stress and acclimatization
- Effect of altitude or Physical performance.
- Mental health and exercise

UNIT-3

- Meaning Philosophy and aim of Yoga, their special features with reference to their objectives.
- Importance of yoga
- 08 Elements of yoga: Yams (Abstinences) Niyamas (Observances) in the field of Yoga.

UNIT-4

- Asanas (Postures) and their purposes, types of Asanas, Principles of Asanas,
- Pranayam (Breathing Exercise): Objectives, Meaning and Varieties of Pranayama.

Relevance of Yoga in Modern Life

- Stress and strains.

**End Semester Examination - No Exam**

**FIFTH SEMESTER : SCHEME OF TEACHING**

**Duration of Semester : 18 weeks**
**Periods per week : 28**
**Duration of each period : 60 minutes**
**Note:** The course work and assignments in each subject must be completed as prescribed.

| Sr. No | Subject | Periods per week | Total periods | Teaching Methodology and Sessional Work |
|---|---|---|---|---|
| 1. | Architectural Design-V | 10 | 180 | Design assignments, time problems |
| 2. | Building Construction-V | 5 | 90 | Notes, sketches, drawings, tests |
| 3. | Structure Systems and Design-V | 2 | 36 | Notes & tests |
| 4. | Elements of Landscape-V | 2 | 36 | Notes, sketches, tests |
| 5. | History of Built Environment-V | 2 | 36 | Notes, sketches, tests |
| 6. | Computer Applications in Architecture-V | 3 | 54 | Theory & Practical |
| 7. | Theory of Design-V | 2 | 36 | |
| 8. | Design And Sociology –V | 2 | 36 | |
| 9. | Educational Tour | 1 week duration | | Tour notes, sketches, reports |
| | Total | 28 | 504 | |

**FIFTH SEMESTER : SCHEME OF EXAMINATION**

PREPARATORY HOLIDAYS One week

EXAMINATIONS Approximately two weeks

NOTE: 1. In addition to the Sessional marks, the subjects of Computer Applications in Architecture-V will be judged through a viva voce and a portfolio containing all the work done by the student during the entire semester. The jury will comprise of the studio in charge and one external examiners appointed by the Principal.

2. In addition to the University Studio Examination, the subjects of Architectural Design-V and Building Construction-V will be assessed through a viva-voce by an external examiner appointed by the Panjab University.

| Sr. No. | Subject | Duration of exam. (in hours) | Max Marks for Exam | Marks for portfolio | Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|---|
| 1. | Architectural Design-V | 18 | 200 | - | 200 | 400 |
| 2. | Building Construction-V | 6 | 100 | - | 100 | 200 |
| 3. | Structure Systems & Design-V | 3 | 50 | - | 50 | 100 |
| 4. | Elements of Landscape-V | 3 | 50 | - | 50 | 100 |
| 5. | History of Built Environment-V | 3 | 50 | - | 50 | 100 |
| 6. | Computer Applications in Architecture-V | - | - | 50 | 50 | 100 |
| 7. | Theory of Design-V | 3 | 50 | - | 50 | 100 |
| 8. | Design And Sociology -V | 3 | 50 | - | 50 | 100 |
| 9. | *Educational Tour-V | - | - | - | - | - |
| | Total | | 550 | 50 | 600 | 1200 |

**Educational Tour –** Tour Assignments should be marked in the relevant subject/s for which tour conducted**.**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-501 | ARCHITECTURAL DESIGN –V | 0-0-8 | | Sessional work : 200<br>Examination : 200 |

Course Objective: To emphasize the significance of contextual factors in architecture through design of socially, climatically and environmentally responsive architecture.

Reference Books :

- The tradition of Indian Architecture Continuity, Controversy – Change since
- 1850, G.H.R. Tillotsum ; Oxford University Press, Delhi, 1989.
- New Vernacular Architecture: Richardson,Vickey; Laurance King
- Publishing,2001
- Vernacular Traditions: Contemporary Architecture, by AishwaryaTipnis, Ashok Lall
- Concepts of Space in Traditional Indian Architecture, YatinPandya
- Saver Standards for Building Types, C. D. Joseph and Callender John;
- Time Saver Standards for Architectural Design Data, C. D. Joseph &
- Callender John;
- Neufert's Architect's Data

Course Contents :

- Study of a vernacular settlement with emphasis on socio-economic characteristics, climate and other geomorphic factors, local materials, building techniques, building typology, urban form, spatial analysis, etc
- To understand social stratification, class structure, family structure and human community development.

UNIT-1

- The analysis and design of vernacular settlement

**Mid Semester Test**

UNIT-2

- Institutional building, public library, museum, buildings in Rural context such as Janj Ghar, Panchayat Ghar etc on the basis of climatic responsive design and environmental responsive design..

**End Semester Examination**

**Teaching and Learning Methodology –**

- Study of any vernacular settlement in village near Chandigarh / Punjab /Himachal /Haryana.
- Features of vernacular settlement and their contextual understanding.
- Relevance of these features in contemporary context by designing new type of building such as resort, kalagram etc.
- 82 Special lectures on the social & economic aspects of vernacular settlements to be organized.

**Evaluation System:**

There will be minimum 02 design assignments each semester. Each design assignment shall be of 05 stages:

Reference studies & idea exploration

- Concept formulation.
- Review – I & Review - II
- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

- Idea / concept originality
- Presentation of drawings to convey the idea
- Graphic presentations
- Model / 3D / Animation etc.

INSTRUCTIONS TO THE PAPER SETTER
Examiner is required to set one compulsory question from the UNIT-II.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-502 | BUILDING CONSTRUCTION-V | 0-0-4 | | Sessional work : 100<br>Examination : 100 |

Course Objectives: To make students understand the concept of detailing in building construction.

Course Content:

Reference Books

- Watson, Don A; "Construction Materials and Processes", McGraw Hill Co., University of Michigan, 1972.
- McKay, W.B. "Building Construction", Vol. 1,2,3,4, Longmans, U.K., 1981.
- Alanwerth, "Materials", The Mitchell Pub. Co., Ltd. London, 1986.
- Chudley, R. "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
- Barry, R. "Building Construction", East West Press, New Delhi, 1999.

UNIT 1

- Interior detailing such as cladding, paneling & partitions.
- Fixing details of cladding with emphasis on traditional & latest building materials.
- Fixing details of paneling with emphasis on traditional & latest building materials.
- Construction details of partition walls with varied materials.

UNIT 2

- Differentiation of Kitchens – Commercial & Residential.
- Concept of Modular Kitchen.
- Design layout of Kitchen as per design standards.
- Construction Details of kitchen components such as – Counter details, Cabinets details, Chimney details, Sink Details etc.

**Mid Semester Test**

UNIT-3

- Differentiation of Toilet – Commercial & Residential.
- Fixture layout of Toilet as per design standards.
- Construction Details of Toilet components such as – Counter details, Cabinets details, Exhaust & Janitor Chamber details, Tile layout, level markings & slope etc.

UNIT-4

- Design and detailing of Shops, Banks and other commercial establishments w.r.t:
- Wardrobes
- Bank Counters
- Niches
- Wooden Furniture.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question from each UNIT.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-503 | STRUCTURE SYSTEMS AND DESIGN–V | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To understand the principles of Design of RCC Structures, Analysis of Portal frames, Principles of Bulk – active and Vector active structures.

Reference Books :

- Mechanics of Structure by Junnarkar
- Building Design And Construction Handbook Sixth Edition

Course Contents :

UNIT-1

- Design of singly and doubly reinforced rectangular beams by limit state method.

UNIT-2

- Moment Distribution Method: Introduction, Basic Propositions, Stiffness of a member, the distribution theorem, the carry-over theorem, relative stiffness, Distribution factor (No derivations).
- Analysis of symmetrical single bay, single and two storey portal frames of uniform section with simple symmetrical distributed or point loads by moment distribution method.

**Mid Semester Test**

UNIT-3

- Introduction to Structure Systems. Study of structures in nature and human body.
- **Bulk Active Structures:** Beams – Bending action, bending stresses, internal couple, moment of resistance. Effect of Shape and Orientation of beam cross – section, type of loading (udl / point load), type of supports, permissible deflection. on the load carrying capacity of simply supported, Cantilever, Fixed and Continuous beams.
- Rectangular and Skew Grids. Curved Beams, Vierendale girder, Honey combed beams.
- Slabs One – way, Two – way and Cantilever: load dispersion, deflected profile and internal forces / stresses under the action of uniformly distributed load.
- Columns: Effective length, short and slender columns, Buckling load, middle third rule
- **Portal Frames:** Stiffness of fixed and hinged members, The Distribution Theorem (No proof). Structural action of portal frames under gravity loads & Horizontal forces, Shear walls.
- **Vector Active Structures:** Trusses: General principles, Types, Concepts of various methods of analysis. Secondary stresses. Various shapes of trusses for different spans. Space truss.
- **Folded Plates:** Structural action of folded plate roofs.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-504 | ELEMENTS OF LANDSCAPE -V | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To familiarise the students with the attributes, use and importance of basic elements of landscape.

Reference Books :

- Introduction to landscape Design by ToyeSumil S
- History of Garden Design 1963 by Clifford Derek

Course Contents :

UNIT-1

- Introduction to landscape design and its role in the built environment.
- Introduction to elements of landscape i.e. Earth, rock, water, vegetation.
- Use of landscape elements in site planning.

UNIT-2

- Detailed study of earth and rock elements of landscape in nature and in landscape design.

**Mid Semester Test**

UNIT-3

- Detailed study of water and vegetation as elements of landscape in nature and in landscape design.

UNIT-4

- History of Garden

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-505 | History of Built Environment – V | 2-0-0 | | Internal- 50<br>External- 50 |

**Course Objectives**: To understand the role of geo-physical, societal, political and technological factors in the evolution of architecture and urban form.
To develop a holistic approach to architecture as an integral component of the built environment

Reference Books:

- Modern Architecture since 1900 - William Curtis
- Space Time and Architecture - SigfriedGiedion
- History of Modern Architecture – Kenneth Frampton
- A Global history of architecture – Ching, Jarzombek, Prakash
- Architecture & Independence – Lang, Desai, Desai
- Architecture in India (Since 1990) – Rahul Mehrotra
- Books on individual Master Architects

Course Contents:

UNIT-1

- Industrial Revolution and its impact on the development of new towns. Tony Garnier's Industrial city.
- Influence of new construction materials, industrial techniques and functional needs on building typology and architectural form.
- Advances in steel construction. The Great Exhibitions. Development of the high-rise.
- Modern Town Planning – Patrick Geddes, Patrick Abercrombie, Ebenezer Howard's Garden City.
- Age of Revivals.

UNIT-2

- Discovery of RCC Steel and its impact on Architecture Development
- Emergence of Modern Architecture in Europe. Social, technological and aesthetic concerns of Modern Movement. New building typologies and architectural expression. Eclectism, Vienna-secession.
- Philosophy and Architectural Style of Louis Sullivan, Walter Gropius

**emester Test**

UNIT-3

Architecture Movements :Neo Classicism, Arts and Craft Movement, Art Nouveau.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-506 | COMPUTER APPLICATIONS IN ARCHITECTURE-V | 0-0-3 | | Sessional work : 50<br>Portfolio : 50 |

Course Objectives: At the end of this part of the course the student should be able to create a project from scratch in a BIM working environment. In which all drawings, surface materials, sectional details, 3D model, 2D drawings, building schedules and MEP of a projects are completely linked. So that by updating one element of that project by any team member will update all interlinked components and drawings automatically. This will enable students to be able to manage a complex project more efficiently.

Course Contents :

UNIT-1 **INTRODUCTION TO BUILDING INFORMATION MODELLING (BIM)**

- Significance of BIM software in project management
- Conceptualizing, Designing, Drawings, Analysis, Construction and teamwork.
- A Report on BIM and its applications.

UNIT-2 **STUDYING A BIM SOFTWARE**

- BIM Software in use – Introduction to **ArchiCAD1, Revit2, AutoCAD, Architecture3.**
- Detailed study of a BIM Software - ArchiCAD or Revit
    - User Interface Introduction and customisation.
- Setting up a BIM Project
    - Working UNITs, dimensions, story settings, Importing reference drawings & images.
    - Elements of a Building in a BIM environment.
- BIM Drawing tools and helpers
    - Working with Guide Lines (construction lines), Snap Guides and Points,
    - Grid snap, reference plan snap and angular Snap
    - Working plane and cutting plane
    - Tracing reference plans or other stories using – 'Trace as reference'
    - Layers setup and layer combinations
- Creating a BIM project
    - Understanding Pallets - Tool-box, Info-box, Status-bar and Navigation
    - BIM components in Tool-box - Design tools and Documentation Tools
    - Using 'Setting dialogue' to alter a BIM components
    - Create (from scratch) or Trace (from reference) - Walls, structure and grids
    - Define Openings and joinery tables - doors, windows, shutters, entries
    - Create floor slabs and roof slabs, cut-outs, parapets and projections in structure
    - Creating staircase, ramps, elevators and other modes of vertical circulation
    - Define surface materials in 3D viewports
    - Define line weights (sectional and non-sectional)
    - Create proper hatch in plans and sections
    - Place Objects from Library – Railings, Frames, Interior or Exterior objects.
    - Create custom objects using 'Morph Tools'
    - Creating site details and landscape using walls mesh and morph tools.
    - Creating MEP in BIM – Mechanical, Electrical and Plumbing Details

**Mid Semester Test**

UNIT-3 **COMPOSITION AND DOCUMENTATION OF A BIM PROJECT**

- Documentation and Visualization of a BIM project
    - Composing and saving different type of drawings using layer Combinations
    - Creating building schedules, joinery tables and energy evaluation charts

| |
|---|
| • Sheet layout setup - Composing drawings on a Sheet layout<br>• Export PDF and DWG |
| UNIT-4 **VISUALIZATION MODULE**<br>• Internal Rendering Engine<br>• External Rendering<br>• Exporting a project in a usable 3D format – OBJ, 3DS, DAE. Keeping the scale and materials intact<br>• Importing the project into External rendering software<br>• Quick rendering techniques in any rendering software - 3DS MAX4, LUMION5, Artlantis6.<br>• Materials refinement<br>• Lighting setup<br>• Camera setup<br>• Setting up the rendering output |
| **End Semester Examination - Internal Portfolio Viva** |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-507 | THEORY OF DESIGN-V | 2-0-0 | | Sessional Work : 50<br>Examination : 50 |

Course Objectives: This concept is to drive deeper into the architectural problems and look for directive principles guiding the philosophy of design used by Makers of Modern architecture and to assess their contribution by their own criteria.

Reference Books :

- Books on Individual Master Architects

Course Contents :

UNIT 1

**Foreign Architects**

1. Louis I Kahn
2. Erro Saarinen
3. Philip Johnson
4. Paul Rudolph
5. JornUtzon
6. Kenzo Tango
7. James Sterling
8. Richard Rogers
9. Le Corbusier
10. Renzo Piano
11. Peter Eiessenmen
12. Frank Gehry

**Mid Semester Test**

UNIT 2

**Indian Architects**

1. A P Kanvinde
2. C M Correa
3. B V Doshi
4. J A Stein
5. Uttam C Jain
6. Raj Rewal
7. Hafeez Contractor
8. Lauri Baker
9. A d Raje
10. H C Patel

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-5-508 | DESIGN AND SOCIOLOGY –V | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives:

- Analyze how architectural sociology assists in perceiving the human use of space
- Examine the social issues and changes and draw directions for designs.
- Analyze determinants of social context and apply the in architectural design.
- Synthesize on the dependency of economic parameters on social and built forms and appraise future solutions.
- Develop and implement solutions for contemporary social issues
- Design built environment integrated with social institutions.

Reference Books :

- An Introduction to Sociology D.R. Sachdeva, VidhyaBhushan,, KitabMahal
- A pattern language, Christopher Alexander

Course Contents :

UNIT-1**- SOCIOLOGY - BASIC CONCEPTS**

Sociology and its uses in human settlement studies; Social structure, concept of culture and differentiation of space; Socio-cultural processes: Socialization, competition, accommodation, Socio economic parameters of commUNITy planning; Sociology and its relationship with Architecture;

UNIT-2**- SOCIETY AND ARCHITECTURE**

Social Impact onhuman living environment; Social diversity andchoices on commUNITy settlements- impact of House-form and culture; Social identity and architectural relevance;

**Mid Semester Test**

UNIT-3**- URBAN ISSUES**

Rural to Urban migration and its consequences - Population Density, Effects of High Density on Humans, Effects of Density on Social Behavior, Effects of Crowding, Effects of Urban Life, Ghettoization with special reference to slums, low cost and Public Housing,

UNIT-4- **URBAN MAPPING**

Cognitive Patterns Mental Maps and orientation Lunch's Theory of Cognitive Mapping; Social and cultural variations in the description cognitive Mapping techniques, Impact of activity on mapping by individuals capsule Images of the whole city.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

## SIXTH SEMESTER : SCHEME OF TEACHING

**Duration of Semester : 18 weeks**
**Periods per week 29**
**Duration of each period : 60 minutes**

**Note**: The course work and assignments in each subject must be completed as prescribed.

| Sr. No. | Subject | Periods per Week | Total periods | Teaching Methodology and Sessional work |
|---|---|---|---|---|
| 1. | Architectural Design-VI | 10 | 180 | Design assignments, time problems |
| 2. | Building Construction-VI | 5 | 90 | Notes, sketches, drawings, tests |
| 3. | Structure Systems and Design-VI | 3 | 54 | Notes & tests |
| 4. | Estimating & Costing and Specification –VI | 2 | 36 | Drawings, tests |
| 5. | Town and Country Planning-VI | 2 | 36 | Notes, sketches, tests |
| 6. | Sustainable Architecture-VI | 2 | 36 | Notes, sketches, tests |
| 7. | Computer Applications in Architecture-VI | 3 | 54 | Theory & Practical |
| 8 | Building Bye-laws & Codes-VI | 2 | 36 | Notes, sketches, tests |
| | Total | 29 | 522 | |

**SIXTH SEMESTER : SCHEME OF EXAMINATION**

PREPARATORY HOLIDAYS : One week

EXAMINATIONS : Approximately two weeks

NOTE: 1. In addition to the Sessional marks, the subject of Computer Applications in Architecture-VI will be judged through a viva voce and a portfolio containing all the work done by the student during the entire semester. The jury will comprise of the studio in charge and one external examiners appointed by the Principal.

2. In addition to the University Studio Examination, the subjects of Architectural Design-VI, and Building Construction-VI will be assessed through a viva-voce by an external examiner appointed by the Panjab University.

| Sr.No. | Subject | Duration of exam. (in hours) | Max. Marks for Exam | Marks for portfolio | Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|---|
| 1. | Architectural Design-VI | 18 | 200 | - | 200 | 400 |
| 2. | Building Construction-VI | 6 | 100 | - | 100 | 200 |
| 3. | Structure Systems and Design-VI | 3 | 50 | - | 50 | 100 |
| 4. | Estimating & Costing and Specification -VI | 3 | 50 | - | 50 | 100 |
| 5. | Town and Country Planning-VI | 3 | 50 | - | 50 | 100 |
| 6. | Sustainable Architecture-VI | 3 | 50 | - | 50 | 100 |
| 7. | Computer Applications in Architecture-VI | 3 | - | 50 | 50 | 100 |
| 8. | Building Bye-laws & Codes-VI | 3 | 50 | - | 50 | 100 |
| | Total | | 550 | 50 | 600 | 1200 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-601 | ARCHITECTURAL DESIGN –VI | 0-0-10 | | Sessional work : 200<br>Examination : 200 |

Course Objective:

- To learn various aspects of design on hilly terrains.
- To learn design of simple service-and-structure oriented buildings.

Reference Books :

1. Time Saver Standards for Building Types, C. D. Joseph and Callender John;
2. Time Saver Standards for Architectural Design Data, C. D. Joseph &Callender John;
3. Neufert's Architect's Data

Course Contents :

1. To understand the layout of buildings on hilly terrain by studying the topography of site and also understand the climatic consideration.
2. To understand the structure and services (air-conditioning, acoustics, lighting and fire fightingetc) in context with designing of building.
3. To understand the provision for differently abled persons as per building byelaws or other guidelines.

UNIT-1

- Housing complex on hilly terrain.

**Mid Semester Test**

UNIT-2

- Theatres, multiplex, exhibition halls, museums, places of worship, recreational and cultural complex, Sports institute, Stadiums.

**End Semester Examination**

**Teaching and Learning Methodology –**

- Site Visit of hilly terrain, any nearby area of Himachal.
- Measured drawing of existing building of hilly terrain to understand the topography.
- 3. Study of services such as air-conditioning, acoustics, lighting and fire fighting etc in auditorium project.

**Evaluation System:**

There will be minimum 02 design assignments each semester. Each design assignment shall be of 05 stages:

- Reference studies & idea exploration
- Concept formulation.
- Review – I & Review - II
- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

- Idea / concept originality
- Presentation of drawings to convey the idea
- Graphic presentations
- Model / 3D / Animation etc.

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set one question which covers the points listed in the course contents.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-602 | BUILDING CONSTRUCTION-VI | 0-0-5 | | Sessional work : 100<br>Examination : 100 |

Course Objectives: To familiarize students with the system of making detailed working drawing required for construction on site.

Reference Books


- Watson, Don A; "Construction Materials and Processes", McGraw Hill Co., University of Michigan, 1972.
- McKay, W.B. "Building Construction", Vol. 1,2,3,4, Longmans, U.K., 1981.
- Alanwerth, "Materials", The Mitchell Pub. Co., Ltd. London, 1986.
- Chudley, R. "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
- Barry, R. "Building Construction", East West Press, New Delhi, 1999.


Course Content:

UNIT- 1**: Theoretical input**

- Basics of Construction Management.
- Introduction to methodology of preparing working drawings. Systems of labeling, dimensioning, writing specifications, & co-ordination of Drawings.

UNIT- 2**: Basic Working Drawings**

- Site Plan
- Excavation Plan and foundation details.
- Grid Plan
- Floor Plans
- Elevations and Sections.
- Terrace Plan
- Joinery Details – Door & Window Schedule

**Mid Semester Test**

UNIT 3**: Services**

- Fire Fighting Drawings
- Electrical Drawings
- Air Conditioning Drawings
- Plumbing Drawings.

UNIT 4**: Construction Details**

- Construction details of Basement and its treatment
- Extension, Expansion and Construction Joints, their details and treatments
- Commercial Kitchen- Study, designing and working drawing
- Case studies/ detailing of Public Toilets

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of four questions, at least one from each UNIT
- The student is required to attempt any three questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-603 | STRUCTURE SYSTEMS & DESIGN – VI | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To appreciate the complexities in the graphic representation of structural. Information for construction purposes and to understand the structure principles in form active structures. Exam to be conducted only on Drawing sheets.

Reference Books :

- Steel structures by Rama Murtham
- Textbook of R.C.C. by Birdie, G.S.
- Mechanics of Structures by Junnarkar

Course Contents :

UNIT-1**- RCC STRUCTURES**

- Preparation of structural drawings of beams, slabs, Lintels, chajjas, columns, isolated column footings, dog legged stairs for a load bearing structure.
- RCC Frame Structures: - Preparation of structural drawings of Portal frames, Coffer slab, sunken slab, Porch and Rectangular combined column footings.

UNIT-2**- STEEL STRUCTURES**

- Structural Drawings for Built up column with lacing. Column Bases (slab, Grillage, Gusseted bases). Fink Roof Truss and North Light Truss along with fixing arrangements for purlins, roof covering and ridge pieces. Seated and Framed Column Beam connections

**Mid Semester Test**

UNIT-3**- STRUCTURE SYSTEMS (Theory only)**

- Cable Structures; - Funicular Polygon, Catenary, relation between tension and sag. Suspension bridges – Fan type, Harp Type, Self anchored bridges.
- Cable Roofs – Polygonal cable roof, cable roof with arch rib, Saddle shape, Pre-stressed cable roofs and cable suspended cantilever roof.
- Arch Structures: Basic concepts of rise, horizontal thrust, variation of arch thrust with rise. Roman, Gothic and Arabic arches. Flying buttress, Bridge structures.
- Arched Roofs – Barrel roof, Diagonal arch roof, Radial arch roof, Lamella cylindrical roof.
- Shells and Domes: Membrane action. Curvatures, Syn-clastic, anticlastic Surfaces, Rotatational, Translational & Ruled Surfaces. Membrane action in Circular Domes. Spherical Shells: Types of forces- Meridional, Hoop forces

  distribution of forces. Support Conditions – Tension and Compression rings

  Buckling of thin shells. Structural action of Schwedler and Geodesic domes.
- Pneumatic Structures: Background, Air – Supported Structures, Air – Inflated Structures, Hybrid Pneumatic Structures, Support Conditions and Materials.
- Introduction to softwares used in structural design such as (stand latest version etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-604 | ESTIMATING & COSTING AND SPECIFICATION–VI | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To inculcate an awareness regarding factors effecting cost of buildings. To familiarise the student with the commonly used methods of preparing estimates of Architectural Projects.

Reference Books :

- BIS Specification, CPWD Specifications, Punjab PWD Specification
- Estimating and Costing B.N Dutta
- Text Book on Estimating and Costing.

Course Content :

UNIT-1

- Basic principles of Economics as applied to buildings and factors affecting cost of buildings.
- Types of Estimates in common usage.

UNIT-2

- Bill of Quantities of Materials. Its importance and methods of preparation. Practical examples.

**Mid Semester Test**

UNIT-3

- Standard rates and their derivation from given rate.
- Case study/practical expertise in preparing detailed estimates of quantities of materials and analysis of rates of material and labour for a small residential building.

UNIT-4

- Introduction to the importance of specification and their functions, different types of specifications, revision of specifications of building materials, brick, stone, cement, lime, aggregate, timber and various other finishes.
- Writing specifications for civil works of a small building project, starting with excavation, earth work, foundations, damp proof course, brick masonry work, concreting, flooring, plastering, painting, timber doors and windows, steel doors and windows, painting, varnishes etc.
- Writing specifications for Building services, such as water supply, plumbing, electrification, fire fighting, etc.
- CPWD specifications
- BIS specifications
- Punjab PWD Specifications.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-605 | TOWN AND COUNTRY PLANNING-VI | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To understand the role of planning in evolution of urban form.

Reference Books :

- Town planning by G.K Hiraskar
- Managing the Sense of Region by Kevin Lynch
- The Making of Cities by Leonard Hill

Course Contents :

UNIT-1

- Overview of evolution of settlement design from the River Valley to Pre-Industrial (I7th century) towns with emphasis on the factors that influenced Town Planning principles and theories.
- Classifications of settlements based on form, use, scale, etc.

UNIT-2

- Role and contribution of the following towards contemporary town planning thought.
- Patrick Geddes, Patrick Abercrombie, Daniel Burnham, Soria Y Mata, Frederick Olmstead, Ebenezer Howard, Clarence Perry, CA Doxiadis, Le Corbusier.

**Mid Semester Test**

UNIT-3

- Town Planning Policies in India from the18th century till present day.
- Methodology (planning process) for the development of new towns involving various stages like population projection, requirement of infrastructure, distribution of land use, formulation of alternative proposals for a healthy plan having possibilities of phase wise development, economic sustainability, analysis and selection of the optimum plan.
- Issues and strategies of Urban renewal of existing and historical towns – need for renewal, problems involved in urban renewal schemes, surveys to be conducted, methods of collection and analysis of data, rehabilitation and compensation, scope for future growth. Case studies of Urban renewal schemes in Indian and Western towns.

UNIT-4

- Introduction to concept of smart cities.
- Case Study of cities (India and World) which have started functioning as smart cities.

UNIT-5

- Le Corbusier And Chandigarh,
- Planning Principles of Chandigarh
- Architecture and Architects of Chandigarh i.e. Pierre Jeanneret, Maxwell Fry, Jane Drew

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-606 | SUSTAINABLE ARCHITECTURE-VI | 2-0-0 | | Sessional Work : 50<br>Examination : 50 |

Course Objectives: To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form.
To develop a holistic approach to Architecture as an integral component of builtenvironment.

Reference Books :

- Sustainable by Design: Methods for Holistic Housing, Basics, Strategies, Projects by Hans Drexler & Sebastian El Khouli
- The Sustainable Sites Handbook: A Complete Guide to the Principles, Strategies, and Best Practices for Sustainable Landscapes by Meg Calkins
- Material Revolution: Sustainable Multi-Purpose Materials for Design and Architecture by Sascha Peters
- Cradle to Cradle: Remaking the Way We Make Things by William McDonough & Michael Braungart

Course Contents :

UNIT-1 **-Understanding SUSTAINABLE DEVELOPMENT:**

- Global Warming-Reasons, responses to global warming, the Kyoto Protocol, 3R rules
- Introduction to sustainable Development,
- Different report to the General Assembly for sustainability: World Commission on Environment and Development, 1987, Brundtland definition, Pearce and Warford, 1993, The UN Development Program (1994,)Dasgupta (2001)
- Three Pillars of the sustainable Development i.e. Economic, Social & Environment
- Sustainable architecture as a subset of sustainable development.

UNIT-2 **- Concepts in SUSTAINABLE DEVELOPMENT and their terminology:**

- Sustainable Architecture; introduction, need, parameters and methods for achieving sustainable design
- Eco-design, ecological balance, Green Building via respective case studies
- Difference between green building and sustainable building

**Mid Semester Test**

UNIT-3 **- Issues in Sustainable Development**

- Resources; introduction to Renewable resources Non-renewable resource
- Energy ; introduction to the optimizing energy conservation techniques and designing with alternative energy systems such as passive solar architectural systems with a view of achieving energy efficiency energy conservation and energy efficiency, optimizing energy conservation techniques
- Material;sustainable material selection, production and use
- Water ;conservationand ways to conserve water, use of recycled water and storm water drainage, planning and design for natural and impacted on-site water features, hydrologic processes
- Site; Topography - slope, orientaion, exposure, elevation, hills or valleys at/near the site, Ground surface, Three-dimensional objects-trees/tree-belts, fences, walls and buildings
- Quality of indoor/outdoor environment

UNIT-4 **-Climatic wise Design Strategies and challenges in Sustainable Design**

- Active & Passive Architecture
- Solar passive Techniques; passive solar heating, five elements of passive solar home design, passive solar cooling
- Design guidelines; Introduction, Description of Buildings, Methodology, General Recommendations, Specific Guidelines
- Climatic responsive Architecture

UNIT-5**- Bio-mimetic & Vernacular architecture in Sustainable Architecture:**

| |
|---|
| • Definition, approaches, principles in bio mimicry<br>• Three levels of bio mimicry in architecture; Organism level, behavioural level, ecosystem level, Bio mimetic architecture; case examples, bio mimetic design, in architectural education<br>• Vernacular architecture and sustainability, culture and sustainability |
| **End Semester Examination** |
| INSTRUCTIONS TO THE PAPER SETTER<br>• The examiner is required to set a total of six questions, at least one from each UNIT.<br>• The student is required to attempt any four question. |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-607 | COMPUTER APPLICATIONS IN ARCHITECTURE-VI | 0-0-3 | | Sessional work : 50<br>Portfolio : 50 |

Course Objectives: At the end of this part of the course the student should be able to understand how to make detailed 3d graphical visualizations using an Industry standard animation software - 3DS MAX, for communicating various design aspects of an Architectural Building to all type of audience – A layman, a professional and the client.

Reference Books :

- Mastering TM 3DS Max 4,2001 by Cat Woods

Course Contents : Since students have covered basic introduction to 3ds max in IV semester with a purpose of creating visual content for training reports and NASA competitions, Teacher may straight away start with the advanced techniques for 3DS MAX after a brief introduction.

UNIT-1- **3D STUDIO MAX – INTRODUCTION FOR ADVANCED LEVEL TRAINING**

- Quick Introduction to Software interface, Basic commands, viewport transformation tools, object transformation tools, 3D coordinate system and snapping.
- Various Type of modelling in 3DS MAX, modifiers and the modifier stacking.
- Deformation Modifiers - Bend, skew, twist, symmetry, waves, noise etc.
- Mesh modifiers – Edit mesh modelling, edit poly modelling and nurbs modelling.

UNIT-2**- MODEL A BUILDING IN 3DStudio MAX**

- Importing a DWG or a reference Image in 3ds max.
- Placing a DWG or an image in relevant position or in background to trace reference.
- Tracing a plan and creating walls, openings, door/windows, floor, roof and other details.

**Mid Semester Test**

UNIT-3**- IMPORT A BUILDING IN 3DS MAX FROM OTHER DESIGN SOFTWARE - AutoCAD, ArchiCAD, Revit, Rhino, Sketchup.**

- Exporting a model for 3DS max from Design software on proper scale
- Importing a model in 3DS max with intact materials and on proper scale
- Techniques to keeping the building model 'reversibility editable' (To be able to edit the model in the primary design software and update in 3ds max).

UNIT-4**- SETTING UP A PROJECT IN 3DS MAX**

- MATERIALS - Maps, Textures, UV and Displacement
  - Understanding and creating different type of materials in 3ds max.
  - Applying materials to mesh surfaces using UVW Map and UV Unwrap.
  - Editing and updating imported materials with pre-applied UV maps from primary design software.
- LIGHTING
  - Understanding Type of lights – Point, Linear, directional, area, dome, sky, sun, Artificial lights with company specs (IES).
  - Lighting Analysis of a real case scenario in case of Exterior and Interior setup.
  - Different type of Lights in 3DS max (point light, linear, directional, area light, skylight etc.) and their Attributes (Intensity, inverse square decay, shadow casting etc.)
  - Replicating the Analysed lighting setup in 3ds max to understanding lighting techniques.
- POPULATING – Adding detailed pre-rendered 3D models of objects in 3ds max, downloaded from internet libraries for scale comparison and to replicate real life giving it a natural feel. – Foliage, Interior or Outdoor Objects, Fixed or Movable components, Background (Site surroundings, Buildings, Scenery, Landscape).

UNIT-5**- ANIMATING A PROJECT IN 3DS MAX**

- CAMERA SETUP

- Understanding type of cameras in 3ds max – Target, Direct.
- Understanding Technical terms of a DSLR – Exposure, Aperture, Focus etc.
- Understanding the approach of a photographer for composing a real life interior or exterior scene
- Changing camera exposure, aperture, focal length, view angle etc. in 3ds max

- ANIMATION TECHNIQUES
  - Understanding time line and key framing 3ds max
  - Techniques for Creating camera animation
  - Techniques for Creating basic object animation
  - Animation constraints and controllers

UNIT-6**- RENDERING IN 3DS MAX**

- Understanding how rendering works universally and comparing with real life Maxwell principals or light photons propagation and why rendering requires powerful CPU and GPU.
- RENDERING SETUP
  - Defining Output Resolution and Output format
  - Determining the render times and optimising scene materials according to available time.
  - Setting up Internal Rendering engines in 3ds max - Default scan line rendering and mental ray.
- EXTERNAL RENDERING ENGINE
  - Rendering with Advanced rendering engines like vray.
  - Latest evolved techniques for photorealistic lighting and how vray has made optimal use of all these techniques.
  - Vray rendering setup for quick, efficient and high quality rendering.
- RENDERING AN OUTPUT
  - Rendering through render setup (F10 and F9).
  - Automatic Rendering through 'Batch render'.
  - Rendering multiple frames of an Animation clip ( ~24 to 30 frames per second).

UNIT-7**- POST PROCESSING**

- IMAGE – Enhancing the output in Photoshop
  - Adding further Populating details to make scene look more natural.
  - Adding labelling or text in case of a descriptive 3D graphics.

- VIDEO – Joining animation frames in a Video editing software
  - Basic understanding of a video editing software and introduction to Interface of Aftereffects and Premium.
  - Importing the image sequence in Adobe After-effects or Adobe Premier.
  - Editing and enhancing a video and rendering an HD video output.

**End Semester Examination – Internal Portfolio Viva**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-6-608 | BUILDING BYE-LAWS & CODES-VI | 2-0-0 | | Sessional Work : 50<br>Examination : 50 |

Course Objectives:

To familiarize the students with various kinds of building regulations required to control and promote the ordered growth of a city /town, with special reference to Chandigarh Bye laws.

Reference Books :

- National Building Code, 2016
- HUDA,PUDA,GMADA byelaws
- Draft master plan 2031 Chandigarh

Course Contents :

UNIT-1

- Need for controls at various levels of town development.
- Background of controls and regulations.
- Overview of basic terminologies
- An overview of various Building Acts prevailing in independent India.
- Nature of building codes in special regions like heritage zones, air funnels, environmentally sensitive zones, disaster prone regions, coastal zones, hilly areas, etc.

UNIT-2

- Study of National Building Code in relation to specific definitions, architectural controls, services, fire protection etc
- Building bye laws framed by local bodies of Chandigarh, Delhi, and Punjab.
- Study of the requirements of submission drawing for approval of the concerned authority.

**Mid Semester Test**

UNIT-3

- Detailed study of Chandigarh Bye laws with emphasis on zoning, architectural controls, frame control, etc.
- Case study of buildings along V2s, marla houses, semi-detached houses, commercial and public buildings in Chandigarh.

UNIT-4

- HUDA & PUDA Bye Laws comparison with Chandigarh

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four question.

**7th semester examination scheme and contents of syllabus:**
**SEVENSEMESTERS: SCHEME OF TEACHING**
**Duration of Semester : 18 weeks**
**Periods per week : 28**
**Duration of each period : 60 minutes**
**Note**: The course work and assignments in each subject must be completed as prescribed.

| Sr. No. | Subject | Periods per week | Total Periods | Teaching Methodology and Sessional work |
|---|---|---|---|---|
| | COMPULSORY SUBJECTS | | | |
| 1. | Architectural Design-VII | 12 | 216 | Design assignments, time problems. |
| 2. | Building Construction-VII | 6 | 108 | Notes, sketches, drawings, tests |
| 3. | Professional Practice-VII | 2 | 36 | Notes & Tests |
| ELECTIVES (ANY 4) | | | | |
| 1. | Hill Architecture-VII | 2 | 36 | Assignments/Seminar/ Dissertation |
| 2. | Lighting Design-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| 3. | Vernacular Architecture-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| 4. | Architectural Conservation-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| 5. | Disaster Management for Buildings-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| 6. | Interior Design-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| 7. | Art & Architecture-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| 8. | Urban Design-VII | 2 | 36 | Assignments/Seminar/Dissertation |
| | Total | 28 | 504 | |

## 7th SEMESTER : SCHEME OF EXAMINATION

**PREPARATORY HOLIDAYS** : One week

**EXAMINATIONS** : Approximately two weeks

| Sr. No. | Subject | Duration of exam. (in hours) | Marks for Exam / Portfolio | Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|
| COMPULSORY SUBJECTS | | | | | |
| 1. | Architectural Design-VII | 18 | 200 | 200 | 400 |
| 2. | Building Construction-VII | 6 | 100 | 100 | 200 |
| 3. | Professional Practice-VII | 3 | 50 | 50 | 100 |
| ELECTIVES (ANY 4) | | | | | |
| 1. | Hill Architecture-VII | 3 | 50 | 50 | 100 |
| 2. | Lighting Design-VII | 3 | 50 | 50 | 100 |
| 3. | Vernacular Architecture-VII | 3 | 50 | 50 | 100 |
| 4. | Architectural Conservation VII | 3 | 50 | 50 | 100 |
| 5. | Disaster Management for Buildings-VII | 3 | 50 | 50 | 100 |
| 6. | Interior Design-VII | 3 | 50 | 50 | 100 |
| 7. | Art & Architecture-VII | 3 | 50 | 50 | 100 |
| 8. | Urban Design-VII | 3 | 50 | 50 | 100 |
| | Total | | 550 | 550 | 1100 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-701 | ARCHITECTURAL DESIGN –VII | 0-0-12 | | Sessional work : 200<br>Examination : 200 |

Course Objective**:** To familiarize the students with specialised building design, laying emphasis on advanced structure and service requirements

Course Content

- A design involving large spans, viz. exhibition pavilions, industrial buildings, etc.
- Design of multi-storeyed buildings with sepcialised services, such as hospitals and hotels/Multipurpose/Mixed used Buildings.

**Evaluation System:**

There will be minimum 02 design assignments. Each design assignment shall be of 05 stages:

- Reference studies & idea exploration
- Concept formulation.
- Review – I & Review - II
- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

- Idea / concept originality
- Presentation of drawings to convey the idea
- Graphic presentations
- Model / 3D / Animation etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

The examiner is required to set one question which covers the points listed in the course contents.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-702 | BUILDING CONSTRUCTION-VII | 0-0-6 | | Sessional work : 100 Examination : 100 |

Course Objectives: To make the students learn about all the aspects of advanced building construction techniques as applicable to High Rise buildings & large span structures.

Course Content:

Reference Books

- Chudley, R; "Building Construction Handbook'", British Library Cataloguing in Publication Data, London, 1990.
- Barry, R.; "Building Construction", East west press, New Delhi, 1999.
- Mitchell-Advanced Building Construction.

UNIT-1

- Various systems of construction of high-rise buildings in RCC and steel.
- Structure system of High Rise Buildings.
- Foundations and superstructure for high rise.

UNIT-2

- Construction of large span structures such as verendeel girder, space steel frames, hinged portal trusses, air frames. Steel structural systems etc.

**Mid Semester Test**

UNIT-3

- Details of Vertical Transportation System like lifts & escalators in case of High Rise & Large span structures.
- Power supply systems, Fire Fighting Systems, Air conditioning & Garbage disposal, etc. in high-rise buildings.

UNIT-4

- Installation of solar water/heating/Solar Power system in buildings.
- Construction details of terrace garden & swimming pool.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-703 | PROFESSIONAL PRACTICE-VII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: Introduction to the professional, vocational and legal aspects of architectural practice

Reference Books :

- Architectural Practice and procedure by V.S. Apte
- Professional Practice by Dr.Roshan H. Namavati

Course Contents :

UNIT-1

- Profession - vocation, trade union vis-à-vis professional activities, social obligations of profession, architectural professional association in its role and responsibilities
- Architects Act 1972/87. Council of Architecture - its role and responsibilities.

UNIT-2

- Code of professional conduct.
- Condition of engagement and scale of professional fees.
- Copyright Act as applicable to architectural work.
- Architectural competition

**Mid Semester Test**

UNIT-3

- Concept of Contract and Arbitration.
- Duties and liabilities of architects, duties and liabilities of contractors
- Articles of agreement, execution of works and payments
- Valuation and valuation methods.

UNIT-4

- Pre-tender qualification and registration of contractors.
- Office organisation and management, expense, structure, salaries and overheads. Role of design staff and supporting managerial staff; Personnel management and training responsibilities.
- Expression of Interest.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four questions.

| Course no | Course name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-704/EL | HILL ARCHITECTURE VII | 2-0-0 | | Internal-50<br>External-50 |

Course Objectives:

To impart a comprehensive knowledge of architecture suited for hilly regions and to develop an understanding of historical and environmental responsiveness for building up on the hills.

Reference Books:

- Thakkar Jay, “Matra: Ways of measuring Built form of Himachal Pradesh”, CEPT University.

Course Contents:

UNIT -1

- Historical perspective of hill architecture and its unique attributes and concerns.
- Traditional hill architecture of medieval European settlements: overview, specific features, building materials and technologies

UNIT-2

- Hill architecture in India: growth, development, character and unique feature.
- Examples in western and central Himalayas: Kashmir, Leh&Laddakh,Garhwal.

**Mid Semester Test**

UNIT-3

- An overview of vernacular hill architecture of Himachal Pradesh.
- Building types, techniques and materials of vernacular architecture of Himachal Pradesh.
- Lessons from vernacular architecture and their time tested indigenous technology.

UNIT-4

Factors affecting design of building in hill areas: Constraints of climate, topography, vegetation and availability of materials, access, circulation and gradients

UNIT-5

- Structural aspects of modern buildings and necessary safeguards.
- Environmental and ecological concerns and safeguards.
- Selected examples of Modern buildings on the hills in India in western and central Himalayas

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-705/EL | LIGHTING DESIGN-VII | 2-0-0 | | Sessional work : 50<br>Examination : 50 |

Course Objectives: To introduce methods of determining qualitative & quantitative lighting requirements both for interiors and exteriors.

Reference Books :

- Lighting design hand book, 200 by Watson Lee
- Lighting design an introductory guide for professionals by Barry Hannaford & Carl Gardner

Course Contents :

UNIT-1

- Basic anatomy and functions of the eye. Adjustments made by the eye, Age-related defects and their design implication
- Visual arc, Visual acuity, resolution angle, Contrast, Colour Contrast, Colour Adaptation, Visual performance and its relationship to Contrast, Size of task and Illuminance. Central and peripheral vision
- Photometric terms used in the lighting industry and their interrelationship. Measurement of these terms.
- Colour Specification with Munsel and CIE system, Additive and Substractive colour mixing**.**

UNIT-2

- Lamp Properties; Effect of voltage & Temperature fluctuation on functiuoning of lamps, lamp cost, Lumen Loss, Lampphotometrics, etc. Brief history of lamps.
- Lamps – Incandecent, Discharge sources. High intensity discharge sources. Fiber optics, Induction Lamps, LED lamps. Recent developments in lamp technology.
- Luminaire properties like intensity distribution for ceiling luminaries & floodlights, LOR, ULOR, DLOR, IP rating, Glare control methods, Aesthetics and applications.

**Mid Semester Test**

UNIT-3

- Quantitative lighting design of a simple space manually using lumen methods. Lighting design-using computers.
- Design principles used for lighting of various types of internal spaces. Design principles used for lighting of various external situations.
- Day lighting, Importance and method to calculate illumination due to daylight using daylight factor, day lighting practices. Integration with electric lighting.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-706/EL | VERNACULAR ARCHITECTURE-VII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To understand vernacular architecture as distinct from other historical & modern styles of architecture to appreciate that it is site responsive and an outcome of indigenous techniques and various social, economic and mythical values of the society.

Reference Books :

- Lesson in vernacular Architecture,2014
- Concepts of space in traditional Indian Architectural 2005 by YatinPandya

Course Contents :

UNIT-1

- Vernacular Architecture – Meaning & theories.
- Determinants of vernacular architecture: Role of social, cultural, political, economic symbolic, climatic, technological contest in creation of form.

UNIT-2

- Materials & technology,
- Role of vernacular architecture in disaster management

**Mid Semester Test**

UNIT-3

- Illustrated case studies of vernacular settlements/building typology from various regions in India and abroad.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four questions.

| Course no | Course name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-707/EL | ARCHITECTURAL CONSERVATION-VII | 2-0-0 | | Internal- 50<br>External- 50 |

Course Objectives:

To understand the significance of conservation for an inclusive approach towards architecture. Understanding concepts of heritage, theories and processes of conservation and the role of an architect; all this while focusing at the scale of a building or maximum a precinct.

Reference Books:

- Conservation of historic buildings - Bernard Feilden
- History of architectural conservation - JukkaJokilehto
- Outstanding Universal Values - 1970 Convention, UNESCO

Course Contents:

UNIT -1 **Basic Understanding: Concepts And Definitions**

- Define heritage, its types and importance
- History of conservation, ethics of conservation and types of interventions (preservation, restoration, adaptive-reuse etc.)
- Establishing the purpose of conservation and brief introduction to different aspects covered under scales ranging from conservation of a building or precinct to an urban or rural settlement.

UNIT-2 **International Developments**

- Value Assessment: Outstanding Universal Values
- Understanding the concepts of authenticity and integrity
- Role of International agencies like UNESCO, ICOMOS, ICCROM etc
- Introduction to International Charters and other important legislation

**Mid Semester Test**

UNIT -3 **Modern Heritage**

- Inclusion of Modern Heritage to the international dialogue on heritage conservation
- Processes and Manifestations: Brief introduction to historical development and nature of innovations such as material, technology and concepts

UNIT- 4 **Conservation In India (**Preferably understanding supported by field visit exercise)

- Conservation of ancient architecture - focus on monument conservation in India and role of ASI
- Conservation of modern architecture in India - technical and philosophical issues like material, aesthetics, function and expression
- Role of agencies like INTACH and other policies or legislation

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each UNIT
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-708/EL | DISASTER MANAGEMENT FOR BUILDINGS - VII | 2-0-0 | | Sessional work : 50<br>Examination : 50 |
| Course Objective**:** To make the students understand the various pre & post disaster design and management measures. | | | | |
| Course Content | | | | |
| **UNIT- I**<br>• Earthquake: Problems & design issues<br>• General Principles.<br>• Special Construction techniques. | | | | |
| **UNIT- II**<br>• Fire, floods, cyclones, avalanche, etc.<br>• General requirements and principles for building design.<br>• Special construction techniques. | | | | |
| **Mid Semester Test** | | | | |
| **UNIT- III**<br>• Post disaster problems, issues & management. | | | | |
| **Evaluation System:** | | | | |
| **End Semester Examination:** | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| CCA-7-709/EL | INTERIOR DESIGN-VII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To understand and appreciate the complexities and constraints in the design and execution of architectural interiors.

Course Content :

UNIT- I

- Interior design in historical perspective.
- Principles of aesthetic composition in interiors.
- Meaning of spatial organization, perceptual needs, psychological needs, convenience, maintenance, durability and image in interior design.
- Application of colour, form and texture in interiors.
- Use of artificial and natural lighting in interiors.

UNIT- II

- Built-in furniture and movable furniture.
- Interior furnishings.
- Interior design accessories and decorative elements.

**Mid Semester Test**

UNIT- III

- Traditional and modern building materials for interior finishes.
- Treatments applied to floors, walls, partitions and ceilings for interior design.
- Electrical and mechanical services and their integration into interior design schemes.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-710/EL | ART AND ARCHITECTURE – VII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives:

- To understand the symbiotic /interdependent nature of art and architecture.
- Familiarization with various art forms used in architecture.

Reference Books :

- The Art and Architecture of India by Benjamin Rowland

Course Content :

UNIT-1

- Comparison of attributes of 'Art and Architecture'. Introduction to forms of pure and applied arts.
- Role of art in history of world architecture, including folk and vernacular examples.
- Symbiotic relationship of Art and Architecture at the levels of the single building, the cluster, the city, landscape, etc. (Note: Suitable examples may be drawn from different periods of history as well as of various forms of art /art objects).

UNIT-2

- Detailed study of the following art forms as applied to architecture with reference to techniques of production, visual qualities, application through history and present day trends: Painting, Sculpture, Mosaics, Stained glass, Tapestries, etc.

**Mid Semester Test**

UNIT-3

Detailed case studies such as:

- Contribution of artists such as Henri Moore, Alexander Calder, etc. to enrichment of Architecture
- Works of architect–artists such as Le Corbusier, SatishGujral, Michelangelo, etc.
- Specific examples of interrelation of art and architecture from different contexts, such as Folk Art of Madhubani, Byzantine Murals, Ajanta Wall Paintings, Gothic Churches, ShekhavatiHavelis, Chandigarh's Rock Garden, etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-7-711/EL | URBAN DESIGN-VII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To appreciate the nature and role of various facets of Urban Design in the making of the built environment.

Reference Books :

- Death and Life of great American City by Kevin Lynch
- Christopher Alexender; A pattern language

Course Content :

Unit-1

- Introduction to the role and scope of Urban Design. Comparison with 'architecture' and 'town planning'.
- Determinants of Urban Form such as landform, climate, symbolism, activity patterns, socio-cultural factors, materials and techniques and other contextual references. Case examples from various periods in history and different parts of the world.
- Vocabulary of Urban Design. Urban Pattern, Grain, Texture, Density, etc.
- Concepts of Imageability. Elements of the city's image. Paths, nodes, landmarks, edges, and districts – their characteristics, role and interrelationship.
- Designing parts of the city: Systems of communication, and utilities, visual expression, accent and contrasts, urban character, landscape features and city extension areas.

Unit-2

- Types of Urban Spaces - street, square, precinct, piazza, mall, etc.
- Various elements of urban space – their identification, characteristics and role in the shaping of the space.
- Changing role of urban spaces through history. Role of public places in the contemporary city.
- Design principles – Scale and Enclosure
- Case studies of well known urban spaces from various periods of history to illustrate their design and performance aspects.

**Mid Semester Test**

Unit-3

- Role of Legislation and Controls in design of the built environment.
- Types of urban controls: FAR, Incentive Zoning, Density, Planned Unit Development, Building height, Building Bulk etc. Special provisions of Town planning Acts. Analysis of urban legislation in Delhi, Mumbai, etc.
- Aesthetic Legislation – Historical Development and applications. Case example of aesthetic controls of Chandigarh – their basis, characteristics and problems of implementation and enforcement.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

**8th semester examination scheme and contents of syllabus:**

**EIGHTSEMESTER : SCHEME OF TEACHING**

**Duration of Semester : 18 weeks**

**Periods per week 28**

**Duration of each period : 60 minutes**

**Note**: The course work and assignments in each subject must be completed as prescribed.

| Sr. No | Subject | Periods per week | Total periods | Teaching Methodology and Sessional work |
|---|---|---|---|---|
| | COMPULSORY SUBJECTS | | | |
| 1. | Architectural Design-VIII | 12 | 216 | Design assignments, time problems. |
| 2. | Building Construction- VIII | 6 | 108 | Notes, sketches, drawings, tests |
| 3. | Research Methodology- VIII | 2 | 36 | Notes & tests |
| ELECTIVES (ANY 4) | | | | |
| 1. | Architectural Photography- VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 2. | Services Control Systems in Buildings-VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 3. | Settlement Conservation- VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 4. | Traffic & Transportation- VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 5. | Low Cost Effective Building Design & Construction- VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 6. | Landscape Design- VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 7. | Construction Management- VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| 8. | Sustainable Architecture – VIII | 2 | 36 | Assignments/Seminars/tests/CD |
| | Total | 28 | 504 | |

## EIGHT SEMESTER : SCHEME OF EXAMINATION

**PREPARATORY HOLIDAYS** : One week
**EXAMINATIONS** : Approximately two weeks

| Sr.No. | Subject | Duration of exam. (in hours) | Max Marks for Exam / Portfolio | Marks for Sessional work | Total Marks |
|---|---|---|---|---|---|
| | COMPULSORY SUBJECTS | | | | |
| 1. | Architectural Design-VIII | 18 | 200 | 200 | 400 |
| 2. | Building Construction- VIII | 6 | 100 | 100 | 200 |
| 3. | Research Methodology- VIII | 3 | 50 | 50 | 100 |
| ELECTIVES (ANY 4) | | | | | |
| 1. | Architectural Photography- VIII | 3 | 50 | 50 | 100 |
| 2. | Services Control Systems in Buildings- VIII | 3 | 50 | 50 | 100 |
| 3. | Settlement Conservation- VIII | 3 | 50 | 50 | 100 |
| 4. | Traffic & Transportation- VIII | 3 | 50 | 50 | 100 |
| 5. | Low Cost Effective Building Design & Construction- VIII | 3 | 50 | 50 | 100 |
| 6. | Landscape Design- VIII | 3 | 50 | 50 | 100 |
| 7. | Construction Management- VIII | 3 | 50 | 50 | 100 |
| 8. | Sustainable Architecture – VIII | 3 | 50 | 50 | 100 |
| | Total | | 550 | 550 | 1100 |

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-801 | ARCHITECTURAL DESIGN- VIII | 0-0-12 | | Sessional work : 200 Examination : 200 |

**Course Objective:** To make the students aware of design issues related to problems of urban development, urban renewal and housing .

Course Content:

- Urban Design Studio dealing with issues such as campus planning/designing buildings in

Historic context, related to urban development and renewal/design or ecologically sensitive control. This project will be dealt in two parts:

- Study of an existing urban environment to identify its typical characteristics and
- problems.
- Design solution to issues/problems identified above.
- Multistoreyed Housing project/integrated townships taking into consideration services, site planning, traffic and circulation

**Evaluation System:**

There will be minimum 02 design assignments each semester. Each design assignment shall be of 05 stages:

- Reference studies & idea exploration
- Concept formulation.
- Review – I & Review - II
- Preliminary Submission
- Final Submission.

Marks of each stage should be distributed by the design team. Each of the above stages shall be evaluated on the following parameters:

- Idea / concept originality
- Presentation of drawings to convey the idea
- Graphic presentations
- Model / 3D / Animation etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

The examiner is required to set one question which covers the points listed in the course contents.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-802 | Building Construction – VIII | 0-0-6 | | Internal- 100<br>External- 100 |

Course Objectives:

To educate the students with the preparation of a set of working drawings for a high-rise/large span/specialized building project, using advances constructional and structural building techniques.

Reference books.

- Watson. Don A:" Construction Materials and Processes", MeGraw Hill Co., University of Michigan, 1972.
- McKay. W.B. "Building Construction". Vol. 1.2.3. Longmans, U.K., 1981, Practice of Architectural Working Drawings. John Wiley & Sons publication.
- Chudley. R. "Building Construction Handbook". British Library Cataloguing in Publication Data. London. 1990.
- Barry, R. "Building construction", Last West Press. New Delhi.1999

Course Content:

UNIT-1

- Constructional principles of – Prefabricated and Pecast building construction and details.
- Modular Construction- Objectives, basic principles, planning and structural modules. Tubular construction system and details.

UNIT-2

- Basic formwork & construction details required for concrete structure such as shell, coffers, waffle roof, folded plates & span frame. etc

**Mid Semester Test**

UNIT-3

- Thermal & Acoustical treatment in RCC framed buildings including construction details. Construction of structural & non-structural cladding & glazing.

UNIT- 4

- Study of interior show room/shops, designs & details of Banks, Hotel, Offices, Public buildings, restaurants. etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER:

- The examiner is required to set a total of four questions i.e. one from each UNIT.
- The student is required to attempt any three questions from each UNIT

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-803 | RESEARCH METHODOLOGY-VIII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To appreciate the process of research and make the students aware of its potential in the field of architecture.

Reference Books :

- Architectural research methods by David Wang & Linda Groat
- Research methodology; C.R. Kothari

Course Content :

UNIT-1

- Research in architecture - its nature, purpose & scope
- Basic and applied research.
- Technical and behavioral - oriented research.

UNIT-2

- Science and scientific method - various steps in scientific method : hypothesis, research design, data collection & analysis, conclusions and implications with special reference to architectural research.
- Methods of conducting research.
- Selection of topic, and its relevance.

**Mid Semester Test**

UNIT-3

- Identification and formulation of problem.
- Compiling and analyzing existing research database.
- Research design, research instruments and analysis.
- Presentation of results.
- Evaluation of findings, conclusions and recommendations.
- Techniques of research - report writing.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-804/EL | ARCHITECTURAL PHOTOGRAPHY-VIII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To familiarize students with the basic skills of photography for use in architecture, and related fields like, landscape design interior design both as a tool of documentation and aesthetic interpretation.

Reference Books :

- Architectural Photography, 1976
- Photographers equipment book, 1984 by Brusselle Michael
- Architectural Photography by Michacl G. Harris

Course Content :

UNIT-1

- Nature, history and scope of photography.
- Various applications of photography.
- Creative composition in photography.
- Architectural photography and its role in documentation and creative design process.
- Various types of cameras and films.

**Mid Semester Test**

UNIT-2- **UNDERSTANDING THE TOOLS**

- Components of 35 mm SLR camera.
- Various types of lenses for 35 mm cameras and their uses/applications.
- Other camera accessories.
- Medium, format and large format cameras and their special uses.
- Digital cameras and their usage.

UNIT-3**- CREATING EXPERSSION**

- Laboratory demonstration of developing and printing of black and white photography
- Field assignments in groups of architectural photography, interior and landscape photography work - both in colour and black and white mediums.
- To document and interpret as aesthetic expression - various subjects of photography such as buildings, landscapes and interiors

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-805/EL | SERVICES CONTROL SYSTEMS IN BUILDINGS- VIII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives: To make students aware of the capability and limitations of control systems for various building services, gain fundamental knowledge of types of controllers, prepare basic diagrams required for automatic control systems and implement automated control system in their projects.

Reference Books : BIM Handbook A guide to Building Information Modellling for owners, Mana, Gers, Designers, Engineers, and Contractors (second edition)

Course Contents :

UNIT-1

- Sensors & Actuators
- Pneumatic controls systems, electric control systems.
- Computerized control systems, Direct Digital controls

UNIT-2

- Control in HAVC (Climate Control), Control of valves, dampers, stair pressurization, temperature, humidity, chillers, VAV boxes, night purging.
- Control in electric supply, electrical power distribution, SB, MDBs, DBs, MCBs, ELCBs, Fuses, Relays, switches, contractors, motor starters, start-to-start timers, delay switches etc.
- Controls systems in vertical transportation, remote elevator monitoring.
- Controls in fire services, fire panels, door and window automation, and fire door operation.
- Lighting controls.
- Access control and security, biometrics.

**Mid Semester Test**

UNIT-3

- Energy efficiency and services control systems, outside air economy cycle, automated louvers for sun control, electrochromics
- Integrated building management systems (BMS), intelligent buildings, and communication protocols used in services control, remote monitoring and management.
- Home automation
- Appliance control systems.
- Recent developments in services control systems industry.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-806/EL | SETTLEMENT CONSERVATION VIII | 2-0-0 | 2 | Sessional work :50<br>Examination : 50 |

Course Objectives: To understand the significance of conservation for an inclusive approach towards urban development and to develop an understanding of gauging the value of built heritage at the scale of a settlement.

Outcome of the Course: Acknowledging the role and significance of conservation as a tool for a sensitive inclusive urban development

Outlines of Syllabus:

- Introductions to concepts like cultural landscapes, historic urban landscape etc.
- Methods and documents preparation procedures for settlements level conservation projects.
- National and International discussions, proposals, Policies and legislations.
- Case Study exercise.

Reference Books:

- 1970 Convention, UNESCO
- The Historic Urban Landscape: Managing Heritage in an Urban Century - Francesco Bandarin and Ron van Oers
- Managing Built Heritage: the role of cultural values and significance - Stephen Bond and Derek Worthing.

Course Content:

UNIT -1 **Basic Understanding: Concepts And Definitions**

- Historical development of concepts of Settlement Planning
- Introduction to the concepts for a settlement level conservation such as Cultural Landscapes.
- Detailed understanding of UNESCO's approach of Historic Urban Landscape

**First Mid Semester Test**

UNIT-2 **International Agencies And Policies**

- Establishment and role of UNESCO WHC. Introduction to World Heritage Convention, its advisory bodies and State Parties.
- Procedure of nomination of site on World Heritage List
- Guidelines and processes of listing and creation of inventories.
- International standards of levels of protection - heritage areas/ heritage zones

**Second Mid Semester Test**

UNIT-3 **Urban Conservation In India**

- Introduction to legislation and government initiatives like HRIDAY, creation of responsible agencies etc.
- Understanding listing and creation of heritage zones through a field study.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-807/EL | TRAFFIC & TRANSPORTATION – VIII | 2-0-0 | | Sessional work: 50 Examination : 50 |

Course Objective:

To make the students conversant with methods, techniques of traffic & transportation, the socioeconomic and environmental issues related to the movement of humans and goods in general and in urban areas in particular.

Reference Books :

- L,.R. Kadiyali, Traffic and Transportation.
- I.R. Kadiyali, Traffic Engg. And transportation planning.
- Agarwala S C,f Architecture and Town Planning.
- National Transport Policy.
- Institute of Town planner (India)- Readers Volume.
- UDPFI Guidelines- Ministry of Urban Development.
- National Building Code,2005

Course Content :

UNIT-1

- Historical Development of transport network and various modes of transport.
- Traffic and urban environment.
- Various kinds of transportation systems with their qualitative analysis.
- Problems encountered in Intra-city transport systems.
- Road accidents: Causes and remedial measures.
- Infrastructure along highways to mitigate accidents/ emergencies.

UNIT-2

- Traffic control devices, Typology, Application and comparative merits and Demerits.1
- Road design elements: Hierarchy, Classification, Capacity, Road Cross-sections..
- Road design elements: Intersections.
- Case study of Junctions in India and abroad.

**Mid Semester Test**

UNIT-3

- Surveys-Objectives, Need, Importance, Types and Methodologies for conducting Traffic Surveys.
- Traffic surveys: volume, speed & delay, origin & destination.
- Parking surveys: Introduction, Type, Requirement, Problems and solutions.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-808/EL | Low Cost Effective Building Design & Construction- VIII | 2-0-0 | | Internal- 50<br>External- 50 |

**Course Objectives**:

To make the student to learn the basic design and construction techniques related to Low Cost Buildings.

Reference Books :

- Illustrated handbook or vernacular architecture
- Matra: Ways of Measuring Vernacular Built Forms of Himachal Pradesh. Jay Thakkar.
- Wooden Architecture of Kerala. Desai Miki.
- Mud architecture of the Indian Desert. 1992 Minakshi and Kulbhushanjain.
- Hand Book of Low Cost Housing, A.K. Lal.
- Rural Housing. MajumderBhaskar.
- Building an Affordable House. Ruiz Fernando.
- Technology transferred and recent research publication by C.B.R.I.
- Environment friendly Indian building material technologies for cost effective housing. BMTPC.
- Laurie Baker Life. Work and writings. Gautam Bhatia.
- Laurie Baker: Truth in Architecture. AtulDeulgaonkar.
- Indian standard on Low cost technologies.
- http://www.lauriebakercentre.org
- http://cbri.res.in

Course Content:

UNIT-1

Meaning and definition of Low Cost construction. Concept of low cost Buildings. Information about various construction methods. Introduction and Function of Low Cost Skeletal system – Foundation. Walling, Roofing, Detailing techniques, Market survey for Low Cost Materials.

UNIT-2

A study of traditional / vernacular construction techniques. Zone specific vernacular construction technology, regional variations in vernacular expressions. (Hot-Dry, Humid, Composite, Moderate etc.) Use of cost- effective technologies through the use of Architecture design, Local materials, Building construction techniques etc. Up gradation of traditional technologies.

**Mid Semester Test**

UNIT-3

Low Cost Construction techniques in Rural Area Concept, Need and Importance and recent innovations by C.B.R.I, B.M.P.T.C, COSTFORD & A.E.I.

UNIT- 4

Low cost Construction techniques in Urban Area – Concept, Need an Importance and recent innovations by C.B.R.I, B.M.P.T.C, COSTFORD & A.E.I.

UNIT-5

Indian standards for low cost buildings, construction technology – Pre-fabrication, In-situ, Modular co-ordination etc. Low cost housing in urban areas – design and functional criteria by inhabitants, Economical construction, Comparative analysis of low cost and contemporary construction.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-809/EL | LANDSCAPE DESIGN – VIII | 2-0-0 | | Sessional work :50<br>Examination :50 |

Course Objectives:

This course is aimed at providing a comprehensive knowledge regarding ecological aspects and environmental concerns in landscape design.

Reference Books :

- Architecture and Landscape, Clemens and Steenburgen.
- Forman and Godron, Landscape ecology.
- Cook Vanderazanden, Sustainable Landscape Management.
- Michael Laurie, An An introduction to Landscape Architecture, Elsevier, 1986.
- Robinette, water conservation in landscape- Design and Management.
- N.S. Raman, A.R. Gajbhiye, S.R. Khandeshwar, environmental impact Assessment.
- John Glasson, Introduction to Environmental impact Assessment.

Course Content :

UNIT-1

- Introduction and historical backdrop of the evolution of landscape and garden design in relation to art, architecture and city planning from the earliest period to the present day.

UNIT-2

- Introduction to ecology : patches, corridor, matrix; principles of ecology; and itsimportance to Landscape Designers with example.

UNIT-3

Advanced knowledge of the following with examples-soil, land and water.

- Soil and land conservation: Causes of soil degradation, remedial actions such as erosion control measures.
- Water conservation: sources of ground water pollution and its control; watershed and their characteristics, protection of natural bodies and theirtechniques.

**Mid Semester Test**

UNIT-4

- Environmental Impact Assessment techniques.
- National environmental policy
- Significance of Bio-diversity in urban areas.

UNIT-5

- Contemporary landscape design work/projects of eminent landscape arfchtiects inIndia such as RavindraBhan, MohmmandShaheer etc.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from eachunit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-810/EL | CONSTRUCTION MANAGEMENT – VIII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objectives:

To provide an insight into management of building construction projects involving handling of various resources.

Reference Books :

- Construction Planning, equipment and Methods by RL Peurifoy
- Project management for architects by S.P. Mukopadhyay
- Pert and CPM by L.S. Srinath
- Project management through network technologies M. Thyagarajah
- Construction Project Management Planning, Scheduling & Controlling K. Chitkara-Tata McGrawhill
- Construction planning and management by P.S. Gahlot, B.M. Dhir

Course Content :

UNIT-1 **- INTRODUCTION**

- Aim, objectives and functions of Construction Management.
- Construction stages, Construction team.
- Role of an Architect in Construction Management.
- Management techniques and tools.

UNIT-2**- METHODOLOGIES AND TOOLS**

- Bar charts and limitations of bar charts.
- Programme Evaluation and Review Technique (PERT)
- Critical Path Method (CPM) for project management
- Development and analysis of CPM net work.
- Cost time analysis in network planning.
- Scientific methods of construction management.

**Mid Semester Test**

UNIT-3- **PARALLEL ASPECTS**

- Project management for repetitive type of buildings. Line of Balance Method - its working knowledge with exercises.
- Resources scheduling methods through Bar charts, CPM and Line of Balance method.
- Inspection and Quality control.
- Safety in construction.

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-8-811/EL | SUSTAINABLE ARCHITECTURE-VIII | 2-0-0 | | Sessional work : 50 Examination : 50 |

Course Objective**:** To make the students aware of design issues related to problems of urban development, urban renewal and housing .

Reference Books:

- GRIHA MANUAL VOL 1-5
- Sustainable by Design: Methods for Holistic Housing, Basics, Strategies, Projects by Hans Drexler & Sebastian El Khouli
- The Sustainable Sites Handbook: A Complete Guide to the Principles, Strategies, and Best Practices for Sustainable Landscapes by Meg Calkins
- Material Revolution: Sustainable Multi-Purpose Materials for Design and Architecture by Sascha Peters
- Cradle to Cradle: Remaking the Way We Make Things by William McDonough & Michael Braungart

Course Content:

UNIT-1**- Understanding Sustainable Development**

- Introduction to sustainable Development; Fundamentals of sustinability,
- Agenda 21, UN Goals, post-2015 sustainable devleopment
- Agenda, UNDP's role with the SDGs
- Three Pillars of the sustainable Development i.e. Economic, Social & Environment
- Sustainable architecture as a subset of sustainable development

UNIT-2**- Measuring Sustainability Of Buildings**

- Sustainable Construction
- Terminologies related to sustainable buildings- carbon footprint, life cycle analysis
- Code and compliances - ECBC, NBC
- Green Building & Rating system; GRIHA, IGBC & BEE
- Carbon Credits and Rating System

**Mid Semester Test**

UNIT-3**- Six Sustainable Architecture fundamental principles**

- Optimize Site Potential; Site development-site selection, UHI, Public Transport, vegetation, development footprint, storm water runoff
- Optimize Energy Use; energy efficiency, energy conservation, ECBC, renewable energy, solar panels calculations
- Protect and Conserve Water; water harvesting calculations
- Greener Materials; segregation, recycling, reduction in waste, reuse of materials and building renewability
- Enhance Indoor Environmental Quality (IEQ); day lighting, natural ventilation, comfort, VOC free
- Optimize Operational and Maintenance Practices

UNIT- 4**- Design Strategies**

- Solar Passive
- Fundamentals of passive designing and climatology, thermal comfort, visual comfort, acoustic comfort

- Process and Assessment
- Psychometric process
- Surroundings
- Lesser consumption of resources (optimization of resources)
- Climate responsive
- Recycling/Reuse
- Life Cycles assessment (LCA)

**UNIT-5- India's approach to sustainable Development**

- India follows a holistic approach towards its 2030 sustainable development
- 30-80% reduction in emission**;** Zero-net emissions in new buildings by 2020 and 2030
- Transdisciplinarity approach

**End Semester Examination**

INSTRUCTIONS TO THE PAPER SETTER

- The examiner is required to set a total of six questions, at least one from each unit.
- The student is required to attempt any four questions.

**9th semester examination scheme and contents of syllabus:**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-09-900 | THESIS STUDIO | | | Sessional work : 500<br>Examination : 500 |

Course Objectives: To use and synthesise knowledge of various disciplines in an architectural project of the students' own choice.

Course Contents :

Unit-1**- The thesis project will comprise the following:**

- An illustrated report, which will include the validity and scope of the chosen project, methodology, prototype studies, site analysis, client's and architect's briefs, delineation of programme and design criteria.
- A fully worked-out design proposal including consideration of site planning structures, services, and any other aspects/specific to the project.

Unit-2**- Stages of Work:**

- Approval of project:
- Synopsis
- Rough Report, comprising all analytical aspects of the project including the synopsis, library studies, prototype studies, site analysis, delineration of building program, etc.
- Evolution of Design, to be worked out in a minimum of four stages.
- Draft of Final Report, including Evolution of Design
- Final Report, drawings and model, to be evaluated through a University Examination.

**Note:**

- Students will submit two copies of the final report (original and one photocopy) on a standard format prescribed in the thesis programme issued every year by the Thesis Coordinator.
- The report must also include A-4/A-3 size copies of all final drawing and at least two photographs of the final model/models
- The original copy of the report, the final drawings and models will be returned to the student after the declaration of the result. The photocopy of the report will be retained for reference in the college library.

**Schedule of Submissions/examination**

(Note: Commencement of the semester is considered as 0 week)

| Stages of Work | | Time allocated | Max. Marks |
|---|---|---|---|
| **1.** | **Sessional Work** | | |
| **A** | Rough Report | | |
| **i.** | Introduction & topic finalization | 1 Week | |
| **ii** | Synopsis | 2 Week | 25 |
| **iii** | Preliminary Library Studies | 2 Week | 25 |
| **iv** | Site analysis, Prototypes additional library studies | 3 Week | 100 |
| **B** | Evolution of Design | | |
| **i** | Design Criteria and Concept | 2 Week | 50 |
| **Ii** | Design Proposal Stage-1 | 3 Week | 50 |
| **iii** | Design Proposal Stage-2 (incorporating structure & services) | 2 Week | 50 |
| **iv** | Pre-final Design | 2 Week | 150 |
| **C** | Draft Final report<br>(Incorporating improvements suggested in Rough Report, Design Criteria and explanatory sketches of Evolution of Design). | 1 Week | 50 |
| **2.** | **External Examination** | 4 Weeks | 500 |

Note:

- Students are required to submit the Final Report, all final drawings and model/s in the standard format prescribed in the Thesis Programme.
- Submission will be made one day before the date of examination.

Teaching and Evaluation System:

- The thesis studio will be conducted under the overall coordination of the Thesis Coordinator. In addition, two members of the Visiting Faculty/invited Guest Faculty would also be associated throughout the duration of the studio. Each student will be assigned a Thesis Guide (from amongst the faculty) who will supervise the progress of the student's work on a regular basis.

- The Principal, the Thesis Coordinator and the concerned Thesis Guide will do approval of the thesis project/topic.

    - All stages of sessional work will be evaluated jointly by the Principal, the entire studio team (Thesis Coordinator, Visiting/invited guest Faculty members and the concerned Thesis Guide) and two experts one from academics and one practicing Architect, invited by the Principal Chandigarh College of Architecture, out of which any one expert should be present.
    - Jury for the External Examination will comprise the Principal, Thesis Coordinator and two External Examiners (one Academician and one practicing Architects) appointed by the Panjab University.
    - Marks awarded at each stage will be based on the average of those awarded by all jury members. The decision of the Principal will be final in case of dispute/discrepancy.
    - Students will be required to attend weekly reviews for their sessionsal and attendance.
    - In view of the practical and creative nature of the thesis projects, the presence of the candidate at the viva voce examinations at all the prescribed stages shall be mandatory. If the candidate fails to appear in the viva voce examination at any stage, the thesis project submitted by him/her shall not be accepted.
    - Candidate who fails to clear the thesis examination either in the periodic assessment or in the final examination can only be allowed to reappear with the regular batch of thesis students in the next academic year.
    - Students, who fail to obtain pass marks in the periodic assessment, shall be required to change their thesis project.
- Any point which is not covered in the above syllabus will be jointly resolved by the Principal, Dean of Academics and the thesis coordinator.

## 10th SEMESTER (PRACTICAL TRAINING): SCHEME OF EXAMINATION

**The total marks assigned to the Practical Training are 500. These shall be distributed as detailed below:**

| | | |
|---|---|---|
| **A.** | **Periodical Reports** | |
| 1. | Joining Report | |
| 2. | Monthly progress report (6 Nos.) of 20 marks each | 120 |
| **B.** | **Work to be presented for Training Viva** | |
| 1. | Work done during office hours | 150 |
| 2. | Building Analysis Report | 150 |
| **C.** | **Viva Voce** | 80 |

**NOTE:**

1. Detailed guidelines regarding the nature and quantum of work to be presented for the Training Examination and the Periodical Reports will be specified in the Training Schedule.
2. The Training Examination will be conducted by the Principal, the Practical Training Coordinator and two External Examiners appointed by the Principal.

**10th semester examination scheme and contents of syllabus:**
**Duration of Semester : 24 weeks**

| Course No. | Course Name | L-T-S | Credits | Marks |
|---|---|---|---|---|
| CCA-10-1000 | PRACTICAL TRAINING | | | Practical Training Marks : 500 |
| Course Objectives: This entire semester will be used for Practical Training, which is to be undertaken with an architect having a minimum professional experience of 8 years. The students would be expected to gain practical experience in an architecture firm and to acquaint themselves with how work takes place in the field. | | | | |
| Course Contents : The following work is to be done by each trainee during the Practical Training: | | | | |
| UNIT-1<br>• During office hours<br>(i) Drafting, tracing, presentation drawings, perspectives, models, etc.<br>(ii) Working drawings and details.<br>(iii) Site visits. | | | | |
| UNIT-2<br>• <u>In extra-office hours:</u><br>The trainee is also required to prepare a study report on building/buildings designed by his/her employer. The report is to be based on site visits and personal observations and will cover aspects of design, structure, use of material, construction methods, services etc. | | | | |
| **End Semester Examination – Internal Portfolio Viva** | | | | |