



HINDUSTAN

INSTITUTE OF TECHNOLOGY & SCIENCE

(Deemed to be University)

SCHOOL OF ARCHITECTURE

**BACHELOR OF ARCHITECTURE
(B.ARCH)**

**CHOICE BASED CREDIT SYSTEM (CBCS)
CURRICULUM AND SYLLABUS**

APPLICABLE FOR 2015-2016 BATCH



SCHOOL OF ARCHITECTURE
DEGREE FOR BACHELOR OF ARCHITECTURE
(10 SEMESTER PROGRAMME)
CURRICULUM 2015 - 2016

SEMESTER I

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------------------|----------|-----------------------------|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | ARB101 | Art Appreciation | 2 | 0 | 0 | 2 | 2 |
| 02. | ARB102 | History of Architecture - I | 2 | 0 | 0 | 2 | 2 |
| 03. | MAA111 | Mathematics | 3 | 0 | 0 | 3 | 3 |
| Theory Cum Studio | | | | | | | |
| 04. | ARB103 | Materials & Construction- I | 2 | 0 | 2 | 3 | 4 |
| 05. | ARB104 | Architectural Drawing- I | 2 | 0 | 4 | 4 | 6 |
| Studio | | | | | | | |
| 06. | ARB131 | Computer Studio -I | 1 | 0 | 4 | 3 | 5 |
| 07. | ARB132 | Architectural Design - I | 0 | 0 | 10 | 5 | 10 |
| TOTAL | | | 12 | 0 | 20 | 22 | 32 |

SEMESTER II

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------------------|----------|-------------------------------|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | ARB105 | Theory of Architecture –I | 2 | 0 | 0 | 2 | 2 |
| 02. | ARB106 | History of Architecture –II | 2 | 0 | 0 | 2 | 2 |
| 03. | CEB121 | Mechanics of Structures - I | 3 | 0 | 0 | 3 | 3 |
| Theory Cum Studio | | | | | | | |
| 04. | ARB107 | Materials & Construction - II | 2 | 0 | 2 | 3 | 4 |
| 05. | ARB108 | Architectural Drawing - II | 1 | 0 | 4 | 3 | 5 |
| Studio | | | | | | | |
| 06. | ARB133 | Computer Studio - II | 1 | 0 | 4 | 3 | 5 |
| 07. | ARB134 | Architectural Design - II | 0 | 0 | 12 | 6 | 12 |
| TOTAL | | | 11 | 0 | 22 | 22 | 33 |

SEMESTER III

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------------------|----------|--------------------------------------|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | ARB201 | Theory of Architecture – II | 2 | 0 | 0 | 2 | 2 |
| 02. | ARB202 | History of Architecture – III | 2 | 0 | 0 | 2 | 2 |
| 03. | CEB221 | Mechanics of Structures – II | 3 | 0 | 0 | 3 | 3 |
| 04. | CEB222 | Building Services - I | 3 | 0 | 0 | 3 | 3 |
| 05. | CEB223 | Surveying, levelling & Site Planning | 2 | 0 | 2 | 3 | 4 |
| Theory Cum Studio | | | | | | | |
| 06. | ARB203 | Materials & Construction – III | 2 | 0 | 4 | 4 | 6 |
| Studio | | | | | | | |
| 07. | ARB231 | Architectural Design - III | 0 | 0 | 14 | 7 | 14 |
| TOTAL | | | 14 | 0 | 20 | 24 | 34 |

SEMESTER IV

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------------------|----------|--|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | ARB204 | History of Architecture – IV | 2 | 0 | 0 | 2 | 2 |
| 02. | ARB205 | Climate and Built Environment | 3 | 0 | 0 | 3 | 3 |
| 03. | CEB224 | Design of Structures I | 3 | 0 | 0 | 3 | 3 |
| 04. | CYA221 | Environmental Science and Engineering. | 2 | 0 | 0 | 2 | 2 |
| Theory Cum Studio | | | | | | | |
| 05 | ARB206 | Materials & Construction – IV | 2 | 0 | 4 | 4 | 6 |
| Studio | | | | | | | |
| 06. | ARB232 | Advanced Computer Graphics. | 2 | 0 | 2 | 3 | 3 |
| 07. | ARB233 | Architectural Design – IV | 0 | 0 | 14 | 7 | 14 |
| TOTAL | | | 14 | 0 | 20 | 24 | 33 |

SEMESTER V

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------------------|----------|------------------------------|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | ARB301 | Building Services - II | 3 | 0 | 0 | 3 | 3 |
| 02. | ARB302 | Sustainable Architecture | 3 | 0 | 0 | 3 | 3 |
| 03. | ARB303 | Contemporary Architecture | 3 | 0 | 0 | 3 | 3 |
| 04. | CEB321 | Design of Structures – II | 3 | 0 | 0 | 3 | 3 |
| 05. | CEB322 | Estimation and specification | 3 | 0 | 0 | 3 | 3 |
| 06. | E 1 | Elective -I | 2 | 0 | 0 | 2 | 2 |
| Theory Cum Studio | | | | | | | |
| 07 | ARB304 | Materials & Construction - V | 2 | 0 | 4 | 4 | 6 |
| Studio | | | | | | | |
| 08. | ARB331 | Architectural Design - V | 0 | 0 | 14 | 7 | 14 |
| TOTAL | | | 19 | 0 | 18 | 28 | 37 |

SEMESTER VI

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------------------|----------|------------------------------------|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01 | ARB305 | Human Settlement Planning | 3 | 0 | 0 | 3 | 3 |
| 02. | ARB306 | Building Services – III | 3 | 0 | 0 | 3 | 3 |
| 03. | ARB307 | Professional Practice & Ethics - I | 2 | 0 | 0 | 2 | 2 |
| 04. | CEB323 | Design of Structures - III | 3 | 0 | 0 | 3 | 3 |
| 05. | E 2 | Elective II | 2 | 0 | 0 | 2 | 2 |
| 06. | E 3 | Elective - III | 2 | 0 | 0 | 2 | 2 |
| Theory Cum Studio | | | | | | | |
| 07. | ARB308 | Materials and Construction - VI | 2 | 0 | 4 | 4 | 6 |
| Studio | | | | | | | |
| 08. | ARB332 | Architectural Design - VI | 0 | 0 | 14 | 7 | 14 |
| | | | 17 | 0 | 18 | 26 | 35 |

SEMESTER VII

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|---------------|----------|-------------------------------------|-----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | ARB401 | Urban Design and Renewal | 3 | 0 | 0 | 3 | 3 |
| 02. | ARB402 | Landscape and Ecology | 3 | 0 | 0 | 3 | 3 |
| 03. | ARB403 | Urban Economics and Sociology | 2 | 0 | 0 | 2 | 2 |
| 04. | ARB404 | Professional Practice & Ethics – II | 3 | 0 | 0 | 3 | 3 |
| 05. | E4 | Elective-IV | 3 | 0 | 0 | 3 | 3 |
| Studio | | | | | | | |
| 06. | ARB431 | Architectural Design - VII | 0 | 0 | 16 | 8 | 16 |
| 07. | ARB432 | Dissertation | 0 | 0 | 4 | 2 | 4 |
| TOTAL | | | 14 | 0 | 20 | 24 | 34 |

SEMESTER VIII & IX

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|--------------|----------|--------------------|----------|----------|-----------|-----------|-----------|
| 01. | ARB433 | Practical Training | 0 | 0 | 48 | 24 | 48 |
| TOTAL | | | 0 | 0 | 48 | 24 | 48 |

SEMESTER X

| S.No. | CODE No. | SUBJECT NAME | L | T | P | C | TCH |
|---------------|----------|---------------|----------|----------|-----------|-----------|-----------|
| Theory | | | | | | | |
| 01. | E5 | Elective - V | 3 | 0 | 0 | 3 | 3 |
| 02. | E6 | Elective - VI | 3 | 0 | 0 | 3 | 3 |
| Studio | | | | | | | |
| 04. | ARB501 | Thesis | 0 | 0 | 30 | 15 | 30 |
| TOTAL | | | 6 | 0 | 30 | 21 | 36 |

TOTAL NUMBER OF CREDITS: 215**Note:**

- 2 hours of Studio in Architectural Design / Materials and Construction / Architectural Drawing / Computer Studio = 1 Credit
- 2 hours of Dissertation / Practical Training / Thesis = 1 credit
- 1 hour of Lecture (L) = 1 Credit
- P = Studios / Lab / Dissertation / Practical Training / Thesis
- TCH = Total contact hours.

ELECTIVES

| Elective No. | Semester | Code No. | Subject Name | L | T | P | C | TCH |
|--------------|----------|----------|--|---|---|---|---|-----|
| I | V SEM | ARC351 | Theory of Interior Design | 2 | 0 | 0 | 2 | 2 |
| | | ARC352 | Energy Efficient Architecture | 2 | 0 | 0 | 2 | 2 |
| | | ARC353 | Construction Equipment and Methods | 2 | 0 | 0 | 2 | 2 |
| II | VI SEM | ARC354 | Visual Communication and Architecture | 2 | 0 | 0 | 2 | 2 |
| | | ARC355 | Landscape Construction | 2 | 0 | 0 | 2 | 2 |
| | | ARC356 | Building Maintenance and Retro techniques. | 2 | 0 | 0 | 2 | 2 |
| | | ARC360 | Glass Architecture and Design <i>(Special Elective in association with Glass Academy)</i> | 2 | 0 | 0 | 2 | 2 |
| III | VI SEM | ARC357 | Building Interior materials and construction. | 2 | 0 | 0 | 2 | 2 |
| | | ARC358 | Urban Ecology | 2 | 0 | 0 | 2 | 2 |
| | | ARC359 | Construction Quality and Cost Control | 2 | 0 | 0 | 2 | 2 |
| | | ARC360 | Glass Architecture and Design <i>(Special Elective in association with Glass Academy)</i> | 2 | 0 | 0 | 2 | 2 |
| IV | VII SEM | ARC451 | Urban Housing | 3 | 0 | 0 | 3 | 3 |
| | | ARC452 | Disaster Mitigation and Management | 3 | 0 | 0 | 3 | 3 |
| | | ARC453 | Conservation of Built Vernacular | 3 | 0 | 0 | 3 | 3 |
| V | X SEM | ARC551 | Interior accessories and furniture design. | 3 | 0 | 0 | 3 | 3 |
| | | ARC552 | Landscape Services and EIA | 3 | 0 | 0 | 3 | 3 |
| | | ARC553 | Project Management | 3 | 0 | 0 | 3 | 3 |
| VI | X SEM | ARC554 | Interior Lighting and Landscape | 3 | 0 | 0 | 3 | 3 |
| | | ARC555 | Landscape System Integration | 3 | 0 | 0 | 3 | 3 |
| | | ARC556 | Infrastructure Planning and Management | 3 | 0 | 0 | 3 | 3 |



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| | | | |
|--|--|---|----------------------------------|
| ARB101 | ART APPRECIATION | 2 Credits | L T P C 2 0 0 2 |
| Goal | To understand that arts and art forms were simultaneously developing with architecture in cultures and civilization and to understand that architecture is also a form of art. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the students to:</p> <ul style="list-style-type: none"> • To understand and appreciate the Role of Art in History of World Architecture- Past and present. • To familiarize students with grammar of Art from the study of works Renowned Artists.[Sculptures'/painters] • To study vocabulary of Art and its principles, the symbolic relationship of Art and Architecture. • To identify art in terms of its form: Content and context [social and cultural] and to develop a sense of AESHETICS which is a necessary component in Architectural Design. • To study Modern Art and New directions [isms] evolved during 19th and 20th centuries. • To study Art in Indian Context through Ages/periods. [Vernacular traditions] and its contemporary manifestations. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Identify, understand and appreciate – Art in Architecture, • To create Built Forms incorporating [Judicially] • To understand appropriate Indigenous Art elements. | |

UNIT I UNDERSTANDING ARTS

5

The definition of art – the needs and meaning of works of art – Technical language of art - Appreciation of art form

UNIT II THE TECHNIQUES OF ART

5

Drawing – architecture – sculpture – painting - printing minor arts (glass wave stain glass, lithographic prints, etc.) – Industrial art (Art Nouveau, Bauhaus)

UNIT III ART IN WESTERN WORLD

8

Cave paintings of pre-historic period –Art forms and shapes in Egyptian, Mesopotamian, Greek, Roman and Italian Renaissance periods –Birth of Modern arts, definitions of- Impressionism and postimpressionism, artnouveau, cubism Dadaism, surrealism, Abstract art, expressionism, futurism &constructivism.

UNIT IV ART HISTORY OF ASIAN WORLD**8**

Cave art, Indus valley civilization, Vedic civilization, Buddhist, Hindu (Indo Aryan and Dravidian), rock - cut art. Islamic art form, Imperial style, Post- independent, Mughal. Recent developments in Indian Art and Architecture.

UNIT V RECENT TRENDS**4**

Art forms, patterns and furniture of the British period in India, Use of modern materials and technique- Recent development in Indian Art.

TOTAL : 30**TEXT BOOK**

1. Helen Gardner, Fred S. Kleiner, Christin J. Mamiya , “Art Through The Ages: The Western Perspective” , Cengage Learning, 2005

REFERENCES

1. Peter and Linda Murray, “ The penguin Dictionary of Art and Artist”, Penguin Books – 1997.
2. Opdyke H.G. “Art and Nature Appreciation”, Macmillan 1932(digitized -2008).
3. Judith Collins, “Techniques of Modern Artists”, Chartwell Books – 1997.
4. H. Horvard Arnason, Marla F. Prather, Daniel Wheeler,” History of Modern Art:
5. Painting, Sculpture, Architecture, Photography”, Prentice Hall Press, 1998

| | | | |
|---|--|---|----------------------------------|
| ARB102 | HISTORY OF ARCHITECTURE -I | 2 Credits | L T P C 2 0 0 2 |
| Goal | To inform about development of architecture in Europe from pre-historic to Byzantine period-- to study the contributions in various periods with selected examples of buildings and their uniqueness in terms of form, material and construction techniques. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Understand the progress in civilization leading to the development of shelter and how art and architecture emerged in Egyptian civilization. • Understand how science emerged during the Sumerian period and how architecture and planning evolved. • Study the development of art and architecture and the contribution of Greece. • Understand the concept of republican state and the architectural character of Romans. • Study the birth & spread of Christianity, its influence on architecture and architectural character during the Roman period. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a comprehensive knowledge about the development of shelter and art and architecture in Egyptian civilization. • Have a comprehensive knowledge about the development of science during the Sumerian period and the evolution of architecture and planning. • Express the development of architecture and its contribution towards growth of Greece with the help of sketches. • Articulate knowledge on the development of republican state and the influences it had on the architectural character during the Roman era. • Articulate the birth and spread of Christianity and identify its influences on architecture during the Roman period. | |

UNIT I PREHISTORIC AGE AND EGYPT

6

Old Stone Age - the Agricultural revolution – The New Stone Age - Development of Shelter. Nature of Art and Architecture - Factors influencing Architecture - Outline of Architectural Character – Great Pyramid of Cheops, Gizeh, Great temple of Ammon, Karnak.

UNIT II WEST ASIA

4

Evolution of Sumerian, Babylonian and Persian cultures - Factors influencing architecture - Outline of architectural character - Ziggurat, Urnammu, Palace of Sargon, Khorsabad - Palace at Persepolis.

UNIT III GREECE

8

Evolution of city states - Development of Art, Sculpture, architecture in the archaic and classic periods – Factors influencing architecture - Outline of architectural character– optical illusion in buildings, Orders in architecture - Doric Ionic and Corinthian, Parthenon; Erechthion, Athens, Theatre Eipdaurous; Tower of Winds.

UNIT IV ROME**8**

Evolution of Republican states - Factors influencing architecture - outline of architectural Character Forum Romanum; Rome; Thermae of Caraculla; Colloseum Rome; Pantheon, Rome: Circus Maximus, Rome.

UNIT V EARLY CHRISTIAN AND BYZANTINE**4**

Birth and spread of Christianity - Evolution of church forms - Factors influencing architecture - Outline of Architectural character - St. Clement, Rome St. Sophia, Constantinople; St. Marks, Venice; St. Vitale, Ravenna.

TOTAL 30**TEXT BOOK**

1. Sir Banister Fletcher, "A History of Architecture", University of London, The Athlone Press 1996, 20th edition.
2. Percy Brown, "Indian Architecture (Buddhist and Hindu Pd.)"- Tarapore Vala and Sons Bombay 1996.
3. Satish Grover, "The Architecture of India (Buddhist and Hindu Period)", CBS Pub., 2003

REFERENCES

1. Yatin Bandy, "Concepts of Space in Traditional Indian Arch", Mapin, 2005.
2. Mitchell, George (1996) "The Hindu Temple, University of Chicago Press.
3. Spiro Kostof, "A History of Architecture : Setting and Rituals", Oxford University Press, London, 2005 (digitized – 2007).
4. Pier Luigi Nervi, "History of World Architecture Series". Harry N. Abrams Inc. Publication, New York, 1972.
5. Meaning in Western Architecture - Christian Norberg-Schulz-Rizzoli, New York, 1974.

WEBSITES:

1. <http://library.advanced.org/10098>
2. <http://www.encyclopedia.com/articles/05371.html>
3. <http://www.cup.org/Titles/09/0521094526.html>

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|---|---|---|----------------------------------|
| MAA111 | MATHEMATICS | 3 Credits | L T P C 3 0 0 3 |
| Goal | To create the awareness and comprehensive knowledge in engineering mathematics. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the students to:</p> <ul style="list-style-type: none"> • Understands the representation of points in space, direction cosines and different forms of the plane. Learns symmetrical and unsymmetrical forms of a straight line and the concept of skew lines. • Understands the different forms of the sphere, plane section of a sphere and the tangent planes. Understands the formation of cone and cylinder. • Find the inverse of the matrix by using Cayley Hamilton Theorem and Diagonalisation of matrix using transformation. • Learn the solutions of second order linear differential equations of standard types and Euler's linear differential equation. • Learn partial differentiations involving two and three variables and expansions of functions using Taylor series. Understands the concept of envelopes. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Use 3D object plots the points in space. Evaluates the direction cosines of a straight line. Determines the shortest distance between the skew lines. • Study models, 3D objects and learn different concepts of sphere, cone and cylinder. • Identify Eigen value problems from practical areas and obtain its solutions and using transformation diagonalising the matrix which would render Eigen values. • Recognize and to model mathematically and solving, the differential equations arising in science and engineering. • Expands functions using Taylor's theorem. Understand and model the practical problems and solve it using maxima and minima as elegant applications of partial differentiation. Evaluates the envelopes of standard functions. | |

UNIT I PLANE AND LINES

9

Direction ratios and direction cosines of a line - Equations of a plane and intersecting planes -Symmetric form of a straight-line - Angle between lines and planes - Coplanar lines- skew lines - shortest distance.

UNIT II CURVED SURFACES

10

Equations of sphere - section by a plane – Tangent plane - standard equations of cone, cylinder and - properties

UNIT III MATRICES

9

Characteristic equation, Eigen values and Eigenvectors of a real Matrix, Cayley -Hamilton Theorem without proof; Reduction of a real symmetric matrix to diagonal form.

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS

8

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

UNIT V FUNCTIONS OF TWO VARIABLES**9**

Partial differentiation, total derivative, approximations, Taylor's Theorem, Maxima and Minima, envelope

TOTAL : 45**TEXT BOOKS**

1. Venkataraman, M.K., "Engineering Mathematics", Volume I, Fourth Edition, The National Pub. Co., Chennai, 2003.
2. Chandrasekaran .A, "Engineering Mathematics (for I Semester) ", First Edition Dhanam Publishers,Chennai, 2008.

REFERENCES

1. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi, 1998.
2. P.Kandasamy, K.Thilagavathy and K.Gunavathy, Engg Mathematics Vol & II, S.Chandan Publishers - 1998

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|--|--|--|----------------------------------|
| ARB103 | MATERIALS AND CONSTRUCTION - I | 3 Credits | L T P C 2 0 2 3 |
| Goal | To introduce various components of buildings and conventional materials used in building construction. | | |
| Objectives | | Outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> To understand the basic [STRUCTURAL & FUNCTIONAL] components of a building such as Foundation: walls /Roof/Fenestrations/ and the Materials and method of construction. To understand the potential of rural natural building materials namely Mud Bamboo, casurina. To know about stone, variety of stones –their application in Building. Study briefly about manufacture of bricks – types of bricks: Properties uses and application and clay products.[tiles, ceramics etc.] | | The students should be able to: <ul style="list-style-type: none"> To have a comprehensive knowledge about natural building materials [conventional/rural] To understand method of constructions using natural materials. To explain the method of construction through drawings. | |

UNIT I INTRODUCTION

10

Functional requirements of a building and its components - Drawings of foundations, plinth, superstructure, roofing. Soils - Formation – grain size distribution soil classification systems. Lime - fat/Hydraulic Limes - Their uses and properties Manufacturing process - Mortar, functions – requirements - mix proportions.

UNIT II RURAL - MATERIALS AND CONSTRUCTION

30

Mud as a building material - Soil stabilization, soil blocks - Drawings of foundations -types, S.S.Block – S.S.Cast in situ walls - flooring - roofing - plastering. Bamboo, casuarinas coconut, palm, hay, coir, jute – properties - uses - fire retardant treatment, insect proofing. Types of foundations - walls - simple roof trusses, floors for rural structures.

UNIT III STONE

25

Classification of rocks - Building stones - their uses –physical properties - brief study of tests for stone – deterioration - preservation of stone - various stone finishes – cutting and polishing of granites. Drawings of foundations - types of masonry – random rubble/Ashlar, etc. - cavity walls - flooring copings, sills, lintels, corbels, arches.

UNIT IV BRICKS AND CLAY PRODUCTS

10

Bricks - brief study on manufacture of bricks - properties – uses - suitability - types of bricks - uses in buildings, structural tiles, ceramics, terracotta - uses.

TOTAL 75

TEXT BOOKS:

1. S.C.Rangwala , “Engineering Materials”, Charotar Publishing House – Anand 2007
2. Dr.Bala Gopal, “Building Design and Civil Engineering Drawing”, Spades Publishers & Distributors, 2008
3. Dr.B.C.Punmia, “Building Construction” Laxmi Publications, 2008.

REFERENCES

1. W.B.Mckay , “Building Construction”, Vol. 1,2,3- Longmans U.K 1992.
2. R.J.S.Spencke and D.J.Cook, “Building Materials in Developing Countries”, John Wiley and Sons, 1983.
3. HUDCO “All you want to know about soil stabilized mud blocks", HUD Pub., New Delhi, 1989.
4. D Narayanamurty, United Nations Department of Economic and Social Affairs,” Use of bamboo and reeds in construction”, UNO Publications,1972.

WEBSITES:

1. <http://www.baboo-Flooring.com>
2. <http://ag.avizona.edu/SWES>
3. <http://www.angelfite.com/in>
4. <http://www.idrc.ca/library/documents/104800/chapz-e.html>
5. <http://www.angelfite.com/inz/granite>

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|--|---|---|----------------------------------|
| ARB104 | ARCHITECTURAL DRAWING - I | 4 Credits | L T P C 2 0 4 4 |
| Goal | To develop manual sketching and drafting skills through 2D shapes and 3D objects, which is a handy tool to practicing architects. | | |
| Objectives | | Outcomes | |
| The course should enable the student to <ul style="list-style-type: none"> • Train the students to sketch with pencil & pen drawing and painting both indoor and outdoor using appropriate media. • To comprehend and draw manually using T² Square, set square or parallel drawing in the form of plates. • To understand the relation between Elevation, plan, and section of an object, group of objects and 3D views of simple object, and demonstrate through drawings. | | The students should be able to: <ul style="list-style-type: none"> • Have a comprehensive knowledge about the sketching and the usage of color media. • Handle the instruments T square, set square et al manually to draw plan, elevation and section of an object. • Understand the relationship between elevation, plan and section of the objects. | |

UNIT I FREE HAND DRAWING

45

Free hand drawing of object human figures and natural elements – part of building environment, plants, trees, flowers, etc. Outdoor sketching: study of form, their combination balance, etc. Sketching of simple building forms and their relations, simple three-dimensional compositions.

Study of colour, composition, colour rendering of object, plants, interior and exterior spaces. Rendering of objects, built and natural environment with advance presentation skill, surface finishes (human figures, street furniture's, etc.) to communicate meaningfully and effectively.

UNIT II GEOMETRICAL DRAWING

30

Plane Geometry - scales and angle construction of planes, curves, circles tangent and regular polygon area construction. Solid geometry - simple projections, projection and development of the solid, section of solids, interpenetration of solids and true shape of sections.

UNIT III ORTHOGRAPHIC PROJECTION

15

Introduction to orthographic projections - isometric and axonometric projections. Drawing of lines, basic shapes in different positions. Orthographic projections of planar surface - geometrical shapes like square, circle, hexagon, etc. and combination of shapes. Orthographic projection of 3D object - construction of plan, elevation and section of 3D objects and projections in various positions.

TOTAL : 90

TEXT BOOKS

1. I.H.Morris , “Geometrical drawing for Art Students”, Orient Longman, Madras 1982
2. Albert. O. Halse , “Architectural Rendering Techniques”, McGraw-Hill Book Co. New York, 1972

REFERENCES

1. Jeremy Gatton “Choosing & Mixing Colours”, Quantum Books Ltd., 1997
2. Francis Ching, “Architectural Graphics, Wiley Publications, 2002.
3. Alejandro Bahamon “Sketch Houses”, Loft Publications, 2008.
4. Jonathan Andrews, ‘Architectural Visions’, Brown Publishing AG, 2010
5. Engineering drawing, Bhatt N.D.[1990], Charotar publishing house, Anand, India.
Engineering drawing, K.V.Natarajan.

WEBSITES:

1. <http://www.cs.brown.edu>
2. <http://www.dtcc.edu/> - document, project info – Arch.dwg.

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|--|---|---|----------------------------------|
| ARB131 | COMPUTER STUDIO – I | 3 Credits | L T P C 1 0 4 3 |
| Goal | To introduce the technology of computer system, operation principles, use of other related hardware, with a thrust on 2D Drafting as a necessity for architects. Coverage will be on drawings objects, fitting, setting, size and dimensioning, with a thrust on advanced 2d drafting techniques. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Inform the student, basic understanding of components, operation system, (windows) application software and other accessories. • Make a student understand basic tools of ACAD i.e., formatting (limits, units, etc) drawing tools or drafting, modification of the same. • Make a student to obtain knowledge of advanced tools such as layers, line type, etc., 2d drafting of building drawings. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Work on systems with ease of the software understanding the performance of the hardware relatively. • Create architectural drawings required for their presentations with precision and accuracy. Revising them without spending much time. • Work at large scale of drawings in terms of Size or complexity in details or levels of a built form. | |

UNIT I INTRODUCTION TO COMPUTER

5

Technology of small computer system, computer terminology operation principles of P.C., basic shortcuts in windows, introduction to application software, graphic system, and use of printers, scanner, plotter, File management, etc.

UNIT II INTRODUCTION TO COMPUTER AIDED 2D DRAFTING

25

Understanding the use of drawing tools, object editing, drawing objects, filing and setting Drawing units, scales, limits that size and dimensioning, texting. Setting up of drawings of various simple architectural objects with complete text and Dimensioning.

UNIT III ADVANCE COMPUTER AIDED 2D DRAFTING

30

Advance command programming - transparent overlays hatching utilities, assigned colour and line type, use of multilane, style, block and block editing, symbol Library manipulation for Accurate drawing. Advance exercise in 2D drafting of various complex building drawings, incorporating the above said utilities.

TOTAL : 60

TEXT BOOK

1. Sham Tickoo, “**Autocad** 2009; A Problem Solving Approach” Autodesk Press; 1 edition (July 18, 2008)

REFERENCE

1. AutoCAD reference manual - Autodesk UNC, 1998.
2. AutoCAD architectural users guide - Autodesk Inc., 1998.
3. Elements of Architecture, Rob Krier , Van Nostrand Rein Hold
4. Architectural colour, Pokter
5. Form and Function and Design, Paul Jacquess Grills
6. Principles of three dimensional design , Wang Wucius , Van Nostrand Rein Hold
7. Principles of Two dimensional design, Wang Wucius, Van nostrand Rein hold.
8. Access by design, George A. Covington & Bruce Hannan , Van Nostrand Rein hold 1996.
9. Design through Discovery, Majore Elliot Bevin, Half Rinehart and Wintan, Newyork 1977.
10. Visual thinking for Architects & Engineers , Ron Kasprisin & James Pettinari - Van Nostrand Rein Hold 1995.

WEBSITES:

1. [http://www.sln.fi.edu/-Computer drafting](http://www.sln.fi.edu/-Computer%20drafting)
2. <http://www.ccollege.hccs.cc.tx.us/-Comp.graphic>

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|---|--|--|-----------------------------------|
| ARB132 | ARCHITECTURAL DESIGN – I | 5 Credits | L T P C 0 0 10 5 |
| Goal | To introduce the meaning of “design” and relate it to “architecture” through an understanding of basic elements of design, the principles of design relationships and analysis of design elements. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Theoretically understand first the various elements of basic design relationship, principles and demonstrate the same through drawing exercises. • Understand the workshop tools and equipments useful for model making and practically experiment with creative design ideas both in exterior and interior applications. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Develop abstract and real compositions in drawings. • Familiarize with doing exercise involving real and abstract models made of match sticks, card boards, wires, wood pieces | |

UNIT I BASIC DESIGN I

100

Introduction to Architectural Design through Basic Design. Introduction to elements of design., Properties, qualities, and characteristics of (i) line, (ii) direction, (iii) shape,(iv) size,(v)texture, (vi) value and (vii) colour exercises involving the same including use of the computer. The principles of design relationships -Repetition, Harmony, Contrast. Transformations - Rotation, Reflection, Translation (mirror), Resizing. Symmetry - Reflection symmetry, Rotational symmetry, Point symmetry, Lines of symmetry of plane shapes. Exercises involving the same. The analysis of design elements - Exercises involving the same.

UNIT II WORKSHOP

50

Use of hand tools and materials in carpentry, masonry and model making. Making mount board models employing cubes, cuboids, square pyramid, cylinder and cones. Space frame models using match sticks, straw, steel wires, bamboo splits. Texture applicability to murals and interior decoration.

TOTAL : 150

TEXT BOOK

1. Maitland Graves – The Art of Colour and Design McGraw-Hill Book company Inc. 1951

REFERENCES

1. Francis D.K.Ching, “A Visual Dictionary of Architecture”, John Wiley & Sons, Inc. 1997
2. Professor Miles Lewis, “Architecture – Elements of Architectural Style”, Global Book Publishing Pvt. Ltd. 2008.
3. Archiworld Co., Ltd., “Object-Creative Idea & Unique Design” Choseok Publishing 2010
4. Edward D.Mills “ Planning -The Architects Hand Book” - Butterworth-Heinemann Ltd, London, 1985.
5. V.S.Pramar, “Design fundamentals in Architecture”, Somaiya Publications Pvt. Ltd., New Nelhi, 1990.
6. Francis D.K.Ching , “Architecture - Form Space and Order”, Van Nostrand Reinhold Co., (Canaa), 1980.

WEBSITES:

1. <http://infinet.net> – elements of design
2. <http://www.okino.com> - design, visualization, rendering system
3. <http://www.interface-signage.com>
4. <http://www.designcommunity.com> – arch rendering, 3D design

SYLLABUS II SEMESTER

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|--|--|---|----------------------------------|
| ARB105 | THEORY OF ARCHITECTURE - I | 2 Credits | L T P C 2 0 0 2 |
| Goal | To establish the understanding that architecture is a social/human need and to develop a vocabulary for future design processes in understanding the relation and impacts of Space & Mass, elaborating and discussing aesthetic components in design & finally introducing the use of color in architecture. | | |
| Objectives | | Outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Understand various definitions of architecture and justifications for architecture creations • Understand the relationship between function and aesthetics through analysis of selected buildings. • Understand the relationship between mass, geometrical form and space through analysis of selected buildings. • Understand the definition and use of components of design by studying representative examples. • Understand the definition, combination and relationship and symbolism of using color in architecture | | The students should be able to: <ul style="list-style-type: none"> • Define architecture and recognize its influence on society • Connect function and aesthetic in future design processes • Recognize the relation between of space and mass and translate it into design • Develop a design vocabulary for the various aspects of aesthetic components in design and actively apply them. • Apply color in architecture with the theoretical knowledge about the physical and psychological effects | |

UNIT I INTRODUCTION TO ARCHITECTURE

5

Definition of Architecture - Elements of Architecture backed by need and followed by fulfillment of need.

UNIT II SCOPE OF ARCHITECTURAL DESIGN

5

Architectural design - An analysis - Integration of aesthetic and function.

UNIT III ARCHITECTURAL SPACE AND MASS

5

Mass and space, visual and emotional effects of geometric forms and their derivatives -The sphere, the cube, the pyramid, the cylinder and cone.

UNIT IV AESTHETIC COMPONENTS OF DESIGN

10

Proportion, scale, balance, rhythm, symmetry, hierarchy, pattern and axis with building examples.

UNIT V APPLICATION OF COLOUR IN ARCHITECTURE

5

Effect of colour in Architecture - Colour symbolism – A case study on colour theory in any famous architectural buildings - A small scale project incorporating all the principles learnt in all the units.

TOTAL : 30

TEXT BOOKS:

1. Francis D.K.Ching, "Architecture-Form, Space and Order", 3rd ed. John Wiley, 2007

REFERENCES:

1. V.S.Pramar, "Design Fundamentals in Architecture", Samaiya Publications Private Ltd., New Delhi.
2. Paul Alan Johnson – "The Theory of Architecture - Concepts and themes, Van
3. Nostrand Reinhold Co., New York, 1994
4. Forms and functions of 20th century Architecture - Talbot. Hamlin.
5. The four elements of Architecture - Senner Goltfried - Cambridge University press London. U.K.

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| ARB106 | HISTORY OF ARCHITECTURE -II | 2 Credits | L T P C 2 0 0 2 |
| Goal | To inform about development of architecture in India from River-valley civilization to Indo Aryan Period. Exposure will be on selected examples from various historic periods resulting in an understanding of materials, their uses and development of construction technology. | | |
| Objectives | | Outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Understand contributions to architecture by the river valley, Aryan and Mauryan civilization and the kinds and building materials and techniques adopted by them. • Understand the influence of Buddhism in northern India and architecture of buildings and caves. • Study the mythological evolution of Hindu temple during the Gupta and Chalukyan period. • Understand the rock cut and stone architecture of Dravidian period and later developments in south India. • Understand the plan forms of Indo Aryan temple. | | The students should be able to: <ul style="list-style-type: none"> • Have a comprehensive knowledge about the development of Aryan and Mauryan civilization and identify different building materials & techniques used by them. • Have a comprehensive knowledge about the development of Buddhist architecture. • Articulate knowledge on the evolution of Hindu temple during the Gupta and Chalukyan period • Have a comprehensive knowledge about the rock cut and stone architecture of Dravidian period and trace later developments in South India. • Express different plan forms of the Indo Aryan temple with the aid of sketches. | |

UNIT I ANCIENT INDIA

4

Indus Valley Civilization - Culture and pattern of settlement. Impact of Aryan culture - Vedic village and the rudimentary forms of bamboo and wood, wooden construction under the Mauryan rule.

UNIT II BUDDHIST ARCHITECTURE

8

Hinayana and Mahayana Buddhism - Interaction of Hellenic & Indian Ideas in Northern India - Architectural Production during Ashoka's rule - Ashokan Pillar, Sarnath, Rock cut caves at Barabar, Sanchi Stupa. Salient features of a Chaitya hall and Vihara, Rock cut architecture in the Western and Eastern ghats - Karli, Viharas at Nasik, Rani gumphs, Udaigiri. Takti Bahai, Gandhara.

UNIT III HINDU ARCHITECTURE

6

Evolution of Hindu temple - Early shrines of the gupta and chalukyan periods – Tigawa temple, Ladh Khan and Durga temple, Aihole, Papanatha and Virupaksha temples, Pattadakal.

UNIT IV DRAVIDIAN ARCHITECTURE

6

Dravidian culture - Rock cut productions under Pallavas –Shore temple, Mahaballipuram - Dravidian Order – Brihadeeswara Temple, Tanjore - Evolution and form of gopuram - Complexity in temple plan due to complexity in Ritual - Minakshi temple, Madurai.

UNIT V INDO ARYAN STYLE

6

Salient features of an Indo Aryan temple - Lingaraja Temple, Bhuvaneshwar - Sun temple, Konarak. Kunds and Vavs – Sabali kund vav - Adalaj - Surya kund, Modhera.

TOTAL : 30

TEXT BOOK

1. Sir Banister Fletcher, "A History of Architecture", University of London, The Athlone Press 1996, 20th edition.
2. Percy Brown, "Indian Architecture (Buddhist and Hindu Pd.)"- Tarapore Vala and Sons Bombay 1996.
3. Satish Grover, "The Architecture of India (Buddhist and Hindu Period)", CBS Pub., 2003

REFERENCES

1. Yatin Bandya, "Concepts of Space in Traditional Indian Arch", Mapin, 2005.
2. Mitchell, George (1996) "The Hindu Temple, University of Chicago Press.
3. Spiro Kostof, "A History of Architecture : Setting and Rituals", Oxford University Press, London, 2005 (digitized – 2007).
4. Pier Luigi Nervi, "History of World Architecture Series". Harry N. Abrams Inc. Publication, New York, 1972.
5. Meaning in Western Architecture - Christian Norberg-Schulz-Rizzoli, New York, 1974.

WEBSITES

1. <http://www.greatbuildings.com/gbc-types/styles/hindu.html>
2. <http://indianculture.tqn.com/msub19.htm>
3. http://web1.arch.hawaii.edu/courses/courses/300/arch371/09_04/9-4htm
4. http://www.hindunet.org/alt_hindu/1995_Apt_1/msg00069.htm
5. <http://bishop.calpoly.edu/libarts/jwetzels/study/HinduArtOflaterDynasties.htm>

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| CEB121 | MECHANICS OF STRUCTURES - I | 3 Credits | L T P C 3 0 0 3 |
| Goal | To sensitize students on how structural resolutions become important in realization of architectural design concept. At this stage, students shall be exposed to forces, moments, and resolution that are to be resolved. Concepts of determinate and indeterminate structures. Thrust shall be on steel and concrete structures, and enable students to solve basic, simple problems. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Understand the effect of action of forces on a body and the concept of equilibrium of the body through exercises. • Determine the internal forces induced in truss members due to external loads by working out problems. • Calculate the sectional properties (centroid, moment of inertia, section modulus and radius of gyration) for various sections by working out problems. • Study the stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action through selected problems. • Derive the relationship between elastic constants and solving problems. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand action of forces on a body • Analyze different types of trusses • calculate centroid, moment of inertia, section modulus and radius of gyration for a given section • Solve problems on stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action • Understand the relationship between elastic constants | |

UNIT I FORCES AND STRUCTURAL SYSTEMS 5

Types of force systems - Resultant of parallel forces - principle of moments - principle of equilibrium - simple problems

UNIT II ANALYSIS OF PLANE TRUSSES 10

Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilever trusses by Method of joints and Method of sections.

UNIT III PROPERTIES OF SECTION 10

Centroid- Moment of Inertia - Section modulus – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis

UNIT IV ELASTIC PROPERTIES OF SOLIDS 10

Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and volumetric stresses and strains.

UNIT V ELASTIC CONSTANTS 10

Elastic constants - Relation between elastic constants - Application to problems.

TOTAL : 45

TEXT BOOKS:

1. R.K.Bansal, "A textbook on Engineering Mechanics". Lakshmi Publications Delhi 2008
2. R.K.Bansal, "A textbook on Strength of Materials" Lakshmi Publications. Delhi 2005.

REFERENCES:

1. P.C.Punmia, "Strength of Materials" and "Theory of Structures" Vol. I, Laxmi publications, Delhi ,2005.
2. S.Ramamrutham, "Strength of materials", Dhanpatrai & Sons, Delhi, 1990.
3. W.A.Nash, "Strength of Materials" Schaums Series – McGraw-Hill Book Company, 1999.
4. R.K. Rajput "Strength of Materials", S. Chand & Company Ltd., New Delhi 1996

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|---|---|------------------|----------------------------------|
| ARB107 | MATERIALS AND CONSTRUCTION - II | 3 Credits | L T P C 2 0 2 3 |
| Goal | To enable the students understand how bricks, clay products and timber are used as building material in foundation walls and roofing systems. Also to learn cost effective technology developed in India for components of buildings. | | |
| Objectives | Outcomes | | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Understand both in general and in detail innovative method of construction using materials such as Brick and clay products. • Understand both in general and detail about Timber its properties uses and application [Frame/ roof]and about commercial forms of Timber like plywood/particle board/M.D.F • Familiarize the students with appropriate materials and method of construction of Foundation/walls /Roof /Fenestrations etc to achieve cost effectiveness. • Familiarize students with details in building construction suitable for physically challenged. | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a thorough know-how about innovative [appropriate] material and method to achieve cost effectiveness in Design.[Represent graphically/manual/electronic media] • Have comprehensive knowledge about timber and allied products and application in the Interior /furniture. • Incorporate details, conducive to physically challenged. | | |

UNIT I BRICKS AND CLAY PRODUCTS

15

Drawings of brick foundations - buildings in brick bonds, walls, columns, corners –structural members in brickwork. Reinforced brick masonry - Arches - Lintels –Corbels - copings. Hollow clay blocks - for walls - partitions - roofs. Roofings -Flat Roofs - Terrace roofs - Sloping roofs.

UNIT II TIMBER AND ALLIED PRODUCTS

10

Softwood and hardwood - Secondary timber - Physical properties and uses - Defects, Conversion, Seasoning, decay and preservation of timber - Fire retardant treatment, anti-termite treatment. Industrial timbers - plywood, block board, particle board, fiber boards. Manufacture and uses - current developments.

UNIT III TIMBER

40

Drawings of timber joinery for Windows, doors, ventilators. Timber partitions, fixed partitions, sliding, folding, top hung bottom rested false ceiling, – wall panelling. Timber staircases - timber trusses - Lean to – close couple – Kingpost – Queen post. Timber floors-timber built-in-furniture.

UNIT IV LOW COST BUILDING TECHNOLOGY

10

Drawings of foundations – walling – Roofs – partitions – ceiling panel – doors and windows.
Miscellaneous – Drawing of Brick jalis, Screen walls – pavement blocks –Ferro cement water tanks.

TOTAL : 75

TEXT BOOKS:

1. S.C.Rangwala , “Engineering Materials”, Charotar Publishing House – Anand, 2007

REFERENCES:

2. W.B.Mckay , “Building Construction”, Vol. 1,2,3- Longmans U.K 1992.
3. Don A.Watson, “Construction Materials and Processes”, McGraw Hill Co., 1972.
4. Alanwerth, “Materials”, The Mitchell Pub. Co. Ltd., London, 1986.
5. R.Chudleu, “Building Construction Handbook”, Butterworth-Heinemann Ltd; 4th Revised edition, 2001.

WEBSITES

1. 1. <http://www.ibex-ibex-intl.com>
2. 2. <http://www.inika.com/chitra>
3. 3. <http://www.routbdge.com>
4. 4. <http://www.venturaindia.com>

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|--|--|--|---------------------------|
| ARB108 | ARCHITECTURAL DRAWING - II | 3 Credits | L T P C 1 0 4 3 |
| Goal | To perceive built environment in terms of their detail, form, colour, texture, so as to present architectural design solutions in a realistic way. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> • Make the student conversant with architectural drafting using instruments, train him to draw and write with knowledge on composition, of selected components and details of a building. • Enable a student understand the theory of perspective to draw an object and later on simple buildings in perspective by doing series of exercises. • Make a student understand the theory and purpose of casting shade and shadows in buildings in simple objects and later in simple building through selected exercises | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Articulate knowledge on composition and detailing in measured drawing. • Identify and understand the perspective. • Understand the casting of shade and shadow on any object. | |

UNIT I MEASURED DRAWING

45

Principle of basic architectural drafting - line value lettering basic, multiview projections and sections - presentation formats. Measured drawing of simple objects (like furniture, entrance gates, etc.) and building components (like columns, cornice, door, window, etc.) Detailed measured drawing/documentation of historic and architectural monument or building.

UNIT II PERSPECTIVE

30

Characteristics of Perspective Drawings, Perspective systems and methods, Two point perspective of simple objects, outdoor and indoor view of a building, etc. One point and three point perspective of interiors Perspective theory and practice

UNIT III SCIOGRAPHY

15

Principles of shades and shadows - Shadows of lines and circles, Shadows of architectural elements, circular solids, buildings, etc.

TOTAL : 90

TEXT BOOKS:

1. T.Jeyapoovan “Engineering Graphics 2000” Vikas Publishing House, Pvt. Ltd., 2002.
2. K.V.Natarajan “Engineering Drawing” Vikas Publishers, 1999.

REFERENCES:

1. Francis D K Ching “Design Drawing”, John Wiley & Sons, Inc. 1998
2. Jonathan Andrews “Architectural Visions”, Brown Publishing Ag. 2010
3. William Kirby Lockard, “Drawing as a Means to Architecture”, Van Nostrand, Reinhold Company, New York.
4. George A.Dinsmore, “Analytical Graphics” - D.Van Nostrand, Company Inc., Canada.
5. Francis Ching, “Architectural Graphics”, 4th ed. John Wiley, New York 2003
6. Engineering drawing, Bhatt N.D.[1990], Charotar publishing house, Anand, India.
7. Architectural graphics, C.Leslie Martin, The Macmillan Company, New York.

WEBSITES

1. <http://www.cs.brown.edu>
2. [http://www.dtcc.edu/-document,project info](http://www.dtcc.edu/-document,project%20info) – Arch.dwg.

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|--|--|--|---------------------------|
| ARB133 | COMPUTER STUDIO - II | 3 Credits | L T P C 1 0 4 3 |
| Goal | To introduce tools of productivity, concept of object linking and editing session, with a thrust on 3d modeling and 3d rendering as a necessity for architects. Coverage shall be on construction planes, 3d surfaces, use of dynamic projections, techniques of setting to create photo realistic renderings. It also proposed to cover environment setting and image filing as an additional presentation technique. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Enable the student understand basic interface and editing necessary for creating 3d objects. • Enable the student an understanding of tools for creating 3d modeling and understanding of modification tools for the same. • Enable student understanding of finishing and output of the 3d model. • Familiarize the student with latest software like AUTOCAD, Sketch up etc.,. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Create independent 3d from or convert 2d diagram in to 3d form. • Edit the 3d forms in the perspective platform for better understanding of the form and its design. • Visualize the form, color, texture, material application and structural feasibility of the same. • Compatible with other software to have flexibility in working. | |

UNIT I COMPUTER APPLICATIONS IN ARCHITECTURE (NON GRAPHIC) 8

Developing skills in non-graphic applications of computer as required for architectural presentation & documentation, such as word processing, spreadsheets, power point presentations, etc.

UNIT II PRODUCTIVITY TOOLS

12

Introduction to tools of productivity -blocks, slide facilities, script files, attributes. Understanding concepts of V.Port, concept of object linking, and editing session.

UNIT III INTRODUCTION TO 3D DRAFTING

20

Introduction to 3D modeling technique and construction planes, drawing object, 3D surfaces setting up elevation and thickness, and use of dynamic projections. Solid modeling, with driving primitive command and boolean operation. Use of region modeling, solid modification.

UNIT IV 3D RENDERING AND SETTING

20

Rendering and scene setting to create a photo realistic image, understanding material mapping, environment setting and image filing. Modeling of any object or building using above said utilities.

TOTAL : 60

TEXT BOOKS:

1. Sham Tickoo, “3D Max Design, 2009: A tutorial Approach”, CADCIM Technologies (November 15, 2008)

REFERENCES

1. V.Rajaraman, “Principles of Computer Programming” - Prentice Hall of India.
2. Byron S.Gottfried, “Theory and problems of programming with C”,.Schaum's outline series, McGraw-Hill Publishing Co.
3. “AutoCAD reference manual” - Autodesk UNC, 1998.
4. “AutoCAD architectural users guide” - Autodesk Inc., 1998.

WEBSITES

1. <http://college.hccs.cc.tx.us/>
2. <http://www.ciips.ee.uwa.edu.au/>

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|--|---|--|----------------------------|
| ARB134 | ARCHITECTURAL DESIGN – II | 6 Credits | L T P C 0 0 12 6 |
| Goal | To bring in confidence as to how basic design principles and knowledge are used in solving simple space, small span buildings and create spaces and buildings responding to human anthropometrics and creating environments which are barrier free. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Enable a student understand the basics of anthropometrics, its application in articulating vertical, horizontal space and later on in simple buildings including considerations for physically challenged through a design process resulting in specific typologies, as specified. • Enable a student to work with hand, details, and simple models of selected elements of components of a building. Later on the students are to be trained to make models of simple buildings and structure, which they design in their exercises. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Trained to solve design solutions based on simple typologies • Present design solution in the form of drawings | |

UNIT 1 DESIGN STUDIO

100

The problems involve simple space organization starting with single space single use -small span Horizontal movement - single bay - passive energy type spaces. The study of space standards and anthropometrics related to each problem is stressed upon. Anthropometry as related to physically handicapped and elderly persons are required to be studied.

Examples of exercises include Toilet for a physically handicapped person, hostel room, bedroom, kitchen, Shop, pavilions, snack bar, Residence, petrol bunk, fire station, police station.

UNIT II WORKSHOP II

80

Elementary models indicating wall surfaces floral designs, ceilings, glass areas, lawn, water bodies, etc. Block models of small campuses using wood, thermacol mount board, soap, cork board, etc.

Detailed model of a small buildings like branch bank, small residences, bus shelter, snack bar, including landscape details.

TOTAL: 180

TEXT BOOKS:

1. De. Chiara and Callender, "Time-saver Standards for Building Types", McGraw-Hill Co., New York, 1973.
2. The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3. Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).
4. Ed.By.Quentin Pickard RIBA "The Architects' Hand Book", Bladewell Science Ltd., 2002

REFERENCES:

1. Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2. National Building book of India 2005, Bureau of Indian Standards, New Delhi
3. Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4. A visual dictionary of Architecture, Francis D.K.Ching, John wiley & Sons, Inc. 1997

WEBSITES

1. www.designbasics.com/-(on house type – Americans)
2. <http://www.geosystems.gatech.edu/> - (on detail design method)
3. <http://www.c.s.berkeley.edu/> - (on bubble diagram builder with interaction)
4. <http://www.plannet.com/resources.htm> - (on resource info)

SYLLABUS III SEMESTER

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| ARB201 | THEORY OF ARCHITECTURE - II | 2 Credits | L T P C 2 0 0 2 |
| Goal | Understand the principals of organization of forms and spaces, their variations and application in architectural design by highlighting the connection between architecture and society by exposure to character and style of various forms of architectures and the driving forces behind it. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the students to:</p> <ul style="list-style-type: none"> • Expose student to the relation between form and spaces, resulting in defined relationships and various forms of organization influencing the concept of design. • Explain selected architectural styles and their characteristic features. Lead the students to understand the reasons and driving forces behind developments and changes in Architectural forms and styles in various cultures over the centuries. • Expose the students to various principals of composition • Highlight the importance of the aspect of movement and circulation and their implications in design with selected samples • Expose the students the ideas and concepts and philosophy of contemporary architects through analysis of selected samples. | | <p>The course should enable the students to:</p> <ul style="list-style-type: none"> • Identify and apply the vocabulary of organizing form and spaces • Identify the various styles in architecture and understands the driving forces involved in architectural changes. • Aware of various principles of composition and can apply them in design • Understands the aspects of circulation and the need for circulation diagrams and their influence/importance in the design for specialized buildings. • Understands concepts and theories behind contemporary architecture. • Aware that architecture with lasting impact has a theoretical background. | |

UNIT I- ORGANISATION OF FORMS AND SPACES 5

a) Spatial Relationships: i) Space within space, ii) Interlocking spaces, iii) Adjacent spaces, iv) Space linked by a common space b) Spatial Organization: influencing factors and their types
 i) Centralized, ii) Linear, iii) Radial, iv) Clustered, v) Grid c) Articulation of forms and spaces types: i) Edges and corners, ii) Surface. A Project on Creation of forms & spaces using the principles learnt.

UNIT II- CHARACTER AND STYLE IN BUILDINGS 9

Factors influencing the character and style of buildings. Study of examples from Buddhist, Hindu and Islamic Architecture in India - Greek, Roman, Gothic Renaissance, Modern and Post Modern Movement.

UNIT III- PRINCIPLES OF COMPOSITION 3

Unity, harmony and specific qualities of design to include dominance, punctuating effect, dramatic effect, fluidity, climax, accentuation and contrast with building examples.

UNIT IV- CIRCULATION**4**

Function of building circulation components of building circulation - The building approach, The building entrance, configuration of the path, path space relationship, form of circulation space with examples. Simple circulation diagram for buildings.

UNIT V -WORKS OF CONTEMPORARY ARCHITECTS**9**

Works of following modern and post modern architects and their ideologies and philosophies in brief - Louis Sullivan, F.L.Wright, Louis Khan, Le Corbusier, Philip Johnson, Charles Correa, and Michael Graves.

TOTAL: 30**TEXT BOOKS**

1. Paul Alan Johnson , “The Theory of Architecture - Concepts and Themes” - Van Nostrand Reinhold Co - 1994.
2. Francis D.K.Ching, “Architecture - Form, Space and Order”, Van Nostrand Publications, New York, 2007.
3. V.S. Pramar, “Design Fundamental in Architecture” - Somaiya Publications Pvt. Ltd. New Delhi, 1973.

REFERENCES

1. Ernest Burden , “Elements of Architectural Design - A visual resource”, Van Nostrand Reinhold, 1995.
2. Sir Bannister Fletcher , “A History of Architecture”, Architectural Press, 1996.
3. Forms and functions of 20th century Architecture - Talbot. Hamlin.
4. Approach to Architectural design ARG Isaac Butterworth & co. London 1977.
5. The four elements of Architecture - Senner Goltfried - Cambridge University press London. U.K.

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|--|--|---|----------------------------------|
| ARB202 | HISTORY OF ARCHITECTURE -III | 2 Credits | L T P C 2 0 0 2 |
| Goal | To inform the development of architecture of Europe from the Romanesque period to the Renaissance period, (6th - 16th Century AD). To understand the impact of various geographical, cultural, social, religious and political forces on architecture. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Understand how religious and civic buildings were constructed with grammar. • Understand the synthesis of structure and aesthetics during the Gothic period in France. • Understand the architectural character of Gothic style of buildings with plans, elevations and sections of selected buildings. • Understand social and cultural influences contributed to Renaissance architecture in Italy. • Understand the philosophy of renaissance architects of France and England, as to how they designed world renowned buildings. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Articulate knowledge on the construction of religious and civic buildings with grammar. • Have a comprehensive knowledge about the development of Gothic Period in France and express the synthesis of aesthetics and structure with the aid of sketches. • Articulate knowledge on the architectural character of Gothic style of buildings in Europe and express them with sketches of plans, elevations and sections. • Have a comprehensive knowledge about the philosophy of Renaissance and how they influenced architecture in England and France. | |

UNIT I ROMANESQUE

6

The medieval ages - learning in the monasteries, evolution of the guilds - Factors influencing architecture - outline of architectural character in Italy, France and England- Examples: Pisa group, Italy Abbay aux Hommes, Caen, Tower of London.

UNIT II FRENCH GOTHIC

4

Religious and social influences - evolution of vaulting and development of structural systems - outline of Architectural character - Examples: Notre Dame, Paris.

UNIT III ENGLISH AND ITALIAN GOTHIC

4

Development of English gothic vaulting - outline of Architectural character in England and Italy - Examples: Westminster Abbey, Hampton Court Palace, London, Doges Palace, Venice, Milan Cathedral.

UNIT IV ITALIAN RENAISSANCE

8

The idea of rebirth and revival of art - sociological influences in art and architecture - Development of thought, emergence of merchant communities and their patronage. Outline of the Architecture during the early Renaissance, High Renaissance and Baroque Periods - Features of a typical Renaissance palace, eg. Palazzo Ricardi, Study of life history philosophy, contribution of the following architects; Brunelleschi, Michelangelo, Andrea Palladio.

UNIT V FRENCH & ENGLISH RENAISSANCE

8

Outline of the architectural character of French and English Renaissance - Domestic Architecture in England - Study of the life, philosophy and works of the following architects: Sir Christopher Wren, Inigo Jones.

TOTAL : 30

TEXT BOOK

1. Sir Banister Fletcher, "A History of Architecture", University of London, The Athlone Press 1996, 20th edition.
2. Percy Brown, "Indian Architecture (Buddhist and Hindu Pd.)"- Tarapore Vala and Sons Bombay 1996.
3. Satish Grover, "The Architecture of India (Buddhist and Hindu Period)", CBS Pub., 2003

REFERENCES

1. Yatin Bandy, "Concepts of Space in Traditional Indian Arch", Mapin, 2005.
2. Mitchell, George (1996) "The Hindu Temple, University of Chicago Press.
3. Spiro Kostof, "A History of Architecture : Setting and Rituals", Oxford University Press, London, 2005 (digitized – 2007).
4. Pier Luigi Nervi, "History of World Architecture Series". Harry N. Abrams Inc. Publication, New York, 1972.
5. Meaning in Western Architecture - Christian Norberg-Schulz-Rizzoli, New York, 1974.

WEBSITES

1. <http://www.clr.toronto.edu> - virtual lib.
2. <http://www.lib.virginia.edu/> - Renaissance and baroque
3. <http://2.sis.umich.edu/> - Image browser

| | | | |
|---|---|---|---------------------------|
| CEB221 | MECHANICS OF STRUCTURES - II | 3 Credits | L T P C 3 0 0 3 |
| Goal | To impart the students with knowledge about different types of parameters for the design of beam and column | | |
| Objectives | | Outcome | |
| The course should enable the students to <ul style="list-style-type: none"> • Understand shear force and bending moment. • Understand shear stress distribution and bending moment distribution • Learn to find slope and deflection of beams • Understand the behaviour of long and short columns • Learn the behaviour of continuous beams | | The course should enable the students to <ul style="list-style-type: none"> • Impart knowledge on shear force and bending moment. • Learn shear stress distribution and bending moment distribution • Learn to find slope and deflection of beams • Understand the behaviour of long and short columns • Learn the behaviour of continuous beams | |

UNIT I- SHEAR FORCE AND BENDING MOMENT

10

Concept of shearing forces and bending moments - shear force and bending moment diagrams for cantilever and simply supported beams subjected to point load, uniformly distributed loads and their combinations

UNIT II -STRESSES IN BEAMS

10

Theory of simple bending -bending stresses in beams, shear stresses in beams - examples on simple sections. Stress distribution diagrams.

UNIT III- DEFLECTION OF BEAMS

10

Slope and deflection at a section - Double Integration method for calculation of deflection for simply supported and cantilever beams for concentrated loads and uniformly distributed loads.

UNIT IV- THEORY OF COLUMNS

10

Short and long columns - Euler's theory and its limitations - Derivations of Euler's formula (for different end conditions) – Rankine's formula for columns (No derivations) – Application to simple problems.

UNIT V- INTRODUCTION TO INDETERMINATE STRUCTURES

5

Concept in Analysis of continuous beams, fixed beams, and partial frames (No analysis problems).

TOTAL: 45

TEXT BOOKS

1. M.M.Ratwani & V.N.Vazirani, “Analysis of Structure”, Vol.1, Khanna Publishers – Delhi, 2008
2. A.R.Jain and B.K.Jain, “Theory and analysis of Structures”, Vol. 1, Nemchand and Bros, Roorkee, 1987.
3. R.S.Khurmi “Strength of Materials”, S.Chand & Company Ltd., New Delhi

REFERENCES

1. Dr.V.S.Prasad, “Basic Structural Mechanics”, Galgotia Publications.
2. Timoshenko, S.P., and D.H. Young, “Elements of Strength of Materials”, Fifth edition, East West Press, 1993.
3. B.C.Punmia, “Strength of Materials and Theory of Structures”, Vol. 1, Laxmi publications, New Delhi 1994.
4. R.K. Rajput “Strength of Materials”, S.Chand & Company Ltd., New Delhi, 2007

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|---|---|--|---------------------------|
| CEB222 | BUILDING SERVICES – I | 3 Credits | L T P C 3 0 0 3 |
| Goal | To sensitize students that efficiency of building function also depends on integration of services like sewage disposal system, water supply systems, identification of sources, segregation, treatment, augmentation, distribution, the important equipments and gadgets involved, their installation and maintenance. | | |
| Objectives | | Outcome | |
| <p>The course should enable the students to:</p> <ul style="list-style-type: none"> • Have knowledge on rainwater harvesting, management, and how to recycle wastewater from the buildings and at city levels. • Understand theoretical fundamentals of sewage treatment, their collection and disposal at campus level and construction system involved in services. • Understand other city level disposal collection, conveyance, recycling, and storm water drains and dispersals. • Understand the need of rain water management and conservation of raw and waste water. • Understand the selection and choice, installation and maintenance of various types of pumps | | <p>The students will be able to:</p> <ul style="list-style-type: none"> • Find the type of impurity present in water and the effect of the impurities in human body. • Know the Fundamentals of sanitation in buildings, various sewage treatment process, and construction details of sewer and connections. • Know about the collection, conveyance, recycling and disposal of town refuse systems. • Select, install and maintain the various pumps as available in the Indian market. • Collect rain water and conserve raw and waste water. Use them for appropriate purposes. | |

UNIT I WATER QUALITIES, PURIFICATION, TREATMENT AND DISTRIBUTION

12

Surface and ground water sources - quality/quantity - nature of impurities - treatments - water supply systems - treatment systems - centralized treatment - user and treatment - Desalination - ozonisation - reverse osmosis etc. - Distribution system in small towns - Types of pipes used - Laying, jointing, testing internal water supply in buildings - Municipal byelaws, regulations, standards.

UNIT II RAIN WATER MANAGEMENT AND CONSERVATION OF RAW AND WASTE WATER

6

Water conservation, rainwater collection - methods of harvesting - storm water drains in layouts, towns and cities - Waste water recycling.

UNIT III FUNDAMENTALS, SEWAGE TREATMENT AND SEWERAGE SYSTEMS

12

Environmental sanitation - Sanitation in buildings. Primary and secondary treatment - Activated sludge - Intermittent and trickling sand filters - Arrangement of sewerage systems in Housing, large factories, shopping centers - sewage pumping station, sewage disposal, construction details of sewers and connections.

UNIT IV- CITY LEVEL SERVICES AND DISPOSAL

6

Collection, conveyance, recycling and disposal of town refuse system - sanitation in unsewered areas of cities - alignment of storm water drains in residential areas and cities.

UNIT V- PUMPS AND MOTORS, SANITARY FIXTURES AND FITTING - PRODUCT RANGE

9

Pumps including reciprocating, centrifugal, deep well, submersible, sewage pumps - their selection and choice, installation and Maintenance.

TOTAL : 45

TEXT BOOKS

1. K.N.Duggal, "Elements of Environmental Engineering", Chand & Co., 2010
2. P.C.Punmia, "Environmental Engineering 1" Vol I – Water Supply, Vol II Waste water, Laxmi Publication, 2006.
3. S.K.Garg, "Environmental Engineering" Vol I, Khanna Publishers, 2001

REFERENCES

1. S.C.Rangwala, "Water Supply and Sanitary Engineering, Charotar Publishing House, Anand 388 601, 2009.
2. G.M.Fair, J.C.Geyer and D.Okun, "Water and Waste Water Engineering", Vol. II, John Wiley & Sons, Inc., New York, 1968.
3. "Manual of Water supply and Treatment", Second Edition, CPHEEO, Ministry of Works and Housing, New Delhi, 1977.
4. "Manual on Sewerage and Sewage Treatment", CPHEEO, Ministry of Works and Housing, New Delhi, 1980.

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|---|---|---|---------------------------|
| CEB223 | SURVEYING, LEVELLING & SITE PLANNING | 3 Credits | L T P C 2 0 2 3 |
| Goal | To understand the principles of surveying, classification, types of surveys and their applications. | | |
| Objectives | | Outcome | |
| The course should enable the students to: <ul style="list-style-type: none"> • Understand the principles of surveying. • Know about chain surveying and plane table surveying. • Understand the concepts of levelling and its applications. • Understand the concept of Theodolite surveying. • Get exposed to total station surveying, GIS and GPS. | | The students will be able to: <ul style="list-style-type: none"> • Gain the knowledge about the usage and principles of various surveying instruments with proper care and adjustments. • Describe the bearing systems and the instruments used in chain surveying and plane table surveying. • Use the instruments of levelling for levelling and contouring purposes. • Do the temporary and permanent adjustments of vernier transit, measurement of horizontal and vertical angles using theodolite. • Know the various uses of total station, GIS and GPS instrument. | |

UNIT I CHAIN SURVEY AND LEVELLING 15

Chain survey- principles- classification- instruments used, ranging, reciprocal ranging, Leveling , methods of leveling, booking and reduction of levels, longitudinal leveling, cross sectioning, errors in leveling, problems in leveling, contouring.

UNIT II THEODILITE SURVEY. 15

To understand Theodolite survey, measurement of horizontal and vertical angles, problems tackled like centre line of building, setting out angles, etc.

UNIT III TOTAL STATION 10

Total Station Survey – Different types - Introduction of GIS and GPS

UNIT IV SITE ANALYSIS AND TECHNIQUES 10

Importance of site analysis – factors involved in accessibility – site characteristics - land, contours, water shed, climate and topography, preparation of site analysis diagram

UNIT V ENVIRONMENTAL FACTORS 10

Man made structures, sensuous qualities, cultural data, images and data correlation vegetation plant associations, types and distribution preparation of ecological profile for an area

TOTAL: 60

TEXT BOOKS:

1. Punmia B.C., “Surveying”, Laxmi Publications Private Limited,2005.
2. Venakataramaiah, “Text Book of Surveying”, University Press,1996.
3. Kevin Lynch, Site Planning, MIT Press cambridge

REFERENCES:

1. Joseph De. Chiarra and Lee Copleman, Planning Design Criteria Van Nostrand Reinhold Co., New York
2. Beer R, Environmental Planning for Site Development, Turner, Landscape Planning and Environmental Impact Design.
3. T.P.Kanetkar, S.V.Kulkarni, “Surveying and Levelling”; Vol.I , Pune Vidhyarthi Griha Prakashan, Pune,1989.
4. Arora, K.R., “Surveying”, Vol.I, Standard Book, New Delhi,2009.
5. Kanetkar T.P., and Kulkarni .S.V., “Surveying and Levelling (Part– I)”, Pune, Vidhyarthi Griha Prakashan.
6. P.B. Sahani, “ Modem Surveying”, Nemichand & Bros.,Roorkee, UP.

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|---|--|--|---------------------------|
| ARB203 | MATERIALS AND CONSTRUCTION - III | 4 Credits | L T P C 2 0 4 4 |
| Goal | To introduce knowledge on how cement, concrete and reinforcements are used in various components of buildings like foundations, columns, beams, slabs and staircases. Thrust will also be on use of glass, treatment processes, properties and applications in building industry in buildings. The input is provided as theoretical knowledge base and practical applications in the form of construction drawings as included in objective below. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Provide theoretical knowledge about the material cement: Its varieties, properties uses and applications. • Make the students understand how cement, concrete, reinforcement are used in different components of building. • Construction of simple framed building using RCC, in footings, columns. beams and slab. • Details of concrete lintels/sunshade/arches/shading devices. • Concrete stairs according to profile namely straight flight, quarter turn, Dog legged open well bifurcated, grand helical and spiral. According to structural system /waist slab, stringer- trimmer, cantilever -beam, spine wall continuous slab and folded plate. [all through site visit, case study and exercises] • To provide theoretical knowledge about glass, composition, manufacture variety properties, uses and applications in modern buildings.[structural glazing / curtain walling] | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Design medium and large span low rise structure, of RCC • Design RCC stair case of appropriate form and structural system. • Incorporate structural glazing /curtain wall in the architectural design of buildings. | |

UNIT I- CEMENT

6

Varieties of cement, composition, properties and uses - tests for cement - mortar for various works.

UNIT II-CONCRETE, IT'S INGREDIENTS AND PROPERTIES

16

Ingredients - suitability requirements for aggregates, grading of aggregates – water mix in concrete - reinforcement - admixtures - properties of concrete. Concreting process its properties - mix proportioning - batching, mixing, transporting, placing, compaction, curing, formwork - quality control - tests for concrete - joints in concrete - concrete finishes.

UNIT III- CONCRETE CONSTRUCTION**27**

Introduction to framed structures. Concrete in foundations - types of footings - isolated, combined, continuous, strap. Concrete floors (PCC), walls and partitions. Concrete lintels, sunshades. Concrete beams and columns and slabs – one-way and two-way slabs.

UNIT IV-CONCRETESTAIRCASES**15**

Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral, helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever - foundations finishes for staircases - detailing out of handrails and balusters. Designing and detailing for physically handicapped.

UNIT V -GLASS**11**

Composition of glass - brief study on manufacture, treatment properties and uses of glass - special types of glass, sheet glass, plate glass, safety glass, tinted and coated glass - glass blocks - properties and applications in the building industry - current developments.

TOTAL : 75**TEXT BOOKS**

1. Dr.B.C.Punmia, “Building Construction”, Firewall Media , 2005.
2. Francis D.K.Ching, “Building Construction Illustrated” ,John Wiley & Sons Inc, 2002.

REFERENCES

1. W.B.Mckay , “Building Construction”, Vol. 1,2,3- Longmans U.K 1992.
2. S.C.Rangwala, “Engineering Materials”, Charotar Publishing House, India, 1997.
3. Alan Banc, “Stairs, Steps and Ramps”, Butter worth Heinemann Ltd., 1996
4. M.S.Shetty, “Concrete Technology-Theory and Practice”, S.Chand & Co. Ltd., New Delhi, 2005.
5. W.B.Mckay , “Building Construction” , Longmans, UK, 1981.

WEBSITES

1. Economy/companies/construction/concrete/materials
3. <http://www.easyads.co.2a/yellow/india/construct>
4. <http://www.concrete.t.v-tokyo.ac.ip>
5. www.larsentoubro.com
6. www.dalmiacement.com/index.html

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|--|--|--|----------------------------|
| ARB231 | ARCHITECTURAL DESIGN – III | 7 Credits | L T P C 0 0 14 7 |
| Goal | To enable the student into the process of design articulate, glorify spaces in respect of buildings of small scale, small span, horizontal and vertical movements (two or three levels), incorporating barrier free elements and detail. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Enable student to familiarize with the given design topic by choosing, relevant and appropriate case studies within the region, visiting the sites and analyzing the same. • Expose students to familiarize with the given topic of design by arranging special lectures from architects. • Expose him/her to knowledge available on the relevant design at international level, through books and websites. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Learn single level planning in small scale • Solve design solution and present in the form of drawing. | |

UNIT I DESIGN STUDIO

180

Single level planning in small scale, small span, horizontal movement and simple vertical movement, data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for physically handicapped persons - Concepts and presentation of design with scaled models

Examples: Residential buildings, Institutional buildings: banks, nursery or primary schools, primary health center, school for children with learning disabilities, neighborhood market, etc.

TOTAL: 180

TEXT BOOKS:

1. De. Chiara and Callender, “Time-saver Standards for Building Types”, McGraw-Hill Co., New York, 1973.
2. The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3. Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).
4. Ed.By.Quentin Pickard RIBA “The Architects’ Hand Book”, Bladewell Science Ltd., 2002

REFERENCES:

1. Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2. National Building book of India 2005, Bureau of Indian Standards, New Delhi
3. Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4. A visual dictionary of Architecture, Francis D.K.Ching, John wiley & Sons, Inc. 1997

WEBSITES

1. <http://www.hamptons.com/freshair>
2. <http://www.columbiamedical.com>
3. <http://www.mgarchitects.com>

SYLLABUS IV SEMESTER

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|--|---|---|---------------------------|
| ARB204 | HISTORY OF ARCHITECTURE - IV | 2 Credits | L T P C 2 0 0 2 |
| Goal | To inform the students on the influence of Islamic and British Neoclassical style in India. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ol style="list-style-type: none"> 1. Understand the emergence of Islamic Architecture with the need for newer typologies of buildings and to know how style is unique in terms of its elements, décor, materials and construction systems. 2. Identify and critically discuss the predominant Delhi or imperial style as well as the characteristic features of provincial style through study and drawings of selected buildings. 3. Be exposed to various Mughal rulers who contributed to Islamic architecture and the development of its famed landscape design. 4. Realize the impact of colonialism in India - the adoption of Neo-classical architecture and the development of the Indo Sarcenic style. | | <p>The students should be able to:</p> <ol style="list-style-type: none"> 5. Identify and discuss the finer points and nuances of Islamic architecture and its influence on the development of Architectural sciences and styles. 6. Provide an understanding on the various styles and the ruler patrons who influenced the development of this style of architecture. 7. Realize the techniques and wonders behind various Islamic architectural and landscaping elements and principles and re-interpret them in today's context. 8. Discuss the impact of colonialism and the wealth of architectural legacy the period introduced in India 9. Critically evaluate historical principles and methods and impart that learning to create informed and relevant current architectural solutions that are meaningful and rooted in our historic and traditional knowledge and wealth. | |

UNIT I INTRODUCTION TO ISLAMIC ARCHITECTURE

6

Influences on Islamic Architecture – a Brief study on the Islamic Architectural Character: the mosque, the tomb, and minaret, the madarasa, the palace, the caravanserai, vernacular architecture, the market - important principles, elements and character of Islamic architecture in terms of structure materials and methods of construction, elements of decoration, color, geometry, light.

UNIT II DELHI OR IMPERIAL STYLE

5

Development of architectural style during the rule of the slave, Khalji, Tuqlaq, Sayyid and Lodhi Dynasties - important examples for each period.

UNIT III PROVINCIAL STYLE

7

Development of the provincial styles in different regions - Punjab, Jaunpur, Bengal, Gujarat, Malwa, the Deccan (Bijapur, Golconda, Bidar and Gulbarga) - important examples for each style.

UNIT IV CONTRIBUTION OF RULERS OF ISLAMIC INDIA**6**

Development of the Mughal style under the different rulers - Babur, Shershah, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb - important examples - development of the Mughal garden - important examples.

UNIT V ARCHITECTURE IN COLONIAL INDIA**6**

Colonialism and its impact - Early British Neo-classical Architecture - Indo-Sarcenic Architecture and the works of Chisholm - P.W.D. and the Institutionalization of Architecture - Building New Delhi.

TOTAL : 30**TEXT BOOK**

1. Sir Banister Fletcher, "A History of Architecture", University of London, The Athlone Press 1996, 20th edition.
2. Percy Brown, "Indian Architecture (Buddhist and Hindu Pd.)"- Tarapore Vala and Sons Bombay 1996.
3. Satish Grover, "The Architecture of India (Buddhist and Hindu Period)", CBS Pub., 2003

REFERENCES

1. Yatin Bandy, "Concepts of Space in Traditional Indian Arch", Mapin, 2005.
2. Mitchell, George (1996) "The Hindu Temple, University of Chicago Press.
3. Spiro Kostof, "A History of Architecture : Setting and Rituals", Oxford University Press, London, 2005 (digitized – 2007).
4. Pier Luigi Nervi, "History of World Architecture Series". Harry N. Abrams Inc. Publication, New York, 1972.
5. Meaning in Western Architecture - Christian Norberg-Schulz-Rizzoli, New York, 1974.

WEBSITES

1. <http://www.islamicart.com/pages/archcrea/index.htm>
2. <http://libraries.mit.edu/rvc/aka/agakhan/index.html>
3. <http://www.greatbuildings.com/types/styles/islamic.html>
4. <http://www.ets.uidaho.edu/arch499/nonwest/Islam1.html>
5. <http://indiagateway.com/culture/architecture.html>

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|--|---|--|---------------------------|
| ARB205 | CLIMATE AND BUILT ENVIRONMENT | 3 Credits | L T P C 3 0 0 3 |
| Goal | To create an awareness that architecture to a large extent gets influenced by climate, by exposing the student to factors of climate, climatic zones, heat flow through materials and buildings, the resultant ambience and finally leading to design considerations. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Provide information on factors that contribute to climate and what is a comfort zone. • Enable students to understand the movement of the sun, its paths, angles, the radiation levels and how to overcome the harmful effects through shading devices. • Make student understand the transfer of heat into buildings through materials and building elements. • Expose the students to air movements in and around buildings and the resulting effects. • Provide information on various design considerations and parameters that are required for various climatic zones and as to how landscape could be integrated into building designs. | | <p>At the end of the course the students will:</p> <p><i>Knowledge:</i></p> <ul style="list-style-type: none"> • Have a broad knowledge of climate and human and building interactions with details regarding the movement of the sun and its effect. • Be aware of the physics of heat transfer through materials and building elements. • Be familiar with the dynamics of air-movements in and around buildings. <p><i>Thinking Skills:</i></p> <ul style="list-style-type: none"> • Be able to place this specialized knowledge in the context of the design of buildings and the wider subject • Be able to critically evaluate the wider implications of how human beings interact with their environment • To be able to think in an innovative and creative way <p><i>Subject-based practical skills:</i></p> <ul style="list-style-type: none"> • Be able to address particular practical issues such as designing of shading devices based on sun path diagram. | |

UNIT I CLIMATE AND THERMAL SENSATION

6

Factors that determine climate - Components of climate - Characteristics of climatic types - Body heat balance –Effective temperature – Comfort zone.

UNIT II SOLAR CONTROL

6

Solar geometry - solar chart - Sun angles and shadow angles - Design of solar shading devices.

UNIT III HEAT FLOW THROUGH MATERIALS

4

Basic principles of Heat Transfer - Performance of different materials 'U' value - Time lag and decrement of building elements.

UNIT IV AIR MOVEMENT**6**

Wind rose - Wind shadows - Air movement around and through buildings - Stack effect - Thermally induced Air currents.

UNIT V SHELTER DESIGN IN TROPICS**8**

Design considerations for warm humid, hot dry, composite and upland climates - Heavy rainfall regions - Landscape and climatic design. Case studies of climate responsive building design in India for the various climate types.

TOTAL: 30**TEXT BOOKS**

1. O.H.Koenigsberger and others, "Manual of Tropical Housing and Building - Climatic Design," University press, Chennai, 2010.
2. Donald Watson and Kenneth Labs., "Climatic Building Design : Energy Efficient Building Principles & Practices", McGraw-Hill Book Company - New York - 1983.

REFERENCES

1. Arvind Krishnan, "Climate Responsive Architecture – A Design handbook for Energy efficient buildings", Tata Mc.Graw Hill publications Co., Ltd., New Delhi, 2001, Reprinted 2004
2. Mili Majumdar, "Energy Efficient Buildings in India", Teri press, New Delhi, 2002.
3. M.Evans , "Housing, Climate and Comfort", Architectural Press, London, 1980.
4. Joseph de chiara and Le Copplemann, "Planning and Design Crieteria", McGraw-Hill, New York 1983.
5. B.Givoni, Man, "Climate and Architecture, Applied Science", Banking, Essex, 1982.

WEBSITES

1. www.teriin.org/
2. www.wiki.naturalfrequency.com/wiki/sun-path_diagram
3. <http://www.imdchennai.gov.in>

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|--|--|---|---------------------------|
| CEB224 | DESIGN OF STRUCTURES-I | 3 Credits | L T P C 3 0 0 3 |
| Goal | To enable students understand on steel structures. At this stage they would be exposed to the design of riveted and welded joints and steel beams and columns. | | |
| Objectives | | Outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Inform to students the need for Steel Structures, the concept of abstract and detailed Design of steel structure. • Inform the importance and contribution of Bolt Connections , Weld connections • Make students know about the Design of steel beams & columns. | | The students should be able to: <ul style="list-style-type: none"> • Understand the need for steel structure, and the concept of abstract and detailed Design of steel Structure. • Calculate the stability of Bolt & Weld Connections. • Design steel column and beams for the various Support Condition. | |

UNIT I PROPERTIES OF STEEL & INTRODUCTION TO LIMIT STATE DESIGN

5

Structural properties of steel – codal provisions and design requirements of steel - Limit state - characteristic load and characteristic strength of materials - partial safety factor - stress-strain relationship of steel - safety and serviceability requirements.

UNIT II BOLTED JOINTS

10

Bolted joints-lap joints-butt joints, Analysis and Design.

UNIT III WELDED JOINTS

10

Types of welding, permissible stresses, Design of fillet welds (excluding eccentric connections)

UNIT IV STEEL BEAMS

10

Allowable stresses, General specifications, Design of laterally supported beams.

UNIT V STEEL COLUMNS

10

Allowable stresses, various shapes, built - up sections, Design of columns –simple cross sections only.

TOTAL : 45

TEXT BOOKS

1. Ramachandra S., “Design of Steel Structures”, Standard Book House, Delhi, 2006.
2. IS 800:2007 General Condition in Steel – Code of practice
3. Comprehensive Design of Steel Structures, Purnia, A.K Jain, 1998
4. Composite Structures of Steel & Concrete: Beams, Slabs, Columns & Frames for buildings, Volume-1, R.P Johnson,2004

REFERENCES

1. “National Building Code of India – 2005”, Part VI, Structural Design.
2. Gurucharan Singh, “Design of Steel Structures”, Standard Publishers, New Delhi, 1982.
3. L.S Negi “Design of steel Structures”, Tata McGraw-Hill Book Company, New Delhi 1997.
4. S.K Duggal, Design of Steel Structures, 2000
5. “Teaching Resources for Structural Steel Design” – Vol I and II – INSDAG Kolkata

WEBSITE:

1. www.steel_insdag.org

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|--|---|--|---------------------------|
| CYA221 | ENVIRONMENTAL SCIENCE AND ENGINEERING | 2 Credits | L T P C 2 0 0 2 |
| Goal | To impart basic knowledge on the significance of environmental science for engineers. | | |
| Objectives | | Outcomes | |
| <p>The objective of the course is</p> <ul style="list-style-type: none"> • To make the students aware of the existing natural resources such as forest water resources etc. and to educate them to understand the need for preserving the resources. • To educate the students about the functions of various ecosystems and biodiversity. • To provide knowledge on the various aspects of different types of pollution such as air pollution, water pollution, soil pollution etc. • To give a basic knowledge on the social issues such as global warming, acid rain, ozone layer depletion, nuclear hazards etc. and to educate them about the various Environmental Protection Acts and ill effects of fireworks. • To create an awareness among the present generation about the various aspects of human population and their effect on environment. | | <p>Upon successful completion of the course, the outcomes are as follows:</p> <ul style="list-style-type: none"> • The students would have understood the effects of over exploitation of water resources, forest resources etc. and their impact on day to day life on earth. • Knowledge on the functions of several of ecosystems will help the students to design the processes that are eco-friendly. • Knowledge on the different types of pollution will help the young minds to device effective control measures to reduce rate of pollution. • Exposure on the issues such as global warming, acid rain, ozone layer depletion, nuclear hazards and ill effects of fire-works will make the students understand the significances of sustainable development and the need to enforce Environmental Acts. • Educating on the various aspects of population explosion will create an awareness on population control for effective utilization of the resources and the need to explore new alternate energy resources for a healthy environment. | |

UNIT 1 INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES

10

Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and

desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT II ECOSYSTEMS AND BIODIVERSITY 12

Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity – Biogeographical classification of India – Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Field study of common plants, insects, birds

Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT III ENVIRONMENTAL POLLUTION 10

Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Soil waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

Effects of fireworks and upkeep of clean environment: Chemical contents of fireworks- and health hazards-Soil pollution, water pollution, air pollution and noise pollution.

Field Study of local polluted site – Urban / Rural / Industrial / Agricultural

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – Wasteland reclamation – Consumerism and waste products – Environment Protection Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness

UNIT V HUMAN POPULATION AND THE ENVIRONMENT**6**

Population growth, variation among nations – Population explosion – Family Welfare Programme – Environment and human health – Human Rights – Value Education – HIV / AIDS – Women and Child Welfare – Role of Information Technology in Environment and human health – Case studies.

TOTAL: 45**TEXT BOOKS**

1. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, ISBN 81-297-0277-0, 2004.
2. Miller T.G. Jr., Environmental Science, International Students Edition, Thomson Learning Inc. 2004.
3. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, 1999.
4. Trivedi R.K. and P.K. Goel, Introduction to Air Pollution, Techno-Science Publications, 1998.

REFERENCES

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad India, 2004.
2. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media.
3. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopaedia, Jaico Publ., House, Mumbai, 2001.
4. Wager K.D., Environmental Management, W.B. Saunders Co., Philadelphia, USA, 1998.

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|--|---|---|---------------------------|
| ARB206 | MATERIALS AND CONSTRUCTION – IV | 4 Credits | L T P C 2 0 4 4 |
| Goal | To enable the students to understand that Ferrous metals and Non-Ferrous metals are equally important in construction industry by studying their manufacturing process, properties, applications and uses and current trends in terms of theory and through drawings as indicated in objective below. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Study ferrous metals in detail and their role in construction industry. • Study structural steel construction in detail • Study aluminum alloys, copper, brass, tin and lead. • Study aluminium doors, windows, partitions etc. Use of copper, bronze, brass in architectural construction. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand the progressive achievements of cast iron to steel, types of steel, its properties, application in construction industry and present developments. • Understand the steel in foundation, columns, beams and roofs. Details on steel stair cases, doors, windows and furniture. • Understand properties and use of non ferrous metals in building industry. • Understand in detail how aluminum, its alloys and its products are used in construction industry. | |

UNIT I- FERROUS METALS

10

Brief study on manufacture, properties and uses of cast iron, wrought iron, pig iron and steel - anticorrosive measures for steel - mechanical and heat treatment of steel - market forms of steel - structural steel, stainless steel, steel alloys - properties and uses - current developments.

UNIT II- STEEL CONSTRUCTION

32

Structural steel sections - types of connections in steel - Steel in foundations, columns and beams - different types of steel roof trusses including north light truss - space frames - materials for roof covering.

Steel staircases and handrails, balusters - Doors and windows - openable, sliding - collapsible gates - rolling shutters.

UNIT III- NON FERROUS METALS

8

Aluminium and Aluminium Alloys - brief study on *properties* and uses - Aluminum products - extrusions, foils, castings, sheets, etc. - brief study of other non-ferrous metals like copper, bronze brass, tin and lead, properties and uses - current developments.

UNIT IV- CONSTRUCTION USING NON-FERROUS METALS

25

Aluminum doors - openable, sliding.

Aluminum windows - openable, sliding, fixed.

Aluminum partitions, false ceiling, shop front handrails, curtain walling.

Use of other nonferrous metals like copper, bronze, brass, etc. in architectural construction.

Detailing and specification for physically handicapped.

TOTAL : 75

TEXT BOOKS

1. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.

REFERENCES

1. W.B.Mckay , “Building Construction”, Vol. 1,2,3- Longmans U.K 1992.
2. B.C.Punmia, “Building Construction”, Laxmi Publications Pvt. Ltd., New Delhi, 1993.
3. Arthur Lyons , “Materials for Architects and Builders - An Introduction” Arnold, London, 1997.
4. Harold B.Olin, Construction Principles Materials and Methods, The Institute of Financial Education, Chicago, 1980.
5. Time Saver Standards for Architectural Design Data, Calendar JH, McGraw-Hill, 1974.
6. Don A. Watson, Construction Materials and processes, McGraw Hill Co., 1972.

WEBSITES

1. <http://www.britmetfed.org.uk/frmedu.html>
2. <http://www.indiabusinessonline.com>
3. <http://www.nrwas.com>
4. <http://www.arcadiaproducts.com>
5. <http://www.sail.com.in>

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|--|---|---|---------------------------|
| ARB232 | ADVANCED COMPUTER GRAPHICS | 3 Credits | L T P C 2 0 2 3 |
| Goal | To inspire the students with theories of digital media, along with, using the high-end software for developing the conceptual designs. The students are also to be exposed to current trends in presentation using latest software. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Provide information on historic and contemporary theories and developments in the digital era. • Enable the students to use the Digital Media, not just as a drafting tool but also as a design process and presentation tool. • Make the students understand the need for the visualization and latest presentation techniques. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Know how isms evolved over a period of time affecting architecture. • Evolve design as a process thru digital media or computational methods. • Provide complete solution using the digital media to compete in the architectural field. | |

UNIT I INTRODUCTION

5

Past trends and theories of digital media – the influence of digital media on the perception of space and architecture, Virtual spaces.

UNIT II VISUALIZATION STUDIO

12

Role of visualization as a tool in the interpretation of design- development of conceptual models – design wall, windows, openings, roofs, staircase, design library, generate – elevations, sections, perspective views – schedule tables – layer management- exercises involving the same.

UNIT III ADANCED 3 D MODELLING

8

Enhancing the virtual model with the application of light, color, materials, texture, environments - introducing cameras.

UNITIV ANIMATION AND PRESENTATION

10

Working with key frames, time configurations, converting as media files (avi, jpeg, etc.) - high- resolution photo rendering and photo realistic images – exercises involving the same.

UNIT V CONTEMPORARY DESIGN PROCESS

10

Formal and functional abstraction – Development of conceptual design models – design development – documentation and presentation.

TOTAL: 45

TEXT BOOKS

1. Watt, Fundamentals of Three Dimensional Computer Graphics, Addison - Wesley, Massachusetts, 1989.
2. Sham Tikoo, Autocad 2000, A Problem solving approach, Leaming 1999.
3. Contemporary Architecture and the Digital Design Process-Peter Szalapaj,2005

REFERENCE:

1. L. Conway et.al. Virtual Architecture, Batsford, 1985.
2. John Beckman, The Virtual Dimension, Architecture, Representations and crash culture, Princeton Architecture Press, 1998.
3. User Guide, Architectural Desktop 2004.
4. User Guide, 3D studio max.
5. Google sketch up
6. Omura George, Mastering AutoCAD, BPB Publications, New Drelhi.
7. Kolareric Branko, Architectural Rendering and Modelling with AutoCAD, John Wiely, New York, 1998.
8. Synder James, Architectural Construction Drawings with AutoCAD, John Wiely, NewYork, 1998.

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|---|--|--|----------------------------|
| ARB233 | ARCHITECTURAL DESIGN – IV | 7 Credits | L T P C 0 0 14 7 |
| Goal | To enable the student into the process of design in different context (Urban and Rural) by choosing relevant topics of community or civic importance. Thrust will be on rural materials, construction techniques and design details. Exposure to Computer usage is to be given importance. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • To enable students to familiarize with given topic of design by choosing appropriate case studies through visits and documentation. • To give additional input on the topic of design by organizing special lectures from expert architect. • To enable students understand the knowledge available at international level through books, literatures and websites. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand more about rural materials, construction techniques and design details • Convert the details into drawings using appropriate software | |

UNIT I DESIGN STUDIO

60

Problem related to multi room, single use, small span - multiple story, Horizontal and vertical movement, Active cum passive energy, conventional and frame type buildings. **Examples:** Departmental store, Library, higher secondary school, campus students center, etc. The projects will consciously provide for movement and use by the physically handicapped and elderly.

UNIT II DESIGN STUDIO - RURAL STUDY

120

Problems related to Rural Housing - Visits to selected village - surveys on socio-economic, physical, housing and surveys, etc. to study existing conditions - analysis of survey data - preparation of report, documentation and presentation in a seminar - preparation of design brief solutions for housing and community facilities.

TOTAL : 180

TEXT BOOKS:

1. De. Chiara and Callender, "Time-saver Standards for Building Types", McGraw-Hill Co., New York, 1973.
2. The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3. Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).
4. Ed.By.Quentin Pickard RIBA "The Architects' Hand Book", Bladewell Science Ltd., 2002

REFERENCES:

1. Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2. National Building book of India 2005, Bureau of Indian Standards, New Delhi
3. Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4. A visual dictionary of Architecture, Francis D.K.Ching, John wiley & Sons, Inc. 1997

WEBSITES

1. <http://www.focusnet.co.uk/cib/library/physdishous94.htm>
2. <http://www.ourvirtualmall.com/cloth.htm>
3. <http://www.ddimagazine.com/>
4. <http://www.atlasmagazine.com/photo/lande6>

SYLLABUS V SEMESTER

| | | | |
|---|---|---|---------------------------|
| ARB301 | BUILDING SERVICES - II | 3 Credits | L T P C 3 0 0 3 |
| Goal | <p>To educate the student the importance of Building services in attaining a holistic Architectural Design and explore integration of all the allied building services into their Architectural Design.</p> <p>To Educate them to explore all the fundamentals, byelaws, Rules and Regulations, Codes and understand the importance of references and Recommendations. Example: National Building Code, National Plumbing code, National Electrical Code, EGBC for Lighting and International Lighting Codes.</p> | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Expose the students on the basics of acoustics and its relation with the building profile. • Expose the students on basics of mechanized transportation in buildings and complex services. • Give detailed input on low and high voltage supplies, precautionary methods required for safety, electrical circuit supply and distribution and knowledge on Sub-station required for public buildings and campuses. • Enable students to understand the importance of lighting in buildings for visual appreciation, factors and laws involved in illumination. • Give additional knowledge on sources of light, its classification and intensities required for various types of gadgets, their advantages and disadvantages in usage. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Exercise on Soundscape and Acoustical Design brief for a Design Context like Lecture Halls, Classrooms, Conference room, Theatres and Auditoriums. • Browse catalogues of various vendors of Elevators, Escalators, Dumpwaiters, Car Lifts, Freight Lifts and Hospital Lifts, Fire Lifts and provide a comparative Statement on the Technical specification of selected Vendors. • Understand Electrical Symbols used in Electrical Layouts and understand reading an Electrical layout as SLD and understand the technical design brief for an Electrical Design for a Building. Understand the concept of Safety, Security and control in Electrical System. • Understand the Design of Lighting and Integration of same with Architectural Design and explore all the fundamentals of Lighting in arriving at a technical Design brief for a Building. • Understand the Selection criteria of Lighting fixtures and fittings based on comparison of technical specification of various vendors available in the Market. | |

UNIT I – ACOUSTICS

6

Acoustic fundamentals – Properties of sound and waves – Sound sources – Sound field in Enclosures, Sound propagation and transmission inside the building.

Noise control criteria and regulations – Instrumentation – Noise sources – Room acoustic – walls, barriers and enclosures.

UNIT II MACHINERY AND EQUIPMENT **4**

Mechanized transportation in buildings: Lifts, escalators, Conveyors, Traveletors. Hot water boilers, diesel generators, Essential services in Hospital, Hotels, Labs - Gas, water, air and electricity.

UNIT III ELECTRICAL SYSTEMS AND INSTALLATIONS **7**

Basics of electricity - Single/Three phase supply - Protective devices in electrical installations - Earthing for safety - Types of earthing - ISI specifications. Types of wires, wiring systems and their choice - Planning electrical wiring for building - Main and distribution boards - transformers and switch gears - Layout of substations.

UNIT IV PRINCIPLES OF ILLUMINATION **5**

Visual tasks - factors affecting visual task - Modern theory of light and colour - synthesis of light - Additive and subtractive synthesis of colour - Utilization factor - depreciation factor - MSCP - MHCP - Laws of illumination.

UNIT V LIGHTING DESIGN **8**

Classification of lighting - Artificial light sources - spectral energy distribution - luminous efficiency - colour temperature - colour rendering.

Design of modern lighting - Lighting for stores, offices, schools, hospitals and house lighting. Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types.

TOTAL: 30

TEXT BOOKS

1. E.R.Ambrose, "Heat Pumps and electric heating", John and Wiley and Sons, Inc., New York, 1968.
2. R.G.Hopkinson and J.D.Kay, "The Lighting of buildings", Faber and Faber, London, 1969.

REFERENCES

1. "Architectural Acoustics" by David Egan.
2. Philips, "Lighting in Architectural Design", McGraw-Hill, New York, 1964.
3. "Light Architecture" – New Edge city, Cianni Ranulo, Birkhauser – Publishers for Architecture 2001
4. "Lighting Design", Ulrike Brandi Light, 2006, Institute for International Architectural Documentation GMBH & Co. KG
5. "Road Lighting for Safety", Da.Schrender, Dr.Ir, Dr.Schreuder, 1998

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|--|--|--|---------------------------|
| ARB302 | SUSTAINABLE ARCHITECTURE | 3 Credits | L T P C 3 0 0 3 |
| Goal | To enable student understand how architecture is related to Sustainable and green building concept in the planning process; how the environment has an impact on the society: the conventions which binds the nations; the global agenda to tackle it; and how architects can contribute to building and planning concept through understanding of climate resilient materials, technologies, credit points of Architecture and Planning an more of greener society. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Enable student understand the meaning, definition and relationship between Architecture, Environment, climate and its impact on the spaces • Critically evaluate how spaces have been organized and utilized by using the concept of sustainable materials and technologies • Examine the usage and selection of spaces for designing, the global conventions, Eco system balance and environment friendly buildings • Enable students understand the concept of Green Architecture, LEEDS rating and Griha rating of buildings and public involvement, in the planning process. • Make students know about the policies and actions of Government and awareness and case studies. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a comprehensive knowledge on the evolution and impact of environmental aspects and sustainable issues • Be equipped to handle the architectural design process from the studies, analysis, interpretation and design in accordance to the case studies done on the green building concepts. • Have a knowledge on the Government policies and actions towards the Sustainable society and the latest technologies involved in the Building process • Have knowledge on the organic and sustainable Building materials used in the design and execution. | |

UNIT I- INTRODUCTION

10

Concept and Definition – 1970; Stock home Declaration – 1972 ; Brunt land commission – 1987; Earth summit – 1992 (UCED).

Environmental impact on human development related activities due to population growth, pace of urbanization, increase in consumption of energy, natural resources, waste generation, deforestation and pollution.

UNIT II- IMPACT OF CONSTRUCTION INDUSTRY ON ENVIRONMENT

10

Depletion of Earth's resources, minerals and energy, towards anthropogenic Climatic changes- towards hotter and drier, Desertification, Coastal flooding and erosion, Water shortage - decline in water quality, Food security- threatened, Imbalance in Eco system.

UNIT-III – GLOBAL INITIATIVE AND MAJOR ACHIEVEMENTS 5

Rio Declaration, Agenda – 21 - Forest principles - legally binding conventions, the need: Governments’ commitments -priority areas.

UNIT IV-ACTION PLANNING TOWARDS SUSTAINABLE ARCHITECTURE 10

Appropriate Policy framework for sustainable planning and development, Selection of land for human settlement and quarrying, Reduction of construction activities in eco sensitive zone. Selection and use of timber from sustainability managed forest. Integrated waste management policy and system- segregation, collection, recycling, treatment and disposal at sustainable managed site. Integrated Energy, water, construction materials and technology, management policy, framework for built environment waste management policy framework. Sustainable building material Technology options. Application of concept of Green architecture, Agile architecture, LEEDS rating., TERI rating system, Building automation etc.

UNIT V- SUSTAINABLE PLANNING AND POLICIES 10

Government policies, programmes and actions - Action by architects and designers, Action by builders/ promoters - Awareness programme - Case studies /workshops. Sustainable City Planning initiatives.

TOTAL : 45

TEXT BOOKS

2. Manik & Girish Komisva, IIPA, " Keeping Cities Clean and Green", Uppal Publishing House, 1997.
3. Anne Beer, "Environment Planning for Site Development", E & Fn Spon 1994.
4. Sustainable Building Design Manual – Vol 1 & Vol 2, Published by Energy & Resources.

REFERENCES

1. "Bioclimatic Architecture" ENEA and IN/ARCH Publication Edition, 1990.
2. "Wealth from waste" – TERI , 2005.
3. Steele, James (1997) Sustainable architecture: principles, paradigms, and case studies, McGraw Hill.
4. Gauzin-Muller, Dominique (2002) Sustainable Architecture and Urbanism:Concepts, Technologies and Examples, Birkhauser
5. Vallero, Daniel and Brasier, Chris (2008) Sustainable design : the science of sustainability and green engineering, Hoboken, N.J. : John Wiley
6. Mostaedi, Arian (2002) Sustainable architecture: low tech houses, Carles Boto I Comera
7. Wright, Richard T. (2008) Environmental science : toward a sustainable future, Upper Saddle River, NJ : Pearson
8. Guest editor Jay Yang [eBook] (2008) , Bradford, England : : Emerald Group Publishing

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|---|--|--|---------------------------|
| ARB 303 | CONTEMPORARY ARCHITECTURE | 3 Credits | L T P C 3 0 0 3 |
| Goal | To expose to students the knowledge about impact of industrialization, invention of new materials, revolutionary thinking and philosophies of Architects, emerging schools of thought, and contributions made by architects of international fame. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Be exposed to various architectural movements and manifestoes over the past century • To study the work of pioneering architects and institutions and comparing varied schools of thought. • Understand the impact of technological and philosophical progress which produced radical new thoughts such as the deconstructivist theory, digital architecture and Fractile geometry. • Be aware of architecture and urban design in post independent India, including both works of foreign architects and Indian masters. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Provide considerable insight on the progress of architectural philosophies globally over the past century and discuss current trends and theories knowledgably. • Independently research trends in architecture and form critical opinions on differing ideologies and schools of thought. • Look beyond singular history text books and develop an understanding of ‘why’ things happen and what their impact can be, more than simply ‘what’ happened. • Practice in India with an understanding of what the architectural community has been developing in the country after independence and sharing a common vision for the benefit of all. | |

UNIT I INTRODUCTION

4

Brief on Neo-Classicism - Enlightenment Architects: Boullée and Ledoux. Industrial Revolution; Invention of Materials and Technologies and their influence on Architecture.

UNIT II ARCHITECTURAL MOVEMENTS

6

Art Nouveau and the works of Gaudí, Horta, Macintosh – A brief study of the Early works of F.L.Wright, Adolf Loos ; Futurists Movement Manifestos and the works of Sant'Elia - Expressionism and the works of Mendelsohn, Taut, Polzeig - Cubism and Constructivism and its influence on Architecture - De Stijl: Ideas and works.

UNIT III INSTITUTIONS

6

Werkbund and Bauhaus/Works of Behrens and Gropius - Canonising Modernism - International Style - CIAM Congresses and Declarations. Works and Ideas - LeCorbusier - Mies - Later Works of Wright - Alvar Alto

UNIT IV MODERNISM, POST MODERNISM AND LATER

8

Brief on critiquing modernism, through writings of Venturi, Jane Jacobs, Aldo

Rossi - Christopher Alexander. Historic Revivalism - Pop Architecture - Critical Regionalism - Deconstructive Theory and Practice - their limitations. Later Ideas and selected Works of - Fathy - Baker - Ando - Soleri - Bawa. works of Zaha Hadid, Frank O Gehry, Peter Eissenman, Rem Koolhaas, Skidmore, Owings and Meryl, Michel Graves - study of concepts like Digital Architecture – Fractile Geometry and influence of Digitization and Globalisation on Architecture.

UNIT V POST-INDEPENDENT ARCHITECTURE IN INDIA

6

Chandigarh and Bhubaneswar experiments - Influence of Corbusier, Louis Khan , Koenigsberger - The formation of Institutions - Debates on Tradition as a source and burden - works and ideas: Nari Gandhi - Doshi - Kanvinde - Correa - A. Raje - U.C.Jain - Stein Housing and the issues of Appropriate Technology- Architecture in the Horizon.

TOTAL : 30

TEXT BOOKS

1. Bill Risebero, “Modern Architecture and Design”, MIT Press ,1985.
2. Kenneth Frampton, “Modern Architecture: A Critical History”, Thames and Hudson, London, 1994.
3. James Steele, “The Complete Architecture of Balakrishna Doshi”, Thames and Hudson, 1998.
4. “McMillan’s Encyclopedia of Architecture” ,Macmillan Publications,1990.

REFERENCES

1. Thomas Metcalf, “An Imperial Vision”, Oxford University Press,2002.
2. Manfredo Taferi/Francesco dal co., “Modern Architecture”, Faber and Faber/Electa, 1986.
3. Sigfried Giedion, “Space Time and Architecture: The Growth of a New Tradition”, Harvard University Press, 1978.
4. Aldo Rossi, “The Architecture of the City”, MIT Press, Massachusetts, 1982.
5. Charles Jencks, “The Language of Post-Modern Architecture”, Rizzoli, 1984.
6. Christopher Alexander, “Pattern Language”, Oxford University Press, 1977.
7. Jon Lang, Madhavi Desai , “Architecture & Independence – India 1880 to 1980” paper bags, Oxford India 1997.
8. Derek Avery, “Modern Architecture”, Chaucer Press ,London , 2003.

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|--|---|--|---------------------------|
| CEB321 | DESIGN OF STRUCTURES -II | 3 Credits | L T P C 3 0 0 3 |
| Goal | To introduce design of reinforced cement concrete structures by working stress and limit state design methods based on IS codes IS 456 for design of beams and slabs. | | |
| Objectives | | Outcome | |
| <p>The course should enable the students to :</p> <ul style="list-style-type: none"> • Be familiar with the knowledge of limit state design method for concrete structures and also know about partial safety factor, stress-strain relationship of concrete. • Be acquainted with the knowledge of limit state design of beam including singly reinforced, doubly reinforced and flanged beam. • Gain knowledge of limit states design of R.C.C slab using IS code. • Be familiar with the limit state method of design of R.C.C column of rectangular and circular section. • Gain knowledge of working stress design of foundation. Isolated pad footing and combined footing. | | <p>The students will be able to:</p> <ul style="list-style-type: none"> • Develop knowledge about of limit state design methods for concrete structures. • Use the limit state design methods to design RCC beam. • Use the limit state method to design R.C.C slabs. • Use the limit state methods to design RCC column. • Use working stress method to design footing for foundation. | |

UNIT I LIMIT STATE DESIGN FOR CONCRETE STRUCTURE – INTRODUCTION

5

Limit state - characteristic load and characteristic strength of materials - partial safety factor – stress-strain relationship of concrete - safety and serviceability requirements.

UNIT II LIMIT STATE DESIGN OF BEAMS

10

Design of rectangular sections for bending - singly reinforced, doubly reinforced and flanged sections

UNIT III LIMIT STATE DESIGN OF SLABS

10

Design of one-way and two-way slabs using IS Code co-efficient for various edge conditions.

UNIT IV LIMIT STATE DESIGN OF RCC COLUMNS

10

Behaviour of Columns - Code provisions - Design of axially loaded short columns of rectangular and circular sections - ties and spiral reinforcements. Concept of Long columns (No Design calculations).

UNIT V WORKING STRESS DESIGN OF FOUNDATION

10

Types of foundations - Isolated pad footings for simple design problems –Structural Concept of combined footings (No Design calculations)

NOTE: Reference to IS codes and tables be permitted in the examination.

TOTAL: 45

TEXT BOOKS

1. P.C.Varghese, "Limit state Design of Reinforced Concrete", Prentice Hall of India , 2004.
2. Limit State Design of Reinforced Concrete, B.C Purnia, A.K Jain, 2007
3. Reinforced Concrete Design, N.Krishnaraju & R.N. Pranesh, New Age International Publications, 2006.

REFERENCES

1. S.N. Sinha, "Reinforced Concrete Design", Tata McGraw-Hill, New Delhi 1998.
2. Dr.B.C.Punmia, Reinforced Concrete Structures, Laxmi publication, Delhi, 1992.
3. P.Dayaratnam, "Design of Reinforced Concrete Structures", Oxford and IBH Publishing Co., 1983.
4. S.Unnikrishnan Pillai & Devados Menon, "Reinforced Concrete Design", Tata Mc.Graw Hill 2003.
5. N.C.Sinha and S.K.Roy, "Fundamentals of Reinforced Concrete", S.Chand & Co., New Delhi, 1983.

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|--|--|---|---------------------------|
| CEB322 | ESTIMATION AND SPECIFICATION | 3 Credits | L T P C 3 0 0 3 |
| Goal | To enable students understand that economic viability of a project is equally important in design through exposing him/her to procedures involved in estimating quantities of materials and works, various costs and various financial institutions involved in it. Simple projects will be introduced for preparation of estimates. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Inform to students the need for estimation, the concept of abstract and detailed estimates based on measurements of materials and works. • Inform the importance of BOQ, cost control and budgeting, and norms and standards involved. • Make students know about the various financial agencies and institutions involved in land and building development and effecting financial control at various stages of the projects. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand the need for estimation, and the concept of abstract and detailed estimates. • Prepare BOQ and know to control cost and budget within the norms and standards. • Acquaint themselves about the various financial agencies and institutions. | |

UNIT I SPECIFICATION AND TENDER

8

Data – Schedule of rates – Analysis of rates – Specifications – sources – Detailed and general specifications – Tenders – Contracts – Types of contracts

UNIT II INTRODUCTION TO ESTIMATION

10

Types and purpose, approximate estimate, detail estimate of building, Bill of quantity format. Quantity survey - Principle of measurement and billing, elementary billing and measurement of basic materials like brick wood, concrete, etc. – Analysis of rates

UNIT III ESTIMATE OF BUILDING

8

Load bearing and framed structures – Calculation of quantities of Earthwork excavation, foundation, brick work, RCC, PCC, Plastering, white washing, colour washing and painting for shops, rooms residential building with flat roof.

(Problems should be simple eg. Sump, water tank, shop, a room etc.,)

UNIT IV VALUATION

10

Valuation – purpose – Income and outgoings – Depreciation – Methods of depreciation – valuation of building – Methods of valuation – Calculation of Standard rent – Mortgage – Lease

(Questions preferably of theory based, if Problems introduced it should be simple and direct)

UNIT V BUSINESS ENVIRONMENT AND FINANCE

9

The business environment, and its structure in practice, financial control and management for building construction – role of various financial agencies for building and land development.

TOTAL : 45

TEXT BOOKS

1. Dutta B.N., Estimation & Costing in Civil Engg., UBS Publishers and Distributors. Pvt. Ltd 2003.
2. S.C.Rangwala, “Elements of Estimating and Costing”, Charoter Publishing House, India.
3. “Estimating Costing Specification & Valuation In Civil Engineering”, M.Chakrabarti
4. Kohli D.D. & Kohli R.C., “A Text book of estimating & Costing (Civil) S.Chand & Company Ltd. 2004.

REFERENCES

1. W.H.King and D.M.R.Esson, “Specification and Quantities for Civil Engineers”, The English University Press Ltd.
2. “Tamil Nadu Building Practice”, Vol.1, Civil, Govt. Publication.
3. “P.W.D. Standard specifications”, Govt. Publication.

WEBSITES

1. <http://www.builderdata.com/>
2. <http://www.building.ca/>

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|--|--|--|---------------------------|
| ARB304 | MATERIALS AND CONSTRUCTION – V | 4 Credits | L T P C 2 0 4 4 |
| Goal | To educate students on protective, preventive and corrective actions, to be taken in a building with regards to various materials, details, and stages in construction, for comprehensive understanding of practices to cover water proofing, types of insulation, covering, paints and enamels. Relevant construction drawings are stressed, as shown in objective. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Understand causes & methods of various damp / water proofing • Understand general principles of heat gain and heat loss. To educate students on the prevailing methods and materials used for thermal insulation • Understand general principles of acoustics and to educate the current trends in market for sound insulation and optimum sound quality. • Understand different types of floor & wall coverings. Properties uses and its laying methods. • Understand different types of paints and its applications | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand present practices and materials for damp & water proofing including in basements, swimming pools, terraces etc. • Understand the causes for heat gain & heat loss how effectively the insulation helps in keeping the comfortable heat levels in buildings. • Understand major defects and possible rectification is understood. The commonly used acoustic treatments with the thrust on recording studio & auditorium • Understand the floor & wall covering materials in detail. • Recognize how to differentiate various types of paints and its properties. | |

UNIT I DAMP AND WATER PROOFING

20

Damp proofing - hot applied and cold applied - Emulsified asphalt, Bentonite clays, butyl rubber, silicon, vinyl's, Epoxy resins and metallic water proofing materials -properties, uses. (Water proofing membranes such as rag, asbestos, glass, felt - plastic and synthetic rubber - vinyl, butyl rubber, neoprene polyvinyl chloride (PVC) -prefabricated membranes - sheet lead, asphalt - properties and uses. Application of the above under various situations - basement floors, swimming pool, terraces, etc. Market study of current developments.

UNIT II THERMAL INSULATION

15

Heat transfer and heat gain by materials - vapor barriers and rigid insulation. Blanket, poured and reflective insulation - properties and uses of spun glass, foamed glass, cork, vegetable fibers, mineral fibers, foamed plastics, and vermiculite and glass fibers. Gypsum - manufacture, properties and uses, plaster of paris and hydride gypsum. Construction details of the material application of floor, walls and roofs.

UNIT III ACOUSTIC INSULATION**15**

Porous, Baffle and perforated materials such as acoustic plastic, acoustic tiles, wood, partial board, fiber board, cork, quilts and mats - Brief study on properties and uses of the above - current developments

UNIT IV FLOOR AND WALL COVERINGS**10**

Floor coverings - flooring - softwood, hardwood - Resilient flooring - Linoleum, Asphalt tile, vinyl, rubber, cork tiles - terrazzo - properties, uses and laying. Wall coverings - Porcelain, enameled metal, wood veneer, Vinyl, plastic surfaced paneling - properties, uses and lying. Wall and floor tiles - Ceramic glazed, mosaic, quarry and cement files - properties, uses and lying. Detailing for physically handicapped. Market study of current developments.

UNIT V PROTECTIVE AND DECORATIVE COATINGS**15**

Paints - Enamels, distempers, plastic emulsions, cement based paints - properties, uses and applications - Painting on different surfaces - defects in painting. Clear coatings and strains - Varnishes, Lacquer, Shellac, Wax Polish and Strains - Properties, uses and applications.

Special purpose paints - Bituminous, Luminous; fire retardant and resisting paints - properties, uses and applications.

TOTAL : 75**TEXT BOOKS**

1. S.C.Rangwala, "Building Construction", Charotar Publishing House, Anand, India, 2008.
2. B.C.Punmia, "Building Construction", Laxmi Publications Pvt. Ltd., New Delhi, 1993.
3. Francis. D. K. Ching, "A Visual Dictionary of Architecture", Van Nostrand Reinhold – 1997.
4. Arora S.P. and Bindra S.P., Building Construction Planning Techniques and Method of Construction, Dhanpat Rai Sons, 1997.

REFERENCES

1. W.B.Mckay, "Building Construction", Vol. 1,2,3- Longmans U.K 1992.
2. Jack M.Launders, "Construction Materials, Methods", Careers pub, J.Holland, Illinois Wileox Co., Inc. 1983.
3. Arthur R.Llons, "Materials for architects and builders - An introduction", Holder Headline group, Great Britain, 1997.
4. Don.A.Watson, "Construction Materials and Processes", McGraw-Hill Book Co., 1972

WEBSITES

1. <http://www.bwpda.co.uk>
2. <http://www.spectrumpaints.com>
3. <http://www.soundesigns.net>
4. <http://www.bmtpc.com>

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| ARB331 | ARCHITECTURAL DESIGN - V | 7 Credits | L T P C 0 0 14 7 |
| Goal | The students will be further oriented on design of small complexes or buildings involving technology, structural clarity and services in terms of lighting, ventilation, movement, fire safety, security, water supply, sewage etc. | | |
| Objectives | | Outcome | |
| The course should enable the students to : <ul style="list-style-type: none"> • Train the student to gather knowledge on the given design project based on books / literature and websites. • Students are to be exposed to expert lecture from expert architect, for each project or design. • Make the student understand the complexity, functioning and salient features of the design project through organizing field visit, train them to document and present the findings. | | The students should be able to: <ul style="list-style-type: none"> • Work on multi planning and mass problems involving building technology • Use computer for drawing and presentation skills using appropriate softwares. | |

UNIT I DESIGN STUDIO

180

Small complexes - concept of multi planning and circulation analysis - massing problems involving building technology, - Design and detailing for movement of physically handicapped and elderly persons within and around buildings.

Examples: Shopping centers (Commercial) Home for aged, apartments (residential) Health centers, Nursing homes (institutional) Etc.

TOTAL : 180

TEXT BOOKS:

1. De. Chiara and Callender, "Time-saver Standards for Building Types", McGraw-Hill Co., New York, 1973.
2. The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3. Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).
4. Ed.By.Quentin Pickard RIBA "The Architects' Hand Book", Bladewell Science Ltd., 2002

REFERENCES:

1. Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2. National Building book of India 2005, Bureau of Indian Standards, New Delhi
3. Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4. A visual dictionary of Architecture, Francis D.K.Ching, John wiley & Sons, Inc. 1997

WEBSITES

1. <http://wwwtest.library.ucla.edu/libraries/arts/websites/www.des.htm>
2. <http://www.clr.toronto.edu/VIRTUALLIB/ARCH/proj.html>
3. <http://www.thehub.net.au/%7Emorrisqc/architext>
4. <http://www.archinet.co.uk/>
5. <http://archinform.de/start.en.htm>
6. <http://www.plannet.com/>

SYLLABUS VI SEMESTER

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|---|---|--|---------------------------|
| ARB305 | HUMAN SETTLEMENT PLANNING | 3 Credits | L T P C 3 0 0 3 |
| Goal | To understand the evolution and application of the planning concepts for the improvement of environment through which the betterment of human living and welfare is achieved. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Understand the evolution and growth of human settlements in the nature and its elements. • Understand about the various planning principles and theories followed by various town planners through the history. • Know about the urban and rural housing conditions in India, and the road geometries which will influence the built environment. • Understand how planning activities are regulated in the state at various levels. • Know about the futuristic ideas of modern proposed cities and its development. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a comprehensive knowledge about the history of human settlements • Have a complete knowledge about the various planning thoughts proposed by the scholars and its successful effects • Understand and analysis the various housing conditions of the people and the road geometries of our cities. • Look at the role and activities of the various nodal agencies who regulate the city growth in our state. • Examine the various futuristic models proposed by the scholars at present. | |

UNIT - I INTRODUCTION TO HUMAN SETTLEMENTS

9

Introduction to human settlements - elements of human settlement - context and examples - major aspects in spatial planning. Classification of human settlements - Growth and decay of human settlements: Factors influencing the growth and decay, growth pattern of urban settlements during the last one-century in our country. Structure and form of human settlements - physical and functional

UNIT - II PLANNING THEORIES

9

Planning Theories enunciated by Ebenezer Howard, Patrick Geddes, Doxiadis, Le-Corbusier & Clarence Arthur Perry, their relevance to Indian Planning.

UNIT - III PLANNING ACTIVITIES

9

Urban and Rural Housing: Assessment of housing need and demand, Meaning of housing units – built units and plots – approved, unapproved – developed, undeveloped and serviced. Roads – Classification, cross – section elements – their geometry and functions, Intersection – conflicting points and channelisers.

UNIT - IV URBAN, REGIONAL PLANNING AND LOCAL GOVERNANCE 9

Aim, Objective, Scope and content of Regional Plan, Master Plan, Zonal Plan and Urban renewal plan. Objectives, Functions, Responsibilities and Organizational structure of Village Panchayats, Municipalities, Corporations and Urban Development Authorities.

UNIT - V SETTLEMENT SYSTEM IN A CHANGING WORLD 9

Human settlement in space. Regionalism and regional approach to human settlements growth. Global city, Information Technology & Communication – the city of the future and future of the cities. Utopian concepts.

TOTAL: 45

TEXT BOOKS:

1. Gallion Arthur B & Eisna Simon, “The Urban Pattern: City Planning and Housing”, Cbs, 2005.
2. L. R. Kadiyali, “Traffic Engineering and Transport Planning”, Khanna Publishers, New Delhi, 2000.
3. Peter Geoffrey Hall, “Urban and Regional Planning”, Fourth Edition, Routledge, 2002.

REFERENCES:

1. De witt Douglas Kilgore, “Astrofuturism: science, race, and vision of utopia in space”, University of Pennsylvania Press, 2003.
2. Frederic P. Miller etall, “Ekistics: Ekistics, Konstantinos Apostolos Doxiadis, Human Settlement, Urban Planning, Architectural Theory, Settlement Hierarchy, Arcology, Conurbation, Consolidated City-county, Global City”, Alphascript Publication, 2010.
3. Government of India, “Report of the National Commission on Urbanisation”, 1988.
4. Scott Campbell and Susan S. Fainstein, “Readings in Planning theory”, Wiley Blackwell, 2003.
5. Thodupuzha M. Jospheh, “Local Governance in India: Ideas, Challenges and Strategies”, Concept Publishing Company. 2009.

Websites:

1. <http://www.virtualref.com/uncrd/558.htm>
2. http://www.unescap.org/huset/m_land/index.htm
3. <http://www.esa.un.org/subindex/prviewsites.asp?termcode=GH.05>
4. <http://www.abuildnet.com>
5. <http://www.buildernews.com/>

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|---|--|------------------|---------------------------|
| ARB306 | BUILDING SERVICES - III | 3 Credits | L T P C 3 0 0 3 |
| Goal | To educate the students to integrate all the allied Building services with Architectural with a prime focus on Air- conditioning, Fire safety and Firefighting Techniques and recent trends in Building Automation, Energy rating, Energy Management and Energy efficient techniques as Recommended by Indian Green Building Council, Bureau of Energy Efficiency and Energy Conservation Building Codes. | | |
| Objectives | Outcomes | | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Inform the students on the basics of building automation and control systems and the various components and gadgets used in it. • Enable the students to understand the importance of energy, its demand, the need, conserving techniques and its management. • Inform students on basic knowledge on thermodynamics principles, transfer of heat in buildings, regulating temperature inside buildings, liquid refrigerants used in air-conditioning, refrigeration cycle and AHU's. • To enable students understand the various types of air-conditioning systems available and their applications and choice based on the typology of building and loads. • To inform students on the cause of fire, standards and norms involved, fire detection and fighting through gadgets, warning systems and various considerations in planning and making it barrier free. | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Case study on a Live Commercial Complex to understand the concepts of Building Automation allied to Building Services and understand the safety, security and control systems integrated to Building Management system. • Understand the importance of Energy in Construction Industry and explore Energy conservation and Energy efficient techniques in current trend. Understand the Energy estimate involving Construction, Operation, Maintenance, Performance phase and explore the concepts of Energy Management. • Exercises on IGBC, ECBC, BEE, USGBC, etc. • Understand thermal comfort; explore the fundamentals of Refrigeration and Air Conditioning. Understand Reverse Carnot Cycle and browse the technical design brief of various vendors for all the types of Air conditioning systems available for different utilities. • Exercises on selection of various Air conditioning system based on utilities to say like Air conditioning for Data centres, Operation Theatres, Auditoriums, hotels, etc. • Impart Knowledge on Fire safety, security and firefighting systems. Industrial visit for a live mock up on Fire escape and fire safety and fire fighting provisions | | |

UNIT I – BUILDING AUTOMATION AND CONTROL SYSTEMS

8

Concept of Building Automation, scope, the need, the significance. various automation systems in buildings – telecom systems – computer systems and networking – security and surveillance system – cable management. Introduction to automatic control systems. elementary local loop and complete control systems.

UNIT II – BUILDING ENERGY CONSERVATION TECHNOLOGIES AND MANAGEMENT **12**

Trends in energy consumption. Energy audit - weather normalization methods, measurements, impact of people behaviour. approaches, materials and equipments, operating strategies, evaluation methods of energy savings. Renewable energy sources - Optimum selection of energy sources - use of computer models. Fundamental of Energy conservation, Energy Management, Basics of Energy Demand and Supply, Principles of Economic analysis in the Energy Management and Audit Programme.

UNIT III - BASIC REFRIGERATION PRINCIPLES **10**

Thermodynamics - Heat - Temperature, measurement transfer - Change of state - Sensible heat - Latent heat of fusion, evaporation, sublimation - Saturation temperature - Super heated vapor - sub cooled liquid - pressure temperature relationship for liquids – Refrigerants - Vapor compression cycle - Air handling units.

UNIT – IV - AIR-CONDITIONING SYSTEM AND APPLICATIONS **6**

Centralized systems - Types - Packed air conditioning - Window air conditioning - Air conditioning systems for various types of buildings.

UNIT – V - FIRE SAFETY, FIRE DETECTION AND FIGHTING INSTALLATIONS

9

Causes of fire in buildings Fire protection, standards - NBC – Multi Storied Building. Special features required for physically handicapped and elderly in building types – Fire Detectors – Alarm Systems – Automatic Sprinklers – Fire Fighting – Dry and Wet Risers.

TOTAL: 45

TEXT BOOKS

1. Steve Doty & Wayne C. Turner, (2009), “Energy Management Handbook”, Seventh Edition, The Fairmont Pres, USA.
2. Ibrahim Dincer & Marc. A. Roren, (2007), “Exergy – Energy, Environment and Sustainable Development”, Elsevier, USA.
3. William H. Severns and Julian R. Fellows, Air-conditioning and Refrigeration, John Wiley and Sons, London, 1988.

REFERENCES

1. Bejami Frakli, “Feedback control of dynamic systems”, PHI Publications 2002.
2. Katsuhiko Ogata, “Modern Control Engineering”, Prentice Hall, 2001.
3. C.L. Wadhwa, “Generation and Utilization”, New Age Publication 1997.
4. A. F. C. Sherratt, “Air Conditioning and Energy Conservation”, The Architectural Press, London, 1980.
5. “National Building Code of India, 2005, Part-8”, Bureau of Indian Standards.

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|--|---|---|---------------------------|
| ARB307 | PROFESSIONAL PRACTICE & ETHICS - I | 2 Credits | L T P C 2 0 0 2 |
| Goal | To create an awareness about the profession ethical values & commitments to the society | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> Architects role in this society, his major contributions in various areas like academic and professional practice Engagement of architect by the client and for the building and other services. Fees as laid down by COA Types of competitions – assessors – as per the guideline given by COA & IIA Architects Act 1972 – building bylaws of CMDA. Panchayat rules of 1942. Heritage act Urban act commissions architectural control. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> Get a proper understanding of the role played by an architect. Various types services that an architect can provide to this society Role of COA with regards to architect fees for different types of services will enable the students to understand the architect/client and contractor relationship. The important role played by the COA & IIA in the matters of conducting competitions The important act 1972 gave architect greater recognition and importance. Building bylaws gives a guidance for proper built environment and value of the heritage building The urban art commissions are functioning well at Delhi and other important cities in India for better architectural control and thereby preserving the importance of heritage valued building | |

UNIT I ARCHITECT AND PROFESSION

7

Role of architect in society - relationship with client and contractor - code of conduct - management of an architect's office - elementary accountancy.

UNIT II ARCHITECT'S SERVICES AND SCALE OF FEES

7

Conditions of engagement of an architect - normal additional, special and partial services - scale of fees for various services - claiming of fees

UNIT III ARCHITECTURAL COMPETITIONS

4

Open and closed competitions - appointment of assessors - duties of assessors - instructions to participants - rejection of entries - award of premium - guidelines prescribed by COA & IIA for promotion and conduct of competitions

UNIT IV LEGISLATION

8

Salient features of various Acts such as Architects' Act 1972, Chennai Corporation Building Rules 1972, The Panchayat Building Rules 1942, The Tamil Nadu Factory Rules 1950, Development control Rules for Chennai Metropolitan Area 2008, Heritage Act, ECBC code, etc.

UNIT V EMERGING AREAS OF IMPORTANCE

4

Role of urban Arts Commissions - need for special rules on architectural control and development.

TOTAL : 30

TEXT BOOKS

1. Derek Sharp, The Business of Architectural Practice William Collins Sons & Co. Ltd, 8 Erafton St., London W1 1986.
2. Publications of COA IIA Hand book on Professional Practice, The Architects publishing Corporation of India, and Bombay 1987

REFERENCES

1. J.J. Scott, Architect's Practice, Butterworth, London 1985.
2. Architects' Act 1972. and Architects Professional Regulation 1989.
3. Handbook of Professional Documents – Council of Architecture.
4. Handbook of Professional Practice - IIA.
5. Architectural Practice in India – Prof.Madhav Deobhakta.
6. Government of Tamil Nadu publications on Various building rules ,1972.
7. Development Control Rules , CMDA.

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|---|---|---|---------------------------|
| CEB323 | DESIGN OF STRUCTURES -III | 3 Credits | L T P C 3 0 0 3 |
| Goal | To impart the students with the knowledge about the design of column, foundation which may be applied in architectural design projects and building construction details. | | |
| Objectives | | Outcome | |
| The course should enable the students to : <ul style="list-style-type: none"> • Understand designing and detailing of short RC column by limit state design. • Know about continuous beams and slabs using IS code coefficients. • Understand design of circular slab and flat slab • Understand detailing of seismic resistant structures • Learn design concepts of raft foundation and pile foundation. | | The students should be able to: <ul style="list-style-type: none"> • Develop knowledge about limit state design methods for continuous beam. • Use the limit state design methods to design and analyze of bricks masonry. • Use the limit state design methods to design circular slabs. • Gain the knowledge about seismic resistant structures • Gain the knowledge about wind Engineering. | |

UNIT I LIMIT STATE DESIGN OF CONTINUOUS BEAMS **10**

Limit State Design of continuous beams and slabs using code coefficients.

UNIT II MASONRY **10**

Analysis and Design of brick masonry, load bearing walls - codal requirements.

UNIT III CIRCULAR SLABS **10**

Design of RCC Circular slabs - simply supported and fixed slabs with uniformly distributed loads. Design concept of flat slabs –code provisions.

UNIT IV DETAILING SEISMIC RESISTANT STRUCTURES **10**

Introduction to detailing of Seismic Resistant Structures – IS 13920:1993 codal provisions - R.C.C. Structures and Masonry Structures

UNIT V INTRODUCTION TO WIND ENGINEERING **5**

Terminology – Wind Data – Gust factor and its determination – wind Speed Variation with height – Shape factor – Aspect Ratio - Drag and Lift

TOTAL: 45

TEXT BOOKS

1. Limit State Design of Reinforced Concrete, B.C Punmia, A.K Jain, 2007
2. A.S Arya Structural Design in Steel, Masonry & Timber, Nemchand & Bros, Roorkee,1978
3. Pankaj Agarwal, Manish Shrikhande, Earthquake Resistant Design of Structures, 2008

REFERENCES

1. S.Unnikrishnan Pillai & Devados Menon, “ Reinforced Concrete Design”, Tata Mc.GrawHill 2003.
2. N.L. Shinha and S.K. Roy, “Fundamental of Reinforced Concrete”, S.Chand and Company, New Delhi, 1983.
3. P.Dayaratnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co., 1983.
4. Ashok K. Jain, “Reinforced Concrete Limit State Design”, Nemchand and Bros., Roorkee, 1983.
5. Reinforced Concrete Design . N.Krishnaraju & R.N. Pranesh, New Age International Publications 2006
6. IS 13828 (1993) – Indian Standard Guidelines for improving Earthquake
a.Resistant low strength masonry building.
b.RCC Structures subjected to seismic forces.
7. IS 13920 (1993) - Indian Standard Code of practice for ductile detailing
8. IS 875-1987(Part3)- Indian Standard code for Wind Loads on Buildings and Structures

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|---|--|---|---------------------------|
| ARB308 | MATERIALS AND CONSTRUCTION – VI | 4 Credits | L T P C 2 0 4 4 |
| Goal | To gain knowledge on vertical movement systems in multi – storied and high-rise buildings and to know the recent construction technology developed by leading research organizations in India. | | |
| Objectives | | Outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Study the construction system innovated through research organization • Study different foundation for high rise building in various soils • Study about mass vertical movements in high rise buildings and the equipments used in building industry • Study various types of escalators, conveyors & moving walkways. • Study innovative structures for large spans | | The students should be able to: <ul style="list-style-type: none"> • Understand how to innovate and better techniques through research • Understand advanced techniques in foundations with a thrust in pile foundations. • Understand various types of equipments and their installation details • Understand the novel systems in escalators, conveyors and moving walk ways through basic theory • Understand shell structures, domes, space frame etc. The aesthetic appeal and general efficiency of such structures. | |

UNIT I CONSTRUCTION SYSTEMS DEVELOPED BY RESEARCH ORGANISATIONS

20

Study of construction system innovated through research organizations like CBRI, NBO, SERC, etc. Floor, wall and roofing systems. Ferro cement its properties, uses and application in building construction including the techniques of preparation, casting, curing, etc.

UNIT II FOUNDATIONS

15

Pile foundation, different types of piles, precast and cast insitu with reinforcement details for different types of grids, details of pile capping, jointing of precast piles and columns.

UNIT III VERTICAL MOVEMENT EQUIPMENTS IN BUILDINGS

15

Elevators - Historical development of elevators or lifts. Elevators - size, capacity, speed, mechanical safety method, positioning of core under planning grid. Types of elevators - Electric, hydraulic - passenger, hospital, capsule, freight, etc. Dumb waiters, details of lift shaft and other mechanism. Detailing and fitting for physically handicapped.

UNIT IV ESCALATORS AND CONVEYORS

10

Parallel and criss-cross escalators, horizontal belt conveyors, horizontal moving walkways - concern for physically handicapped mechanical safety systems and automatic control

UNIT V MISCELLANEOUS STRUCTURES

15

Shell structures, domes, space frame, shell barred vault, folded plate structures, tensile structures, pneumatic structures, and etc

TOTAL: 75

TEXT BOOKS

1. J.H.Callender, “Time Saver Standard for Architectural Design Data”, McGraw-Hill, 1994.
2. James Ambrose, “Building Construction, Service Systems”, Van No strand Reinhold, New York, 1992.

REFERENCES

1. W.B.Mckay , “Building Construction”, Vol. 1,2,3- Longmans U.K 1992.
2. H.A Thiruvananthapuram , “Hand Book on Elevators”, Printing and Publishing co – 1997.
3. United Technologies, “ – OTIS -Tell me About Escalators” – Printed in USA – 1990.
4. Pamphlets supplied and other literatures from N.B.O., SERC, CBRI, 1970 onwards.
5. R.Chudley, “Construction Technology”, Richard Clay (Chaucer Press) Ltd., Suffolk, 1987.

WEBSITES

1. <http://www.nas.otis.com>
2. <http://www.hugo.lib.ryerson.ca/marion>
3. <http://www.ibex.intl.com>
4. <http://www.tridelta.com>
5. <http://www.pilebrick.com>

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|--|--|---|----------------------------|
| ARB332 | ARCHITECTURAL DESIGN - VI | 7 Credits | L T P C 0 0 14 7 |
| Goal | To prepare student to confidently design large complex buildings and campuses, which involves structural synthesis, effective movement systems, within and around buildings, complying with all rules and regulations demonstrated in at least two large projects. | | |
| Objectives | | Outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • To train the student to gather knowledge on the given design project based on books/ literature and websites. • The students are to be exposed to expert lecture from expert architect, for each project or design. • To make the student understand the complexity, functioning and salient features of the design project through organizing field visit, train them to document and present the findings. • | | The students should be able to: <ul style="list-style-type: none"> • Design multi use multi span and multi level buildings involving technology and service • Use computer for drawing and presentation skills using appropriate softwares. | |

UNIT I DESIGN STUDIO

180

Design of large structures - Multiuse, multispans, multilevel (six to eight floors) - building types involving technology and services – Design and detailing for movement and use by physically handicapped people within and around building.

Examples: College office buildings (Institutional) Large Commercial Complex (Commercial) Resorts (Recreational) - Mixed Residential Developments (Residential) etc.
Working drawings for any one design Using Computer for presentation Skills.

TOTAL : 180

TEXT BOOKS:

1. De. Chiara and Callender, “Time-saver Standards for Building Types”, McGraw-Hill Co., New York, 1973.
2. The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3. Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).
4. Ed.By.Quentin Pickard RIBA “The Architects’ Hand Book”, Bladewell Science Ltd., 2002

REFERENCES:

1. Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2. National Building book of India 2005, Bureau of Indian Standards, New Delhi
3. Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4. A visual dictionary of Architecture, Francis D.K.Ching, John wiley & Sons, Inc. 1997

WEBSITES

1. <http://wwwtest.library.ucla.edu/libraries/arts/websites/wwwdes.htm>
2. <http://www.clr.toronto.edu/VIRTUALLIB/ARCH/proj.html>
3. <http://www.thehub.net.au/%7Emorrisqc/architext>
4. <http://www.archinet.co.uk/>
5. <http://archinform.de/start.en.htm>
6. <http://www.plannet.com/>

SYLLABUS VII SEMESTER

| | | | |
|--|--|--|---------------------------|
| ARB401 | URBAN DESIGN AND RENEWAL | 3 Credits | L T P C 3 0 0 3 |
| Goal | To enable student understand how architecture is related to urban design in the planning process; how cities have aesthetic and visual impacts, how cities could be visualized as an act of will and how architects can contribute to city's re building and renewal through understanding of space articulation in cities of east and west; analysis of various implementation techniques and involving public in the process | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Enable student understand the meaning, definition and relationship between Architecture, urban design and town planning and the urban environment. • Critically evaluate how spaces have been organized and articulated in cities of west and east by documenting selected case studies. • Examine how space in contemporary cities are organized and articulated in various land use zones through selected case studies. • Enable students understand the concept of urban renewal, community development and public involvement, in city building process. • Know about the imageability of towns and cities, the policies required at town level | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a comprehensive knowledge on the evolution of urban planning and its relation today. • Be equipped to handle the urban design studio project at a town/city, region level from the studies, analysis, interpretation and design in accordance to the jurisprudence. | |

UNIT I INTRODUCTION

5

Study of the relationship between architecture, urban design and town planning – Definition of urban design (broadly) – Scope and content of urban design in India and in the West.

UNIT II THEORY AND LITERATURE

10

Study of literature – Townscape: Gordon Cullen; Image of the city: Kevin Lynch; Death and Life of great American Cities: Jane Jacobs; and other authors - Christopher Alexander, Aldo Rossi, Camillo Sitte – Three theories of urban spatial design: Roger Transick.

UNIT III PUBLIC DOMAIN DESIGN THROUGH HISTORY

10

Comparative analysis of the design of public spaces through history; covering ancient, medieval, renaissance, colonial and contemporary cities – Analysis of socio – cultural, economic and political forces acting on the evolution of these spaces.

UNIT IV URBAN FORM AND SPACE**10**

Space articulation through conscious design of residential, commercial, industrial and recreational areas – Comparative analysis of evolved functions versus designed functions – Urban form and morphology as discussed by Rob Krier, Spiro Kostof and Edmund Bacon.

UNIT V CONTEMPORARY PRACTICES**10**

Objectives of Urban Renewal; methods of survey –Examples of Urban Renewal and Redevelopment – Transit oriented development – Concept of community participation – Implementation: policies, bye laws, regulations, DCR - Role of civic bodies in the implementation of urban design.

TOTAL : 45**TEXT BOOK**

1. Gosling and Maitland - URBAN DESIGN - St.Martin's Press, 1984.
2. “Time Saver Standards for Urban Design”, Donald Watson, Alan Plattus, Robert Shibley 2003.
3. “Urban Design Reader”, Mathew Carmonia (ed.) and Steve Tiesdell (ed.) 2007

REFERENCES

1. Gordon Cullen , “The concise TOWNSCAPE”, The Architectural Press – 1995.
2. Kevin Lynch - Image of the City, Joint centre of Urban Studies, 1992.
3. “A Concise Townscape”, Gordon Cullen, 2004.
4. Edmund Bacon - Design of cities, Penguin Books, 1976.
5. Gallion & Eisner - The Urban Pattern, D.Vau, Nostrand, 1963.
6. Jonnathan Barnett - Introduction to Urban Design, Harper &Row, Publishers, 1982.
7. Jave Jacobs, “Death & Life of Great American Cities”, Random House, 2002.

WEBSITES

1. www.Tribnet.com/News/projects/Rudat
2. www.Megranahan.com/Rudat98/Report/Report.html.
3. www.Dom.Gov.an/climate/viron/design/design-d/shtml.
4. <http://iesd-dmu.oc.uk/ecadap/projects.htm>

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|--|--|---|---------------------------|
| ARB402 | LANDSCAPE AND ECOLOGY | 3 CREDITS | L T P C 3 0 0 3 |
| GOAL | To understand basics of ecology, planting design, site planning and landscaping of functional areas. | | |
| Objectives | | outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Acquire knowledge on ecology and conservation • Know about common plants and the use in landscape design • Evolution of garden design during different periods and countries. • Acquire knowledge to do a comprehensive landscape development plan for various landscape functional areas. | | The students should be able to: <ul style="list-style-type: none"> • Learn about basics about ecology and conservation and reclamation of derelict areas. • Learn to identify common and popular plants, contextual to the region and to work with guidelines. • Learn about historical landscapes, planning styles and elements used in landscapes • Learn to do landscape plan for recreational spaces, housing development, water front areas and urban centers considering the planning aspects and elements that has to be used in design. | |

UNIT I INTRODUCTION

6

Introduction to ecology, landscape conservation, reclamation and landscaping of derelict areas.

UNIT II PLANT MATERIALS

6

Notes on basic plant data for plant selection and planting design, in the Indian context.

UNIT III GARDEN DESIGN

8

A brief description of Mughal gardens of India, Japanese gardens and Italian gardens. Basic principles of landscape design and the visual aspects of plant forms.

UNIT IV SITE PLANNING

10

Site investigation appraisal and site planning neighborhood parts, Children's parks toilets and sports area.

UNIT V LANDSCAPING OF FUNCTIONAL AREAS

15

Landscaping for various types of housing areas. Landscape design for waterfront areas and functional areas in urban centers. Principles of urban landscape, urban design and architectural control.

TOTAL : 45

TEXT BOOKS

1. "Landscape Ecology", Jim Sanderson & Larry D Harris by CRC press LLC, 2000.
2. "Landscape Architect's Portable Handbook", Nicholas T Dines & Kyle D Brown, 2001 by Mc Graw Hill Companies, Inc.
3. The Living Landscape – An Ecological approach to Landscape Planning", Frederick Steiner by the Mc Graw Hill Companies, Inc, 2000.

REFERENCES

1. "Tropical Garden Plants", William Warren, Thames & Hudson Ltd, London, 1997.
2. "the Landscape of Man", Geoffrey & Susan Jellicoe, Thames & Hudson Ltd, London, 1995.
3. "The Practical Encyclopedia of Garden Planning Design & Decoration", Peter Mc Hoy & Tessa Eveleigh, Anness Publishing Ltd., 1999.
4. "Time – Saver Standards for Landscape Architecture", Charles W Harris & Nicholas T Vines by Mc Graw Hill, Inc, 1998
5. "Contemporary Trends in Landscape Architecture", Steven L. Cartor by John Wiley & Sons, Inc, 1997.

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|---|--|------------------|---------------------------|
| ARB403 | URBAN ECONOMICS AND SOCIOLOGY | 2 Credits | L T P C 2 0 0 2 |
| Goal | To give input in terms of sciences and humanities as an integral part of architecture, that architect is a humanist and social reformer and that architecture can flourish and be practiced with an understanding of urban economics. | | |
| Objectives | Outcomes | | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> • Have general idea about the economic principles and their relevance to Architecture and construction industry. • Have a clear understanding about urbanization, their problems and the remedial measures taken. • Understand the relevance of land economics and its applicability in the building execution and also in the various programmes like urban design, urban renewal, urban housing, etc. • Understand the evolution of the society, its growth, its needs and requirements for a sustained development. • The environmental issues and impact of the development programmes in our Indian cities. | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a comprehensive knowledge on the basic principles of economics • Understand how urbanization happens, its positive and negative effects and the governmental measures to regulate it. • Know the intricate details of real estate and the reasons for such major shifts and changes. • Have a complete knowledge on the formation and the existence of the society • Have a idea about the different social development programmes happening in the country and its impact on the people life. | | |

UNIT- I GENERAL ECONOMICS 6

Subject matter of Economics as related to built environment – relevant economic theories to urban development - Principles of consumption, production and distribution – demand and supply - laws of returns.

UNIT- II URBANIZATION 6

Origin, growth and influence of cities. Definition of urbanization - Reason for existence of cities - factors influencing urbanization - Migration and its impact on urbanization. Review of Planning Commission Reports. Social problems of urbanization – problems relating to public health, public transport and public housing, sociological understanding of slums.

UNIT- III URBAN LAND AND BUILDING ECONOMICS 7

Demand and supply of urban land – Land value – speculation - factors influencing urban land values – Municipal taxes -Construction labor market, economic evaluation of urban renewal & housing.

UNIT- IV SOCIOLOGICAL CONCEPTS AND SOCIAL CHANGES 6

Concept of society, community, group and culture, institution organization, social stratification, role of status, social norms, social structure and social changes.

UNIT- V ECOLOGICAL PROCESS AND DEVELOPMENT IMPACTS 5

Ecological process and land use structures of the cities, impact of urbanization and development programmes on social development.

TOTAL:30

TEXT BOOKS

1. Arthur O'sullivan. Urban economics, McGraw-Hill/Irwin, 2009.
2. Gopal Bhargava (ed) Urban Problems and policy perspective, Abhinav Publications New Delhi 1981.
3. John. F. Mcdonald and Daniel. P. Mcmillen, "Urban economics and real estate – Theory and Practice" 2nd edition, John wiley and sons, 2010.

REFERENCES

1. David M. Newman, "Sociology – Exploring the architecture of everyday life", Ping forge press, 2009.
2. Government of India, "Report of the National Commission on Urbanisation", 1988.
3. Nath,. V, "Urbanisation, urban development and Metropolitan cities", edited by surrender. K. Agarwal, concept publishing company, 2007.
4. Subramanian, K.K.et.al. Construction Labour Market : A study in Ahmedabad, Conceptpublishing Co, New Delhi, 1982.
5. Unmareddy Venkateswarlu, "Urbanisations in India: Problems and prospects", New age international, 1998.

Websites:

1. www.nwmisseuri.Edn/nwcourses/martin/urban
2. www.solent.ac.uk/socscilmf/urban1.html
3. <http://directorysearch.mozilla.org/science/social-sciences/Economics/urban-economics>
4. <http://11cs.uop.edu/cop/economics/econ15/.html>

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|---|---|------------------|---------------------------|
| ARB404 | PROFESSIONAL PRACTICE & ETHICS - II | 3 Credits | L T P C 3 0 0 3 |
| Goal | To create a total awareness about the architectural practice. | | |
| Objectives | Outcomes | | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> • Types of easement and their implications • Basic objectives of tender preparation of tender documents • After acceptance of tender and it becomes a contract between client and the contractor. • Advantages of having arbitrator to resolve the disputes between the client and the contractor. • Environmental acts & laws in all situations like hill coastal and heritage etc. | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand the properly and its implications to the owner of the property • The issues regarding tenders architects and client role towards the contract. • The role played by various agencies within the contractual clauses. Duties of sub contractor payments, etc. • Disputes between client and contractor areas of disputes likely to arise – Arbitral award to be final & binding. • Learn about the laws regarding environment along with the building norms which are already available. | | |

UNIT I EASEMENTS

4

Definition - types of easement - acquisition extinction and protection of easements

UNIT II TENDER

12

Calling for tenders - tender documents - open and closed tenders - item rate, lumpsum, labour and demolition tender - conditions of tender - submission of tender - scrutiny and recommendations

UNIT III CONTRACT

15

Conditions of contract - Form of contract articles of agreement - Contractor's bill certification

UNIT IV ARBITRATION

6

Arbitration in disputes - arbitration agreement - sole arbitration - umpire - excepted matters and - award

UNIT V LEGISLATION

8

Environmental Acts and Laws - Special Rules governing Hill Area Development - coastal area development and management - Heritage Act of India - Consumer protection act and their relevant provisions.

TOTAL : 45

TEXT BOOKS

1. Publications of COA IIA Hand book on Professional Practice, The Architects publishing Corporation of India, and Bombay 1987.
2. Roshan Namavathi, Professional Practice, Lakshmi Book Depot, Mumbai 1984

REFERENCES

1. J.J.Scott, Architect's Practice, Butterworth, London 1985
2. D.C. Rules for Chennai Metropolitan Area 2008.
3. T.N.D.M. Building Rules, 1972
4. Chennai City Corporation Building Rules 1972
5. Derek Sharp, The Business of Architectural Practice William Collins Sons & Co. Ltd., 8 Erafton St., London W1 1986
6. The Tamil Nadu Hill Areas Special Building Rules – 1981
7. Environmental Laws of India - by Kishore Vanguri, C.P.R. Environmental Education Centre, Chennai

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|--|---|--|----------------------------|
| ARB431 | ARCHITETURAL DESIGN - VII | 8 Credits | L T P C 0 0 16 8 |
| Goal | To prepare students to be conversant with all challenges in large complex design, in group, multi storied developments covering structural innovations, energy conservation, awareness to costing of projects and legal implications. | | |
| Objectives | | Outcomes | |
| <p>The coarse should enable the student to :</p> <ul style="list-style-type: none"> • Make the student realize that architectural design process become more and more complex at advanced level and could be understood by analyzing live case studies - appropriate documentation and presenting the same. • Create awareness among students through organized expert lectures and various aspects of design. • Strengthen the knowledge base on architectural design processes thro' works of international and national architects referred from libraries, available literature and websites. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Design advanced and complex problem comprising of group and multi stories structures and infrastructures. • Use computer for drawing and presentation skills using appropriate software's. | |

DESIGN STUDIO

180

Design of advanced and complex problems - comprising of group and multi storied structures and infrastructure - with regard to climatic conditions, orientation, services, circulation problems relating to large developments Design and detailing for movement and use by handicapped persons within and around building.

Examples: Multi storied Residential flats, campus design, urban centers, Housing Senior citizens' neighborhood, Transport terminals etc, and Time problem using computer-aided design shall be introduced.

TOTAL : 180

TEXT BOOKS:

1. De. Chiara and Callender, "Time-saver Standards for Building Types", McGraw-Hill Co., New York, 1973.
2. The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3. Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).
4. Ed.By.Quentin Pickard RIBA "The Architects' Hand Book", Bladewell Science Ltd., 2002

REFERENCES:

1. Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2. National Building book of India 2005, Bureau of Indian Standards, New Delhi
3. Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4. A visual dictionary of Architecture, Francis D.K.Ching, John wiley & Sons, Inc. 1997

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|---|--|---|---------------------------|
| ARB432 | DISSERTATION | 2 Credits | L T P C 0 0 4 2 |
| Goal | To prepare the students for formal report writing systematically on a particular topic related to architecture | | |
| Objectives | | Outcomes | |
| The course should enable the student to : <ul style="list-style-type: none"> • Widen and enrich the literature pertaining to the topic of interest • Prepare for their thesis | | The students should be able to: <ul style="list-style-type: none"> • Impart indepth knowledge on selected topics on their interest through wide literature study. • Focus and orient for the thesis | |

Dissertation is a formal report written systematically on a particular topic as related to Architecture. This exercise is taken up as to widen and enrich the literature pertaining to a topic of interest in Architecture. It may focus upon cross section of literature of a topic with or without research hypothesis. The material written systematically may be useful for the thesis in tenth semester when the same topic with literature reviewed systematically be confined as a part of thesis.

There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the university comprising of a panel with one external member.

SYLLABUS VIII & IX SEMESTER

| | | | |
|--|--|--|-----------------------------|
| ARB433 | PRACTICAL TRAINING | 24 Credits | L T P C 0 0 48 24 |
| Goal | To provide adequate knowledge on the practice of Architectural Profession to learn the administration, managerial and professional skills and demonstrate the same in future architectural design study. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> • Learning office procedure and management. • Preparation of architectural drawings including detailed and working drawings. • Supervision of project site or sites. • Critical appraisal of one of the projects dealt by the student. • Selection of possible areas / themes thesis topics for approval. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Know what is happening in the field or in actual practice • Go to various construction sites, learn and experience • Understand the system of working and management in the office. | |

The choice of the place of training shall be Architectural Firms, Organizations, Development Authorities, etc. which are headed by architects. The Dean, School of Architecture, shall approve the choice of the office.

The final evaluation of the practical training will be based on the following features.

- i. Architectural office training
- ii. Site supervision and training
- iii. Critical study of project built
- iv. Field Documentation of Architectural details and working drawings.

Students should send their joining report, monthly progress reports (in the prescribed format) and completion report during the period of practical training. Students should prepare the portfolio of the work done during this period.

There will be an end semester viva voce conducted by the university comprising of a panel with one external member to assess the work done by the students.

30 WEEKS

SYLLABUS X SEMESTER

| | | | |
|---|---|---|-----------------------------|
| ARB501 | THESIS | 15 Credits | L T P C 0 0 30 15 |
| Goal | To test whether a student has acquired the requisite skill and competence in architecture before becoming a full fledged architect. | | |
| Objectives | | Outcomes | |
| The course should enable the student to : <ul style="list-style-type: none"> • Undertake a detailed investigation on a topic of his/her choice • Come out with comprehensive design proposals | | The students should be able to: <ul style="list-style-type: none"> • Handle large scale design problems • Manage the profession at ease | |

TOPICS OF STUDY

The main areas of study and research shall be Architecture, Urban design, Urban renewal, Urban and Rural Housing and settlements, Sustainable and Environmental Design, Conservation, Landscape Design etc. However, the specific thrust shall be on architectural design and environment context with full understanding.

PRESENTATION REQUIREMENTS

The Thesis Project shall be submitted in the form literature and case study report, presentation drawings, models, reports, slides and CD's as required for the project.

Periodic reviews will be conducted internally consisting of a panel and at the end of the semester there will be a viva voce conducted by the university comprising of panel with two external members.

TOTAL : 450

TEXT BOOKS & REFERENCES

As per requirement of Topic and as suggested by the supervisor of Thesis.

ELECTIVE-V SEMESTER

| | | | |
|--|---|--|---------------------------|
| ARC351 | THEORY OF INTERIOR DESIGN | 2 Credits | L T P C 2 0 0 2 |
| Goal | To impart knowledge on basics of interior design and building aesthetics. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Deal in details with various aspects of space interiors. • Give an opportunity to understand qualities of spaces • Design for functional and meaningful space interiors. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a complete idea about interior design and its relation to human behavior and their response to interior spaces. • Make wonderful colour schemes for the interior spaces in order to make them aesthetically pleasing. • Identify the different possibilities in order to make a functional yet meaningful interior spaces. | |

UNIT I INTRODUCTION TO INTERIOR DESIGN 5

Meaning and significance of interior design, Historical review of interiors as regards to concept, interior design trends in India and abroad, style, fashion, decoration etc.

UNIT II PRINCIPLES OF INTERIOR DESIGN 5

Visual composition, theory of Colors, Function and character for space.

UNIT III THEORY OF AESTHETICS 9

Understanding aesthetics and its importance and the underlying theories explaining the term Introduction to the subject, Introduction to the western aesthetics and Indian Aesthetics. Relating the spaces, surfaces and interior designing with Aesthetics For this, a study of the relation between the traditions of Architecture and aesthetics, Understanding the concept of 'Critical Judgement'.

UNIT IV PERCEPTION OF INTERIOR SPACES THROUGH LITERATURE 6

Effects of design movements and various schools of thoughts on interior environment from historical period till date and its impact on lifestyle, art and crafts

UNIT V PROMINENT INTERIOR DESIGNERS AND THEIR WORKS 5

Differentiation between individual Design and design as evolution process of culture, tradition and society

TOTAL:30

TEXT BOOK

1. Ching, Francis D. K. (2005) Interior Design Illustrated 2nd Edition, John Wiley & Sons
2. Lewis, Susan A. (1998) Interior Design Sourcebook: A Guide to Resources on the History and Practice of Interior Design (Design Reference Series), Omnigraphics

REFERENCES

1. Riley, Noel and Bayer, Patricia (2003) *The Elements of Design: A Practical Encyclopedia of the Decorative Arts from the Renaissance to the Present*, Free Press
2. Beacham, Cindy V., McFall, Barbara S. and Park-Gates, Shari (2007) *Designing YOUR Future: An Introduction to Career Preparation and Professional Practices in Interior Design*, Prentice Hall
3. Znoy, Jason (2004) *Professional Interior Design: a career guide*, ASID Illinois
4. Calloway, Stephen (1991) *The Elements of Style: A Practical Encyclopedia of Interior Architectural Details from 1485 to the Present*, Simon and Schuster.
5. Pile, John (2005) *A History of Interior Design*, Laurence King Publishing Ltd
6. *Interior Design in the 20th Century* by Allen Tate, C.Ray
7. *Interior Graphic & Design Standards* by S.C.Reznikoff.

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|---|---|--|---------------------------|
| ARC352 | ENERGY EFFICIENT ARCHITECTURE | 2 Credits | L T P C 2 0 0 2 |
| Goal | To understand the importance of Energy conservation in general and solar energy particularly and to incorporate energy efficient techniques in Planning, design and detailing of buildings. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Trace out evolution of energy conscious buildings and techniques from historic period based on climatic zone of the world. • Enable students understand solar geometry and heat transfer mechanism in buildings and energy conservation. • Study methodologies to incorporate solar passive heating system in buildings through selected case studies with stress on materials and techniques. • Study ways to incorporate solar passive cooling systems thro' selected examples with stress on materials and techniques. • Enable student to understand importance of site planning, vegetation types, water bodies as factors inspiring concepts of design. | | <p>At the end of the course the students will:</p> <p>Knowledge:</p> <ul style="list-style-type: none"> • Have a broad knowledge of the evolution of energy conscious buildings in various climatic zones a historical context. • Be aware of the physics of heat transfer through materials and building elements and aware of the patterns of movement of the sun and its implications. • Have comprehensive knowledge of passive (heating and cooling) design features, systems and strategies. • Have a good understanding of the role of site planning strategies, vegetation types and water bodies in energy efficient architecture. <p>Thinking Skills:</p> <ul style="list-style-type: none"> • Be able to place this specialized knowledge in the context of the design of buildings and the wider environment. • Be able to critically analyze the implications of energy efficient architectural design in a given specific context and the wider environmental context. • To be able to think in an innovative and creative way. <p>Subject-based practical skills:</p> <ul style="list-style-type: none"> • Be able to address particular practical issues such as incorporation of passive design features and strategies in the design process. | |

UNIT I CLIMATE AND SHELTER

6

Historic buildings - pre-industrial, post-industrial and modern architecture - examples from different climatic zones.

UNIT II SOLAR ENERGY AND BUILDINGS

6

Thermal comfort - Heat Transfer - Heating and cooling loads - Energy estimates - Conservation - Day lighting - Water Heating and Photo voltaic system.

UNIT III PASSIVE SOLAR HEATING**6**

General principles - Direct gain - Thermal storage wall - sunspace - convective air loop - examples

UNIT IV PASSIVE COOLING**6**

General principles - Ventilation - Radiation - Evaporation and Dehumidification - Mass effect - examples.

UNIT V SITE PLANNING AND DEVELOPMENT**6**

Landform - vegetation type and pattern - water bodies open spaces and built spaces - urban scape - design strategies.

TOTAL: 30**TEXT BOOKS**

1. A.Konya, Design Primer for Hot Climates, Architectural Press, London, 1980.
2. Energy Efficient Buildings in India – Published by TERI – 2001
3. Fuller Moore, “Environmental Control Systems”, McGraw-Hill, Inc., New Delhi, 1993.

REFERENCES

1. “Climatically Responsive Energy Efficient Architecture”, PLEA/SPA, New Delhi - 1995.
2. Ms.Sudha, N.K.Bansal and M.A.S.Malik, “Solar Passive Building”, Pergamon Press.
3. V.Gupta , “Energy and Habitat” - Wiley Eastern Limited, New Delhi , 1984.
4. Donald Watson, “Climatic Building Design- Energy Efficient Building Principles and Practice”, McGraw-Hill, 1993.
5. Energy Conservation Building Code

WEBSITES

1. www.terin.org/
2. <http://solstice.crest.org/efficiency/index.shtml>
3. <http://www.envinst.conu.edu/~envinst/research/built.html>

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|--|---|--|----------------------------|
| ARC353 | CONSTRUCTION EQUIPMENTS AND METHODS | 2 Credits | L T P C 2 0 0 2 |
| Goal | To provide an insight into construction practices and equipment used for various construction activities. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Be aware of the basics of practical building construction and the process of construction work at a site • Be sufficiently informed of various construction techniques and practices that are used in specific and special sub-structures and superstructures. • Have an understanding of Building damage and repair. • Have reasonable knowledge on various construction equipment used. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand how a design is practically executed and thus handle site decisions and project management accordingly. • Have reasonable knowledge about various construction procedures involved in various types of sub-structures and special superstructures that the basic courses do not necessarily cover. • Assess and identify causes of building damage and decide on suitable measures for the building's damage control, retro-fitting and rehabilitation. • Exhibit awareness on the availability, specialty and usage of various equipment needed for different types of construction work. • Work knowledgeably and independently on large scale construction projects, exhibiting a detailed understanding of practical site considerations, usual construction procedures, special constructions and the latest equipment available. | |

UNIT I CONSTRUCTION PRACTICES

6

Specifications, details and sequence of activities and construction co-ordination – Site Clearance – Marking – Earthwork – masonry – flooring – damp proof courses – Building foundations – basements – temporary shed – centering and shuttering sheet piles – slip forms – scaffoldings – frames – braced domes – weather and water proof – roof finishes

UNIT II SUB STRUCTURE CONSTRUCTION

5

Techniques of Box jacking – Pipe Jacking -under water construction of diaphragm walls and basement-Tunneling techniques – Piling techniques- shoring for deep cutting- Dewatering and stand by Plant equipment for underground open excavation.

UNIT III SUPER STRUCTURE CONSTRUCTION

8

In-situ pre-stressing in high rise structures, aerial transporting handling - erecting light weight components on tall structures -erection of transmission towers - Construction sequences in cooling towers, silos, chimney, sky scrapers, Support structure for heavy Equipment and conveyors -Erection of articulated structures, braced domes and space decks

UNIT IV REPAIR AND REHABILITATION**4**

Study on causes of building damage and deterioration – Assessment of materials and methods of repair and restoration.

UNIT V CONSTRUCTION EQUIPMENT**7**

Selection of equipment for earth work - earth moving operations - types of earthwork equipment - tractors, motor graders, scrapers, front end loaders, earth movers – Equipment for foundation and pile driving. Equipment for compaction, batching and mixing and concreting - Equipment for material handling and erection of structures - Equipment for dredging, trenching, tunneling, drilling, blasting — dewatering and pumping equipment – Transporters.

TOTAL : 30**TEXT BOOKS**

1. Peurifoy, R.L., Ledbetter, W.B. and Schexnayder, C., "Construction Planning, Equipment and Methods", 5th Edition, McGraw Hill, Singapore, 1995.
2. Arora S.P. and Bindra S.P., Building Construction, Planning Techniques and Method of Construction, Dhanpat Rai and Sons, 1997.

REFERENCES

1. Jha J and Sinha S.K., Construction and Foundation Engineering, Khanna Publishers, 1993.
2. Sharma S.C. "Construction Equipment and Management", Khanna Publishers New Delhi, 1988.
3. Deodhar, S.V. "Construction Equipment and Job Planning", Khanna Publishers, New Delhi, 1988.
4. Dr. Mahesh Varma, "Construction Equipment and its Planning and Application", Metropolitan Book Company, New Delhi-, 1983.

ELECTIVE-VI SEMESTER

| | | | |
|--|---|---|---------------------------|
| ARC354 | VISUAL COMMUNICATION AND ARCHITECTURE | 2 Credits | L T P C 2 0 0 2 |
| Goal | To make students understand that visual communication was simultaneous developing with architecture and it is a source of inspiration to application to Architecture. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Learn the need and importance of visual communication and theories and philosophies related to it. • Learn the elements of design, materials, techniques and tools of graphic design. • Learn the way finding in built environment and outdoor using advanced computer applications. • Learn Digital sculpture and installation • Learn various techniques behind architectural photography. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Understand the basic relationship between visual communication and architecture. • Understand the basic concept behind graphic design. • Familiarize with mobile augmented reality and use of GPRS & GPS. • Understand about installation art and architecture. • Perception and visual documentation of architectural projects. | |

UNIT I INTRODUCTION TO VISUAL COMMUNICATION

4

Need for and the Importance of Human and Visual Communication. Communication an expression, skill and process. Relation between visual communication and architecture. Theories and Philosophies of Visual Communication.

UNIT II GRAPHIC DESIGN

6

Basics of Graphic Design. Definition, Elements of GD, Design process-research, a source of concept, the process of developing ideas-verbal, visual, combination & thematic, visual thinking. Problem associated with editing and manipulation of image/pictures using PhotoShop/Corel Draw. Associative techniques, materials, tools (precision instruments etc.) design execution, and presentation.

UNIT III WAY FINDING IN ARCHITECTURE

8

Basics of Way finding in complex built environments. Study of semiotic theory. Study of signs and signages and their application in built environment. Use of advanced computer applications such as mobile augmented reality and RFID tagging in process of way finding in indoor environment. Use of GPRS and GPS for way finding in outdoor environment.

UNIT IV INSTALLATION ART AND ARCHITECTURE

5

Introduction to Digital sculpture and installation art and their association to architecture. Integration of Open spaces and public spaces with installations. Study of works of Contemporary Installation artist. Conceptual design of Installation for place architecture.

UNIT V ARCHITECTURAL PHOTOGRAPHY

7

Human Eye and Camera. Basics of Camera and its operations. Types of Camera. Visual Perception. Perception of Colour, depth, lighting, foreground, mid ground, and background in architectural photography. Visual Documentation of Architectural projects. Image processing, Editing/Post production. Preparation of port folio.

TOTAL: 30

TEXT BOOKS

1. Graphic Designers, and Artists,1982, Astragal Books. London
2. Louis Smith, Kenneth (2005) Handbook of Visual Communication: Theory, Methods and Media, Lawrence Erlbaum Associates.

REFERENCES

1. Schildgen, T (1998). Pocket Guide to color with digital applications. Thomsom Learning
2. Picture this: Media Representation of Visual Arts and artists. University of Luton Press
3. Lester, Paul Martin, (2010) Visual Communication: Images with Messages, Thompson Wadsworth, USA
4. O Huck, Fedrick, Fales.L.Carl and Rahman, Zia-Ur (2010) Visual communication: an information theory approach, Kluwer Academic Publishers.
5. Edited by Anna Bentkowska-Kafel, Trish Cashen and Hazel Gardiner. (2009) Digital visual culture : theory and practice, Intellect :Bristol,UK
6. Hembree, Ryan (2008) The complete graphic designer : a guide to understanding graphics and visual communication, Beverly, Mass. : Rockport Publishers

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|--|--|--|---------------------------|
| ARC355 | LANDSCAPE CONSTRUCTION | 2 Credits | L T P C 2 0 0 2 |
| Goal | To make the students learn about the elements used in landscape design | | |
| Objectives | | outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Acquire knowledge about contours, slope analysis and to manipulate grading plans • Create awareness on landscape elements and surfaces and the construction details of the elements. • Learn about historical recount of water gardening, the types and the details of water features in landscape. • Provide ideas of how to do garden lighting, the purpose about outdoor lighting and the types of outdoor lighting | | The students should be able to: <ul style="list-style-type: none"> • Learn to do contour manipulation, slope analysis and to do grading plan. • Acquire knowledge about different landscape elements and their use in the landscape design. • Have a comprehensive knowledge on types of water features, selection of materials and construction details of water features. • Learn about the purpose, types of lights available in the market, its use and will be doing a lighting plan. | |

UNIT I SHAPING THE LANDSCAPE

8

Grading and the soil-maps for grading-representation of landform –contour interpretation – classifying the landform. The six cardinal laws of contours-contour manipulation –grading around building and structures. Evenly sloped surfaces, Roadways, drainage etc., Grading standards –calculating grades. The grading plan-calculation of cut and fill.

UNIT II CONSTRUCTION OF ELEMENTS

10

Construction details – vehicular and pedestrian paving. Garden steps and ramps. Edge treatment,Markers,Walls,Trellises,Pergolas,Planters,Kerbs and Drainage channels,Types of fencing –Simple Fencing,Agricultural Fencing,Security Fencing,Palisade Fencing,Railings and gates.

UNIT III LANDSCAPE SURFACES

4

Soft surfaces – Flexible surfaces – Cellular and curb paving-Firm surfaces – Garden paving – Timber paving – Other surfaces – Construction of sport ground surfaces, highways, parking areas, Tree pits and tree surroundings.

UNIT IV WATER GARDEN

4

A Historical recounting of water gardening – General guidelines for designing a water garden – Brief over view of formal and informal stypes – Basic Data`s – Materials selection,Edging option, making a site plan etc., Construction details - Lined in-ground pond, Pre formed in-ground pond, Streams and Waterfalls, Fountains and Lighting,Bridges and Stepping stones,Wetland or Bog garden.

UNIT V GARDEN LIGHTING

4

Types of Garden lighting – Garden lighting purpose, Features and its effects – Brief overview of the lighting design for the indoor and outdoor landscapes - Planning the lighting system – Implementation and installation.

TOTAL:30

TEXT BOOKS

1. “Landscape Ecology”, Jim Sanderson & Larry D Harris by CRC press LLC, 2000.
2. “Landscape Architect’s Portable Handbook”, Nicholas T Dines & Kyle D Brown, 2001 by Mc Graw Hill Companies, Inc.
3. The Living Landscape – An Ecological approach to Landscape Planning”, Frederick Steiner by the Mc Graw Hill Companies, Inc, 2000.

REFERENCES

1. “Tropical Garden Plants”, William Warren, Thames & Hudson Ltd, London, 1997.
2. “the Landscape of Man”, Geoffrey & Susan Jellicoe, Thames & Hudson Ltd, London, 1995.
3. “The Practical Encyclopedia of Garden Planning Design & Decoration”, Peter Mc Hoy & Tessa Eveleigh, Anness Publishing Ltd., 1999.
4. “Time – Saver Standards for Landscape Architecture”, Charles W Harris & Nicholas T Vines by Mc Graw Hill, Inc, 1998
5. “Contemporary Trends in Landscape Architecture”, Steven L. Cartor by John Wiley & Sons, Inc, 1997.

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|---|--|--|---------------------------|
| ARC356 | BUILDING MAINTENANCE AND RETRO TECHNIQUES | 2 Credits | L T P C 2 0 0 2 |
| Goal | To familiarize students with the technique of building maintenance and retrofitting. | | |
| Objectives | | outcomes | |
| <ul style="list-style-type: none"> To learn defects in buildings due to environmental effects. Learn about different natural disasters and building failures Learn about preventive maintenance and retrofitting Learn about different materials techniques for building repair | | <ul style="list-style-type: none"> Study about the factors affecting the durability of buildings Students will be able to diagnose building failures due to disasters. Students Will be able to give solution for preventive maintenance and retrofitting. The students will be able to suggest appropriate material and techniques for building repair. | |

UNIT I ENVIRONMENT AND BUILT FORM 5

Durability of buildings – environmental effects, corrosion and natural deterioration – effect of chemical elements and pollution – damage due to biological agents

UNIT II NATURAL DISASTER –EFFECT ON BUILTFORM 7

Natural disasters – buildings failures, diagnosis and techniques of assessment,

UNIT III MAINTENANCE AND REPAIR STRATEGIES 5

Maintenance, repair and rehabilitation, Facets of Maintenance, importance of Maintenance various aspects of Inspection, Assessment procedures for evaluating a damaged structure. Causes of deterioration.

UNIT IV MATERIALS AND TECHNIQUES FOR REPAIR 8

Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, Ferro cement, Fibre reinforced concrete. Rust eliminators and polymers coating for rebar's during repair, foamed concrete, mortar and dry pack, vacuum concrete, unite and shotcrete, Epoxy injection, Mortar repair for cracks, shoring and underpinning, Methods of corrosion protection, corrosion inhibitors, corrosion resistance steels, coatings and cathodic protection.

UNIT V REPAIRS AND RETROFITTING 5

Repairs to overcome low member strength Deflection, Cracking, Chemical disruption, Weathering corrosion, wear, fire, leakage and marine exposure.

TOTAL: 30

TEXT BOOKS

1. "Belen Garcia; - Earthquake Architecture 2000 – Loft Publications, NY
2. Naseem Ahmed – Managing Disasters – Kilaso Books N.Delhi, 2003.
3. Tarnath BS; Wind and Earthquake resistant buildings – Marcel Dekkar, 2005

REFERENCES

1. Philip H Perki : “ Concrete Structures “, 1978, E & FN Spon, London
2. S.Champion, “Failures and Repair of Concrete Structures”, 1961, Contractors record,London.
3. Jacob Feld “Construction Failures”, 1968, John Wiley.
4. Peter H Emmens, “Concrete Repair and Maintenance illustrate”
5. Eldridge H J, “Common Defects in Buildings”, 1976, Her Majesty Stationery Office,London.
6. Mathews M S, “Conservation Engineering”

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|---|--|---|----------------------------|
| ARC 360 | GLASS ARCHITECTURE AND DESIGN | 2 Credits | L T P C 2 0 0 2 |
| Goal | This is an Industry based elective course offered to students of Architecture to provide them with concepts on modern concepts on Glass Architecture, Role of Glass in Green design and concepts on considerations for improving the building performance using glass. | | |
| Objectives | | Outcomes | |
| <ul style="list-style-type: none"> ● To understand the different types of glass and it's applications. ● To understand the factors affecting energy efficiency of glass. ● To understand the features of energy codes and rating systems. ● To understand the usage of special glasses ● To understand the safety compliance in execution of glasses in buildings ● To evaluate the energy performance of glass through passive and active methods. ● To analyze usage and performance of glass. | | <ul style="list-style-type: none"> ● Usage Glass as a building material in various contexts. ● An understanding of the parameters affecting performance of glass ● Use glass in the contemporary context of energy codes and rating systems. ● Working knowledge of performance evaluation softwares. | |

UNIT I GLASSS – AS A BUILDING MATERIAL 4

Glass a building material, Float glass manufacturing technology, Types of glasses, Value addition : Mechanical Properties – Glass Processing - Pre processing, Tempering / Heat Strengthening – Process & Applications, Insulated Glass Units / Double Glazing – Process & Applications, Laminated Glass – process & Applications, Ceramic Frit.

UNIT II BUILDING PHYSICS & CODES 5

Building Physics : Theory of electromagnetic radiation. Factors defining performance & Selection of Glass : (VLT, SF, UV, SHGC). Need for Green Buildings : Energy efficient buildings. Achieving energy efficiency using glass. Factors of energy efficient material selection: Performance parameters. Energy codes and Green ratings : ECBC, IGBC, GRIHA

UNIT III USAGE & SAFETY OF GLASSES 5

Human Safety Compliances, Fire Resistant Glazing : Types & Applications, Understanding Acoustic Glazing : Principle & Applications, Interior Glazing : Types & Applications, Optical Properties – Coating Technology, Glass for segments – Hospitals, Green Homes, Airports, Offices, Educational Institutions.

UNIT IV ENERGY PERFORMANCE OF GLASS 8

Approaches of energy efficiency: prescriptive method, trade off method – accommodating passive architecture, whole building simulation. Calculations involving basic factors in glass design, software analysis and case studies, create your building: interactive modeling, find when it's hot: sun path analysis, feel the weather : solar exposure analysis, know the angles : building orientation analysis

UNIT V ANALYSIS OF PERFORMANCE OF GLASS USING SOFTWARE 8

Optimization Of Glass : For Wastage Reduction & Standardization Of Design, Software Analysis And Case Studies, Accommodate Comfort: Daylight Analysis And Acoustic Analysis, Check For Safety: Thickness Analysis, Foresee How Things Look: Colour And Aesthetics, Money Matters: Wastage Optimization, Ac Load Calculations And Payback Analysis – A Comparative Case Study, Creative Use And Solutions Of Glass

TOTAL 30

REFERENCES:

1. Structural Glass Facades and Enclosures, Mic Patterson; ISBN : 978-0-470-93185-1
2. Glass in Architecture ISBN 0714829226 by Micheal Wigginton
3. Joseph.S.Amstock's Glass in Construction (McGraw-Hill, 1997)
4. Envelop Design for buildings ISBN 0750628545 by William Allen
5. Thomas Herzog, Façade Construction Manual; Birkhauser, 2004.
6. FOSG Architectural Guide
7. Glass Academy Foundation Manual Volume-I
8. Glass Academy Foundation Manual Volume-II
9. Glass Academy Foundation Manual Volume-III

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|---|--|---|---------------------------|
| ARC357 | BUILDING INTERIOR MATERIALS AND CONSTRUCTION | 2 Credits | L T P C 2 0 0 2 |
| Goal | To study the physical, behavioral and visual properties of the various components of interior architecture and learn about their construction techniques and uses. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Enable the student to have a profound knowledge of the properties, uses and construction techniques of various materials used for the interior design components like walls, floors, ceilings, doors and windows, staircase etc. • Market survey, case studies and site visits to be conducted to understand system of construction and details. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a profound knowledge about the properties uses and construction techniques used in interior design. • Conduct material survey and also produce detailed reports of the same. • Make detailed construction drawings for their designs. | |

UNIT I FOUNDATION

7

General introduction to various elements of building from foundation to roof Masonr : Standard terms in brick and stone masonry, English and Flemish bond, piers, types of stone walls, composite and curved walls, lintels and arches, copings etc.

UNIT II DOORS AND WINDOWS

6

Paneled door in timber, joints in frame, styles, rails, panels, Moldings, fixtures and fastenings. Fully glazed window in timber, fixing of glass, double-glazing, fixtures and fastenings.

UNIT III FLOORS AND WALLS

4

Study of flooring different floor finishes and cladding materials, wooden paneling and wainscoting, glass and metals etc.

UNIT IV SUSPENDED CEILINGS

9

Design, considerations, methods of construction, materials used, catwalks concealed lighting A.C. ducts inlets and outlets, patent systems like Gypboard, Luxalon,. Joily board ceilings etc, space dividers, screens, partitions in interiors.

UNIT V CIVIL WORK

4

services, special services and its integration with interior design scheme. Rate analysis of various items of work

TOTAL: 30

TEXT BOOKS

1. B.C.Punmia, "Building Construction", Laxmi Publications Pvt. Ltd., New Delhi, 1993.
2. Interior design illustrated by Francis D.K.Ching

REFERENCES

1. Jack M.Launders, "Construction Materials, Methods", Careers pub, J.Holland, Illinois Wileox Co., Inc. 1983.
2. Arthur R.Llons, "Materials for architects and builders - An introduction", Holder Headline group, Great Britain, 1997.
3. Don.A.Watson, "Construction Materials and Processes", McGraw-Hill Book Co., 1972
4. W.B. McKay, " Building construction", Longman, U.K,1970.

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|---|---|--|---------------------------|
| ARC358 | URBAN ECOLOGY | 2 Credits | L T P C 2 0 0 2 |
| Goal | To enable the students understand how ecology related with the urban design, contributes the rebuilding & renewal of architecture in city scale and how cities have aesthetic & visual impacts; analyzing the various implementation techniques and involvement of all the living beings in the ecological process. | | |
| Objectives | | Outcomes | |
| The course should enable the student to : <ul style="list-style-type: none"> • Understand the basics of ecology & land features for positive interventions. • Make the students study the urban design that enhances and enriches the built environment in the overall context of ecology. • Make the students know about the imageability of towns and cities in various landuse zones through selected case-studies. | | The students should be able to: <ul style="list-style-type: none"> • Identify and study the basic of ecological features and interventions. • Implicate in urban design planning aspects and to give ecological planning concepts. • Articulate the knowledge on the causes of execution in urban landuse, scales and planning. | |

UNIT I ECOLOGY

5

Definition – Ecological niche – Community ecology : Foodweb, keytone species – Biome & Biosphere – Ecology & Evolution - Historical roots of ecology.

UNIT II INTRODUCTION TO URBAN ECO SYSTEM

6

An overview of the term Ecosystem – Examples of ecosystems – classifications – function & biodiversity – Urban ecosystem legal rights & services.

UNIT III ECOLOGICAL FOOT PRINT & SUSTAINABILITY

8

An overview of ecological foot print – Definition - Understanding & analysis of Ecological foot print – Definition of sustainability – Principles & concepts – Environment, Economic & social dimensions.

UNIT IV WATER SHED AND STORM WATER MANAGEMENT

6

An overview of watershed and definition – Drainage basins – Study on watersheds of Chennai – Storm water management model – model parameters.

UNIT V DESIGN OF URBAN ECOLOGICAL SYSTEM

5

The study of Ecosystem – Ecosystem dynamics – Ecosystem ecology – Design of an urban ecological system of any metropolis in India.

TOTAL: 30

TEXT BOOKS

1. “Landscape Ecology”, Jim Sanderson & Larry D Harris by CRC press LLC, 2000.
2. “Landscape Architect’s Portable Handbook”, Nicholas T Dines & Kyle D Brown, 2001 by Mc Graw Hill Companies, Inc.

3. The Living Landscape – An Ecological approach to Landscape Planning”, Frederick Steiner by the Mc Graw Hill Companies, Inc, 2000.
4. Gosling and Maitland URBAN DESIGN St.Martin’s Press 1984
5. Gordon Cullen THE CONCISE TOWNSCAPE The Architectural Press 1995

REFERENCES

1. “Tropical Garden Plants”, William Warren, Thames & Hudson Ltd, London, 1997.
2. “the Landscape of Man”, Geoffrey & Susan Jellicoe, Thames & Hudson Ltd, London, 1995.
3. “The Practical Encyclopedia of Garden Planning Design & Decoration”, Peter Mc Hoy & Tessa Eveleigh, Anness Publishing Ltd., 1999.
4. “Time – Saver Standards for Landscape Architecture”, Charles W Harris & Nicholas T Vines by Mc Graw Hill, Inc, 1998
5. “Contemporary Trends in Landscape Architecture”, Steven L. Cartor by John Wiley & Sons, Inc, 1997.
6. John O. Sinurds EARTHSCAPE McGraw Hill Book New York 1878
7. Clift Tandy THE URBAN ECOLOGY The Architectural Press London 1971

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|---|--|--|---------------------------|
| ARC359 | CONSTRUCTION QUALITY & COST CONTROL | 2 Credits | L T P C 2 0 0 2 |
| Goal | To familiarize students with quality control techniques, quality management methods and cost control measures. | | |
| Objectives | | Outcomes | |
| The course should enable the student to : <ul style="list-style-type: none"> • Provide introduction fundamental concepts of construction quality • Give input on bench marking quality policy and standards • Learn to prepare construction cost, project organization and cost control for loose scale projects | | The students should be able to: <ul style="list-style-type: none"> • Finalize with total quality management • Enhance students understanding of the complexities of bench marking application of policy and standards for construction. • Understand construction planning and cost control techniques currently in use | |

UNIT I. CONSTRUCTION QUALITY 6

Construction Quality, Inspection and Testing, Quality Control, Quality Assurance, Total Quality Management, Critical Factors of TQM; TQM in Projects

UNIT II BENCHMARKING AND POLICY, STANDARDS FOR CONSTRUCTION 4

Benchmarking, concepts of quality policy, standards, manual, third party certification.

UNIT III CONSTRUCTION AND CONTRACT MANAGEMENT 6

Project cost estimation, rate analysis-labour, materials and equipment production, Overhead charges, Bidding models and strategies, Qualification of bidders.

UNIT IV CONSTRUCTION PLANNING 8

Project Organization, Bar Charts, Work Breakdown Structure, Time estimates, Applications of CPM and PERT- Scheduling, Monitoring and Updating. Line of Balance Scheduling.

UNIT V COST CONTROL 6

Resource Planning-leveling and Allocation. Time-Cost Trade-off. Cost Control in Construction. Material Management- Purchase management and inventory control.

TOTAL: 30

TEXT BOOKS

1. N. Logothetis, "Managing for Total Quality"-Prentice Hall.
2. David Gold Smith, "Safety Management in Construction and Industry", Mc Graw Hill.
3. K.N.Vaid, "Construction Safety Management"- NICMAR, Bombay.

REFERENCES

1. Roshan Namavathi, "Professional Practice"
2. Gajaria GT, "Law Relating to Building & Civil Engg. Contracts in India"
3. Collier, Kieth, "Managing Construction Contracts"

4. Peurifoy. R L, "Construction Planning, Equipment and Methods"- Mc Graw Hill.
5. Srinath L.S, "PERT and CPM", East West Press Pvt Ltd New Delhi.
6. Frank Harris and Roland McCaffer, "Modern Construction Management"- 4th Ed. Blackwell Science Ltd.

ELECTIVE-VII SEMESTER

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|---|---|---|---------------------------|
| ARC451 | URBAN HOUSING | 3 Credits | L T P C 3 0 0 3 |
| Goal | To sensitize students to the need for housing in India; contributing factors and various typologies for the design of housing; and to expose them to the role and machinery of housing agencies in the country. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> • Bring about an understanding about need, demand, supply and other market forces in housing. • Create awareness about the social and economic factors influencing housing design and design options for the types of design as a resultant of this. • Discuss the impact of standards, regulations, laws and acts on contemporary practices that shape the housing market of the country today. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Identify and study the needs, demand and supply and implicate in the process of urban housing planning. • Articulate the knowledge on the different types of planning concepts. • To understand the standards, regulation on practices in the present. | |

UNIT I INTRODUCTION

7

Need and Demand – Socio- economic aspects and contributing factors to the design of housing – Maslow/Hierarchy Theory.

UNIT II HOUSING AGENCIES AND PROCESS

10

National Housing policy – Housing agencies and their role – Community participation – Housing process and management – Stages and tasks in project development.

UNIT III HOUSING DESIGN

10

Traditional patterns – Row housing, cluster housing, Gated communities – Layout concepts – Use of Open spaces – Utilities and common facilities – Case studies – High Rise Building – Township.

UNIT IV HOUSING STANDARDS

8

Standards and Regulations – DCR relevant to Housing – Methodology of formulating standards – Performance standards.

UNIT V CONTEMPORARY SCENARIO AND PRACTICES

10

Environmental aspects – Sustainable Housing Design – Technology – Slum Rehabilitation/Upgradation/Resettlement – Sites & Services scheme – Case studies: works of B.V. Doshi, Charles Correa and Kulkarni.

TOTAL:45

TEXT BOOKS

1. Joseph de chiara & others “Time Saver Standards for Housing and Residential development”, McGraw-Hill Co., New York, 1995.
2. Karnataka state Housing Board - MANE - Publication - 1980.

REFERENCES

1. Richard Untermanu & Robert Small, “Site Planning for Cluster Housing”, Van Nostrand Reinhold Company, London/New York, 1977.
2. Forbes Davidson and Geoff Payne, “Urban Projects Manual”, Liverpool University Press, Liverpool, 1983.
3. Christopher Alexander, “A Pattern Language”, Oxford University Press, New York - 1977.
4. “Housing for the Low income”, Sector Model, HUDCO Publications

WEBSITES

1. www.hudcoindia.com
2. www.indiabuildnet.com/arch/sangath-8.htm

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|--|---|---|---------------------------|
| ARC452 | DISASTER MITIGATION AND MANAGEMENT | 3 Credits | L T P C 3 0 0 3 |
| Goal | To create awareness about natural and manmade hazards, prepare for it, consequence of disasters and post disaster and the social responsibility of individuals during disaster. | | |
| Objectives | | Outcomes | |
| The course should enable the student to : <ul style="list-style-type: none"> To learn about natural and manmade hazards - cause & consequences To learn about vulnerability assessment and solution for the same. To learn about legal and financial issues related to disaster | | The students should be able to: <ul style="list-style-type: none"> Make out the type of disasters. Prone areas and impacts of disasters. Understand seismic repairs and retrofitting. Apply during the occurrence of disasters | |

UNIT I NATURAL HAZARDS AND BUILDING SAFETY 10

Natural hazards – Brief description on cause and formation of flood, cyclone, earthquake, tsunami and landslides. Zoning and micro zoning of vulnerable areas- Vulnerability atlas of India.

UNIT II MAN MADE HAZARDS AND BUILDING SAFETY 5

Man made hazards – Fire, gas, chemical leakages, pollution, and health hazards. – vulnerability analysis and risk assessment.

UNIT III - SEISMIC UPGRADATION OF DIFFERENT EXISTING BUILT FORM 10

Introduction of seismic repairs and Retrofitting- Vulnerability assessment of existing built form - Damaged buildings.- Undamaged buildings- Cost- benefit and decision making about retrofitting.

UNIT IV.- ISSUES IN EARTHQUAKE PRONE AREAS 5

Techno- Legal and Techno- Financial issues . Proposed amendments to Town Planning Act- implications and accountability.

UNIT V - DISASTER MANAGEMENT, CASE STUDIES . 15

Pre disaster phase - Disaster phase - Post disaster Phase - Case studies – Social responsibilities of Architects

TOTAL:45

TEXT BOOKS

1. “Belen Garcia; - Earthquake Architecture 2000 – Loft Publications, NY
2. Naseem Ahmed – Managing Disasters – Kilaso Books N.Delhi, 2003.
3. Tarnath BS; Wind and Earthquake resistant buildings – Marcel Dekkar, 2005

REFERENCES

1. Mary C Comerio; Disaster Hits Home, New policy for Urban Housing recovery, Oxford University press, London 2001
2. Proceedings – Learning from practice – Joint US and Italy Workshop – October 18-23 ; 1992 National Science Foundation ; US.
3. Earthquake Resistant Design and Construction of buildings – Code of Practice – Bureau of Indian Standards ; 1993
4. S.L.Goel, Encyclopedia of Disaster Management Policy and Administration, Vol.I, Deep of Deep Publication Pvt. Ltd., New Delhi, India.
5. S.L.Goe, Encyclopedia of Disaster Management Policy and Administration, Vol. II, Deep of Deep Publication Pvt.Ltd., New Delhi, India.
6. HUDCO Publications.

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|--|---|---|---------------------------|
| ARC453 | CONSERVATION OF BUILT VERNACULAR | 3 CREDITS | L T P C 3 0 0 3 |
| GOAL | To understand various manmade, natural and cultural forces behind the evolution of traditional architecture and the methods to conserve these traditional buildings for further generations | | |
| Objectives | | outcomes | |
| The course should enable the student to : <ul style="list-style-type: none"> • Study different approaches, concepts and typologies of vernacular architecture. • Understand the various elements, materials, influences , building systems and regional expression through case studies • Understand the various threats and deterioration mechanism associated with traditional buildings • Establish the need and purpose for conservation • Study the various tools, technologies, methods, materials and systems available for conserving traditional buildings. • Understand the effective application of the tools for conserving the built vernacular | | The course should enable the student to : <ul style="list-style-type: none"> • Understand and appreciate the uniqueness of Indian vernacular architecture • Acquire knowledge about the advantages, causes and issues related with the maintaining these buildings • Equip themselves to develop the need, tools and technologies to conserve the vernacular heritage. | |

UNIT I INTRODUCTION TO VERNACULAR ARCHITECTURE 5

Approaches and concepts to study vernacular architecture- Different typologies or classifications of vernacular architecture- Study of vernacular architecture by various fields.

UNIT II TRADITIONAL BUILDING SYSTEMS 14

Traditional building materials, structural building systems, construction technology, ornamentation, influences and regional cultural expressions through case studies in India.

UNIT III DEFECTS AND DETERIORATION OF VERNACULAR BUILDINGS 8

Various cause and defects in traditional building materials and building systems- methods to identify and monitor the defects and damage.

UNIT IV INTRODUCTION TO ARCHITECTURAL CONSERVATION 8

Introduce conservation methodology, various assessment methods, implementation tools and mechanisms (documentation, community participation, legislation, valuation, statement of significance, grading, listing etc)

UNIT V CONSERVATION TECHNOLOGIES 10

Study various methods, techniques, technology, and application of modern materials in rectifying the defects, causes and agent of deterioration required to conserve the vernacular

buildings with an appropriate case study of one building and also the effective application of traditional construction systems and crafts.

TOTAL:45

REFERENCES

1. Guideline for conservation of Historic buildings - Sir Bernard Feilden
2. Repair and Maintenance of Historic Building- C. A. Berbbia
3. House ,form and culture - Amas Rapport
4. ICOMOS charter on Built Vernacular
5. Practical Building Conservation: Traditional Building Materials, Their Repair and Conservation - John Ashurst; Nicola Ashurst

ELECTIVE - X SEMESTER

| | | | |
|--|--|---|----------------------------|
| ARC551 | INTERIOR ACCESSORIES AND FURNITURE DESIGN | 3 Credits | L T P C 3 0 0 3 |
| Goal | To impart unique design, synthesis and expression of a furniture (product) through skills in drawing. To study the materials and technique search to evolve alternatives in design. | | |
| Objectives | | Outcomes | |
| The course should enable the student to <ul style="list-style-type: none"> • Create general awareness of role of ergonomics in work effectiveness & efficiency and system design approach through furniture design. | | The students should be able to: <ul style="list-style-type: none"> • Have a comprehensive knowledge about the furniture's and their standards • Handle the design problems independently. • to understand the necessity and importance about materials | |

UNIT I ELEMENTS OF INTERIOR DESIGN 12

Interior design elements such as flooring, carpets, tapestry, color, texture, plants, sculptures, paintings, murals, lighting fixtures etc. Accessories & Coordinating Accessories Floor coverings-Carpets, rugs and other resilient floor coverings. Upholstery materials - Inner Construction of upholstered furniture. Window treatment – Curtains, Draperies, Blinds

UNIT II INTERIOR SPACES 6

Qualities and settings of interior space, historical settings, Regional & ethnic settings, Contemporary interiors for creating image identity.

UNIT III TERMINOLOGIES OF ERGONOMICS 10

Biomechanics - Comfort zone - Elements of comfort zone - Noise, motion, temperature, colour, humidity, light etc. Analysis and designing furniture (forms) based on ergonomics, materials, working parameters and visual perception for furniture as single form and as a system in a given interior space.

UNIT IV SPATIAL PLANNING 8

General awareness of the role of ergonomics in work effectiveness and efficiency. Understanding the environmental factors contributing to performance of work. System design approach and space planning through furniture as Elements of design

UNIT V MODULAR COORINDATION IN INTERIORS 9

Modular furniture design through materials evolving coordinated system for entire space. Modular approach and multiple use of furniture forms. Exploration of wood, metal, glass, plastics and FRP as material for system design. Dimensional study of various interface platforms – kitchen, wardrobes, storage unit, toilets.

TOTAL:45

TEXT BOOK

1. Ching, Francis D. K. (2005) Interior Design Illustrated 2nd Edition, John Wiley & Sons
2. Lewis, Susan A. (1998) Interior Design Sourcebook: A Guide to Resources on the History and Practice of Interior Design (Design Reference Series), Omnigraphics

REFERENCES

1. Riley, Noel and Bayer, Patricia (2003) The Elements of Design: A Practical Encyclopedia of the Decorative Arts from the Renaissance to the Present, Free Press
2. Beacham, Cindy V., McFall, Barbara S. and Park-Gates, Shari (2007) Designing YOUR Future: An Introduction to Career Preparation and Professional Practices in Interior Design, Prentice Hall
3. Znoy, Jason (2004) Professional Interior Design: a career guide, ASID Illinois
4. Calloway, Stephen (1991) The Elements of Style: A Practical Encyclopedia of Interior Architectural Details from 1485 to the Present, Simon and Schuster.
5. Pile, John (2005) A History of Interior Design, Laurence King Publishing Ltd
6. Interior Design in the 20th Century by Allen Tate, C.Ray
7. Interior Graphic & Design Standards by S.C.Reznikoff.

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| ARC552 | LANDSCAPE SERVICES AND EIA | 3 Credits | L T P C 3 0 0 3 |
| Goal | To create awareness on basic knowledge on the landscape services and the procedures and systems of Environmental Impact Assessment. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to:</p> <ul style="list-style-type: none"> • Enables the students to govern the special projects and protect the rights. • Have a comprehensive knowledge in various methodologies and assessments in the execution of Landscape projects. • Understand the various environmental management plan. • Design projects as per Indian bye-laws • Comprehend the methods that causes pollution and their control systems. | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Create awareness in students about the environmental policies, acts and their rules & regulations on a broader scale. • Provide comprehensive knowledge in various assessments and understand the methodologies involved. • Make the students understand on the documentation of EIA and environmental management plan. • Create awareness in students on the bye-laws as per Indian constitution they have to adhere to. • Provides a broad knowledge on the various pollutants and methods to control pollution. | |

UNIT I INTRODUCTION TO LANDSCAPE SERVICES 10

National environmental policies – precautionary principle & polluter pays principle –
Concept of absolute liability – Montreal Protocol, Kyoto protocol Rio declaration.

UNIT II ENVIRONMENTAL IMPACT ASSESSMENT 8

Evolution of EIA – Concepts – Methodologies – Screening – Scoping – Base line Studies –
Mitigation – Matrices – Check list.

UNIT III ENVIRONMENTAL MANAGEMENT 10

Assessment of impacts – Air – Water – Soil – Noise – Biological.
Socio cultural environment – Public participation – Resettlement and rehabilitation
Documentation of EIA – Environmental Management Plan – Post project monitoring –
Environmental Audit – Life cycle assessment - EMS – Case studies in EIA.

UNIT IV ENVIRONMENTAL SERVICES & ACTS 9

Environmental protection Act 1986 – Water Act 1974 – Air act 1981 – Relevant provisions
of Indian forest Act – Public interest Litigation – Wret petitions.

UNIT V PRINCIPLES OF WATER & WASTE WATER TREATMENT 8

An overview of pollutants in water and waste water – Physical treatment methods –
Biological pollution control system.

TOTAL:45

TEXT BOOKS

1. "Landscape Ecology", Jim Sanderson & Larry D Harris by CRC press LLC, 2000.
2. "Landscape Architect's Portable Handbook", Nicholas T Dines & Kyle D Brown, 2001 by Mc Graw Hill Companies, Inc.
3. The Living Landscape – An Ecological approach to Landscape Planning", Frederick Steiner by the Mc Graw Hill Companies, Inc, 2000.
4. Anne Beer ENVIRONMENT PLANNING FOR SITE DEVELOPMENT E & Fn Spon 1994
5. Prof. Madhav Deobhakta LANDSCAPE PRACTICE IN INDIA Council of Architecture

REFERENCES

1. "Tropical Garden Plants", William Warren, Thames & Hudson Ltd, London, 1997.
2. "the Landscape of Man", Geoffrey & Susan Jellicoe, Thames & Hudson Ltd, London, 1995.
3. "The Practical Encyclopedia of Garden Planning Design & Decoration", Peter Mc Hoy & Tessa Eveleigh, Anness Publishing Ltd., 1999.
4. "Time – Saver Standards for Landscape Architecture", Charles W Harris & Nicholas T Vines by Mc Graw Hill, Inc, 1998
5. "Contemporary Trends in Landscape Architecture", Steven L. Cartor by John Wiley & Sons, Inc, 1997.
6. JJ Scott Architects Practice Butterworth London 1985
7. Environmental Impact assessment, Govt of India, 1982

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| ARC553 | PROJECT MANAGEMENT | 3 Credits | L T P C 3 0 0 3 |
| Goal | To establish and develop project management skills and network techniques. At this stage, the student are exposed to network logic and to develop alternaic siralogics. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to</p> <ul style="list-style-type: none"> • Learn traditional management system. • Learn project programming and unidimensional management techniques. • Understand CPM network analysis and network logic. • Learn probabilistic time estimate and PERT network analysis. | | <p>The students should be able to:</p> <ol style="list-style-type: none"> 1. Have a comprehensive knowledge about the management of projects as per the requirement of the industry. 2. Handle the management problems independently and effectively, to the occasion. | |

UNIT I INTRODUCTION TO PROJECT MANAGEMENT 5

Introduction to project Management concepts - background of management, purpose, goal and objectives, characteristics of projects and different aspects of management. Traditional management system, Gantt's approaches load chart, progress-chart, bar-chart merits and limitation. Schedule, time estimates units

UNIT II PROJECT TEAM 4

The actors involved in a project ,Project team, Basic understanding of the role of individual actors, The role of architect at various stages of a project

UNIT III PROJECT PROGRAMMING 6

Project programming, resources balancing, phasing of activities, programmes, scheduling, project control, reviewing, updating and monitoring. Introduction to modern management, concepts, unidimensional management techniques - Introduction to PERT and CPM introduction to network concepts, network elements and inter-relationships.

UNIT IV NETWORK TECHNIQUES 15

Network techniques, network logic - interrelationships, activity information, data sheets, and development of network. CPM for management, CPM network analysis, identification of critical path floats computation result sheets. PERT network,Introduction to Theories relating to the activites of PERT network

UNIT V PROJECT COST 15

Introduction to two dimensional network analyses, activity cost information. Cost time relationship, crashed estimates for the activities, compression potential, cost slope, utility, data sheet, project direct cost and indirect cost. Crashed programmes, network compression

least cost solution least time solution, optimum time solution. Network techniques, PERT/CPM, generating alternative strategies using computers

TOTAL : 45

TEXT BOOKS

1. Dr. B.C. Punmiya and K.K. Khandelwal - Project Planning and Control with PERT\CPM Laxmi Publications, New Delhi, 2009.
2. S.P. Mukhopadyay, Project Management for Architects and Civil Engineers, IIT, Kharagpur, 1974.
3. Project management: a systems approach to planning, scheduling, and controlling , Harold Kerzner, John wiley & sons, 2006

REFERENCES

1. Jerome D. Wiest and Ferdinand K. Levy, A Management Guide to PERT/CPM, Prentice Hall of Indian Pub. Ltd. New Delhi, 1982.
2. SR.A. Burgess and G. White, Building production and Project Management, The Construction Press, London 1979.
3. Dr. P. N. Modi, "PERT and CPM", standard Book House, 2009.
4. Fundamentals of project management , James P. Lewis, AMACOM, 2007

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| ARC554 | INTERIOR LIGHTING AND LANDSCAPE | 3 CREDITS | L T P C 3 0 0 3 |
| GOAL | To understand the importance of landscape and lighting design in landscape. | | |
| Objectives | | outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Make students aware about importance of site planning and landscaping and treatment of outdoor spaces. • Acquire knowledge on lighting, types of lighting systems its uses and calculation of intensity of artificial lights. • Ideas about indoor lighting, lighting design of various areas. | | The students should be able to: <ul style="list-style-type: none"> • Learn about ecology relationship between architecture, interior design and landscape and elements of landscapes, their use and construction details. • Learn about the purpose, types of lighting systems available in the market and the calculation of intensity of lights its use and will be doing a lighting plan. • Learn about types of indoor lights, lighting systems its use and lighting design for Offices, Shops, Showrooms, Hotels Auditorium and Cinema halls, Industries etc. | |

UNIT I INTRODUCTION TO LANDSCAPE ARCHITECTURE

9

Definitions, importance, need and scope. Levels of landscape planning and design. Landscape architecture and ecology. Relationship between landscaping, architecture and interior design.

UNIT II LANDSCAPE ELEMENTS

12

Different factors and components of a landscape. Social and economical factors. Psychological considerations of spaces and enclosures. Brief idea about man made components like walls, fences, entrances, gates, barriers, screens, planters, roads & pathways, street furniture, signage, services-electrical, water supply and drainage. Basic natural components - land, trees, water and climate.

UNIT III LIGHT SOURCES

8

light and its properties. Artificial light calculation by Lumen Method and Point y point method. Light sources, various types of Lamps and their characteristics.

UNIT IV LIGHTING SYSTEM

8

Types of lighting systems, task lighting, accent lighting, general lighting, lighting for mood etc.

Luminaries, their types , properties and uses.

UNIT V INDOOR LIGHTING

8

Indoor lighting design for Offices, Shops, Showrooms, Hotels Auditorium and Cinema halls, Industries etc.

TOTAL: 45

TEXT BOOK

1. Ching, Francis D. K. (2005) Interior Design Illustrated 2nd Edition, John Wiley & Sons
2. Lewis, Susan A. (1998) Interior Design Sourcebook: A Guide to Resources on the History and Practice of Interior Design (Design Reference Series), Omnigraphics

REFERENCES

1. Landscape Architecture By J.O.Symonds. McOraw Hill Publications.
2. Earthscape by J.O,Symonds,McGraw Hill Publications,
3. Architecture-A manual of site planning and design by J.O.Symonds, McGrawHill Publications,
4. Site Planning by Kevin Lynch,
5. Site Planning by R.Genebrooks, Prentice Hall.
6. Architectural Illumination by Dr.R.G.Edkie, Ekweera Prakasan.

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| ARC555 | LANDSCAPE SYSTEM INTEGRATION | 3 Credits | L T P C 3 0 0 3 |
| Goal | To graduate and sensitize the students on the process of landscape system integration through management techniques and the study of various landscape strategies | | |
| Objectives | | outcomes | |
| The course should enable the student to: <ul style="list-style-type: none"> • Provides a broad knowledge on Institutional and legal support and landscape strategies. • Understand the green building concepts and approach. To also learn the various evaluation system involved in rating green building. • Give an indepth knowledge on the application of digital techniques in Landscape design • Learn about the various principles in Landscape planning. • Explore and apply the various parameters for sustainable and Green building design. | | The students should be able to: <ul style="list-style-type: none"> • Get an idea on Landscape strategies and in many different scenario. • Aware in the current trends and on how to apply it in their designs. • Understand the role of digital media and the application of GIS in Urban Landscape projects. • Understand the global planning systems and principles through examples. • Gain the practical application of sustainable design development through various urban scenarios. | |

UNIT I LANDSCAPE PLANNING & MANAGEMENT 8

Components of environment – Institutional & legal support in management of landscape and environment – Environmental policies – Landscape strategies in landuse, transportation, Infrastructure planning & Management.

UNIT II GREEN CONSTRUCTION & ENVIRONMENTAL QUALITY 8

Sustainable architecture & Green building definition – Green building Evaluation systems; LEED certification; Green Globe certification ; Case studies which look at the environmental approach. (Indian & International)

UNIT III APPLICATION OF DIGITAL TECHNIQUES IN LANDSCAPE DESIGN

12

Depiction of urban spaces in digital media – Role of digital media in reconfiguring landscape space – case studies – Application of GIS, diagramming & 3D modeling tools in urban design.

UNIT IV PLANNING SYSTEM & PRINCIPLES

7

Principles in landscape planning – Landscape planning systems in India –Comprehensive Landscape Development Plan (CLDP) - Comparison of planning systems in UK & USA.

UNIT V SUSTAINABLE & GREEN BUILDING DESIGN STUDIO

10

This studio will explore the collaborative learning to explore, investigate, apply various parameters of sustainability for design development projected buildings – Urban scenarios

TOTAL:45

TEXT BOOKS

1. "Landscape Ecology", Jim Sanderson & Larry D Harris by CRC press LLC, 2000.
2. "Landscape Architect's Portable Handbook", Nicholas T Dines & Kyle D Brown, 2001 by Mc Graw Hill Companies, Inc.
3. The Living Landscape – An Ecological approach to Landscape Planning", Frederick Steiner by the Mc Graw Hill Companies, Inc, 2000.

REFERENCES

1. "Tropical Garden Plants", William Warren, Thames & Hudson Ltd, London, 1997.
2. "the Landscape of Man", Geoffrey & Susan Jellicoe, Thames & Hudson Ltd, London, 1995.
3. "The Practical Encyclopedia of Garden Planning Design & Decoration", Peter Mc Hoy & Tessa Eveleigh, Anness Publishing Ltd., 1999.
4. "Time – Saver Standards for Landscape Architecture", Charles W Harris & Nicholas T Vines by Mc Graw Hill, Inc, 1998
5. "Contemporary Trends in Landscape Architecture", Steven L. Cartor by John Wiley & Sons, Inc, 1997.
6. Landscape Architecture Construction by Harlow C. Landphair, Fred Klatt, Jr.
7. Landscape Construction and Detailing by Alan Blanc
8. Landscape Detailing – Surfaces – Volume 2 by Michael Littlewood.
9. Complete guide to water gardens by Kathleen Fisher.
10. Garden Lighting by John Raine.
11. Site sections and Details by David J. Ciaccio

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|---|---|--|---------------------------|
| ARC556 | INFRASTRUCTURE PLANNING AND MANAGEMENT | 3 Credits | L T P C 3 0 0 3 |
| Goal | Planning for the infrastructure is an integral part of a settlement. Planning and Management of infrastructure is being given top priority through out the world. | | |
| Objectives | | Outcomes | |
| <p>The course should enable the student to :</p> <ul style="list-style-type: none"> • Understand the importance of infrastructure in the economic development of the country and our countries current scenario. • Understand the overall framework on the planning, implementation and the techniques employed to plan the infrastructure. • Know how to manage and maintain the existing infrastructure facilities • To know the current trends in the infrastructure development models like PPP, BOOT, BOT, etc. • Have a overview of the major infrastructural facilities like water supply, storm water drainage, sewerage, solid waste, roads, pavement, bridges, etc | | <p>The students should be able to:</p> <ul style="list-style-type: none"> • Have a comprehensive knowledge on the importance and the need for infrastructure development in our country • Have a complete knowledge on how the major infrastructure facilities are planned, and the various techniques adopted in the planning stage. • Know the various techniques employed to maintain and manage the existing infrastructure facilities • Understand the various models currently used to build the mega infrastructure projects and the reasons for the development of such models. • Have a basic idea of all the major infrastructure facilities essential for the development of the city. | |

UNIT I INTRODUCTION

12

Definition of basic terminologies, role of infrastructure in economic development, types of infrastructure, measurement of infrastructure capacity, bases for quantification of demand and supply of various types of infrastructure, Indian scenario in respect of adequacy and quality

UNIT II INFRASTRUCTURE PLANNING:

12

Goals and objectives of infrastructure planning; Identification and quantification of the casual factors influencing the demand for infrastructure; review and application of techniques to estimate supply and demand for infrastructure; use of econometric, social and land use indicators to forecast the demand and level of service of infrastructure and its impact on land use; critical review of the relevant forecasting techniques; infrastructure planning to identify and prioritize preferred areas for development;

UNIT III INFRASTRUCTURE MANAGEMENT

6

Concepts, Common aspects of urban and rural infrastructure management systems; pavement and bridge management systems, integrated infrastructure management.

UNIT IV EMERGING TRENDS IN INFRASTRUCTURE

6

Overview of Public-Private Sector Participation in infrastructure projects, Understanding stakeholders concerns, regulatory framework, risk management in infrastructure projects, public policy for infrastructure

UNIT V SECTORAL OVERVIEW:**9**

Highways, railways, waterways, airports, urban and rural infrastructure: roads, housing, water supply, sanitation and electricity.

TOTAL:45**TEXT BOOKS**

1. George Rainer, "Understanding Infrastructure: a guide for architects and planners", Wiley-Interscience, 1990.
2. James Parkin and Deepak Sharma, "Infrastructure Planning", Thomas Telford, 2009.
3. Luis Andrews et al, "The impact of private sector participation in Infrastructure: Lights, shadows and the road ahead", World Bank Publications, 2008.
4. Robert D. Cigolini et al, "Recent advances in Maintenance and Infrastructure Management", Springer Publication, 2009.

REFERENCES

1. Jeffrey Delmon, "Private sector investment in infrastructure: Project finance, PPP Projects and risks", Kluwer Law International, 2009.
2. Neil S. Grigg, "Infrastructure Engineering and Management", John Wiley and Sons, 1988.
3. W. Ronald Hudson, Ralph Haas and Waheed Uddin, "Infrastructure Management: Design, Construction, Maintenance, Rehabilitation, Renovation", McGraw Hill Co., 1997
4. W. Ronald Hudson, Ralph Haas and Zeniswki, "Modern Pavement Management", McGraw Hill and Co, 1994.