



UNIVERSITY OF CALICUT

Abstract

Faculty of Engineering - B.Arch Degree Course - Syllabi for third to tenth Semesters - approved - implemented - with effect from 2012 admissions - orders issued.

UNIVERSITY OF CALICUT (G & A - IV - E)

U.O.No. 3916/2013/CU

Dated, Calicut University.P.O, 11.09.2013

- Read:-*1. U.O. No. GAV/E1/1439/2011 dt. 14.06.2012.
2. U.O. No. GAV/E1/1323/2012 dt. 14.08.2012.
3. Minutes of the meeting of the Board of Studies in Architecture held on 21.03.2013 (item No. 1)
4. Minutes of the Faculty of Engineering held on 24.07.2013 (item No. 2 & 4 respectively).
5. Minutes of the Academic Council held on 30.07.2013 (item No. IIF)

ORDER

As per paper read 1 above, orders were issued for implementing the Regulations of B.Arch Degree Course with effect from 2012 admissions.

Vide paper read 2 above, orders were issued for implementing the Curriculum and Syllabus of Combined first and second semester B.Arch Degree Course with effect from 2012 admissions.

The Board of Studies in Architecture at its meeting held on 21.03.2013, vide item No.1, has approved the detailed Syllabi for the third to tenth semesters of B.Arch Degree course to be implemented from 2012 admissions onwards, vide paper read 3 above.

Vide paper read as 4 above, the Faculty of Engineering at its meeting held on 24.07.2013, (vide item No. 2 & 4), approved the above resolution of the Board of Studies in Architecture held on 21.03.2013, which was approved by the Academic Council vide paper read 5th above.

Sanction has therefore been accorded for implementing the Syllabi for third to tenth Semesters for B.Arch Degree Course with effect from 2012 admissions. (The Syllabi for 3rd to 10th Semesters are uploaded in the University website)

Orders are issued accordingly.

Muhammed S
Deputy Registrar

To

The Principals of all affiliated Engineering colleges offering B.Arch course
Copy to :- PS to VC/ PA to PVC/PA to Regr/ Ex. Sn/ EG Sn/ DR- B.Tech Sn/ Dean, Faculty of Engineering/Ch'man, BOS in Architecture /System Administrator (With a request to upload in the Uty website) SF

Forwarded / By Order

Section Officer

AR12-31 ARCHITECTURAL DESIGN I

Teaching scheme

Credits: 5

9 hrs per week

The Course prepares the students to gain understanding into basic functional aspects in architectural design and develop skills to create architectural solutions for simple problems.

Objectives: _

- To understand space requirements related to human activities and study anthropometric data
- To introduce students to rules and regulations related to building design
- To introduce concept to the process of design
- To introduce students to standards and norms related to different functions
- To conceive 3 dimensional forms and establish relation to functional requirements which will result in optimal utilization of space
- To develop a basic understanding of building materials

Projects:

Two projects- one minor and one major- shall be completed during this semester and these shall have minimum complexity in terms of design and site challenges.

Minor Project: Design of simple structures like Bus Shelter/ fast food Kiosks/ Entrance Gateways/ Park Shelters etc.

Major Project: Design of a residence within a set of limited specific requirements

Process & Deliverables:

Students should attempt data collection from various reference books, carryout adequate number of relevant case studies. The concepts of architectural programming shall be introduced to assist the design process. Handmade sketches, manual drafting and scaled study models shall be made part of the design process.

Deliverables shall be manually drafted presentation drawings including free hand perspectives, scaled working models etc.

Reference:

Time saver standards, Neufert's Architectural data, KMBR

JURY WILL BE CONDUCTED AS PER THE B.ARCH DEGREE COURSE MANUAL

**AR12 – 32 BUILDING CONSTRUCTION MATERIALS &
STRUCTURAL SYSTEM- II**

Teaching scheme

Credits: 2

1 hr lecture and 2 hrs drawing per week

Objectives: Understanding of materials of construction, concrete and its properties, basic principles of construction and elements of building through theory and drawing

Module I (10Hrs)

Concrete – Aggregates – Mechanical & Physical properties and tests – Grading requirements – Water quality for concrete – Admixtures – types and uses – plasticizers – accelerators – retarders – water reducing agents – batching – mixing – types of mixers – transportation – placing – compacting – curing

Properties of concrete – fresh concrete – workability – segregation and bleeding - factors affecting workability & strength – tests on workability – tests for strength of concrete in compression, tension & flexure – mix proportioning (B.I.S method) – nominal mixes

Module II (10 Hrs)

Iron and Steel – Iron-Brief study on manufacture, composition, properties and uses of cast iron, wrought iron, pig iron – Steel: Composition, Properties, anticorrosive measures, mechanical and heat treatment of steel -Market forms of steel : Steel for Reinforcement - Hot rolled bars, CTD Bars, TMT bars , Welded wire fabrics; Steel for Pre stressed concrete; Structural steel; Stainless steel, steel alloys, current developments.

Doors and windows and Ventilators: Types - steel and aluminium- construction details - fixing of doors, windows and ventilators

Detailed drawings : Steel and Aluminium doors, windows and ventilators

Module III (15 hrs)

Lintels and arches – types and construction details. *Roofing:* Pitched and flat roofs - timber and steel trusses - fink truss and north light truss - RCC slab roof jack arch, shell, dome and folded plate roofs - Roof covering - thatching, tiling, AC sheets, GI and Aluminium sheets, FRP and RMP sheets and modern roofing.

Detailed drawings – Types of Arches, Truss – King post truss, Queen post truss, Steel-angular and tubular truss, details of covering and gutter details.

Module IV (12hrs)

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

Text books

1. Punmia B.C ,” Building construction”
2. Arora & Bhindra, “building construction”
3. Rangwala, “Building Materials”
4. Shetty M.S., “Concrete Technology”
5. Balagopal T.S. Prabhu, “Civil Engineering Drawing Hand book”

References

1. Huntington W.C.,”Building Construction "
2. Mackey. "Building construction"
3. Barry R., "The construction of Buildings (Vol. I-V)"
4. Chudly R, “Construction technology”
5. Neville A.M.and Brooks.J.J, “Concrete Technology, "
6. Krishna Raju N, “Design of Concrete Mixes”
7. Relevant BIS Codes

Sessional Requirements

Assignments	= 70 marks
2 Tests	= 20 marks
Regularity	= 10 marks
Total	= 100 marks

University examination pattern

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

AR12-33 HISTORY OF ARCHITECTURE – II

Teaching scheme

Credits: 3

3 hrs per week

Objectives: The objective of the course is to develop an understanding of appreciation of Islamic architecture and its influence in India's local and regional history of architecture, its changes in social processes and lifestyle. Architecture is to be seen as an important and long lasting by-product of development of civilization by understanding the role of technology, construction techniques, climate and materials with inherent visual aspects like spatial organisation, scale, compositional organisation, Architectural vocabulary and design grammar.

Module I (10 hrs)

A brief introduction into origin & characteristics of Islamic architecture: building types, elements, structural systems, construction techniques.

Islamic Architecture of

Syria and Egypt- Great Mosque of Damascus, Syria , Dome of the Rock, Jerusalem ,

The Mosque of Ahmad Ibn , Tulun, Cairo

Persia - The Masjid-i Shah, Isfahan

Spain - The great mosque at Cordoba. The Alhambra

Morocco -King Hassan II Mosque, Casablanca

Module II (10 hrs)

Beginning of Islamic Architecture in India

Islamic Architecture in Delhi (Imperial Style)

Slave dynasty -Quwat-ul-Islam mosque, Qutb Minar, Mosque at Ajmer, Sultan Ghari, Tomb of Iltumish, Tomb of Balban.

Khilji Dynasty -Alai Darwaza., Jamat Khana masjid

Tughlaq dynasty -Tomb of Ghias-Ud-din, City of Tughlaqabad, City of Firoz shah Kotla, Khirki Mazjid.

Sayyid and Lodi dynasty-Tomb of Mubarak shah, tomb of Mohamed Sayyid,

Garden tomb of Sikander Lodi , Bara Khan Ka Gumbad, Chota Khan Ka Gumbad, Shish Gumbad, Bara Gumbad.

Module III (10 hrs)

Provincial styles:

Punjab -Tomb of Shah Rukhn-I-Alam.

Jaunpur -Atala Masjid, Jami Masjid

Bengal -Dakhil Darwaza, Firoze Minar, and Adina Masjid.

Gujarat	-Jami Masjid, Teen Darwaza, Well retreats of Ahmedabad.
Malwa	-Hindola mahal ,Jami Masjid at Mandu, Jahaz Mahal, Hawa Mahal
Deccan	- Charminar at Hyderabad, Tomb of Golconda.
Bijapur	- Jami Masjid, Golgumbaz.

Module IV(10 hrs)

Evolution of Mughal style and the different eras of rule:

Early period	-Babar, Humayun, Shershah
Akbar	- Tomb of Humayun, Jahangir Mahal Agra, Fatehpur Sikri - city planning & the various structures inside
Jahangir	-Akbar's tomb.
Shah Jahan	-Red fort at Agra, Taj Mahal, City of Shahjahanabad(Delhi fort), Jami Masjid at Delhi.
Aurangazeb	-Tomb of Rabi Durrani at Aurangabad, Moti Masjid at Delhi fort.

Reference books

1. Percy Brown , 'Indian Architecture (Islamic Period)' ,D.B. Taraporevala Sons & Co. Private Ltd., Bombay, 1997.
2. Satish Grover , 'Islamic Architecture in India', CBS Pub, New Delhi, 2002
3. Banister Fletcher, Dan Cruickshank Sir Banister Fletcher's a History of Architecture, Architectural Press, 1996
4. Christopher Tadgell , 'The History of Architecture in India', Phaidon Press Ltd, 1994.
5. John Julius Norwich : Great architecture of the world
6. Stephen Gardiner: Introduction to architecture
7. Henri Sterlin : Encyclopedia of world Architecture

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

- QI - 8 short type questions of 5 marks, 2 from reach module.
 QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.
 QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.
 QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.
 QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12-34 BUILDING CLIMATOLOGY

Teaching scheme

Credits: 3

3 hrs per week

Objective: The objective of the course is to develop an understanding and appreciation of climate and its influence on built form and architecture of a region. The role of technology and locally available building materials in shaping of the local vernacular and traditional styles shall be studied and documented to understand the impact of climate on inherent visual aspects like spatial organization, Scale, Compositional organization, Vocabulary and Design grammar of architecture.

Module I (9 hrs)

Elements of Climate and Climatic Factors: Climate- Macro and micro climate- elements of climate- temperature, humidity, vapour pressure, precipitation, solar radiation and wind - Measurement, representation techniques of climatic data and implication of climatic elements in design – Global Climatic zones and architectural design considerations in different zone, Site climate-Influence of terrain features, vegetation and manmade objects in changing Site climate. Global wind pattern-Trade wind, westerly and polar winds, Reason for seasonal change - Tilt of earth, solar radiation quantity

Module II (9 hrs)

Design Criteria for Comfort Environment: Mechanism of comfort in human system in various climatic environments, comfort indices, concept of effective temperature, its correction and application- comfort scales, bio-climatic chart- solar charts- orientation of building, structural controls like design of openings, shading devices, glazing and louvers, Use of Mahoney's table in design.

Module III (12 hrs)

Heat Load in Built Environment: Heat flow through building: Mechanism of heat flow - Thermal characteristics of common building materials and building components Concept of sol-air temperature - conductance of heat through building envelope, Heat gain and heat loss, Design of building for thermal comfort, Passive design techniques in built and un-built environment.

Module IV (10 hrs)

Lighting and Ventilation: Function of ventilation, standard provision for ventilation - Wind effect and stack effect - cross ventilation and air movement - Orientation, external and internal features, position and size of openings, ventilation ducts Precipitation, driving rain index,. Climate and lighting, Daylight factor concept, design variables - Day-lighting requirements, daylight protractors, different prediction techniques.

Reference books

1. Koenigsberger : Manual of tropical housing and building
2. V. Olgyay : Design with Climate
3. B. Givoni : Man, Climate and architecture
4. Martin Evans : Housing, Climate and Comfort
5. G Z Brown: Sun, Wind and Light

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12 – 35 THEORY OF DESIGN –II

Teaching scheme

Credits: 3

2 hrs per week

Objective: To provide the student an understanding of the fundamentals of architecture and to learn philosophies of architectural design developed over the years in the history of architecture and structure.

Module I (15 hrs)

Architectural theory in historical perspective: Pragmatic design, Iconic Design, Analogical Design, Canonic Design

Module II (05 hrs)

Society and design: Role of designer in the society. Design for performance, Behavioural Aspects of Design

Module III (10 hrs)

Creativity and design : Concepts of creativity, Issues of creative design, Impact of computer applications on creativity and design

Module IV (10 hrs)

Contemporary movements in architecture: Organic architecture, Modern and Post modern movements in Architecture Deconstruction

Text books

1. Scott- Design fundamentals
2. G .Broadbent – Design in Architecture

References

1. Garry Stevens – The reasoning Architect
2. K.W.Smithies, *Principles of Design in Architecture*, Van Nostrand Reinhold Company , 1981
3. Sam F. Miller, *Design Process - A Primer For Architectural & Interior Design*, Van Nostrand Reinhold Company , 1995
4. Ernest Burden, *Elements of Architectural Design – A Visual Resource*, Van Nostrand Reinhold Company,1994
5. V.S.Pramar, *Design Fundamentals in Architecture*, Somaiya Publications, New Delhi, 1973
6. Y.Ashihara – Exterior design in Architecture
7. Diane Ghirardo – Architecture after Modernism

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module I with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module II with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR 12 – 36 THEORY OF STRUCTURES - I

Teaching scheme

Credits: 3

2 hrs lecture and 1 hr tutorial per week

Objective: The objective of the course is to develop an understanding of fundamentals of stress, strain, force, compression, tension, loads etc. and their related mathematical applications and theorems applied in structural design.

Module I (15 hrs)

Tension, Compression and Shear: Types of external loads, self weight internal stresses, normal and shear stresses, strain, Hooke's law, Poisson's ratio, relationship between elastic constants, stress-strain diagrams, working stress, elongation of bars of constant and varying cross sections, thermal stresses.

Analysis of Stress and Strain: Stress on inclined planes for axial and bi-axial stress fields, principal stresses, Mohr's circle of stress, principal stresses.

Module II (14 hrs)

Bending Moments and Shearing Forces: Different types of beams, Shear forces and bending moment diagrams for simply supported, Cantilever and Over hanging beams, Relationships connecting intensity of loading, Shear force and bending moment.

Stresses in laterally Loaded Symmetrical Beams: Theory of simple bending, limitations, bending stresses in beams of different cross sections, moment of resistance, beams of uniform strength, beams of two materials, principal stresses in bending, strain energy due to bending, shearing stresses in bending

Module III (12 hrs)

Deflection of beams: Differential equation of the elastic curve, slope and deflection of beams by method of successive integration, Macaulay's method, moment area method

Deflection of beams by strain energy method, virtual work, principle of virtual displacement, principle of virtual work for deformable bodies -application to simple beams

Module IV (10 hrs)

Torsion: Torsion of circular and hollow shafts, power transmission

Theory of columns: Axial loading of short strut, Long columns, Euler's formula, Rankine's formula, eccentric loading, direct and bending stresses

Reference books

1. F.V.Warnock : Strength of materials (Sir Isaac Pitman Sons Ltd.)
2. E.P. Popov : Mechanics of materials (SI Version, Prentice Hall, India)
3. William. A. Nash : Strength of materials (SI Version, Schaum's Out line Series)
4. S.S. Bhavikkatti : Structural Analysis, Vol. I, Vikas Publishing House Pvt. Ltd.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module I with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module II with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12-37 VERNACULAR ARCHITECTURE

Teaching scheme

Credits: 2

2 hrs per week

Objectives:To introduce the study of vernacular architecture as a process.To provide an overview of the various approaches and concepts to the study of vernacular architecture.To study the regional vernacular architecture forms.

Module I (9 hours)

Introduction, Approaches and Concepts

Definition and classification of Vernacular architecture – Vernacular architecture as a process-
Cultural and contextual responsiveness of vernacular architecture: an overview
Different approaches and concepts to the study of vernacular architecture: an over view –
Aesthetic, Architectural and anthropological studies in detail

Module II (9 hours)

Vernacular Architecture of Kerala –Residential

Study of factors that shape the architectural character of region- geographic, climatic, social, economic, political and religious aspects of the period with special reference to the region of Kerala

Evolution of early forms of Kerala architecture.

Typologies: ekasala, dwisala, , trisala, chaturasala, etc – palatial complexes- Padmanabhapuram palace, Thuckalay. Krishnapuram palace Kayamkulam

Module III (12 hours)

Vernacular Architecture of Kerala –Religious

Evolution and morphology of religious architectural form - Early Hindu Temples, Churches, and Mosques.

Temple arts performance centres - Kalithattu, Koothambalam, etc

Module IV (12 hours)

Vernacular Architecture of India

Forms ,spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following:

Havelis of Rajasthan

Bohra Houses of Gujarat

Banglas(village huts) of Bishnupur, Bengal

Chettinad Houses of TamilNadu

References

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
2. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.
3. R W Brunskill: Handbook on Vernacular Architecture, 2000
4. V.S. Pramar, Haveli – Wooden Houses and Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
5. Kulbushanshan Jain and Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad 1992.
6. G.H.R. Tillotsum – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.
7. Carmen Kagal, VISTARA – The Architecture of India, Pub: The Festival of India, 1986.
8. S. Muthiah et al, The Chettiar Heritage; 2000
9. Thampuran, Ashalatha. (2001). *Traditional Architectural Forms of Malabar Coast*, Calicut : Vastuvidya Prathishtanam
10. The Bungalow in Twentieth Century India Desai et al ,Ashgate Publishing Ltd, 2012
11. Desai, Madhavi. (2007). *Traditional Architecture: House Form of the Islamic Community of Bohras in Gujarat*, Pune: Design Directions Pvt. Limited.
12. H Sarkar ,An Architectural Survey Of Temples Of Kerala Pub: Archeological Survey Of India, 1978

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

- QI - 8 short type questions of 5 marks, 2 from reach module.
 QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.
 QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.
 QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.
 QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12-38 C A A D LABORATORY –I

Teaching scheme

Credits: 2

2 hrs per week

Objectives

- 1) Learning of CAD software by doing graded exercises
- 2) Linking data and attribute management
- 3) Preparation of hardcopy of drawing in normal architectural scales.

Projects:

Suggested Projects for the lab:

- 1) Graded exercises - measured drawing, site plan, Component details. Lettering and Dimensioning, Layering standards.
- 2) Preparation of a Database and parametric cost estimating
- 3) Municipal drawing preparation for a medium size residence

Exercises:

1. Starting up- Drawing I- Drawing Measured drawing (plan and section) of a room.
2. Architectural Drawing II- Drawing Plans, section and elevation of Residence design project
3. Starting up- Preparing estimation of Residence design project
4. Architectural Drawing III- Preparing drawings for approval of Apartment Design Project

Reference Books:

1. AutoCAD manual
2. Lab Manual
3. Kolareric Branko, Architectural Rendering and Modelling with AutoCAD, John Wiley, New York, 1998.
4. Synder James, Architectural Construction Drawings with AutoCAD, John Wiley, New York, 1998.

Sessional Requirements:

Class work Exercises = 60 marks

Lab Series test = 2X15 = 30 marks

Attendance = 10 marks

Total = 100 marks

AR12 39 BUILDING SERVICES-I :Water Supply and Sanitation

Teaching scheme

Credits: 2

3 hrs per week

Objective: The objective of the course is to develop an understanding of fundamentals of environmental engineering-water supply and sanitary engineering-students will learn about sources of water, water treatment , waste water treatment, solid waste management etc.

Module I (8 hrs)

Water Supply Engineering – Quantity of water, types of water demand, fluctuation in demand, factors affecting consumption, forecasting population – design period.
Sources of water – surface water sources, intakes, ground water sources.

Module II (16 hrs)

Quality of water – drinking water standards – physical, chemical and bacteriological analysis of water. Treatment of water – aeration, coagulation, flocculation, sedimentation, filtration, disinfection. Miscellaneous and advanced treatment methods – removal of iron and manganese, fluoridation and defluoridation, water softening, arsenic removal, desalination, membrane filtration. Transmission of water-gravitational, pumping and combined schemes. Lay out of distribution networks, intermittent and continuous systems of distribution-laying, testing and maintenance of distribution pipes.

Module III (12 hrs)

Wastewater characteristics –different types of oxygen demand.
Preliminary treatment of wastewater – screens, grit chamber, detritus tank, sedimentation tank.
Biological treatment - Activated sludge process, Trickling filter, Oxidation pond.
Anaerobic treatment- Anaerobic digesters, Septic tank and soak pit.

Module IV (12 hrs)

Sewers- sewer appurtenances, laying, testing and maintenance of sewers.
Systems of sewerage-separate, combined and partially combines systems, conservancy and water carriage systems
Wastewater disposal – disposal into land, water bodies-stream, ocean -disposal by irrigation – sludge treatment and disposal.
Solid waste management-sanitary land fill, incineration, composting
Sanitary plumbing - sanitary fixtures, systems of piping, house drainage, connection of house drains and street sewers.

Text books

1. Modi, P. N., Sewage Treatment and Disposal and Wastewater Engineering, Standard Book House, New Delhi, 2008.
2. Birdie, G. S., and Birdie, J. S., Water Supply and Sanitary Engineering, Dhanpat Rai and Sons, New Delhi, 2007.
3. Garg, S. K., Environmental Engineering, Vol. II, Khanna Publications, New Delhi, 2009.
4. Duggal, K. N., Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi, 2008.

Reference books

1. Mark J. Hammer and Mark J. Hammer Jr., Water and Waste Water Technology, Prentice Hall of India Pvt. Ltd. New Delhi, 2009.
2. Ernest W. Steel and Terence J. Mc Ghee, Water Supply and Sewerage, McGraw Hill, New York, 1991.
3. Ehlers, V. M. and Steel, E. W., Municipal and Rural Sanitation, McGraw Hill, 2009.
4. Fair, Geyer and Okun, Water and Wastewater Engineering, John Wiley and sons, Inc., 2010
5. Metcalf and Eddy, Wastewater Engineering Treatment, Disposal and Reuse, Tata McGraw Hill, 2007.
6. Kiely, G., Environmental Engineering, McGraw Hill, McGraw Hill, 2009.
7. Relevant BIS Codes.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short questions of 5 mark each module

QII -2questions of 15 marks from module I with choice to answer any one.

QIII -2 questions of 15 marks from module II with choice to answer any one.

QIV -2 questions of 15 marks from module III with choice to answer any one

QV -2questions of 15 marks from module IV with choice to answer any one

AR12-41 ARCHITECTURAL DESIGN II

Teaching scheme
9 hrs per week

Credits: 5

The Course prepares the students to relate architectural design to surroundings and how to respond to climatic challenges. Evolution of concept for each design project shall be followed. Introduction to Cost effective building materials and techniques.

Objectives:

- To understand the climatic and topographic aspects related to site and how they influence the design
- To introduce students to rules and regulations related to building design
- To enable students to play with light, texture, color etc so as to optimize the functionality of space.
- To enable students to understand various building materials in the perspective of cost effectiveness and response to climate.
- To introduce concept to the process of design

Projects:

A minimum of two projects shall be completed during the semester. These shall be 2-3 storied buildings including Row houses or walk up apartments/ primary school/community halls/ Petrol pump+ Amenities/Drive in restaurants and motels/gym or health club.

Process and deliverables:

Students should conduct data collection from various reference books, carryout adequate no of relevant case studies; carry out detailed site analysis before attempting design. Formulation of a detailed design brief, evolution of Concept shall be part of the architectural programming. Handmade sketches, manual drafting and scaled study models shall be made part of the design process.

Deliverables shall be manually drafted presentation drawings including free hand perspectives, graphical representation of concept, scaled models etc.

Reference:

Kerala Building Rules, National Building Code, Time Saver Standards, Neufert's Architectural data and other data books

JURY WILL BE CONDUCTED AS PER THE B.Arch DEGREE COURSE MANUAL

**AR12 – 42 BUILDING CONSTRUCTION MATERIALS &
STRUCTURAL SYSTEM- III**

Teaching scheme

Credits: 2

1 hr lecture and 2 hrs drawing per week

Objectives: Understanding of materials of construction, Vertical transportation systems, basic principles of construction equipments etc.,

Module I (13Hrs)

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

Module II(10Hrs)

Introduction to vertical transportation system – Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral, helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever - foundations, finishes for staircases-

Design of staircases – details of RCC, wood, steel staircases – fixing details and specifications – detailing out of handrails and balusters – materials and fixing details.

Detailed drawings –RCC, wood and steel staircases.

Module III(13Hrs)

Lifts – Calculation of requirements and number of lifts considering quality and quantity of services – details of construction of lift shaft, lift pit, lift car – machine room etc. Standard sizes – Lifts of various types such as passenger, goods, hospital etc. Modern development in the field of vertical transportation – Capsule lift.

Escalator – Different types – provision to be made during construction – installation of escalator.

Detailed drawings –Typical lift shaft, lift pit and machine room details, Capsule lift, Escalator details

Module IV (12 Hrs)

Construction Equipment and Methods: Use, types, operational characteristics and maintenance of construction equipment such as excavation equipment, hauling equipment, hoisting equipment, and compaction equipment Care and maintenance of scaffolding system - Detailed study on construction techniques of special foundation and underground construction.

Detailed drawings - scaffoldings and underground construction methods

Text books

1. Punmia B.C ,” Building construction”
2. Arora & Bhindra, “building construction”
3. G S Birdie, T D Ahuja, “Building Construction and Construction Materials”
4. Balagopal T.S. Prabhu, “Civil Engineering Drawing Hand book”
5. Purifoy R L “Construction Planning Equipment”

References

1. Huntington W.C.,”Building Construction ”
2. Mackey. "Building construction"
3. V S Foster “advanced building construction”
4. Mitchel “ Advanced building construction”
5. Relevant BIS Codes

Sessional Requirements

Assignments	= 70 marks
2 Tests	= 20 marks
Regularity	= 10marks
Total	= 100 marks

University examination pattern

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

AR12-43 HISTORY OF ARCHITECTURE – III

Teaching scheme
3 hrs per week

Credits: 3

Objectives: To study the influences of events which have led to the outcome of styles such as Romanesque, Gothic & Renaissance and their architects in Italy, France and Britain comprehending the rich vocabulary of forms & shapes and structural systems.

To introduce the various movements and philosophies which shaped the beginning of Modern Architecture and to expose the students to various concepts of architects and evolution of building typologies after industrial revolution?

Module I (8hours)

Early Christian Architecture: Evolution of Church form, surface treatment and materials of construction, Old St. Peters Basilica

Byzantine Architecture: Greek cross and Latin cross plans, Technique adopted to construct domes, surface treatment and material of construction. Pendentives and Squinch arch construction, e.g., Hagia Sophia, St. Marks Venice

Romanesque Architecture: Design evolution, Planning principles and structural details of Romanesque architecture. Types-Italian Romanesque architecture (Pisa Cathedral Complex), French Romanesque (Abbey-Aux-Hommes at Cane), British Romanesque (Durham's Cathedral).

Module II (10hours)

Gothic Architecture: Evolution of structural systems in Gothic Architecture – pointed arches, ribbed vaults, flying buttress, pinnacles etc; Types-French Gothic Architecture (Notre Dame (Reims Cathedral), Paris), British Gothic Architecture (West Minister Abbey, Salisbury Cathedral), Italian Gothic Architecture (Milan Cathedral)

Renaissance Architecture: Introduction of different styles existed in renaissance period, The Idea of rebirth and revival of Art, Architectural character during Renaissance period.

Italian renaissance – St. Peters Rome, Dome of Florence Cathedral .

Works of Brunelleschi, Alberti, Bramante and Michael Angelo

Palaces and Villas Palladio's contribution – Villa Rotunda

French renaissance: Palace of Louvers, Paris de Versailles.

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

Contributions of Inigo Jones and Christopher Wren

Module III (8hours)

Post Renaissance Architecture in Europe: Industrial revolution – Causes, consequence and impact in Architecture – Its influences in building, technology and modern building materials Steel, glass, RCC etc. Demand for new types of building, influence of technology in culture

Advances in Engineering - Crystal Palace Hyde Park, Eiffel tower, Galleries des machines
Art and Craft movement of William Morris – Red House, Philip Webb
Art Nouveau - Victor Horta, Antoni Gaudi
Adolf Loos and critique of ornamentation

Module IV (12hours)

Modern Architecture: Introduction to Modern Architecture-Chicago School of Architecture, Bauhaus School, and Taliesin School of Architecture
CIAM Congresses and Declarations - Great masters like Louis Sullivan, Frank Lloyd Wright, Le Corbusier, Walter Gropius, Mies Vander Rohe.
Contributions of Auguste Peret (Classical Rationalism), Peter Behrens (Werkbund)
Futurist Movement Manifestos and the works of Sant'Elia
Expressionism and the works of Eric Mendelson
Impressionism, Cubism, Constructivism and its influence on Architecture
Destijl Movement : Ideas and works - Schroder House

References

1. Sir Banister Fletcher's – "A History of Architecture", Architectural Press, 1996
2. Louis Grodecki – "Gothic Architecture", Rizzoli, 1991
3. History of World Architecture (Series), Vols. Titled "Ancient Architecture, Primitive Architecture, Greek Architecture, Roman Architecture and Byzantine Architecture", 1980.
4. Kenneth Frampton : Modern Architecture -A Critical History
5. "Builders of Ancient World", A National Geographic Society Publication, 1986.
6. Raeburn Micheal, "Architecture of the Western World", Popular Press, England, 1988.
7. John Jurious Norwich: Great Architecture of the World
8. Stiefen Gardiner : Introduction to Architecture
9. Monographs of Modern Architects
10. Henri Sterlin : Encyclopedias of World Architecture

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

QI – 8 short type questions of 5 marks, 2 from each module
QII – 2 questions of 15 marks from module I with choice to answer anyone
QIII – 2 questions of 15 marks from module II with choice to answer anyone

QIV– 2 questions of 15 marks from module III with choice to answer anyone

QV– 2 questions of 15 marks from module IV with choice to answer anyone

AR 12-44 LAND SURVEY

Teaching scheme

Credits: 3

3 hrs per week

Objective:To understand the fundamental concepts and methods of surveying using basic & advanced instruments for surveying and levelling.

Module 1(10 hours)

General principles and classification of surveying-- Chain survey: instruments - ranging and chaining of lines – chain survey procedure – recording and field notes – plotting – conventional signs.

Compass survey - Description, use and adjustments of prismatic and Surveyors compass – True magnetic meridians, bearings –local attraction – compass traverse - plotting - errors and adjustments.

Module II (12 Hours)

Plane Table Survey: Instruments and other accessories - different methods of plane table surveying - two and three point problem and solutions.

Levelling - levelling instruments - temporary and permanent adjustments of dumpy and tilting level - levelling procedure – plotting of LS and CS contouring and plotting – Study of Auto levels.

Module III (13 Hours)

Theodolite surveying - study of vernier theodolite - temporary and permanent adjustments - measurement of horizontal angles by repetition and reiteration - measurement of vertical angles - theodolite traverse procedure -calculation of co ordinates - plotting

Tacheometric surveying – stadia system – fixed and movable hair methods – staff held vertical & normal – determination of instrument constants – use of direct reading tacheometer.

Module IV (10 Hours)

Introduction to Total Station Surveying-Advantages and disadvantages of Total Station Surveying-Fundamental Parameters of Total Station-Precautions to be taken while Using Total Station-Field Equipments.

Measurements of areas and volumes – computation of area by geometrical figures – by ordinates– trapezoidal and prismoidal formula for volumes – determination of quantities for excavation .

Reference books:

1. *Surveying Vol. I,II&III*, by Kanetkar T.P.
2. *Surveying Vol. I &II*, by Punmia B.C.
3. *Advanced Surveying* by Satheesh Gopi,R.Sathikumar & N.Madhu

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

QI – 8 short type questions of 5 marks, 2 from each module

QII – 2 questions of 15 marks from module I with choice to answer anyone

QIII – 2 questions of 15 marks from module II with choice to answer anyone

QIV– 2 questions of 15 marks from module III with choice to answer anyone

QV– 2 questions of 15 marks from module IV with choice to answer anyone

AR12-45 SOCIOLOGY & ECONOMICS

Teaching scheme

2 hrs per week

Credits: 2

Objectives: To familiarize the students with the basic concepts of sociology & Economics and their influence on architecture

Module I (8hours)

Introduction to sociology: Primary concepts-Society, Community & Institution

Social Processes: Co-operation, Conflict, Competition, Accommodation, Assimilation & Progress

Module II (8hours)

Culture & Concepts related to culture: Cultural lag, Deviant sub culture, Sanskritization

Socialization: its importance and problems of faulty socialization

Social change: factors of social change, social changes in Kerala, sociological insights into the current pattern of housing, Social differentiation, Social mobility, Social disorganization & Social problems

Module V (8hours)

Introduction to Engineering Economics- Technical efficiency, Economic efficiency-cost concepts: Elements of costs, opportunity cost, sunk cost, private and social cost, Marginal cost, Marginal revenue, Profit maximization, Break even analysis.

Supply and Demand: Determinants of demand, Law of demand, Determinants of supply, Law of supply, Market equilibrium. Elasticity of demand- Types of elasticity, Factors affecting the price elasticity of demand.

Module VI (8hours)

Time value of money: Interest formulae and their applications-Single-payment compound amount factor, single-payment present worth factor, Equal payment series compound amount factor, Equal -payment series sinking fund factor, Equal -payment series present worth factor, Equal -payment series capital recovery factor, Effective interest rate.

Investment criteria: Net present value, Internal rate of return, Benefit-cost ratio, Pay Back period, Accounting Rate of return.

References

1. Sociology: C N Sankar Rao (1990) S chand & Company, New Delhi
2. Fundamentals of Sociology: P Gisbert (2010), Orient Blackswan, New Delhi
3. Sociology: Giddens Anthony (2005), Polity press
4. Indian Social System : Ahuja Ram (2001), Rawat Publication, New Delhi
5. Modernization of Indian Tradition: Singh Y (1983), Rawat publications, Jaipur
6. Sociology, A guide to problem & literature: Bottomore T B (1972), George Allen & Unwin, Bombay
7. Social change in modern India : M N Srinivas (1985) Orient Longman, New Delhi
8. Women & Kinship, Comparative perspectives on Gender in South & South east Asia, Dube Leela (1997), Sage Publication, New Delhi

9. Engineering Economics, Paneer Selvam R, (2001) Prentice Hall of India Ltd, New Delhi
10. Managerial Economics 7/E Dwivedi D N(2009) Vikas Publishing House
11. Engineering Economics 14/E Sullivan, W G Wicks, M W and Kowling C.P, (2011) Pearsonl, New Delhi
12. Financial Management, Theory & Practice 8/E, Prasanna Chandra, (2011) Tata-McGraw Hill

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

- QI – 8 short type questions of 5 marks, 2 from each module
- QII – 2 questions of 15 marks from module I with choice to answer anyone
- QIII – 2 questions of 15 marks from module II with choice to answer anyone
- QIV– 2 questions of 15 marks from module III with choice to answer anyone
- QV– 2 questions of 15 marks from module IV with choice to answer anyone

AR 12 – 46 THEORY OF STRUCTURES - II

Teaching scheme

Credits: 3

2 hrs lecture and 1 hr tutorial per week

Objective: The objective of the course is to develop an understanding of analysis of different types of structural systems, and the theories and principles that govern the design of such structures. The study should be application oriented, finding references in structural design of architectural design problems attempted in the studio.

Module I (15 hours)

Statically Determinate and indeterminate Structures: Degree of indeterminacy-Determination of degree of statical indeterminacy of beams, pin jointed trusses and rigid frames- Introduction to force and displacement method of analysis.

Consistent Deformation Method: Introduction to consistent deformation method, Analysis of propped cantilever and fixed beams using consistent deformation method

Clapeyron's Theorem (Three Moment Equation): Derivation of three-moment equation, application of three-moment equation for analysis of continuous beams under the effect of applied loads and uneven support settlements.

Module II (15 hours)

Displacement Method of Analysis : Slope deflection method-analysis of continuous beams-beams with overhang –beams with settlement effect- Frames with sway and without sway (simple portal frames with vertical legs only); Moment distribution method-analysis of continuous beams-beams with overhang –beams with settlement effect- non sway frames.

Module III (10 hours)

Kani's Method of Analysis: Kani's method of analysis applied to continuous beams-beams with overhang-beams with settlement effect-non sway frames

Approximate Method of Analysis of Multistoried Frames: Substitute frames-loading condition for maximum hogging and sagging moments in beams and maximum bending moments in columns. (Theory only)

Module IV (12 hours)

Introduction to Plastic theory: Introduction- plastic hinge concept- plastic modulus- shape factor- redistribution of moments- collapse mechanisms- plastic analysis of beams by equilibrium and mechanism methods.

Reference Books

1. J.SKinney : Indeterminate Structural Analysis (Oxford and IBH).
2. C.K.Wang : Indeterminate Structural Analysis.(McGraw Hill International Edition)
3. Vaziarani & Ratwani: Analysis of Structures-Vol II (Khanna Publishers)
4. Norris & Wilbur : Elementary Structural Analysis. (McGraw Hill International Edition)
5. S.S. Bhavikkatti : Structural Analysis, Vol. I & II, Vikas Publishing House Pvt. Ltd.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

- Q I - 8 short type questions of 5 marks, 2 from each module
Q II – 2 questions of 15 marks from module I with choice to answer anyone
Q III - 2 questions of 15 marks from module II with choice to answer anyone
Q IV - 2 questions of 15 marks from module III with choice to answer anyone
Q V - 2 questions of 15 marks from module IV with choice to answer anyone

Teaching scheme
2 hrs per week

Credits: 2

Objectives: Buildings science laboratory practical sessions are to introduce use of various equipments and materials used, for understanding a buildings performance in terms of structural strength, illumination levels of spaces, acoustical qualities, thermal properties of materials etc.

Course Content:

1. Tests on Cement

- a) Fineness of cement
- b) Normal Consistency
- c) Initial Setting time of Cement
- d) Final Setting time of Cement

2. Tests on aggregate for Concrete

Bulking of Sand

3. Properties of Fresh Concrete- Workability tests

Slump Test

4. Measurement of illumination levels from a point source by using lux meter

5. Wet and dry bulb thermometer

6. Determination of air circulation of room by using anemometer

7. Finding the maximum and minimum temperature of given location by using maximum and minimum thermometer

Sessional Requirements:

Laboratory work Marks	: 50 marks
Record	: 10 marks
Tests	: 30 marks
Regularity	: 10 marks
Total	: 100 marks

AR12-48 C A A D LABORATORY –II

Teaching scheme
2 hrs per week

Credits: 2

Objectives: To equip the students with skills required in using computer as a digital media for design and preparation of 3D images of Architectural drawings and structures

Projects:

Suggested Projects are:

1. Introduction to 3D Modeling and integrating Architectural design with 3D model building and generating 2D drawings using application software like AUTOCAD, SKETCHUP, REVIT, ARCHICAD Etc.
2. Elementary animation- Walk through a small structure.
3. Basic understanding of other applicable software for energy auditing, building simulation, introduction to GIS like ArcGIS, Mapinfo, and design build etc.

Exercises:

1. Architectural Drawing III- Preparing three dimensional drawing of Residence design project
2. Presentation I- Preparing rendered image of Residence Design Project
3. Presentation II- Preparing a simple walkthrough of Residence Design project.
4. Starting up- Spatial analysis and Data Management

Reference books:

1. AutoCAD Manual
2. Lab Manual
3. Sketchup Manual
4. GIS Arcview Manual

Sessional Requirements:

Class work -Exercises = 60 marks

Lab Series test = 30 marks

Regularity = 10 marks

Total = 100 marks

AR 12-49 SURVEY PRACTICAL

3 hours practical per weak

Credits :2

Objective: To impart training in Chain, Compass, Plane table surveying & Leveling, theodolite, total station

List of exercises

1. Chain Survey Traversing and plotting of details
2. Compass Survey Traversing with compass and plotting
3. Plane table survey-plotting by radiation and intersection method
4. Leveling Fly leveling- plane of collimation method and rise &fall method
5. Leveling Longitudinal and cross sectioning
6. Leveling -Contour surveying
7. Theodolite : study of instrument, temporary adjustments, measurement of horizontal angles
8. Heights and distances by stadia tacheometry
9. Study of modern instruments - Automatic levels&Total station .
10. Horizontal and vertical angles, Horizontal distance, Level difference, traversing & Area calculation using total station
11. Setting out of building plans using total station

Sessional Requirements:

Class work -Exercises	= 60 marks
Test	= 30 marks
<u>Regularity</u>	<u>= 10 marks</u>
Total	= 100 marks

Note: A term project, like an application oriented field survey, is to be completed as part of this practical subject.

AR12-51 ARCHITECTURAL DESIGN III

Teaching scheme
9 hrs per week

Credits: 7

The Course prepares the students to conceive larger public spaces and multi functional complexes with an emphasis on physical context and exploration of architectural vocabulary. Students shall be made to understand the fire and safety aspects for low rise buildings, earthquake resistant design methods. The sustainability concepts in architecture are also introduced during this semester.

Objectives:

- To understand the complexities related to designing public spaces
- To study the feasibility with respect to surrounding/neighboring locality
- To introduce MEP services, acoustics and other specialized inputs required during design process
- To understand various materials used for façade treatment and their design considerations
- To outline possible intervention areas of sustainability considerations in design and understand LEED, IGBC and Griha rating systems
- To understand the role of architect as primary consultant for a project and co-ordinate with various other consultants offering specialized services

Projects:

A minimum of two projects shall be completed during the semester. These shall be multi storied buildings including Convention centres/ clubhouses/ medium sized office complexes/ Bus stations/ assembly halls or auditoriums

Process and deliverables:

Students should conduct data collection from various reference books, carryout adequate no of relevant case studies; carry out detailed site analysis before attempting design. Formulation of a detailed design brief, evolution of Concept shall be part of the architectural programming. Energy saving measures used in the design shall be listed by students. Students shall use assistance of various computer softwares during the design and presentation.

Deliverables shall be computer assisted presentation drawings including 3d massing and graphical representation of concept explanation and design evolution, computer rendered perspectives etc.

Reference:

Kerala Building Rules, National Building Code, Time Saver Standards, Neufert's Architectural data and other data books.

JURY WILL BE CONDUCTED AS PER THE B.ARCH DEGREE COURSE MANUAL

AR12 – 52 BUILDING CONSTRUCTION MATERIALS &

STRUCTURAL SYSTEM- IV

Teaching scheme

Credits: 3

2 hrs lecture and 3 hrs drawing per week

Objectives: Understanding of materials for finishes, Damp proofing, concrete construction, basic principles of prestressed concrete and framed structures. Impart required exposure to various constructions through visits to construction sites, batching plants etc.

Module I(10Hrs)

Materials for Finishes-Wall and roof finishes - properties – application - maintenance –Study of advances in field of materials- Finishes in plasters, cement, timber etc. – epoxy, polyurethane products.

Flooring: Construction details of timber, jack arch, and different types of RCC floors.

Floor coverings: Stone and brick pavings - Tiles, timber, mosaic, rubber, linoleum, cork and PVC floor coverings - Specification and details of construction of different floor finishes - Repairs of flooring - Carpets types and laying techniques

Natural Floor Finishes – Shahabad, Kotah- different types of Marble, Granite etc.

Artificial Floor Finishes – Ceramic tiles, Mosaic tiles, Cement tiles, etc.

Detailed drawings Timber floors, carpet fixing details .

Module II (15Hrs)

Concrete Construction -Formwork for concreting - Reinforcement - cutting, bending and placing of reinforcement - striking of formwork - finishing of surfaces - pre-cast and cast-in-situ construction

Prestressed Concrete - Precast prestressed construction for large span structures –Constructional details of various structures in steel, concrete- Portal frame, folded plates, domes, etc.- Principles of cellular structures, Space frames, tensile structure, pneumatic structure - Properties and application of materials and method of construction.

Case study/site study: visit to concrete batching plants, construction sites (at least 3 sites-9 hours)

Detailed drawings – Reinforcement details in typical RCC foundation footings, columns, beams and slabs

Module III (15 Hrs)

Introduction to framed structures. - Concrete floors, walls, beams and columns.

Multi-storied Buildings – Concrete Buildings: - Beam and slab construction - Framed construction - design of formwork - Lift slab and Slip form construction

Steel Structures: Erection of multi-storied buildings and industrial buildings of steel - Construction details of flooring and roofing systems, tools and techniques of fabrication and erection - Cladding systems for framed buildings - "choice of materials and uses - Sandwich panels, partitions and ceilings.

Case study/site study: visit to multi storied building sites (at least 3 sites)

Detailed drawings - Detailed drawings of different types of cladding systems

Module IV (13Hrs)

Damp Prevention: Dampness - causes - materials used for damp proofing: methods of damp proofing, damp proofing of floors, solid and cavity walls, flat and sloping roofs: tile, sheet and RCC roofing.

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

Roof tanks and roof gardens - construction details - standard specifications of treatment

Detailed drawings - Details of construction joints, expansion joints in building, DPC methods and Roof drainage

Text books

1. Punmia B.C , “Building construction”
2. Arora & Bhindra, “Building construction”
3. G S Birdie, T D Ahuja, “Building Construction and Construction Materials”
4. Krishnaraju, “Prestressed Concrete”
5. Balagopal T.S. Prabhu, “Civil Engineering Drawing Hand book”

References

1. Huntington W.C.,”Building Construction "
2. Mackey. "Building construction"
3. V S Foster “advanced building construction”
4. Mitchel “ Advanced building construction”
5. Sinha,N.C., Sujit Kumar Roy, Fundamentals of Prestressed concrete
6. Tall building systems & concepts, Monograph on planning and design of Tall building, council on Tall buildings and Urban Habitat
7. Relevant BIS Codes

Sessional Requirements

Assignments	= 70 marks
2 Tests	= 20 marks
Regularity	= 10marks
Total	= 100 marks

University examination pattern

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

AR12-53 HISTORY OF ARCHITECTURE –IV

Teaching scheme
3 hrs per week

Credits: 3

Objective:

To introduce the various theories and philosophies which characterize the work of contemporary masters. Also to understand the context for the critiques of modern architecture and the evolution of new approaches.

To understand the trajectory of architecture in India from colonial rule to the contemporary period with works of Indian Architects.

Module I (10 hours)

Modernism and after

Growth of International Style - Ideas and works of Alvar Alto, Eero Saarinen, Minoru Yamasaki, Kenzo Tange, Marcel Breuer, Santiago Calatrava, Gio Ponti, Peir Luigi Nervi, Oscar Niemeyer, I.M. Pei, Jorn Utzon,

Radical counter proposal to Modernism-Robert Venturi

Brutalism- Aldo Rossi, Christopher Alexander

Innovation and ideas of Archigram –Peter Cook

Pop architecture and Utopian ideas of Paulo Soleri

Module II (10 hours)

Post Modernism

Intellectual inspirations for Post modernism – Works of Philip Johnson, Charles Moore, Michael Graves, Robert Stern, Richard Meir, James Stirling

Architecture without Architects-MoMA Exhibition

Deconstructivism -works of Peter Eisenman, Frank Gehry, Richard Meier, Rem Koolhaas, Zaha Hadid.

Critical Regionalism- Alvaro Siza, Tadao Ando, Suerre Fehn, Hassan Fathy, Geoffrey Bawa, Kenneth Yeang

High Tech mode of Design-Richard Rogers, Philip Cox, Norman Foster, Renzo Piano

Community architecture - Pecs group and Imre Makovecz

Module III (10 hours)

Colonial Architecture in India

Introduction to colonial architecture in India. The styles and trends of architecture brought to India and their evolution – The Impact of colonial styles in India The characteristics of Colonial Architecture

Portuguese - Goa -Bom Jesus Cathedral Complex -Old Goa-Fountains

French - Pondicherry - Franco -Tamil Style

Dutch - Cochin – Bungalows , Dutch Palace

Danes - Towns-Tranquebar, Serampore ,

British

Adaptation of English architecture to Indian conditions -Climate. Building materials and methods-

Origin of the Colonial house-Bungalows- Country residences- Government Houses – Cantonments –

Godowns - Churches, Palaces and Tombs.

Towns - Calcutta, Hyderabad, Madras, Delhi, Bombay

Mixed Styles

Hindu- Islamic styles-Rajput styles; Influence of Indian art and architecture on later Colonial architecture-Government houses, palaces, secular buildings in India and the West.

Module IV (10 hours)

Contemporary Indian Architecture

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

Post independence city planning: Chandigarh and Bhubaneswar

Philosophy and Works of Indian architects - Charles Correa, B.V. Doshi, A.P. Kanvinde, Raj Rewal , Laurie Baker, Joseph Allen Stein, C.P Kukreja, Sen Kapadia, Uttam Jain, Hafeez Contrator, Aditya Prakash, Sanjay Mohe, Hasmukh Patel, Anant Rajee

References:

1. Sir Banister Fletcher's – "A History of Architecture"
2. History of World Architecture series
3. Pehnt, Wolfgang, 'Encyclopedia of Modern Architecture', Thames & Hudson. 1963
4. Ghirardo,Diane(1996) Architecture after Modernism, Thames and Hudson Ltd
5. Nilsson, Sten: European Architecture in India 1750-1 R50. Faber and Faber
6. Miki Desai , Architecture and independence, Oxford University Press,2000
7. Vikram Adhitya Praksh, Chandigarh's Le corbusier, The Struggle for Modernity in Post colonial India, Mapir Publishing, 2002

University examination pattern

QI - 8 short questions of 5 mark each module

QII -2questions of 20marks from module I with choice to answer any one.

QIII-2 questions of 15 marks from module II with choice to answer any one.

QIV-2 questions of 15 marks from module III with choice to answer any one

QV -2questions of 10 marks from module IV with choice to answer any one

AR-12-54 ESTIMATION , COSTING AND SPECIFICATION

Teaching scheme
3 hrs per week

Credits: 3

Objectives:

To enable the students to prepare detailed and approximate estimate and to have a clear picture of the project expenditure.

To enable the students to have a thorough idea regarding the quality and quantity of materials, quantity and classes of skilled and unskilled labours and tools and plants required for the project.

To equip the students with property valuation.

Module I (10 hours)

Types of Estimates

Introduction, Types of estimates, detailed estimate, revised estimate, supplementary estimate, maintenance estimate, approximate estimate. Explanation of terms-contingencies; work charged establishments, provisional sum, lump sum item.

Introduction to approximate estimate methods-plinth area method, cubic rate method, unit rate method and bay method.

Preparation of specification for materials of construction and items of work.

Module II (16 hours)

Quantity Surveying.

Methods of building estimate-centre line method and long wall-short wall method. Preparation of detailed estimate for simple buildings of load bearing walls.

Details of measurements and calculation of quantities & Abstract of estimate.

Module III (13 hours)

Analysis of rates for main items of work in buildings based on PWD schedule of rates and standard data book..

Introduction to valuation of real properties: Depreciation –sinking fund –methods of valuation - straight line method – constant percentage method –S.F method-rental method –profit based method-depreciation method –valuation of land –belting method-development method-hypothecated buildings scheme method

Module IV (9 hours)

Building Cost Analysis.-Introduction to building cost modelling- Classification of cost models-casual or empirical models-regression models-traditional cost models

Cost parameters of the building –building shape, height, enveloping area, structural elements, service finishes, architectural features-initial cost and maintenance cost.

Text Books

1. Dutta B N, Estimation and costing in Civil Engineering, UBSPD,1992
2. Chakrabarthy, Estimation, costing and specification in Civil Engineering, 1981
3. Mahajan S P, Civil Estimating and Costing, Sathyaprakasam,1988
4. Shah N A, Quantity surveying and specification in Civil Engineering,1981
5. Ferry and Brandon

References:

1. IS 1200(1968), Methods of measurement of building and civil engineering works

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

- QI - 8 short questions of 5 mark each module
- QII -2questions of 20marks from module I with choice to answer any one.
- QIII -2 questions of 15 marks from module II with choice to answer any one.
- QIV -2 questions of 15 marks from module III with choice to answer any one
- QV -2questions of 10 marks from module IV with choice to answer any one

AR12-55 BUILDING SERVICES II (ACOUSTICS AND FIRE FIGHTING)

Teaching scheme
3 hrs per week

Credits: 3

Objectives:

To understand the importance of acoustics in building design

To get familiarise with various acoustical materials, their properties and their construction details

To integrate the architecture design with acoustic considerations.

Module I (9 hours)

Introduction to Acoustics: Nature of Sounds- Propagation of Sound- Velocity, Frequency, and wavelength of sound-sound intensity-sound pressure- loudness-Decibel- Human ear and hearing characteristics.

Module II(14 hours)

Sound in Enclosed Space , Acoustical Construction And Materials: Room acoustics- behaviour of sound in enclosed spaces-sound reflection, diffusion, and diffraction -room resonance- sound absorption coefficient- sound absorptive materials and construction- porous absorbers- membrane absorbers- cavity resonators-space absorbers variable absorbers-measurement of sound absorption

Module III(10 hours)

Reverberation: Reverberation-Calculation of reverberation time- sabine's formula- acoustical defects in the enclosed spaces, acoustical design of auditoriums-rooms for music, speech .

Module IV(15 hours)

Noise Control. Acoustic Design of Various Buildings And Fire Safety Provisions

Effect of noise in human being- air borne and structure borne noise- noise criteria-transmission loss- noise control in specific building types- auditoriums, schools, hospitals, residences and offices .

Fire resistance of building elements , fire rating and assessment. Building bye-laws relating the fire safety provisions in the buildings . Fire fighting equipment , automatic sprinklers

References :

- 1.Kinsler and Frey- Fundamentals of Acoustics
- 2.Ducan Templation- Acoustics in built environment
- 3.Knudson and Harris- Acoustical designing in architecture
- 4.Cavanaugh- Architectural Acoustics

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short questions of 5 mark each module

QII -2questions of 20marks from module I with choice to answer any one.

QIII -2 questions of 15 marks from module II with choice to answer any one.

QIV -2 questions of 15 marks from module III with choice to answer any one

QV -2questions of 10 marks from module IV with choice to answer any one

AR 12 56 STRUCTURAL DESIGN I

Teaching scheme
2 hrs lecture and 1 hr tutorial per week

Credits: 3

Objective:

The objective of the course is to provide the students with the knowledge of the behaviour of reinforced concrete structural elements in flexure, shear, compression, tension and torsion and to enable them to design such elements under various loads. The course also introduces the concept of design of timber structures. The study should be application oriented, finding references in structural design of architectural design problems attempted in the studio.

Module I (14 hours)

Material strength and properties - grades of concrete and steel - characteristic strength and working strength - types of loads, characteristic loads, load combinations.

Working Stress Method of design of RC sections - principles, assumptions, moment of resistance of singly reinforced rectangular sections.

Design of singly reinforced rectangular beam sections subjected to flexure using Working Stress Method.

Module II (16 hours)

Limit State Method of design of RC sections - principles and assumptions - partial safety factors - moment of resistance of singly and doubly reinforced rectangular sections.

Limit State Method of design of RC sections - design of singly reinforced and doubly reinforced rectangular and flanged sections subjected to flexure, shear and torsion using Limit State Method. – Bond-flexural and anchorage bonds, development length etc. Design and detailing of simply supported, cantilever and continuous RC beams - IS Code coefficients for continuous beams

Module III (12 hours)

Design and detailing of one way simply supported and continuous RC slabs - IS Code coefficients for continuous slabs . Design of stairs - general principles - design and detailing of various types of stairs – stairs with waist slab, stringer beam stairs, and stairs with cantilever steps. All designs shall be done by Limit State Method

Module IV (10 hours)

Timber: Introduction, allowable stresses, design of simple beams, struts and ties

Note:

- 1) All designs shall be done as per current IS specifications.
- 2) Special importance shall be given to detailing

- 3) SI units shall be followed.
- 4) Use of IS:456,IS:875 and IS:883 shall be permitted in the examination hall

Text Books

1. Pillai S. U. and Menon D., Reinforced Concrete Design, Tata McGraw Hill
2. Sinha S. N., Reinforced Concrete Design, Tata McGraw Hill
3. Varghese P. C., Limit State Design of Reinforced Concrete, Prentice Hall of India
4. Punmia B. C., Jain A. K. and Jain A. K., Limit State Design of Reinforced Concrete, Laxmi Publications (P) Ltd., 1st Edition, 2007.

Reference Books

1. Park and Paulay, Reinforced Concrete
2. Mallick S. K. and Gupta A. K., Reinforced Concrete, Oxford and IBH.
3. Jain A. K., Reinforced Concrete- Limit State Design, Standard Book House.
4. Jain and Jaikrishna, Plain and Reinforced Concrete Vol I, Nemchand
5. Sinha N. C. and Roy S. K., Fundamentals of Reinforced Concrete, S. Chand and Company Ltd.
6. Purushothaman, Behaviour, Analysis and Design of Reinforced Concrete Elements, Tata McGraw Hill.
7. Gambhir M. L., Design of Reinforced Concrete Structures, , Prentice Hall of India

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

- Q I - 8 short type questions of 5 marks, 2 from each module
- Q II – 2 questions of 15 marks from module I with choice to answer anyone
- Q III - 2 questions of 15 marks from module II with choice to answer anyone
- Q IV - 2 questions of 15 marks from module III with choice to answer anyone
- Q V - 2 questions of 15 marks from module IV with choice to answer anyone

AR12-57 WORKING DRAWING I

Teaching scheme
4 hrs per week

Credits: 3

Objective:

To develop an understanding of standards and conventions used for preparation of architectural drawings

To develop the skills of preparing various architectural drawings and details used for construction of multi-storeyed buildings

Course Content:

Introduction to architectural drafting, lettering, dimensioning conventions, title blocks, office standards representation of different materials in plan and section, graphic symbols, conventions of drawing and representation in plan, elevations and sections in working drawings.

Preparation of working drawings of multi-storeyed structures with floor plans, structural plans, sections, elevations, foundation details, joinery details etc

Projects:

The above drawings need to be prepared for design projects like Apartments, Commercial buildings, Offices, etc handled in the previous Semesters Architectural design studio.

Sessional Requirements

Class work Drawings & Projects	= 70 marks
Assignment	= 20 marks
Regularity	= <u>10marks</u>
Total	100 marks

AR12-61 ARCHITECTURAL DESIGN IV

Teaching scheme
9 hrs per week

Credits: 7

The Course prepares the students to conceive larger projects with emphasis on market standards and marketing requirements. This should also introduce the students to fire and safety aspects for high rise buildings, earthquake resistant design methods.

Objective:

- To understand the design requirements of high rise buildings with respect to services [HVAC, STP], fire and safety aspects etc.
- To study vertical transportation requirements and design considerations for high rise buildings.
- To understand the role of architect as primary consultant for a project and co-ordinate with various other consultants offering specialized services.
- To understand the dimension of marketing as required for a building intended for outright sale/lease/ rent and outline market standards or requirements.

Projects: Large Projects

A minimum of two projects and a short project on concept presentation shall be completed during the semester. These shall be high rise apartments/ large scale office buildings/ mall-multiplex/ super-hypermarkets/ hospitals.

The short project of Concept presentation shall be for a gated community/integrated township with a focus on marketing aspects.

Process and Deliverables:

Students shall conduct data collection from various reference books, carryout adequate number of relevant case studies; carry out detailed site analysis before attempting design. Formulation of a detailed design brief, evolution of Concept shall be part of the architectural programming. Students shall use assistance of various computer softwares during the design and presentation.

Deliverables shall be computer assisted presentation drawings including 3d massing and graphical representation of concept explanation and design evolution, computer rendered perspectives etc. Sale area computations and sale drawings shall be prepared.

Reference:

Kerala Building Rules, National Building Code, Time Saver Standards, Neufert's Architectural data and other data books

JURY WILL BE CONDUCTED AS PER THE B.ARCH DEGREE COURSE MANUAL

AR12-62-1 HOUSING (ELECTIVE –I)

Teaching scheme
3 hrs per week

Credits: 3

Objective: To make the students familiar with housing policies, issues, process and housing design standards.

Module I (11 hours)

Introduction to housing in early settlements – Evolution of settlement pattern in Kerala. Nature and magnitude of housing problems in India. Population Explosion, Urbanization trends, Housing shortage etc. Role of housing in the National level – Housing policies and programs in the various five year plans.

Module II (14 hours)

Study of Urban & Rural Housing, Housing design and standards for Urban and Rural areas conforming to the local climatic & socio economic conditions.

Slums as a consequence of urbanization and industrialization, Anatomy of slums – Origin and growth, Slum Improvement and Slum Clearance.

Module III (16 hours)

Important Housing schemes in India for various categories like H.I.G, M.I.G,

L.I.G, EWS etc. Housing agencies at the Central, State & Local levels.

Co-operative housing in India. Housing the poor through Non Governmental agencies and through mass involvement – Concept of aided self help, Study of relevant housing schemes / projects.

Module IV (14 hours)

National housing policy – Need & Objectives, critical appraisal of the same. Housing Finance – Institutional finance for housing – Sources of housing finance and essential characteristics, Major housing finance agencies at the National level and State level, like NHB, HDFC, LICHF, GIC, etc.

Study of high rise housing - Problems & Prospects.

Reference

1. Urban pattern - Arthur Gallion
2. Architecture of Town and cities - Paul Spriegren
3. Mayamata - Jr. Bruna Dargins
4. Habitat India - Dr. Misra and B. S Bhooshan
5. Habitat Asia - Dr. Misra and B. S Bhooshan

6. Slum improvement Act, Five Year Plans
7. Innovative Approaches To Housing for the Poor - K Thomas Poulouse
8. Reading Material on Housing - Lectures Compiled by ITPI

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

Teaching scheme
3 hrs per week

Credits: 3

Objective: It is introduced to the student to study the various principles and practices of cost effective building techniques and its application in the field of architecture

Module I (11 hours)

Cost Effective techniques: Relevance in today's world-Mass housing, individual houses, public, commercial and institutional buildings-The inter relation of cost effectiveness and sustainability-Maintenance and longevity aspects-Cost effectiveness as a principle.

How to quantify cost effectiveness: Percentage breakup of materials and labour, Percentage breakup of different elements of buildings, Percentage breakup of various items of materials, Percentage breakup of various types of labour.

Module II (14 hours)

How to achieve cost effectiveness through planning and efficient construction management-simple, functional planning and detailing for different types of buildings- time factor, labour and transportation management, supervision, minimizing wastage and recycling materials.

Significance of choice of materials: indigenous materials- organic and inorganic materials- alternative materials- use of agricultural and industrial wastes.

Module III (12 hours)

Significance of construction technology: Traditional, innovative and alternative technologies- local adaptation of innovative technologies-comprehensive cost effective technologies including services and infrastructure.

Movements in cost effective construction: Architects like Laurie Baker, Geoffrey Bawa, Moshe Safdie etc- Research and developments of various agencies dealing with cost effective technology.

Module IV (15 hours)

Case study of a typical cost effective building of minimum 3000 sq. ft (large residences, offices, apartments, public buildings or institutions) considering various aspects discussed previously-Critical analysis in terms of initial investment, maintenance cost and longevity of buildings-Analysis of aesthetics and function with equal importance as cost effectiveness-Estimate the same building for various different materials and finishes-Prepare a project time schedule for one of the design studio projects.

References

1. Hand book of low cost housing
2. Low cost housing in development countries – G.C. Mathew
3. Publication of CBRI, SERC, RRL, NBO, COSTFORD etc
4. Mohan Raj and Jai Singh - Advances in Building and Construction
5. Habitat Asia -Dr. Misra and B. S Bhooshan
6. Innovative Approaches To Housing for the Poor -K Thomas Poulse

7. Reading Material on Housing -Lectures Compiled by ITPI
8. Bansal, N.K, Havser, G.G. Minke, G, - Passive Building Design

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from reach module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

Teaching scheme
3 hrs per week

Credits: 3

Module I (12 hours)

An introduction to Architectural Conservation

Historic Building : Definitions and need for Conservation, Basic concepts, principles, ethics and values in Conservation, Pros and Cons.

Cultural Built Heritage: an introduction, prospects and problems of conserving cultural built heritage.

Preparatory procedures for conservation: inventories, reconnaissance surveys, documentation (preparation of as found drawings, photogrammetric techniques), degrees of Intervention, scope and techniques of architectural conservation, Evaluation and Assessment of historic buildings and artifacts.

Module II (12 hours)

History of Architectural Conservation: History of emergence, formulation and development of Preservation and Conservation philosophies, Pioneers in the field – John Ruskin, William Morris, Violet-le-Duc, formation of SPAB, Scrape and anti Scrape societies, attitudes and debates in the field.

International charters such as Venice charter, Burra charter, Nara charter etc.

International agencies involved in Conservation : ICOMOS, ICCROM, their works

National agencies : INTACH, ASI, role of Urban Arts Commission, Heritage Commission, and other national and regional agencies their philosophies and works citing examples of building conservation.

Module III (14 hours)

Deterioration of Historic Buildings : Factors causing decay and deterioration of Historic structures and materials – Natural and Man made.

Natural causes – Gravity, solar radiation, sun, rain, snow, ground water, wind, moisture, dust, fungi, algae, insects etc, disasters such as earthquakes, flood, storm, fire.

Manmade causes – Vandalism, wars, pollution, extensive withdrawal of ground water, vibrations and neglect.

The process of deterioration – Systematic investigation, recording of decay, assessment and diagnosis of failures and damages in historic buildings.

Module IV(12 hours)

Techniques in Architectural Conservation

Historic stone masonry buildings: Recognition and diagnosis of problems, repair and replacement, maintenance.

Historic brick masonry buildings: Recognition and diagnosis of problems, analysis, control of dampness, mortar analysis, pointing, repair and maintenance.

Historic timber buildings : Recognition and diagnosis of structural problems, rotting of wood, analysis, repair and timber preservation techniques, conservation and maintenance.

Assignment:

Documentation and Visual Appraisal of a Heritage Building making an inventory to analyze the causes and pattern of decay so as to diagnose the problems.

References:

1. Ashurst, John & Ashurst, Nicola (1988). *Practical Building Conservation* – English Heritage Technical Handbook Vol I, II, III,IV and V, Gower Technical Press. England.
2. Earl, John. (2003). *Building Conservation Philosophy*. Donhead Publishing Ltd. Dorset. UK.
3. Feilden, Bernard M. (1982). *Conservation of Historic buildings*. Butterworth Co. London.
4. Hollis, Malcolm. (2000). *Surveying Buildings*. RICS Business Services Limited. Coventry. UK.
5. Marshall, John. (1922). *Conservation Manual*. Govt. Press. Delhi.
6. Oxley, R. (2003). *Survey and Repair of Traditional Buildings*. Donhead Publishers. Dorset. UK.
7. Richardson, Barry A. (1995). *Remedial Treatment of Buildings*. Butterworth Heinemann Ltd. Britain.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from reach module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

Teaching scheme
3 hrs per week

Credits: 3

Objectives:

To introduce the vocabulary of traditional Indian architecture
To expose students to the traditional design concepts and methods
To understand links between traditional and modern architectural concepts
To expose students to traditional building construction techniques

Module I (10 hours)

Origin and development of Vastu Sastra through centuries – categorization of silpins. Their responsibility Categorization of land by name and by various characteristics like climate, use and location. Vastu of basic geometrical shapes-basic concept of vastu for townplanning-study of traditional cities like Mathura, aipur etc.

Module II (14 hours)

Concept of universe Concepts of Mandala Scale and proportion used in Vastusastra- basic unit of measurements-investigation of land,different types of tests for suitability, determination of cardinal direction planning of residential buildings,evolution of residential types from the vastupurusha mandala flexible nature of domestic buildings, the core house and extensions.

Module III (14 hours)

Ancient worship in Kerala – Development of temple cult in Kerala Planning and designing aspects of temple– Its vertical proportions – Construction details of the roof of sanctum -- Planning and designing of ancillary structures Proportioning of various spaces –. Case study of typical architectural forms of temples

Module IV (11 hours)

Materials of construction: classification of materials, brief description of the characteristics and uses of sila,ishtaka,dasru,loha,mrilsna,sudha.-Technology of assembly and joinery-analysis of the basic structural system, tools and techniques of construction

References

1. Architecture Manasara (tr) – Dr.P.K. Acharya – 7 volumes
2. Mayamata (tr) Bruno Dagens
3. Manushyalaya Chandrika Bhastyam – (tr) – Dr. Achuthan & Dr. Balagopalan T.S. Prabhu
4. Vastuvidya Pravisika – Dr. Achuthan & Dr. Balagopalan T.S. Prabhu
5. Traditional Residential forms of Malabar Coast – Dr. Ashalatha Thampruan
6. Vastuvidhanadipika – Dr. Achuthan & Dr. Balagopalan T.S. Prabhu
7. Temples of Kerala – HC Sarkaar
8. Temples of Kerala – Soundara Rajan
9. Temples of Kerala – Sri,. Jayakumar
10. Architectural survey of the temples of Kerala –ASI

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

Teaching scheme
1 hrs lecture and 3hrs drawing per week

Credits: 3

Objective: To introduce students the discipline of interior design and to develop basic skills required for handling simple interior design projects.

Module I (12 hours)

Characteristics of indoor space

Effect of enclosure on space perception -size, volume, proportion and shape of enclosures, ideal space proportions use of scales for space representation psychological effect of space, modulation of space - design elements, criteria for different situations.

Designing the size form of interior space using user-activity analysis and anthropometrics, fenestration, color and lighting on perception of space, application of scale, proportion to enhance the quality of space.

Project: design of murals/floral pattern/ceiling patterns for reception areas/lounges for hotels- apartments, showrooms etc.

Module II (12 hours)

Principles of Interior Design

Back ground for applied decoration- color, texture, plane and fixtures, emphasizing space through change of levels and structural forms.

Modulation of interior spaces with art objects and modulating thermal sonic environment of space through design. Space modulation through artificial and natural lighting. Emphasis of focal points and unity in interior design.

Human perception of Interiors

Views- One point, two point, Birds eye and worms' eye of interiors Building elements in interiors.
Project: Preparation of interior views.

Project: detailed case study of specific room in residences/hotels/offices etc. preparation of interior view

Module III (12 hours)

Interior landscaping: Elements and application of interior landscape, interior plant materials, growth condition, maintenance, importance of plantscaping-aesthetics, functional etc

Exhibits in interiors-private and public.

Water bodies in interiors

Project: plantscaping of private and public interior spaces.

Module IV (15 hours)

Furniture: Role of furniture, evolution of furniture, ergonomics factors of furniture design and materials –its characteristics and application.

Functional classification of spaces-design of interior spaces-bedroom, kitchen, living room, dining room, toilets, show windows, sale counters, toilets, reception desk, lobbies

Models showing interior spaces with colour scheme-furniture accessories of any one space mentioned above.

Surface treatments: Elements of furnishing and surface treatment their need and scope-decorative materials for ceiling walls, floors, drapery and upholstery for openings and furniture

Project: Design of interior spaces of hotels, offices, hospitals, showrooms etc.

References

1. Ching, Form, space and order
2. Ching, Francis, "Interior Design illustrated", Van nostrand Reinhold, Lodon, 1987.
3. Helsel, M.D., "Interior Designer's Drapery Sketch File", Watson Guptill Publishing Co., 1969.
4. Scott, "Design Fundamentals"
5. "Human Dimensions and Interior Space" by Panero un Julious & Zclink Martin
6. "Design of interior environment" by Alexander and Mercourt
7. The use of colour in interiors by Halse
8. "The best architects Working Details'vo1.2 by Colin, Boyne and Lancewright
9. Living Areas - Internal Spaces by Shirish Vasat Bapat
10. "Great Interiors" -Spring Books by Lan Grant

Sessional Requirements

2 tests	2x15	=30 marks
4 term projects	4x15	=60 marks
<u>Attendance</u>		<u>=10 marks</u>
Total		=100 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from reach module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

Teaching scheme
3 hrs per week

Credits: 3

Objectives

- To introduce the students to landscape design and site planning and imbibe importance of integrated design of built & open spaces.
- To study the changing relationship of man with nature in various parts of the world through various ages and study history of landscape design.

Module 1 (10 hours)

Introduction

Introduction of landscape architecture, its scope -Role of a landscape architect - Comparing landscape design with architectural design and understanding the differences.

History of Landscape Architecture

Changing relationship of man with nature in various phases in history and its influence on the- Reviewing landscape design and garden design in history in various parts of the world & phases in history – Eastern (India, China, Japan), Western (Egypt, Mesopotamia, Greece, Roman, Medieval, Renaissance & Baroque, English school) and Central (Persia, Islamic landscapes)

Module II (14 hours)

Elements & Principles of Landscape Design

Elements of landscape Design –Natural & Manmade elements-tangible & intangible elements-Understanding the visual (colour, form, texture) characteristics and also the non-visual characteristics (smell, touch, sound) - their usage to achieve the functional, aesthetic and environmental goals- Principles of landscape design (harmony, balance, contrast, etc.)

Plants and Design

Study of plant materials – trees, shrubs, ground covers and climbers, physical characteristics and habit. Role of plants in landscape design. Plant selection criteria – functional, visual, ecological and micro climatic aspects. Avenue planting-Scientific & local names of plants-Lawn preparations,mowing,maintenance etc

Module III (10 hours)

Site Analysis and Site Planning

Principles of site planning - Site study & analysis- the physical and social context of the site and various site characteristics such as microclimate, topography, hydrology- Introduction to grading, landform modifications.

Landscape Construction and Services

Introduction to construction in landscape - Landscape constructional details of the following-pavings, curbs, steps, roof garden, retaining walls and indoor landscapes - landscape services - lighting, surface water drainage systems, irrigation systems

Module IV (10 hours)

Studio exercises: this would be submitted in the form of drawings for the final assessment. One site /campus planning project of a magnitude similar to third year architectural design , involving complex issues such as contour analysis, multiple functions etc. To cover the following aspects:

1. Site analysis, zoning and site planning.
2. Building program analysis
3. Preparation of landscape master plan showing hard and soft areas, levels, landform modifications etc.
4. Site sections
5. Planting structure and concept.

Reference books

1. Dee, C. Form and Fabric in Landscape Architecture : A visual introduction, UK : Spon Press.2001.
2. Lynch, K. Site Planning, Cambridge : The MIT Press. 1962
3. Bose, T.K. and Choudhary, K. Tropical Garden Plants in Colour. Horticulture and Allied Publishers. 1991.
4. Gopaldaswamiengar, K.S. Complete Gardening in India, 4th ed. Bangalore: Gopalswamy Parthasarathy. 1991.
5. Laurie, M. An Introduction to Landscape Architecture, NY : American Elsevier Pub.Co Inc.1975.
6. Motloch, J. L. Introduction To Landscape Design, US: John Wiley and sons.
7. 2001Jellicoe, G. & Jellicoe, S. The Landscape of Man, London: Thames and Hudson. 1991.
8. Hackette Brian. Planting Design, NY: McGraw Hill Book Co. Inc. 1979
9. Lyall S. Designing the New Landscape. UK :Thames & Hudson. 1998.
10. McHarg I. Design with Nature. NY : John Wiley & Co. 1978.
11. Simonds, J.O. Landscape Architecture : The Shaping of Man's Natural Environment, NY :McGraw Hill Book Co. Inc. 1961.

Sessional Requirements

Studio exercise		= 10 marks
Assignment		= 5 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 6 short type questions of 5 marks, 2 each from module I to III.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 25 marks of module IV with choice to answer any one.

AR12-65 BUILDING SERVICES III – ELECTRIFICATION AND ARCHITECTURAL ILLUMINATION

Teaching scheme
3 hrs per week

Credits: 3

Objective: To introduce students to electrical services and illumination and to sensitize them with respect to their integration into Architectural Design.

Module I (12 hours)

Introduction to electrical services, commonly used terminology.

Supply and distribution of electricity to buildings – familiarization with Substations and components like High Tension and Low Tension Panels and switchgear, transformers, captive power plants– electrical system in multi storied commercial and industrial buildings, apartments, hospitals etc.

Module II (15 hours)

Distribution systems, underground and overhead - Cabling systems, surface and concealed wiring systems, PVC and metal conduits, casing and capping system. Panel boards, switches, distribution boards.

Earthing systems and protective devices such as fuses, MCB's, MCCB's, ELCB's etc. –lightning protection - safety standards and IS codes. Cinema Act - Electrical installation in a cinema theatre

Introduction to Indian Electricity Rules.

Introductory exercise in electrical load calculations and estimation.

Module III (9 hours)

Commonly used terminology in illumination – laws of illumination – measurement of luminous flux and lux meter.

Ambient, task and accent lighting – direct and indirect luminary systems.

Natural lighting – use of daylight – concept of day light factor

Atrium lighting – methods and uses.

Energy efficient lighting system.

Module IV (15 hours)

Sources of illumination – point source – row lighting, area illumination – evaluation of total flux – colouring aspects of lamps – linear and surface sources of illumination – common luminaries – incandescent, fluorescent/CFL, HID's, MV, SV lamps etc.

Criteria and standards for different purpose/activity illumination - flood lighting, functional buildings like hospitals, sports stadia, swimming pools and underwater luminaries – street lighting, commercial display lighting.

Design considerations, estimation exercise, preparation of a lighting and electrical scheme

Reference Books

- 1) Electrical Technology –H.Cotton
- 2) Electrical wiring, Estimating and Costing-L.Uppal
- 3) Electrical Wiring, Design and Estimation – Raina& Bhattacharya
- 4) National Electrical Code
- 5) Lighting Manual

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR 12 66 STRUCTURAL DESIGN –II

Teaching scheme
3 hrs lecture and 1hr tutorial per week

Credits: 3

Objective: The objective of the course is to develop an understanding of design of columns, footings and prestressed concrete structural elements and also to familiarize the fundamental aspects of structural behaviour and design of steel structures. The study should be application oriented, finding references in structural design of architectural design problems attempted in the studio.

Module I (15 hours)

Reinforced Concrete

Columns: Design of columns subjected to axial load, uni-axial and bi-axial eccentrically loaded short and long columns using SP 16 by limit state method.

Module II (13 hours)

Reinforced Concrete

- A. Footings: Design of isolated footings for axially loaded and eccentrically loaded columns- Design of combined footings (using limit state method)-Design principles of raft and pile foundations (design calculations not required).
- B. Long Span Structures: Various forms & classification of shell- Advantage and disadvantages- Folded plate roofs-Applications- Types of folded plates- Structural action of shells and folded plates.

ModuleIII (12 hours)

Prestressed concrete fundamentals- materials, principles-methods of prestressing (pre and post tensioning)- losses of prestress. Analysis of stresses in pre and post tensioned beams. (rectangular sections) at stages of transfer and service- cable profiles (principle only).

Module IV (12 hours)

Steel: Introduction, Properties of structural steel, Design of riveted and welded connections, design of struts and ties

Design of roof elements, roof trusses and purlins, analysis for dead loads and wind loads

Note:

- 1) All designs shall be done as per current IS specifications.
- 2) Special importance shall be given to detailing
- 3) SI units shall be followed.
- 4) Use of IS:456,IS:875, IS:800,IS:1354&SP 16 shall be permitted in the examination hall

Text Books

1. Pillai S. U. and Menon D., Reinforced Concrete Design, Tata McGraw Hill
2. Varghese P. C., Limit State Design of Reinforced Concrete, Prentice Hall of India
3. Punmia B. C., Jain A. K. and Jain A. K., Limit State Design of Reinforced Concrete, Laxmi Publications (P) Ltd.
4. Krishnaraju, Prestressed Concrete, Tata McGraw Hill.
5. IS 800-2007, Code of practice for Structural steel design, BIS
6. S.S Bhavikatti., Design of steel structures by limit state method as per IS: 800-2007

Reference Books

1. Park and Paulay, Reinforced Concrete
2. Mallick S. K. and Gupta A. K., Reinforced Concrete, Oxford and IBH.
3. Lin. T.Y and Burns, Design of Prestressed Concrete Structures, Tata McGraw Hill.
4. Jain and Jaikrishna, Plain and Reinforced Concrete Vol I, Nemchand
5. Sinha N. C. and Roy S. K., Fundamentals of Reinforced Concrete, S. Chand and Company
1. Ltd.
6. Purushothaman, Behaviour, Analysis and Design of Reinforced Concrete Elements, Tata
2. McGraw Hill.
7. Ram Chandra, Design of steel structures, Vol I & II Standard Book House

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

Q I - 8 short type questions of 5 marks, 2 from each module

- Q II – 2 questions of 15 marks from module I with choice to answer anyone
Q III - 2 questions of 15 marks from module II with choice to answer anyone
Q IV - 2 questions of 15 marks from module III with choice to answer anyone
Q V - 2 questions of 15 marks from module IV with choice to answer anyone

AR12-67 WORKING DRAWING II

Teaching scheme
4 hrs per week

Credits: 3

Objective

To enable the students to understand MEP services (PHE/ Fire fighting/ Electrical/ HVAC) and coordination drawings prepared based on the architectural design.

Course Content

- Understand different drawings prepared as a part of services working drawings- routing, fittings diagram, ducting, details etc
- Understand the standard representations for various components / elements used in the drawings
- Understand the tender drawings and specifications

Projects:

Electrical and plumbing fittings layouts shall be prepared for select portion/part of architectural design projects (apartments/commercial buildings/office buildings etc) done in the previous semester.

- ❖ Drainage drawings, water supply and sanitary drawings and plumbing lay outs of multi storied and group buildings
- ❖ Layout drawings of electrical and mechanical details, HVAC details, ducting etc.

Sessional Requirements

Class work Drawings & Projects	= 70 marks
Assignment	= 20 marks
Regularity	= <u>10marks</u>
Total	100 marks

SEVENTH & EIGHT SEMESTER(S7&S8)

AR12-71

INTERNSHIP UNDER A REGISTERED ARCHITECT (PRACTICAL TRAINING)

Credits: 25

The students shall undergo two semester (S7 & S8) practical training immediately after the completion of the 6th semester B.Arch. examinations as per the practical training manual. The training shall be under a registered architect with minimum of five years experience and approved by the Dept of Architecture of the teaching institution. The students are required to submit a report including the details of their work illustrated with sketches, prints and other documents connected with the projects on which he/she has worked both in office and at site, a work diary, originals of monthly report, and a certificate regarding their conduct and performance of work done during the training period. They are also required to do a critical appraisal of an important historical or modern building in the town where training is taken. Evaluation committee will award the marks of end semester examination as per the B.Arch Degree Course Manual-Practical Training. For details refer Practical Training Manual.

AR12-91- ARCHITECTURAL DESIGN V

Teaching scheme
10 hrs per week

Credits: 5

The Course prepares the students to understand the role of architecture in shaping the urban fabric. This semester shall also enable students to attempt master planning of large areas.

Objective:

- To study and understand demographic and socio- economic dimensions, infrastructure requirements and provisions of urban areas
- To understand how to create architecture which fits into a specific urban context or how to influence/regulate the urban environment through a systematic approach
- To understand the requirements while dealing with larger areas for campus/master planning projects

Projects

One major project on urban study and design intervention and a short project to introduce students to master planning concepts.

The UD project shall focus on urban area of appropriate size and resultant design intervention area which can be attempted during the limited time available. Projects may include design of city markets, cultural centres, public buildings etc.

The master planning/campus planning project shall be limited to the initial studies, zoning and concept evolution for educational institutions/ integrated townships/special economic zones/speciality hospitals etc

Process and Deliverables

Students should conduct primary and secondary data collection through surveys and literature studies, carryout adequate no of relevant case studies; carry out detailed site analysis before attempting design. The analysis of collected data/resources shall lead to urban intervention. Students shall use assistance of various computer softwares during the design and presentation.

Deliverables shall be computer assisted presentation drawings including 3d massing and graphical representation of concept explanation and design evolution, computer rendered perspectives etc. Sale area computations and sale drawings shall be prepared.

References:

Kerala Building Rules, National Building Code, Time Saver Standards, Neufert's Architectural data and other data books

JURY WILL BE CONDUCTED AS PER THE B.ARCH DEGREE COURSE MANUAL

AR12-92-1 URBAN DESIGN (ELECTIVE –I)

Teaching scheme
3 hrs per week

Credits: 3

Module I (18 hours)

Urban Design and its Evolution: Need for urban design -The scope and objectives of urban design - The relation between Architecture, Urban design and Urban planning

Urban Spaces and Urban Image: Behavioural issues in urban design - Principles of urban spatial organization, urban scale, urban spaces, urban massing, quality of urban enclosure - Visualization of image of the city and its elements - Perceptions of urban environment: Kevin Lynch's elements of Urban Design, Imageability, Townscape

Module II (12 hours)

Techniques of Urban Design : Urban design policies – Formulation of policies for various components like landscape, infrastructure and built forms - Urban renewal, scope, need and procedure - Urban conservation and economic considerations – Road form and hierarchy - Road pattern, pedestrian areas, malls, urban elements, open spaces and waterfront development, planning Issues.

Module III(16 hours)

Urban Design Project Formulation in various scales : At Micro level- campus planning, city centers, transportation corridors, residential neighbourhood, water fronts; At macro level - National, metropolitan city and project levels, case studies - Surveying methods and techniques, space linkage - Urban design principles – sales and mass, skyline studies - Urban spaces and their characteristics.

Execution of Urban Design Projects: Projects preparation - Agencies involved in the execution –co-ordination, role of planning authorities –Development Control guidelines –Zoning, Role of urban arts commission, Urban project financing agencies.

Module IV (8 hours)

Evaluation of Urban Design Projects : Feasibility study of Urban design projects/Evaluation, Historical Examples of Urban Design Projects.

References

1. Community design and culture of cities – Edudo.E. Lozam
2. Concepts of urban design – David Goshng and BurryMaitland
3. Exterior Design in Architecture – Yoshinra Ashihara
4. Architecture of towns and cities – Paul.D.Sperigen
5. The social logic of space – Hiller.B.J.Hudson
6. The new theory of urban design – Alexander Christopher
7. The image of the city – Kevin Lynch
8. Design of Cities –Bacon Edmund .N.
9. The new landscape – Charles correa
10. The architecture of cities – Rossi, Aldo
11. Townscapes – Collen, Garden

12. Finding lost spaces – Toge Tranik
13. The art of building cities – Sitte, canmitto

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from reach module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12-92-2 ARCHITECTURAL RESEARCH (ELECTIVE –II)

Teaching scheme
3 hrs per week

Credits: 3

Objective: This course is designed to explore and generate understanding about the importance of research, different process involved and methods in conducting studies for different projects. This will help the students to undertake the research work in Architecture, planning and allied fields.

Module I (13 hours)

Introduction to Architectural Research: Origin, Importance, Ethics and values, History of Architectural Research, Approaches – the scientific approach, Conceptual foundations: Concept, Theory and Model, Principles of logic - deduction, induction and abduction, Research and Theory.

Module II(14 hours)

Domain of Architectural Research : Systems of Inquiry and standards of research qualities, Literature studies, Theory and its relation to method, Design in relation to research, Research Design – Process, Selection of research questions, Formulation of research problem, statistical studies, concepts, probability studies and hypothesis formulation and testing.

Module III (10 hours)

Types of Architectural Research : Research Strategies: Interpretive historical research, Qualitative, Co-relational, experimental and quasi experimental, simulation and modeling research, logical argumentation, Case studies and Combined Strategies.

Module IV(14 hours)

*Scholarly writing of research reports :*scientific writing, habit of writing, writing strategies, structure in writing successful dissertations and theses, planning report writing, research report format, principles of writing, readability of the manuscript, evaluation of research reports.

References:

1. Groat, Linda. and Wang, David. (2002). Architectural Research Methods. John Wiley & Sons. Canada.
2. Yin, R.K. (1994). Case Study Research- Design and Methods, Applied Social Research Methods Series. Vol V. Sage Publications. California.
3. Krishnaswami, O.R. (1993).Methodology of Research in Social Sciences. Himalaya Publishing House. Bombay.
4. Creswell John. W. (1994). Research Design – Qualitative and Quantitative Approaches. SAGE Publications. California.
5. Thakur, N. (1998). “Building Knowledge through a Holistic Approach towards Architectural Education and Research”. Proceedings of the seminar on Architecture and Interdisciplinarity.
6. Turabian Kate. L. (1982). A manual for Writers. The University of Chicago Press. Chicago.
7. Bockman, J., R., and Couture, B. (1984). The Case Method in Technical Communication: Theory and Models. Texas: Association of Teachers of Technical Writing.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module I with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module II with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

Teaching scheme
3 hrs per week

Credits: 3

Module I (14 hours)

An introduction to Urban Conservation

Concepts, history, principles and procedures, Development of urban conservation in Europe and other countries, Urban conservation scene in India – past and present, Introduction to definitions and terminologies such as Historicity, Values, Authenticity, Transformation, Historic Continuity, Change etc.

Morphology of historic towns, introduction to the concept of heritage zones, methodology and analysis of character of heritage zones.

Module II(14 hours)

Approaches to Urban Conservation

Formulation and development of Urban Conservation philosophies and approaches, attitudes and debates in the field, Broad concepts of terms such as Reuse, Revitalization, Rehabilitation, Regeneration, Renewal, Up-gradation, Redevelopment of historic areas.

Scope and basic techniques of urban conservation, Case studies of urban conservation sites/ areas in India and abroad.

Module III(10 hours)

Concept of Integrated Conservation

Scope, parameters of Integrated Conservation and its role/ link with development planning and environmental design. Case studies. World heritage sites and their making.

Module IV(14 hours)

Legislative and Administrative aspects of Urban Conservation

Legal and administrative aspects of Urban Conservation, Archaeological acts / International charters pertaining to urban conservation, Role of Urban Arts Commission, Heritage Commission, and other national and regional agencies their philosophies and works citing examples of urban conservation.

References:

1. Roger Kain, Planning for Conservation.
2. Alan Doby, Conservation and Planning.
3. Roy Worskett, Character of Towns.
4. Picard Gilbert, Encyclopedia of Archaeology.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module 11 with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12-92-4 ENERGY EFFICIENT ARCHITECTURE (ELECTIVE –II)

Teaching scheme
3 hrs per week

Credits: 3

Module I (12 hours)

Energy crisis and the need for energy efficiency : Passive heating concepts -direct gain, induced gain and isolated gain - Passive cooling concepts : Minimization of direct beam radiation, minimization of conducted heat through walls and roof - Evaporative cooling, radiative cooling - Exploitation of wind, water and earth for cooling in hot and arid zones - Passive heating and cooling concepts ; Roof pond, roof radiations trap system, earth sheltered structures and earth air tunnels.

Module II (9 hours)

Theory of solar energy tapping: Systems of solar collectors - Transport of heat energy in air based solar system - Advantages and limitations - Active systems for cooling and heating - Inter linking of active and passive systems

Module III (10 hours)

Factors that affect energy use in building: Functional factors, environmental factors, envelope factors, air conditioning system factors, energy source factors and electrical system factors - Fenestration design for optimal day lighting

Module IV (15 hours)

Modern energy conservation techniques: Various methods/techniques of energy conservation in building design - Impact of conventional planning considerations on solar architecture Modification of microclimate through landscape elements for energy conservation - Energy conservation through site selection, siting and orientation - Energy conservation through integration of building and site, site planning and site design

References

1. Bansal, N.K, Havser, G.G. Minke, G, - Passive Building Design
2. Sudha U.S, Bansal, U.K, P.K. Kumar, A.K. Malik M.A.S – Solar Passive Building
3. Olgyaa – Design with climate
4. Robinette – Landscape planning for energy conservation
5. Brown RD, Gillespie, T.J, microclimatic landscape design
6. Moss Kerth – Heat and Mass transfer in building services design
7. Nicol f. Humphreys. M, Sukes. O, Roaj S. – Standards or thermal comfort
8. Kreider J.P. , Keith F – Solar Heating and Cooling
9. Schwckkey R, Williams J.L. – Solar construction

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks

Regularity	= 5 marks
Total	= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module I with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module II with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12-93 TOWN PLANNING

**Teaching scheme
3 hrs per week**

Credits: 3

Module I (12 hours)

Origin and evolution of Human settlements: Development of Town planning in the historical perspective-Town planning in ancient, medieval, renaissance, industrial & post industrial age- Town planning in India -ancient, medieval, colonial and modern. Development of new towns and cities- Chandigarh and Navi Mumbai.

Contributions to modern town planning thoughts: by-Patrick Geddes, Ebenezer Howard, C A. Doxiadis, Lewis Mumford, Le Corbusier and Clarence Stein.

Module II(12 hours)

Need for Town Planning: Impact of Urbanisation on cities, Urban Environmental Problems- LandUse, Traffic and Road Network, Urban Land use- CBD, Urban Nodes, fringe areas and suburbs, Urban Rural Continuum. Contemporary urban problems- growth and changes, overcrowding, slums, sporadic growth and conurbation. Need for sustainable city planning.

Module III(11 hours)

Urban Development Planning system and process: Understanding planning as a multi-level comprehensive process of development through local, urban, rural, regional and national planning- Perspective Plan, Development Plan, Annual Plan, Plan Schemes and Projects.

Introduction to surveying and analytical techniques including household survey, local area surveys, land-use surveys, landscape survey, transportation surveys and service survey.

Module IV(10 hours)

Need for town planning legislation: Different town planning acts- Role of development authorities- Role of town planning departments, Role of local bodies in the implementation of town plan. Land Acquisition Act. 74th Amendment Act. Coastal Regulation Zones and its relevance. SEZ, JNNURM. Land use Plan Tools for land use control -Zoning regulations, building byelaws, Subdivision regulations, Plot reconstitution, Betterment Tax.

Reference Books

1. Arthur B. Gallion, Urban Pattern
1. Keeble Lewis, Principals and Practice of Town Planning.
2. Kevin Lynch, Image of the city
1. 4 AE.J Morris, History of Urban Form
3. C.A. Doxiadis, Ekistics: An Introduction to town and Country planning
4. Peter Hall, Urban and Regional Planning
5. Peter Hall & Ulrich Pfeiffer, Urban Future
6. Ministry of Urban Affairs Govt. of India- Urban Development Plans Formulation and Implementation Guidelines
7. John Ratcliffe, Introduction to Town and Country Planning

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone
- QV - 2 Questions of 15 marks from module IV with choice to answer anyone

AR12-94 PROFESSIONAL PRACTICE

Teaching scheme
3 hrs per week

Credits: 3

Objectives

To introduce the issues relating to the architectural profession in India.

To understand the Architects Act and COA's regulations.

To focus on the issues relating to Tenders and Contracts, arbitration, valuation etc..

To introduce standards and norms of professional conduct and setting up an office\

Module I (10 hours)

Architects Act '72-Council of Architecture, Functions and Powers, Architects Regulations, Standard terms for comprehensive architectural services including UD and Conservation works, guidelines for architectural competitions.

IIA- Functions and Powers, Registration for membership.

Module II(9 hours)

Tenders: Types of tenders, Tender Notice, Inviting, Work order, Tender document, Tender acceptance, Tender for demolition work, Earnest money deposit, Security deposit, Retention amount.

Module III(11 hours)

Contract: General principles, Types of Contract, Discharge of contract, Contract Document, Contract drawings, Contract sum, Bills, Duties & Liabilities of Contractor, Architect and Employer under the contract, Administration of contracts, Determination of Contracts, Certificate of Payments. *Arbitration*-Principles, Indian Arbitration act, Powers & Duties of Arbitrators, Revoking Authority, Umpire, and Award

Module IV(11 hours)

Valuation: Purpose, Value, Factors affecting value, Value classification, Classification of Ownership, Valuation reports, Methods of valuation.

Easement: Definition, Various types, essential conditions for enjoyment of Easements, Valuation for Easements.

Assignments:

A sample tender document comprising the complete formalities of executing a work by inviting tenders.

A report to be prepared by each student after visiting an Architects office on Staff structure, administration, Account keeping, Correspondence and Drawings, Meetings, recording of minutes etc.

Reference:

Professional Practice: Roshan H Namavathi

Hand Book of Professional Documents: COA Publication

“Architectural Practice”: Cow gill; small.

Harold K, Cyril, “Essentials of Management” -1979 Tata Mc Graw Hill

Theory of Practices of Valuation-- Namavathi Roshan

Architects Reference Manual-Workshops professional practice for Architects by IIA Kerala Chapter and Trivandrum Centre, November 1996.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone
- QV -2 Questions of 15 marks from module IV with choice to answer anyone

AR12-95 ENVIRONMENTAL STUDIES

Teaching scheme
3 hrs per week

Credits: 3

Objective

- To understand the problems of pollution, loss of forest, solid waste disposal, degradation of environment, loss of biodiversity and other environmental issues and create awareness among

the students to address these issues and conserve the environment in a better way.

Module I (8 hours)

The Multidisciplinary nature of environmental science. Definition-scope and importance-need for public awareness. Natural resources. Renewable and non-renewable resources: Natural resources and associated problems-forest resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their defects 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 over grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.-Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy resources, Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Module II (8 hours)

Ecosystems-Concept of an ecosystem-structure and function of an ecosystem – producers, consumers, decomposers-energy flow in the ecosystem-Ecological succession- Food chains, food webs and Ecological pyramids-Introduction, types, characteristics features, structure and function of the following ecosystem-Forest ecosystem- Grassland ecosystem –Desert ecosystem-Aquatic ecosystem(ponds, streams, lakes, rivers, oceans , estuaries)
Biodiversity and its consideration Introduction- Definition: genetic, species and ecosystem diversity- Bio-geographical; classification of India –value of biodiversity: consumptive use, productive use, social ethical , aesthetic and option values Biodiversity at Global, national , and local level-India at mega –diversity nation- Hot spot of biodiversity-Threats to biodiversity: habitat loss, poaching of wild life, man , wild life conflicts – Endangered and endemic species of India-Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Module III (10 hours)

Environmental pollution Definition-Causes, effects and control measures of Air pollution- Water pollution –soil pollution-Marine pollution-Noise pollution-Thermal pollution-Nuclear hazards-Solid waste management: Causes, effects and control measures of urban and industrial wastes-Role of an individual in prevention of pollution. Pollution case studies-Disaster management: floods , earth quake, cyclone and landslides-Environmental impact assessment

Module IV (10 hours)

Environment and sustainable development-Sustainable use of natural resources-Conversion of renewable energy resources into other forms-case studies-Problems related to energy and Energy auditing-Water conservation, rain water harvesting, water shed management-case studies-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust-Waste land reclamation Consumerism and waste products-Reduce, reuse and recycling of products-Value education.

Text Books

1. Daniels & Krishnaswamy, Environmental studies, Wiley India pvt ltd, 2009
2. Raman Sivakumar, Introduction to environmental science and engineering, 2nd edn, .Tata McGraw Hill, 2010
3. Anindita Basak, Environmental Studies, Pearson Education, 2009
4. Suresh K.D, Environmental Engineering and Management, Katson Books, 2007
5. Benny Joseph, Environmental studies, 2nd edn, McGraw Hill, 2009

Reference Books

1. Raghavan Nambiar, K Text book of Environmental Studies, Scitech Publishers (India) Pvt. Ltd
2. S.P Misra, S.N Pandey, Essential Environmental studies, Ane books, Pvt Ltd, 2009
3. P N Palanisamy, P Manikandan, A Geetha, Manjula Rani, Environmental Science, Pearson Education, 2012
3. D.L. Manjunath, Environmental Studies, Pearson Education, 2011

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University examination pattern

QI - 8 short type questions of 5 marks, 2 from each module.

QII - 2 questions A and B of 15 marks of module 1 with choice to answer any one.

QIII - 2 questions A and B of 15 marks of module II with choice to answer any one.

QIV - 2 questions A and B of 15 marks of module III with choice to answer any one.

QV - 2 questions A and B of 15 marks of module IV with choice to answer any one.

AR12 -96 EARTH QUAKE RESISTANT DESIGN & DISASTER MANAGEMENT

Teaching scheme
3 hrs per week

Credits: 3

Objectives

To familiarize the basic concepts of seismic design.

To integrate the architecture design process with seismic concept so as to produce safe buildings.

To gain an understanding of the tools for hazard and vulnerability assessment at the city level and to have an overview of the different types of technological hazards.

Module I (15 hours)

Introduction

Seismic zones in India and earthquake hazard. Role of architect and structural designer in safe building design, Comparison of seismic and conventional design. Causes of earthquake, social & economic consequences. Major Earthquake case studies, impact on built environment, classification of observed building failure patterns: Global, Indian.

Basic terms: Fault line, focus, Epicenter distance, Focal depth, Peak ground acceleration etc. Impact of soil characteristics on buildings, seismic zoning and micro zoning

Module II (15 hours)

Earthquake Basics:

Consequences of earthquake ground motion: Ground rupture and ground failure, liquefaction , Landslides, Fire, Tsunamis. Structure of the Earth-Plate Tectonics-Evolution of Indian subcontinent. Waves generated by ground motion and their characteristics: Body Waves (Longitudinal waves; Transverse waves), Surface waves (Rayleigh waves). Attenuation of waves, Random direction of Shaking. Distribution of earthquakes: Global, Indian. Measurement of earthquakes: Introduction of instruments used for measuring earthquakes, Seismograph, accelerograph, various scales of magnitude, various scales of intensity.

Module III (15 hours)

Design of buildings for earthquake resistance:

Factors affecting earthquake loading: Mass, Natural period, Damping, Ductility.

Seismic Design Code Provisions: Basic terms used in seismic codes and their meanings, horizontal design seismic coefficient, base shear of building and vertical distribution of loads.

Building Configuration: scale of building- size in horizontal plane- size in vertical plane- Building proportions- Symmetry of building (Torsion), Re-entrant corners, Redundancy, irregularities in building, Horizontal plane, Vertical plane (Soft storey; short column; discontinuous walls).

Module IV (15 hours)

Disaster Management:

Introduction to the concept of disaster management and mitigation. Types of disasters-nature, causes, impact. Hazard and vulnerability assessment, concepts, tools and techniques, pre-disaster mitigation and protection of lifelines and critical facilities against natural hazards. Concepts and overview of technological hazards at the city level. Safety management system: Strategies for implementation, fire safety at the city level, emergency planning, preparedness and response at the city level. Principles and methods of community based approaches for disaster management practice.

References Books

1. Ambrose, J; Vergun, D: Simplified building design for wind and Earthquake forces, John Wiley, New York, USA
2. Arnold, C; Reitherman, R : Building configuration and Seismic design, 1982, John Wiley, New York USA
3. Bolt, B.A: Earthquakes, Fourth edition, 1999, W H Freeman, Sanfransisco, USA
4. Dowrick, D.J: Earthquake resistant design for Engineers and Architects, 1987, Second edition, John Wiley, New York,USA
5. Hugo Bachmann : Seismic conceptual design of buildings- Basic principle for engineers, architects, building owners and authorities; Swiss Federal Office for Water and Geology and Agency for Development and Cooperation, Switzerland.
6. Lagario, H.J: Earthquakes: An architect's guide for non structural seismic hazards, John Wiley and sons, New York, USA.
7. Murty, C.V.R: Earth quake tips, National information centre for Earthquake Engineering, IITK, Kanpur.
8. IGNOU: Notes on disaster management.
9. Ramani, S. Disaster management- Advanced course on modern trends in housing- SERC, Vol 2, Chennai, 1980.

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone
- QV -2 Questions of 15 marks from module IV with choice to answer anyone

AR 12-97BUILDING SERVICES –IV (HEATING VENTILATION AND AIRCONDITIONING)

**Teaching scheme
3 hrs per week**

Credits: 3

Objectives: To impart the knowledge and skills required for understanding the building services of Heating, ventilation and Air-conditioning and their integration with Architectural design.

Module I (11 hours)

General introduction- Principles of heat transfer-Conduction-Convection-Radiation-Fourier law of heat conduction-Conduction through plane wall, Newton's law of cooling - heat transfer through composite cylinder- critical thickness of insulation- free and forced convection, Overall heat transfer coefficient-simple problems-Stephan Boltzmann's law, radiation shield, reflectivity, absorptivity, transmissibility, Kirchhoff's law, emissive power, emissivity, Wien's displacement law, - Insulation-Properties of insulation-

Module II (11 hours)

Principles of Refrigeration-Capacity-Coefficient of performance (COP)-Carnot refrigeration cycle-vapor compression systems-Theoretical and practical cycles-Thermodynamic analysis using PH diagram-Standard refrigerants including eco-friendly refrigerants and their properties-Study of refrigeration system components-Compressors-Condensers-Expansion devices-evaporators-cooling towers.

Module III (9 hours)

Psychrometry-Psychrometric properties-Psychrometric chart-Psychrometric process-adiabatic mixing-Sensible heating and cooling-humidifying and dehumidifying-bypass factor-sensible heat factor-room sensible factor-RSHF and GSHF line.Human comfort-comfort chart-Effective temperature-Factors governing effective temperature.

Module IV (14 hours)

Air conditioning systems-Room air conditioning systems-window A/C,split-packaged systems-central and unitary systems-summer-winter-year round air conditioning systems-Cooling load calculation-various heat sources.Design of air conditioning systems-AHU,Duct design-air distribution systems-draft-throw-entrainment ratio-spread-location of air outlets-location of return air openings-general consideration in air duct design and layout-noise and noise control. Determination of duct size using equal friction (constant pressure loss) method

References

1. Refrigeration & air conditioning- Ramesh Chandra arora.
2. Refrigeration & Air conditioning-Manohar Prasad
3. Refrigeration & air conditioning- Ahmadul Ameen
4. Refrigeration & Air conditioning-C.P.Arora
5. Refrigeration & Air conditioning-W.F.Stocker
6. Refrigeration & Air conditioning-P.L.Balleny
7. Refrigeration & Air conditioning-Dossat
8. Heating ventilation and a/c by Fage C Mc quiston and Jarald D Parker - John wiley & sons.
9. Refrigeration & air condition by Regiput.
10. ASHRAE data book

Sessional Requirements

Assignments		= 15 marks
2 Tests	2 x 15	= 30 marks
Regularity		= 5 marks
Total		= 50 marks

University Examination Pattern

- Q I - 8 short type questions of 5 marks, 2 from each module.
- Q II - 2 Questions of 15 marks from module I with choice to answer anyone
- Q III - 2 Questions of 15 marks from module II with choice to answer anyone
- Q IV - 2 Questions of 15 marks from module III with choice to answer anyone
- QV - 2 Questions of 15 marks from module IV with choice to answer anyone

AR12- 98 CONSTRUCTION MANAGEMENT

Teaching scheme
2 hrs per week

Credits:2

Objectives

To establish and develop project management skills with particular reference to construction management.

To understand CPM network analysis and network logic.

To learn probabilistic time estimate and PERT network analysis.

Module I (9 hours)

Introduction to construction management, need and importance, objectives of project management-types of construction management, introduction to traditional management systems, role of Project or Construction Managers in the building industry. Project management cycle-planning, scheduling, monitoring and controlling

Module II (10 hours)

Introduction to construction scheduling techniques - Bar chart - Gantt chart. - Work break down structure, Network representation, Principles and application of CPM & PERT

Module III (10 hours)

Network analysis, development of CPM network-Identification of critical path-Different float computations. PERT Network- Probabilistic time estimates of activities-Analysis of PERT Network – Development of Critical path.

Module IV (9 hours)

Expediting the project - Time cost tradeoff – Optimization , Allocation of resources - Resource levelling and smoothing--Project management software packages.

References :

- 1.Srinath, L.S: PERT and CPM Principles and Application
2. Robert B. Hanis: Precedence and Arrow Networking Techniques for Construction
- 3.Steven James D: Techniques or Construction Network Scheduling.
- 4.Bhattacharjee,S.K: Fundamentals of PERT/CPM and Project Management

TENTH SEMESTER (S10)

AR12-101 THESIS AND VIVAVOCE

Credits: 25

Students are required to prepare an Architectural Design Thesis during the last six months of the B.Arch. Degree program. The duration of the thesis will be six months from the date of commencement of the tenth semester of B.Arch. Degree Course. The thesis project shall include an individual's work on a topic selected by the students and approved by the department. The project selected may be either a live architectural project or hypothetical one so that the student gets training in tackling projects similar to what he/she is likely to face in his/her professional career. For details refer Thesis Manual.