CURRICULUM AND SYLLABUS

(applicable to students admitted from 2019-2020 onwards)

For

Bachelor of Archite .Arch.) Programm

NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI – 62(
TAMIL NADU, INDIA 2019

CURRICULUM

SEMESTER I

Code	Course of Study	L	T	P	C
AR101	Environmental Science	3	0	0	3
AR103	History of Architecture - I	3	0	0	3
AR105	Theory of Architecture	3	0	0	3
AR107	Architectural Graphics - I	1	0	4	3
AR109	Communicative English	2	0	2	3
AR111	Basic and Architectural Design - I	0	0	9	7
AR113	Visual Arts - I	0	0	5	3
	NCC, NSS, NSO				
	Total	**12**	**0**	**20**	**25**

SEMESTER II

Code	Course of Study	L	T	P	C
AR102	Computer Applications in Architecture - I	1	2	0	3
AR104	History of Architecture - II	3	0	0	3
AR106	Mechanics of Solids	2	1	0	3
AR108	Architectural Graphics - II	1	0	4	3
AR110	Building Construction and Materials - I	1	0	4	3
AR112	Architectural Design - II	0	0	9	7

AR114	Visual Arts - II	0	0	5	3
	NCC, NSS, NSO				
	Total	**8**	**3**	**22**	**25**

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SEMESTER III

Code	Course of Study	L	T	P	C
AR201	Computer Applications in Architecture - II	1	2	0	3
AR203	History of Architecture - III	3	0	0	3
AR205	Structural Analysis	2	1	0	3
AR207	Building Construction and Materials - II	1	0	4	3
AR209	Surveying and Site Planning	2	0	2	3
AR211	Architectural Design - III	0	0	8	8
AR213	Model Making	0	0	4	2
	Total	**9**	**3**	**19**	**25**

SEMESTER IV

Code	Course of Study	L	T	P	C
AR202	Climate Responsive Architecture	3	0	0	3
AR204	Concrete Technology	3	0	0	3
AR206	Contemporary Architecture	3	0	0	3
AR208	Water Supply and Drainage	3	0	0	3
AR210	Building Construction and Materials - III	1	0	4	3
AR212	Architectural Design - IV	0	0	8	8
AR214	Strength of Materials Laboratory	0	0	4	2
	Total	**13**	**0**	**17**	**25**

SEMESTER V

Code	Course of Study	L	T	P	C
AR301	Architectural Acoustics	3	0	0	3
AR303	Design of R.C.C. Structures	2	1	0	3
AR305	Lighting and Electrical Services	3	0	0	3
AR307	Building Construction and Materials -IV	1	0	4	3
AR309	Interior Design	2	0	2	3
AR311	Architectural Design - V	0	0	8	8
	Elective -I	0	0	4	2
	Total	**11**	**1**	**18**	**25**

SEMESTER VI

Code	Course of Study	L	T	P	C
AR302	Air-conditioning and Mechanical Services	3	0	0	3
AR304	Estimation and Specification	2	1	0	3
AR306	Landscape Architecture	3	0	0	3
AR308	Building Construction and Materials -V	1	0	4	3
AR310	Architectural Design - VI	0	0	8	8
AR312	Architectural Working Drawings	0	0	4	2
	Elective -II	3	0	0	3
	Total	**12**	**1**	**16**	**25**

SEMESTER VII

Code	Course of Study	L	T	P	C
AR401	Building Structural System	2	1	0	3
AR403	Energy Efficient Buildings	3	0	0	3
AR405	Disaster Resistant Building Design and Management	2	0	0	2
AR407	Urban Design	3	0	0	3
AR409	Building Construction and Materials -VI	1	0	4	3
AR411	Architectural Design -VII	0	0	8	8
	Elective-III	3	0	0	3
	Total	**14**	**1**	**12**	**25**

SEMESTER VIII

Code	Course of Study	L	T	P	C
AR402	Professional training (one semester)	0	0	0	15
	Total	**0**	**0**	**0**	**15**

SEMESTER IX

Code	Course of Study	L	T	P	C
AR501	Building Bye-Laws and Codes of Practice	3	0	0	3
AR503	Environment and Behavior	3	0	0	3
AR505	Urban Planning	3	0	0	3
AR507	Architectural Design - VIII	0	0	8	8
AR509	Dissertation – I	0	0	4	2
	Elective - IV	3	0	0	3
	Elective - V	3	0	0	3
	Total	**15**	**0**	**12**	**25**

SEMESTER X

Code	Course of Study	L	T	P	C
AR502	Building Economics and Construction Management	2	1	0	3
AR504	Professional Practice	3	0	0	3
AR506	Dissertation -II	0	0	16	16
	Elective - VI	3	0	0	3
	Total	**8**	**1**	**16**	**25**

LIST OF ELECTIVES

Sl. No.	Sem	Elective	Code	Electives	L	T
1.	V	I	AR351	Advanced Computer Applications	0	0
2.			AR353	Graphic Design	0	0
3.			AR355	Photography, Art and Visual Communication	0	0
4.			AR357	Seminar on Contemporary Architecture	0	0
5.			AR359	Global / Other Department Elective	2	0
6.	VI	II	AR352	Vernacular Architecture	1	0
7.			AR354	Barrier Free Environment	3	0
8.			AR356	Facilities Programming	3	0
9.			-	Global / Other Department Elective	3	0
10.	VII	III	AR451	Product Design	1	0
11.			AR453	Environmental Control and Design Workshop	1	0
12.			AR455	Landscape Design	0	0
13.			-	Global / Other Department Elective	3	0
14.	IX	IV	AR551	Sustainable Architecture	3	0
15.			AR553	Cost efficient Construction Techniques	3	0
16.			AR555	Industrial Architecture	3	0
17.	IX	V	AR557	Building Automation and Management Systems	3	0
18.			AR559	Construction Technology	3	0
19.			AR561	Environmental Planning	3	0
20.	X	VI	AR552	Housing	3	0
21.			AR554	Architectural Conservation	3	0
22.			AR556	Architectural Journalism	3	0

SYLLABUS

SEMESTER – I

AR101 ENVIRONMENTAL SCIENCE

Natural resources and associated problems. Role of and function of an ecosystem. Energy the ecosystem. Introduction, types, characteristic features, conservation of natural Equitable use of resources for sustainable lifestyles.
Concept, Structure, structure and function of various ecosystems.

Biodiversity: Genetic, species and ecosystem diversity. Bio geographical classification of In Value of biodiversity: Biodiversity at global, national and local levels. Hot spots of biodiver Threats to biodiversity: Endangered and endemic species of
India. Conservation of biodiversity.

Environmental Pollution: Definition, Causes, Effects and control measures of**:** Air pollutio pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, and nuclea Role of an individual in prevention of pollution.
Disaster management: Floods, earthquake, cyclone and landslides.

Social Issues: Sustainable development. Urban problems related to energy. Water conser rain water harvesting, watershed management. Resettlement and rehabilitation of pe Environmental ethics. Climate changes and global warming.
Environmental protection Act. Public awareness.

Human Population: Population growth, Population explosion, Environment and human health. Human rights. Value education. HIV/AIDS, Women and Child Welfare. Role of inform Technology in Environment and human health.

REFERENCES

1. MillerT. G Jr., Environmental Sciences, Wadsworth Pub Co. (TB)
2. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, MT.2001, Enviro Encyclopedia, JaicoPubl. House, Mumbai, 1196p.

AR103 HISTORY OF ARCHITECTURE – I

Introduction to Ancient World Architecture - A brief outline of the Neolithic revolution and its on built forms – brief study of a few ancient settlements – Jericho, Catal Huyuk, Hassuna, Kol Lindenthal & Skara Brae. Egyptian Architecture - Evolution of
Pyramids & cult temples.

Early Mesopotamian Architecture Eg. Ziggurat of Urnammu, Ur. Mayan Architecture Eg. Ste Pyramid Complex, Tikal. Assyrian Architecture Eg. Palace of Sargon, Khorsabad. Per Architecture Eg. Palace at Persepolis. A comparative study of all
the styles of the ancient world.

Greek Architecture, Important construction techniques, Visual refinement (Optical corre The Greek Orders, Brief description of the urban spaces, temples & other public buildings, G houses etc. Eg: Agora, Acropolis, Parthenon, Erechtheion &
Theatre at Epidaurus - all in Athens.

Roman Architecture: A brief account of materials, structural systems adopted and construc techniques - The Roman Orders - a short description of Roman urban spaces, temples, the basilicas, theatres, Pantheon amphitheaters, circuses &
houses.

Early Christian Architecture: Evolution of church form, surface treatment and materials of cc Eg.: St. Peters, Rome. Byzantine Architecture: Technique adopted to construct domes over which are square in plan. General structural systems,
surface treatment and materials of construction.

REFERENCES

1. Sir Banister Fletcher, "A History of Architecture", Butterworth Heinmann 19th Edition,
2. "History of World Architecture (series): Vols. Titled Ancient Architecture, Primitive archite Greek architecture, Roman architecture & Byzantine architecture", 1980.

AR105 THEORY OF ARCHITECTURE

An Introduction to Architecture. Scope of architecture. Context of built environment/ archit the fulfillment of human needs: functional, aesthetic and psychological, and the Architect's role in creation of the built environment. Architectural context and its infl the built form- site, climate, material, culture. Vitruvian principles of architecture. Concep beauty and varying dimensions- Philosophical, psychological, subjective & objective va social, regional &
temporal variations. Basic principles of visual perception.

Elements of architecture- Basic elements: Point, line, plane & volume. Qualities of shap texture, scale, proportion; qualities of surfaces, edges and openings; Form, space and th organizational pattern, relationships, hierarchy. Ordering
principles.

Experiencing Architecture: Circulation- approach and entry, path configuration and access, sequence of spaces. Multi-sensory dimension of architectural design- Light, view, to hearing and smell.

Relationship of form and function in architecture. Evolution of styles in architecture. Elaborat "function" in architecture- Pragmatic function, circulatory function, symbolic function, psychological function, cultural and contextual function etc.
Importance of incorporation of empathy in design.

Introduction to Architectural design methodology and processes- Architectural program user requirements, needs, aspirations, socio cultural factors, economic factors, legal restrc activity spatial analysis; Site analysis; concept development; schematic design; workir drawings; site execution. Liaison with other
experts- Structural, services, construction, management etc.

REFERENCES

1. Francis D.K. Ching, "Architecture-Form, Space and Order", Van Nostrand Reinhold Comp York, 2007.
2. Simon Unwin, "Analysing Architecture", Routledge, London, 2003.
3. Yatin Pandya,"Elements of Space making", Mapin 2007.
4. Theo JM van der Voordt, Herman BR van Wegen., "Architecture in Use: An Introdu the Programming, Design and Evaluation of Buildings", Architectural Press, Oxford, Burlington, 2005.

AR107 ARCHITECTURAL GRAPHICS - I

Essentials and Principles of Architectural Graphics: Lines, Lettering, Dimensioning and applic simple Geometric Construction. Introduction to Scales, Representative Factor, Plain Scale, I Scale and Comparative Scale and its use in Architectural
Drawings.

Introduction to Orthographic Projection: The Four Quadrants and the types of projecti Angle and First Angle Projection. Projection of Points, Lines and Planes. Orthographic I of Solids with emphasis on the First Angle method. Introduction to Projection on the Profile Auxiliary Projection. Simple and Complex Solids, Shifting of the Object and Moving of the Sections of Solids and
True Shape of the Section. Intersection/ Interpenetration of Solids.

Development of Surfaces: Parallel line and Radial line Development. Isometric Drawir Projection: Difference between Isometric View and an Isometric
Projection. Construction of Isometric scale- Methods. Simple and Complex Solids.

Learning to observe, measure and draw to scale the plans, elevations of simple objects such as Furniture and small Buildings.

REFERENCES

1. K.L.Narayana & P. Kanniah, "Engineering Graphics - 1st angle projection", Tata McGr publishing company, NewYork,1992.
2. Prof. Vee Ess, "Step by Step Engineering Drawing (1st angle projection)", V.K.Pu Bangalore, 1990.
3. George A. Dinsmore, "Analytical Graphics", Van Nostrand Company Inc., Canc
4. Thomas E French, Charles J. Vierck & Robert J. Foster, "Graphic Science & Design", Interr Edition, McGraw Hill Co., NewYork,1986.

AR109 COMMUNICATIVE ENGLISH

Skimming, scanning, inferring, predicting and responding to content - Guessing the meaning from contexts - Note making and vocabulary extension.

Listening and understanding recorded, structured talks and classroom lectures - Comprehending the matter - understanding the links between different parts of speec practice in note taking.

Features of an effective Speech-Practice in speaking fluently - Dialogue practice- simple social exchanges - short extempore talks.

Effective sentences-cohesive paragraphs - clear and concise writing - Introduction to techr writing -Definition, Description, Instruction - Summary Writing practice. Use
of library - Role of Bibliography, Table of contents, Index etc. - use of Dictionary.

REFERENCES

1. Eric H. Glendinning & Beverly Holmstrom, "Study reading - a course in reading Skills for ac purposes", Cambridge University Press, 1992.
2. John Kirkman, "Good style - writing for science and technology", E&FN Spon, an Imprint c Chapman & Hall, 1992.

AR111 BASIC & ARCHITECTURAL DESIGN - I

Exercises in Points & Lines. Organization of a large number of identical geometric sha obtain symmetrical and asymmetrical patterns. Family of shapes: developing variou from a given geometric shape - working out composition
with such developed shapes.

Organizing a large number of identical geometric shapes to express a given theme. Combi different geometric shapes and making a unit of bigger/larger shape and using many such and expressing a design/pattern. To give emphasis in the
expression of design - introducing value & color.

To achieve focus and center of interest in design using different textural elements. Developr geometric pattern by division, subtraction, and addition or overlapping & to expres with the use of colors. Expressing a given theme in a
geometric pattern.

Models/Sculptures to understand the evolution of three dimensional forms from two dimensi shapes. Additive model with similar forms and dissimilar forms made out
of various mediums/materials. Subtractive model out of a given geometric form.

Models with linear members such as match sticks, reeds, etc. to understand geometric form and structure. Posters with a given theme. Collage with a given theme.

REFERENCES

1. Marjore Elliott Bevin, "Design through Discovery", Holt Rinehart and Winton, New 1977.
2. George A Covington& Bruce Hannah," Access by Design", Van Nostrand Reinhold, 1996.
3. Owen Cappleman & Michael Jack Jordon, "Foundations in Architecture: An Anota Anthology of Beginning Design Project", Van Nostrand Reinhold New York, 1993.
4. Charles Wallschlacgerm & Cynthia Busic-Snyder, "Basic Visual Concepts and Princip Artists, Architects and Designers", McGraw Hill, New York 1992.

AR113 VISUAL ARTS – I

Line, shapes, form, space, colour, value & texture - exercises given to meet the elem

Balance, unity, pattern, emphasis, movement, rhythm & contrast are introduced and exercises to explain this conditions.

Free hand drawing exercises to be introduced to develop visual perception & thinking by drawing still life objects, furniture, equipment.

Outdoor exercises like sketching - buildings, streets, rows of buildings and human figures.

Exercises in different mediums for drawing/sketching - to provide sufficient training and prac using various qualities of pencils, pen & ink. (Pencil, Charcoal, Lumograph Pencil). Understanding of anatomy for anthropometric studies.

REFERENCES

1. Wayne Enstice, Melody Peters, "Drawing space, Form, Expression", Prentice hall, Englev New Jersy, 1990.
2. Palmer John, "Drawing & Sketching", Brock Hampton Press,London,1993.

SEMESTER – II

AR102 COMPUTER APPLICATIONS IN ARCHITECTURE –I

Introduction to CAD, Intro to AutoCAD/ Precision Drawing & Drawing Aids/ Geometric Shap

Setting up & controlling the AutoCAD drawing environment – Creating & Editing Commands. Organizing a drawing with layers

Advanced geometry editing – Creating & using Blocks – Inquiry Tools – AutoCAD Desi Center. Internet and collaboration, Blocks, Drafting symbols, Attributes, Extracting data

Attributes – understanding object linking and embedding – Importing objects into Aut using OLE working with OLE objects, Text annotation – Creating & Customizing Ho patterns – Productive Dimensioning – Defining Text & Dimension Styles

Printing & plotting - creating a slide presentation – Drawing utilities – importing / exporting files.

REFERENCES

1. Mastering AutoCAD 2015 and AutoCAD LT 2015: by George Omura& Brian C. Bento 2014)
2. The Sketch Up Workflow for Architecture: Modeling Buildings, Visualizing Design, and Cre Construction Documents with Sketch Up Pro and Layout – by Michael Brightman, John Sons, (May 2013)

AR104 HISTORY OF ARCHITECTURE-II

Outline of ancient Indian architecture: the Indus valley civilization - city planning, one typic residence, granary, great bath; Evolution of early Aryan architectural forms - impact on arcl of later days; Outline of Buddhist architecture: the Hinayana and Mahayana phases; Evoluti form of the Hindu temple – Gupta and early
Chalukyan temples.

South Indian Hindu architecture: Pallava Architecture - Rock-cut Rathas & Mandapas, Shore temple, Mahabalipuram, Kailasanathar temple & Vaikunthaperumal temple,

Kanchipuram; Chola Architecture: Eg.: Brihadeswara temple, Thanjavur; Pandya& Madu Evolution of the Gopuram, City planning: Eg. Meenakshi temple, Madurai & Temple at S Hoysala Style: Eg. Temple at Belur; a comparative
study of all the South Indian styles.

Hindu architecture of other Regions: Orissa Style - Eg.: Lingaraja temple, Bhubo Indo-Aryan Style Eg.: KhandhariaMahadev temple, Khajuraho; Gujarat Style: (Hindu & Dhilwara temple, Mt. Abu; a comparative study of the Dravidian and Indo-Aryan styles; a comparative study of the Buddhist and Hindu
styles.

Indo Islamic architecture –advent and earlier phase: advent of Islamic architecture in India background, characteristic elements, typical buildings – mosques, tombs etc.; Imperial era: kings - Eg.: Qutub mosque, Qutubminar, Tomb of Nasir - ud – din Mohammed shah, Khilji dyr Alai Darwaya, Tughlaq Dynasty - Eg. Tomb of Ghiyas - ud - din Tughlaq, Kirki mosque, Delhi. and Lodi Dynasty - Development
of Octagonal & Square tombs, Eg.: Mothi - Ki - Masjid.

Provincial styles: Jaunpur Eg. Jami Masjid of Jaunpur; Malwa - royal complex at Manc
- earlier period – Eg. Mosque at Broach, Jami Masjid at Ahmedabad, middle period - Eg. Mc
Champanir, Teen Darwaza, evolution of Tombs, later period - Eg. Siddisayad mosque, Shah
Rauza, Adalaj - step well, Rani Rupavatis Mosque; Outline idea of Bijapur style; Mughal arch
Babur Eg. Humayuns Tomb
– Delhi, Akbar - Eg. Agra fort, Fathepursikri - site planning, Jodhabais palace, Birbal palace,
khas, Salim Chisti's Tomb & Buland Darwaza; Jahangir - Eg. Akbar's mausoleum at Sikandra, S
Jahan - Eg. Red fort, Jami Masjid at Delhi, Taj - Mahal
- Agra.

REFERENCES

1. Brown, Percy. "Indian Architecture: Buddhist & Hindu periods", Taraporewala & Sons,
2. "History of World Architecture series", Oriental/Faber & Faber Ltd., London,1980.
3. Brown, Percy, "Indian Architecture (Islamic period)", DB Taraporevala Sons & Co, Mumbc

AR106 MECHANICS OF SOLIDS

Elasticity - stress & strain - Types of stresses - elastic limit - Hookes law - modulus of elasticity
modulus)- deformation of a body due to force acting on it - stresses in composite bars - r
between elastic constants. Introduction to strain
energy.

Centroid - center of gravity of simple figures - C.G. by geometrical considerations
- solid bodies - C.G. with cut out holes - moment of inertia - theorems of M.I. of parallel
& perpendicular axes - M.I. of a circular section, hollow section - M.I. of composite sectio
modulus of section.

Beams & support conditions - types of supports, shear force and bending moment
diagrams for simply supported beams, cantilevers, and overhanging beams with conc
uniformly distributed and uniformly varying loads.

Theory of simple bending - stress distribution at a cross section due to bending
moment and shear force moment of resistance - bending stresses in sections.

Statically determinate plane trusses, perfect and Imperfect frames - Deficient
&Redundant frames - analytical methods for finding out the forces - method of joints.

REFERENCES

1. S.S.Bhavikatti, "Strength of Materials", VIKAS Publishing House Pvt. Ltd., Chenn
2. Vazirani & Ratwani, "Analysis of Structures", Khanna Publishers, NewDelhi,1996.
3. Khurumi, "Strength of Materials & Mechanics of Structures", Standard Publishing co. Ltd., N
1996.
4. Srinath, "Advanced Mechanics of Solids", Tata McGraw Hill Co., New Delhi, 1996.

AR108 ARCHITECTURAL GRAPHICS –II

Exercises to draw axonometric views. Introduction to Sciography, Shadow of points, lines an
Shades and shadows of simple 2D – Planes. Shades and shadows of cube, pyramid, prism, c
cylindrical forms and combination of these forms. Shades and Shadows of Complex built for
Building Plans and Elevations. Use of Sciography
in Site Plans with real examples.

Perspective projection concepts, Types of Perspective views, Picture plane, vanishing points , station point, horizon , cone of vision , line of vision ,etc. Perspective Projection of sim complex geometrical forms.

Perspective projection of interior views of buildings using two point and one point perspective views. Shades and shadows on the perspective view of interior of building

Perspective projection of exterior views of buildings using two point and one point perspect views. Perspective Construction using the short cut technique/approxima method. Shades and shadows on the perspective view of
exterior of buildings.

Rendering of building exterior & interior perspective views using various techniques and medium.

REFERENCES

1. Mulik, Shankar, "A Text Book of perspective & Sciography", Allied Publishers Ltd., Mumba
2. Mc Goodwin, Henry, "Architectural Shades and Shadows", The American Institute of Arc
Press, Washington, D.C., 1989.
3. Russell D. Light, "On Perspective", Butterworth-Heinemann, Oxford, 1995.

AR110 BUILDING CONSTRUCTION & MATERIALS - I

The properties and uses of materials for simple construction such as mud, bamboo, timber, b stone, cement, lime, mortars, thatch tiles, asbestos, galvanised, iron and reinforced concrete.

Principles of construction of simple foundation for load bearing wall in stone and brick. Plinth fillings, steps.

Standard terms in brick and stone masonry. English, Flemish and Rat trap bond, types of stone walls, Composite wall and piers.

Principles of construction of various types of arches, lintels and brick jollies.

Paneled door in timber, flush doors, Joints in frame, styles, rails, panels, fixture and fastenings.

REFERENCES

1. Arora, S.P. & Bindra, S. P. "A Text Book of Building Construction", DhanpatRai & Sons, Ne 1994.
2. Jha, J. & Sinha, S. K., "Building Construction", Khanna Publishers, New Delhi, 1977.

AR112 ARCHITECTURAL DESIGN – II

Exercises to understand the relationship between form and function. Study and analys common household articles and utility sculptures.

Exercises on the study and application of anthropometrics information. Detail study of a single room with activity space analysis, circulation pattern and furniture layout.

Detail study of a small building with activity space analysis, circulation pattern and furniture layout

Reorganization of an existing space / room for a given activity (which is different from the existing use).

Design of spaces meant for single or multiple function. Developing designs for designs for simple buildings.

REFERENCES

1. Maitland Graves, "The art of color and design", McGraw Hill Inc., 2nd Edition, 1951.
2. De. Chiara and Callender, "Time Saver Standards for Building Types", McGraw Hill Co., Ne 1973.

AR114 VISUAL ARTS - II

Hue, Intensity & Value - other qualities of colours - Primary, Secondary & Comp colours. Shades & Tints - Warm & Cool Colours.

The various functions of colour in creating Designs. Use of various colour harmonies in Design / Art.

Water colours - Transparent, Opaque (Tempera/Poster Colours),Pastels, Colour Pencils and Oils and their uses in expression of a composition / design.

All exercises to be conducted so as to develop observation and skill of expressing graphica understanding objects three dimensionally and to have effective visual thinking.

Rendering - Rendering techniques for architectural drawings - building perspectives, interior exteriors in various mediums like pencil, ink, pastels, water colours - opaque and transparent. Various graphical media presentations like photography

REFERENCES

1. "Learn to Paint and Draw", Victoria House Publishing Ltd., Bath, UK, 1981.
2. Goodman Sue & Porter Tom., "Designer Primer", B u t t e r w o r t h Architecture, Lon

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SEMESTER- III

AR201 COMPUTER APPLICATIONS IN ARCHITECTURE –II

Introduction to Architectural Views & Drafting Views, 3D modeling with AutoCAD (Surfc Solids) 3D Modeling with SketchUp , Understanding 3D coordinate system - Using View ports drawing & Editing commands – Interactive Viewing in 3D.

Introduction to rendering in 3D – Rendering process – Enhancing digital images from CAD a using Adobe Photoshop, Paint Shop Pro & other graphic programs In-depth work with Sketc Massing models, editing tools, texturing/ Import/export, creating animations, working with Earth and 3D Warehouse/ Design to fabrication with SketchUp (3D printing, CNC,…).

3D BIM modeling with Parametric Software- ArchiCAD/Revit: Walls, floors, doors, windo etc./ Revit families: Using components, creating new types and new families

How to work with BIM content: Plans, interactive models (3D for the web), schedules, materi Revit and SketchUp models for analysis: Spatial analysis, Solar analysis, energy performance etc.

REFERENCES

1. Mastering AutoCAD 2015 and AutoCAD LT 2015: by George Omura & Brian C. Ben 2014)
2. Mastering Autodesk Revit Architecture 2014: – by James Vandezande, Eddy Krygiel & Ph Sybex; First edition (June 2013)
3. Rendering in SketchUp: From Modeling to Presentation for Architecture, Landsc Architecture and Interior Design by Daniel Tal ,John Wiley & Sons (April 2013)
4. The SketchUp Workflow for Architecture: Modeling Buildings, Visualizing Design, and Construction Documents with SketchUp Pro and LayOut – by Michael Brightman, John \ Sons, (May 2013)

AR203 HISTORY OF ARCHITECTURE – III

Italian Romanesque Architecture: Architectural characteristics of the churches of North Central Italy and South Italy. eg. Pisa Cathedral - (Central Italy). French Romanesque - eg. A Aux - Hommes at Caen. British Romanesque - eg. Durham's
Cathedral.

Introduction to Gothic architecture, its evolution of structural systems, arches, vaults and vault, decoration, characteristic of French architecture. eg. Notre -
Dame, Paris.

Understanding the general influences and characteristics of British & Italian gothic arch and its structural developments and decorative motives. Characteristics of British gothic Arc Characteristics of Italian gothic Architecture - eg. Milan
Cathedral.

Birth of Renaissance and its impact Architectural style of Early Renaissance: Cha and works of Brunelleschi. High Renaissance and Mannerism: Study of the works of Bramate Michelangelo. Baroque and Rococo: Architectural style
of Palladio & Bernini , Basilica, Vicenza

French Renaissance: Characteristics and style of French Renaissance example The Louvre, British Renaissance: Tudor, Elizabethan and Jacobean Styles: Characteristics and wo Inigo Jones. Christopher wren's contribution towards
Renaissance Architecture with S. Paul's, London as an example.

REFERENCES

1. SIR Banister Fletcher's, "A History of Architecture", Butterworth Heinmamm 19th Edition
2. Cyril mango, "Byzantine Architecture", Harry N. Abrams Inc. Publishers, Newyork, 1976.

AR205 STRUCTURAL ANALYSIS

Slope, curvature of the bending beam - relation between slope, deflection & radius of curv simple problems to find out slope and deflection for different loads on beams - Double int method, macaulay's method, moment area method,
Conjugate beam method.

Propped cantilever beams - Reaction of prop. - Propped cantilever beams with differ of loads - sinking of the prop. Fixed beams - bending moment diagram for fixed beams - c beams - moment distribution method - sinking of the
supports.

Moving loads and influence lines for statically determinate structures - Types of loads - combination of loads - Influence lines – Introduction.

Theory of arches - classification of arches - Analysis of three hinged arches - Bending mome diagram for given loads - Normal thrust and radial shear - Introduction to
cables - Types - Bending moments & force analysis.

Theory of columns - Types of end conditions of columns - Equivalent length of a columr loads, combined bending & axial loads, Indian Standard Code recommendations - Eul formula for long columns - Rankine's formula - Practical
applications.

REFERENCES

1. Punmia, B.C., "Structural Analysis", Standard Publishers Distributors, New Delhi, 1995.
2. Bari S. A. "Elements of Structural Analysis", S. Chand & Company Ltd., New Delhi, 1997.

AR207 BUILDING CONSTRUCTION AND MATERIALS - II

Study the properties and characteristics of different materials used for roof of coverin and composite roof slab flooring materials timber and glass.

Joinery and detailing of various types of wooden doors fully glazed, partially glazed, sliding folding door, etc. fully glazed window in timber fixing of glass, fixtures and
fastenings.

Developmental reference to traditional trusses, different forms, lean-to, double lean-to collar, couple roof , fixing of Mangalore tiles, A.C. & G.I. sheets and gutters.

Flat roof construction in R.C.C. and composite materials, steels trusses and details of roof coverings and gutters.

Principles of flooring and terracing – floors – brick, stone, concrete and timber floors with timber floors with floor finishes.

REFERENCES

1. Arora, S.P. & Bindra, S. P., "A Text Book of BuildingConstruction", Dhanpat Rai & Sons, New 1994.

2. Jha, J. &Sinha, S.K., "Building Construction", Khanna Publishers, New Delhi, 1997.

AR209 SURVEYING & SITE PLANNING

Definition of plot, site, land and region. Units of measurements. Reconnaissance and need f surveying – chain survey, compass survey, plane table & theodolite surveys. Contouring – C interval – Characteristics, uses of contours.

Importance of site analysis – factors involved. Accessibility, size and shape of sites. Confirmi non-conforming uses. Climate and topography, infrastructures available, sources of w supply and means of disposal system, architectural and visual aspects. Preparation of site analysis diagram.

Lie of the land, contours, watershed, surface drainage, ayacuts and irrigation lands. Water, vegetation, soils, climate, land forms. Sewage disposal, irrigation systems and ecolog Preparation of maps of matrix analysis, composite analysis, locality plans, topographical analysis.

Man-made structures, sensuous qualities, cultural data, images and data correlation. Veget plant associations, types and distribution. Preparation of ecological profile of an area.

Note: Practical sessions shall be conducted on surveying.

REFERENCES

1. John Ormsbee Simonds, "Landscape Architecture: A manual of Site Planning and Desigr McGraw Hill, 1961.
2. Kevin Lynch, "Site Planning", MIT Press, Cambridge, MA. 1957.
3. Joseph De Chiarra and Lee Coppleman, "Planning Design Criteria", Van Nostrand Reinh New York, 1988.
4. Thomas H. Russ, "Site Planning and Design Hand Book", Pearson Education, 2002.
5. Diane Y. Carstens, "Site Planning and Design for the Elderly", Van Nostrand Reinho York, 1993.
6. B.C. Punmia, 'Surveying and Levelling', Vol I and Vol II, Laxmi Publications pvt Ltd

AR211 ARCHITECTURAL DESIGN – III

Developing designs for simple buildings like a small residence and medium sized buildings like community hall, health centre etc., in rural setting using locally available mate appropriate construction techniques.

The designs should reflect the application of knowledge gained from courses on mat structures & building construction and Theory of Architecture. Students should be able t communicate their ideas and design effectively with appropriate medium.

REFERENCES

1. Maitland Graves, "The Art of Color and Design", McGraw Hill Inc., 2nd Edition, 1951.
2. Edward. D. Mills, "Planning the Architects Hand Book -Butterworth, London, 1985.

AR213 MODEL MAKING

Materials for Model Making: Paper, Handmade paper / Handmade board, Cardb Mount boards, Balsa wood, soft wood, Plywood, cork sheets, plaster of paris, Perspex sheets expanded polystyrene (Thermacole), Plastic sheets, etc.

Exercises in straight and curved cutting and preparation of simple geometrical object in preparing block models of groups of buildings including roads and landscaped open spaces.

Exercises in preparing detailed models of buildings from given set of drawings.
The subject teacher shall co-ordinate with the Architectural Design Studio in-charge while w
/ Setting out the various exercises in model making.

SEMESTER- IV

AR202 CLIMATE RESPONSIVE ARCHITECTURE

Climate & Weather. Scales of climate - macro-climate, meso-climate and micro climc
Climatic variables: temperature, humidity, precipitation, cooler radiation,
wind, etc. Tropical Climate. Climatic Zones of India & their characteristics.

Geometry of solar movement. Altitude & azimuth angles. Sun path diagram/Solar cha
Horizontal and vertical shadow angles. Use of shadow angle protractor. Design
of shading devices. Performance evaluation of shading devices.

Air flow/wind movement around and through buildings. Natural ventilation. Mahoney Table
application. Climatic design recommendations for various climatic
zones in India.

Thermal comfort. Indices of thermal comfort - Tropical Summer Index & Effective
Temperature. Thermal effects in buildings. Basic concepts of heat transfer in buildings, units
terminology.

REFERENCES

1. Koenihsberger, etal., "Manual of Tropical Housing & Building: Part I - Climatic Desig
Longman, Chennai , 1984.
2. Evans, Martin, "Housing, Climate and Comfort", The Architectural Press, London, 1980.
3. Konya, Alan, "Design Primer for Hot Climates", The Architectural Press, London, 1984.

AR204 CONCRETE TECHNOLOGY

Introduction - classification of concrete mixes - Grades of concrete - Advantages and disac
of concrete. Concrete Making Materials - Cement-Method of Manufacturing of Ce
properties and specific uses of various types of cement. Test on cement - fineness - settir
consistency - soundness - compressive
strength.

General classification of aggregate - properties of aggregate - shape, texture, porosit
absorption, soundness- test on aggregates. Grading of Aggregates.
Water - Quality of Water for mixing and curing - use of sea water for mixing concrete.

Basic consideration - factors influencing mix proportion - Mix Design by ACI method and I.S. method - Design of high strength concrete - test on concrete.
Information on Admixtures Plasticizers.

Introduction - Batching of materials - Mixing of Concrete materials - Transportation of concr Placing of concrete - curing of Concrete. Properties of Concrete - Introduction - strer Concrete - stress and strain characteristics of concrete.
Thermal properties of concrete - Micro cracking of concrete- RMC.

Introduction - lightweight concrete - Fiber reinforced concrete - Polymer composites conc entraining concrete - Ferro cement - sulphur concrete - Mass concrete - Guniting. Qu control in Concrete - Sampling and testing of concrete -
Factors causing variations in the quality of concrete.

REFERENCES

1. Shetty. M.S., Concrete Technology, S. Chand and Co, 1984.
2. Gambhir, M.L., Concrete Technology, Tata McGraw Hill, 1996.

AR206 CONTEMPORARY ARCHITECTURE

Post- Renaissance architecture of Europe in general and England in particular. Industri revolution and its impact on architecture and urban settlement in particular. Arts and crafts Nouveau movements and their impact on architecture. The principles and works of Mackin Antonio Gaudi. Developments in Germany: Deutshers work bund, principles and works of Pe Behrens, German expressionism and the works of Walter Gropius and Erich Mendelsohn Bauhaus Institute and
its impact. Russian Architecture after revolution (1917 – 1934).

The futurism of Antonio Saint Elia, Outline idea of cubism and its impact on architecu movement of Netherlands. Critics of modern movement: Roberty Ventury, Christopher Ale Aldo Rossi and Jane Jacob. Emergence of later
trends in modern architecture.

Rapid Urban growth in Europe and USA. The emergence of International style of architecture. Principles and works of Frank Lloyd Wright.

Principles and works of Mies Van der Rohe, Louis Khan, Paul Rudolf and KenzoTange. The fa contributed to their style of Architecture and their impact. Brutalism, Archigram, Metabolisn architecture, Deconstruction in architecture and the
emergence of rationalistic architecture.

The styles and trends of architecture brought by Britishers to India and their evolution. The im Hindu and Indo-Sarsanic style on the British architecture in India. The characteristics of British architecture with examples from the works of Edwin Lutyen. The impact of International style architecture in India, Early public buildings such as vigyan Bhawan Supreme Court building works of Le corbusier and Louis Kahn in India with examples. Their impact on architecture of sixties. The trend in Indian architecture after 1970 Principles and works of the following archit Balakrishna Doshi, Charles Correa, Anant Raje and Laurie Baker with suitable examples.

Building Material in contemporary architecture style. Energy in modern buildings. Disas management in contemporary buildings. Contemporary Indian Architecture trends in India Buildings, Urban Design projects, Landscape Projects, Housing and others.

REFERENCES

1. Nikolaus Pevsener, "Sources of modern architecture and design", Themes and Huds
2. William J.R., Curtis, "Modern architecture since 1900", Prentice hall, New Jercy USA, 1983
3. Vikram Bhatt & Servier Peter, "Contemporary Indian Architecture after the masters," Mop Publishing Ltd., Ahmedabad, 1996.
4. Jenles Charles, "Architecture Today", Acadamy edition, London, 1988.
5. A Critical History of Contemporary Architecture: 1960-2010, edited by DrElie G Had Prof David Rifkind, Ms Sarah Deyong.
6. A Concise History of Modern Architecture in India by Jon T. Lang.
7. New Architecture and Urbanism: Development of Indian Traditions, Deependra Prasl Saswati Chetia Cambridge Scholars Publishing, 08-Jan-2010

8. Editor in Chief: Adolf K Placrek, Macmillan, "Encyclopedia of Architecture (Vol I to IV)", Fr
Newyork, 1990.
9. Manfern Tofuri & Frences Dal Co. "Modern Architecture -I & II (World architecture series),
Faber /elector, New York, 1989.
10. 10 Editor - in Chief: Adolf K. Placsek, Macmillan, "Encyclopedia of Architecture Vol I to IV'
Press, New York 1990.
11. Kulterman Udo, "Architecture of the 20th Century", Van Nostrand Reinhold, London,
12. The complete architecture of Balkrishna Doshi: rethinking modernism for the develo
world, James Steele, Balkrishna V. Doshi Super Book House, 1998.
13. Contemporary Architecture and City Form: The South Asian Paradigm, Farooq Ame
Publications, 01-Jan-1997.
14. World Architecture: A Cross-Cultural History Richard Ingersoll, Spiro Kost of OUP USA.

AR208 WATER SUPPLY AND DRAINAGE

Surface and underground sources of water supply, rate of demand, water requi
various buildings, suitability of water for domestic and trade purposes, methods of distributic
of supply of water, methods of layout of distribution
pipes.

House service connections, systems of supply, storage tanks, water services to
multistory buildings, design of pipelines, Materials etc., systems of hot water supply.

Sanitary appliances, Basic requirements of Drainage and Sanitation, Selection and
Installation of Sanitary Appliances, Sanitary pipe work within the premises, Drainage system
storied buildings.

Individual disposal systems- cess pool, Septic tank etc., Public Drainage system – Types of sy
Materials, details of Construction etc., Refuse disposal:- Refuse bins, Refuse
chutes etc.

Storm water drainage: Roof drainage – Pitched roofs, flat roofs, Surface Water draina
water drains. Rain water harvesting:- Rainwater harvesting
techniques, methods of recharging ground water, construction details.

REFERENCES

1. Wise, A.F.E. and Swaffield, J.A., "Water Sanitary Services for Buildings", Longman Scientifi Technical, Harlow, 1995.
2. Greeno, Roger, "Building Services Technology and Design", Longman Scientific and Technical, Harlow, 1997.
3. Chatterjee, A.K., "Water Supply and Sanitary Engineering", Khanna Publishers, New Delhi
4. Birdie, G. S., and Birdie, J. S., Water Supply and Sanitary Engineering, DhanpatRai and So Delhi,2007.
5. Garg, S. K., Environmental Engineering, Vol. II, Khanna Publications, New Delhi, 2009
6. Duggal, K. N., Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi,

AR210 BUILDING CONSTRUCTION AND MATERIALS –III

The use and properties of glass, timber products, laminates, paints, terracotta, terrazzo and glazed tiles. Use of alternative details and specifications pertaining to the application/fixing of the same under various circumstances.

Basic rule of relationship and design of riser and tread. Different types of stair way design. Construction details of concrete stairs of composite construction. Design of handra balusters using different materials. Various methods of fixing them.

Definition of partition and the role of partitions in buildings. Different types of partitions, and their properties. Joinery details and constructional techniques involved in timber partiti and double skinned partitions, partially glazed partitions.

Wall finishes - external facing and veneers - stone facing, wall facing, wall tiling, and cement concrete facing - methods of construction and details pertaining to the sam Introduction to fixing devices in walls, ceilings and floors of solid construction.

REFERENCES

1. Arora, S.P. & Bindra, S.P., "A Text Book of Building Construction", Dhanpat Rai & sons, Ne 1994.
2. Jha,.J. & Sinha, S.K., "Building Construction",. Khana Publishers, New Delhi, 1977.

AR212 ARCHITECTURAL DESIGN – IV

Projects – Developing designs and details for buildings, which are multi-room, single use, sm and multiple bay such as market, clinic, elementary school, art gallery and bank.

In addition to the design of a single or a small group of buildings, the students should be able to take into consideration the context in which the buildings are located and desig outdoor spaces appropriately.

Understanding design forces, significance of various factors like privacy, convenience, comfort, circulation pattern, furniture arrangement, texture, colour etc. in the environment.

The design should reflect the application of knowledge gained from courses on materials, structures, construction and theory of architecture.

REFERENCES

1. Edward. D., Mills, "Planning the Architects Hand Book - Butterworth, London, 1985.
2. De. Chiara and Callender, Time Saver Standards for Building types, McGraw - Hill Co., N.

AR214 STRENGTH OF MATERIALS LAB.

Laboratory exercises to be carried out by the students include:
Tension test on steel using UTM - Compression tests on concrete using slump cone. Tests on c for bulking and crushing strength, fineness tests - Tests on bricks and blocks crushing strength water absorption quality - Deflection tests on beams
- Water purity tests

SEMESTER V

AR301 ARCHITECTURAL ACOUSTICS

Acoustical / Sonic Environment and acoustical comfort. Sound, Nature of sound. Beha sound in enclosed spaces. Concept of Geometric Acoustics. Reflection of sound and their applications. Absorption of sound. Sound absorption coefficient.
Reverberation & Reverberation Time Calculation.

Sound absorbing materials - Porous materials, Panel / Membrane absorbers & Cavity / Helmholtz Resonators. Absorption coefficients of indigenous acoustical materials. Space/Functional absorbers. Mounting conditions and its impact on sound absorption.

Acoustical design of Auditoriums - adequate loudness, uniform distribution of sound energy, reverberation time & elimination of acoustical defects. Methods of raking the auditorium f the balcony. Acoustical Design of seminar rooms,
Conference halls, Cinema Theatres etc.

Outdoor & indoor noise, airborne noise & structure borne noise / impact noise, comm noise, & industrial noise. Transmission of noise & transmission Loss. Maximum acceptable noi Means of noise control & sound insulation. Sources of
industrial noise.

Sources of outdoor noise - Traffic noise - air traffic, rail traffic, road traffic and sea shore & inl traffic. Planning & Design against Outdoor Noise - for air traffic, road
traffic and rail traffic.

REFERENCES

1. Marshall Long, "Architectural Acoustics", Second Edition, Academic Press, Walth 2014
2. William J. Cavanaugh, Gregory C. Tocci, Joseph A. Wilkes, Architectural Acoustics: Princi Practice, 2nd Edition, Wiley, New York, 2009.

AR303 DESIGN OF R.C.C. STRUCTURES

Permissible stresses - limit states - characteristic strength and load - partial safety factor - deflection - modification factors.

Design principles of limit state methods - design of singly reinforced, doubly reinforced, T & L beams by LSD method with IS code specifications - design for shear.

One way and two way slabs for different edge conditions - continuous slabs - IS code specifications.

Columns - reduction factors - compression members and slender columns - Design of colum columns with helical reinforcement IS code specifications. Staircases - types
- design as per IS code specifications.

Footings - design of isolated footings - square, rectangular and circular footings - strip footings - combined footings.

REFERENCES

1. Ramamrutham, S. "Design of Reinforced Concrete Structures", Dhanpat Rai & Sons, Delhi, 1996.
2. Sinha, N.C. & Roy, S.K., "Reinforced Concrete Structures", S. Chand & Company Ltd., Nev 1983.
3. Ashok. K. Jain, "Reinforced concrete structures", New Chand & Bros Roorkee, 1992.
4. .H.J. Shah, "Reinforced concrete - Vol I", Charotor Publishing House, Annand, 1994,

AR305 LIGHTING AND ELECTRICAL SERVICES

Light - Electromagnetic radiation, Visual task requirements, Units of Light, Light, Vision and Bu Standards of Lighting and Visual comfort.

The sky as a source of light, Daylight factor, Lighting - Windows, Room proportions and other building elements, Daylight penetration, Calculation of daylight factor.

Artificial lighting - requirements. Types of electrical lamps. Electrical fittings/equipment used buildings. Design of general lighting schemes. Study of lighting systems used in different type buildings. Preparation of lighting layout for different types of spaces/ buildings. Supplementary artificial lighting for buildings.

Principles of electrical installation in buildings. Distribution, Circuits and elements of buildin systems. Safety methods and measures to be adopted, study of relevant I.S. Codes.

Electrical load estimation, branch circuit design and electrical wiring design for different types of buildings.

REFERENCES

1. Pritchard, D.C., "Lighting", Longman Scientific & Technical, Harlow, 1995.
2. Hopkinson, R.G., "Architectural Physics - Lighting", London, 1963.
3. Benjamin Evans, "Daylight in Architecture", McGraw-Hill Book Company, Newyork, 1981.
4. Medan Mehta James Johnson, Jorge Rocafort, "Architectural Acoustics: Principles and D Prentice-Hall, New York, 1998.

AR307 BUILDING CONSTRUCTION & MATERIALS - IV

Understanding the concepts of foundations, its principles & construction of different types o foundations, materials of construction & details of R.C.C. Footings, Raft foundations, Pile foundations.

Purpose and functions of joints in Building construction, types of joints that occur in Buildings. Expansion joints in Brick walls and R.C.C. framed structures and its construction d materials involved in the construction. Study of relevant IS codes.

Principles of temporary works such as shuttering, centering and scaffolding, Form work Centering and scaffolding materials used for these temporary structures - timber & steel, literature survey on temporary structures.

Study of casement windows, steel casement windows side hung, its components, study of relevant IS codes specifications, steel ventilators - Top hung - Staggered.

Methods of fixing the steel window, Ventilator frames to walls, fixing of glass, fixtures & fastenings study of different types of putty & glass.

REFERENCES

1. Arora, S. P. & Bindra, S. P., "A Text Book of Building Construction", Dhanpat Rai & Sons, Ne 1994.
2. Jha, J. &Sinha, S.K., "Building Construction", Khanna Publishers, New Delhi, 1977.

AR309 INTERIOR DESIGN

Designing the size and form of interior spaces using user - activity analysis and anthropometrics. The effect of enclosure, fenestration, colour and lighting on per space. Application of scale, proportion to enhance the quality of space. Psychological effect of space.

Design for comfort - climatic comfort, natural and artificial lighting, air conditioning and acoustics, Services - air conditioning ducts, electrical wiring, water supply and remov water. Elements of furnishing and surface treatment their need and scope.

Applied decoration - colour, texture, plane and fixtures. Emphasizing space through chang and structural form. Modulation of interior spaces with art objects. Space modulation throug and natural lighting. Emphasis of focal points and unity in Interior Design.

Role of furniture, evolution of furniture style, economic factors of furniture design and materials - its characteristics and application. Functional classification of space. Barri design.

Decorative materials for ceiling, walls, floors. Drapery and upholstery for openings and furnit respectively and matching them with overall colour scheme and composition. Sou collection of information. Elements of Indoor plants and
Interior Landscape and use of water.

REFERENCES

1. Ching, Fransis, "Interior Design Illustrated", Van nostrand Reinhold, Lodon, 1987.
2. Helsel, M. B., "Interior Designer's Drapery Sketch File", Watson Guptill Publishing Co., 1969.

AR311 ARCHITECTURAL DESIGN – V

Projects emphasizing detailed studies and drawings of one or more of the following aspects - space analysis, climatic consideration, services and environmental issues, and site

Analytical work on various issues specific to the project introduced will be carried out for the development of link / connection between studio work and lecture courses. A high standard of graphical representation and verbal skills are expected from the stu present their design ideas.

Projects to include buildings with single or multi - use, multi-span & multiple activities such as Library, Institutional buildings (eg. High School), Shopping Center, Nursing Hon Apartments etc.

Display of competence in the application of knowledge gained from the following will be an essential requirement for all the design projects:

Materials, Construction & Structures, Theory of Architecture, Environmental /Architectural Science & Behavioural science.

REFERENCES

1. Edward. D., Mills, "Planning the Architects Hand Book - Butterworth, London, 1985.
2. .De Chiara and Callender, Time Saver Standards for Building types, McGraw - Hill Co., N.

SEMESTER – VI

AR302 AIR CONDITIONING AND MECHANICAL SERVICES

Air conditioning - introduction. Comfort conditions within built environment. Basic refrig systems. Refrigeration system components. Vapour compression cycle. Concept of cooling Introduction to calculation of cooling load. Concept of
zoning.

Unit type equipment: (i) room A.C. & (ii) split A.C.: Package Units: (i) fully self-contained (fact & (ii) split type units: Central DX Plants and Central Chilled Water Plants. Schematic details systems. Comparison of various systems. Space
data of A.C. equipment rooms.

Lifts: types of lifts - Dimension of lifts. Traffic analysis, calculation of round trip time and selection of lifts. Hoist way/shaft/well, machine room & pit. Arrangement of lifts. Escalc characteristics, dimensions and arrangements of escalators.

Causes of fire, Mechanism of fire spread in buildings, classification of fire. Grades of fire haz Personal hazard, internal hazard & exposure hazard classification of building based or occupancy. High temperature effects and combustibility of
building materials and structure. Fire resistance of buildings.

Passive and Active fire precautions: Site planning, Heat sensitive detectors, Fire alarm systen means of escape. Firefighting installations: hose reel, internal hydrant
system, CO_2 system, wet risers, etc.

REFERENCES

1. Jain. V.K., "Design and Installation of Services in Building complexes & High Rise Buildings' Tech. Publishers, New Delhi, 1986.
2. .Croome,.D.J.,.&.Roberts,.B.M.,."Air-conditioning.and Ventilation of Buildings", Prgam Oxford, 1981.

AR304 ESTIMATION & SPECIFICATION

Introduction, Main items of work, Importance of specification, Types of specifications
- General and detailed specifications - Method of preparation of specifications.

Introduction, Types of Estimate, Detailed Estimate - Units of Measurements, Details of measurement and calculation of quantities of various items of work, Methods of Buildi Estimate - separate or individual wall method, Centre line method.

Analysis of rates for main items of work in buildings, considering current market rates for building materials, labour wages, plants and tools, transportation, handling, storage contractor's profit.

Preparation of Detailed estimate (Details of Measurements and Calculation of quantiti abstract of -Estimated cost) for different types of buildings including
R.C.C. framed buildings.

REFERENCES

1. Dutta, B.N., "Estimating & Costing in Civil Engineering Theory & Practice]", UBS Publishe Distributors Ltd., New Delhi, 1995.
2. Rangawala, K.S., & Rangawala, K.K., "Elements of Estimating & Costing", Charotar Publish Anand, 1984.

AR306 LANDSCAPE ARCHITECTURE

Introduction to Landscape Architecture. Introduction to major and minor landscape eleme and man-made elements. Land – as heritage, as resource, Land use implications. Water – P approach, as Resource, as Feature, Water related site
design, Plants – in nature, Introduced plantations, Planned & planted landscape.

Structures – Composition, Structures in landscape, Defined open space. Habitations – Dwelling-nature relationships, Human needs & habitat.

Community – The group imperative, Form order, New Directions City – Cityscape, Possibilities, New urbanity.

Landscape design – Visual arts as ordering mechanism, Circulation as ordering mechanism, spatial development, Architecture & site development.

Study of modern gardens & landscapes. Modification of site topography, Grading & drainage.

Japanese gardens: History, development, features, elements and types of Japanese gardens.

Mughal gardens: History, influences, typical features and elements of Mughal gardens.

REFERENCES

1. Landscape Architecture - A Manual of Site Planning & Design - John O Simonds, McGrav
Co., New York, 1983.
2. Motloch, J. L., "Introduction to Landscape Design", Van Nostrand Reinhold Publis
New York, 1991.
3. Kassler, E.B., "Modern Gardens and the Landscape", Museum of Modern Art, New York, 1
4. Landphair H. C., "Landscape Architecture Construction", Elsevier, 1979
5. Bring, M, "Japanese Gardens: Design & Meaning", McGraw Hill Book Co., New York, 1981

AR308 BUILDING CONSTRUCTION & MATERIALS - V

Properties of aluminium and its uses in buildings, aluminium extrusions, aluminium doors and windows fixing details using extruded sections. Fixing details of neoprene rubb beading, glass panels, fixtures and fastenings.

Study of various types of Aluminum partitions, its extrusions & details of components for partitions, Different types of aluminum panels for partitions, cladding component for various aluminum grill modules, roofing of industrial buildings.

Suspended ceilings and false ceiling using aluminum sections, construction details for pr thermal insulation and insulation of cold storages and study of insulation materials lik wool, insulating boards, gypsum boards, plaster of paris,
and various kinds of perforated boards.

Concrete shell roofs of various types and folded plates construction techniques,
- its strength and durability. Study on different forms & shapes of shell structures - its construc and materials.

Fixing details of sound absorbing materials, its properties and uses, Study of relevant IS code of damp - proofing materials like Bitumen felts, etc. Relevant
construction chemicals for W.P.C. & O.P.C. Study of construction chemical products.

REFERENCES

1. Arora, S. P. & Bindra, S. P, "A Text Book of Building Construction", Dhanpat Rai & Sons, Nev
1994
2. Jha, J. &Sinha, S.K., "Building Construction", Khanna Publishers, New Delhi, 1977.

AR310 ARCHITECTURAL DESIGN – VI

Projects – Projects will emphasis on physical context and the exploration of an archite vocabulary for given situations.

Technology to be integrated in the design process. To consider aspects such as exter detailing, interior design, use of materials and arrive at a coherent language for the building study offers an opportunity to students to research, organise
and produce an extended piece of written and graphical work.

Projects to include buildings or building complexes with single or multi - use public activi Multistoreyed type in sub - urban/urban settlement such as Courts, College,
commercial complex, Hospitals etc.

Display of competence in the application of knowledge gained from the following
will be an essential requirement for all the design projects:

Materials, Construction, Structures, Theory of Architecture, Environmental science / Architectural Science & Behavioural Science.

REFERENCES

1. Edward. D., Mills, "Planning the Architects Hand Book - Butterworth, London, 1985.
2. De. Chiara and Callender, Time Saver Standards for Building types, McGraw - Hill Co., N.

AR312 ARCHITECTURAL WORKING DRAWINGS

Preparation of working drawings (plans, elevations, sections and other detailed drawin suitable scales.

Atleast two working drawing sets preferably one for a small residential building and
one for multistoried building, based on the design done by students shall be prepared.

The list of detailed drawings to be prepared shall include Centre line plan, Foundation plan, grid plan (in case of framed structures), Basement floor plan, Ground floor plan, Typical floo elevations, All sections, Terrace floor plan, Toilet Layout and Sanitation drawings showing t etc., Electrical layout plan, Typical wall profiles sections, Doors and windows details, Detc drawings of special rooms like
kitchens, toilets, staircase etc.

REFERENCES:

1. William J. O'Connell (1985), Graphic Communications in Architecture: Standard Format Architectural Working Drawings, Stipes Publishing; 2nd revised edition
2. Osamu A. Wakita, Richard M. Linde, Nagy R. Bakhoum (2011), The Professional Prac Architectural Working Drawings, 4th Edition, John Wiley & Sons; 4th Revised edition
3. Fred A. Stitt (1998), Working Drawing Manual, McGraw-Hill Education

SEMESTER – VII

AR401 BUILDING STRUCTURAL SYSTEMS

Bulk active structures - beams, columns and slabs; Vector active structures - plane trusses c trusses; Form active structures - cable structures (tensile structures) & arches (compression str Surface active structures - shells, domes and vaults and Vertical structure systems - systems f load transmission (Bay System, Free Span System, Cantilever System &Composite System) systems for lateral load transmission (Shear Wall, Coupled Shear Wall, Interconnected Shec Core Wall,
Framed Tube &Tube in Tube)

REFERENCES:

1. Harbhajan Singh and Sunanda Kapoor "Structure Systems in Architecture", Abhis Publication, Chandigarh, 2008.
2. Heino Engel, "Structure Systems", Third Edition, Hatje Cantz Publishers, 2007
3. Ahmet Hadrovic, "Structural Systems in Architecture", Book Surge Publishing, 2009.

AR403 ENERGY EFFICIENT BUILDINGS

The energy crisis and the need for energy efficiency. Passive heating concepts. Passiv concepts. Passive heating & cooling concepts.

Natural ventilation in buildings as a low energy cooling strategy. Classification and functions ventilation. Factors to be considered for integrating Natural Ventilation in Building Design. W technique of terrain and height correction. Calculation of Air Flow through Openings (due t Pressure) and calculation of probable wind speed indoors as recommended by Bureau of In Standards. Wind speeds and
thermal comfort

Factors that affect energy use in buildings - functional factors, environmental factors, envel factors, air-conditioning systems factors, energy source factors and electrical syster Introduction to the Energy Conservation Building Code
(ECBC)

Introduction to Energy Management of Buildings and Energy Audit of Buildings. The aims and main aspects of Energy Management of Buildings. Energy Audit &

conducting the Energy Audit. Energy Management Matrix. Monitoring and Targetting.

Modification of microclimate through landscape elements for energy conservation. Energy conservation through site selection, siting & orientation. Energy conservation through integration of building and site, site planning & site design.

REFERENCES

1. Wayne Forster and Dean Hawkes, "Energy Efficient Buildings: Architecture, Engi and Environment" W.W. Norton Company Inc. 2002.
2. Mili Majumdar, "Energy-Efficient Buildings in India", The Energy and Resources Institu 2009.
3. Satyajit Ghosh and Abhinav Dhaka, "Green Structures: Energy Efficient Buildings, CRS Pre & Francis Group), 2015.
4. Bureau of Energy Efficiency, India. Energy Conservation Building Code, 2006.
5. Bureau of Energy Efficiency, India. Design Guidelines for Energy Efficient Multi- Store Buildings, 2014.

AR405 DISASTER RESISTANT BUILDING DESIGN & MANAGEMENT

Hazard, Disaster, Risk, Vulnerability. Disaster – an over view; Disaster – the Indian Persp Typology of disasters and increased understanding.

Natural hazards and Disasters -Earthquake, cyclone, floods, droughts, landslides, lightni –Causes, hazardous effects, mitigation measures. Man induced hazards & disasters:- soil causes, conservation measures; nuclear explosion-
environmental problems, corrective measures; fire mitigation measures; terrorism.

Preparedness and mitigation - Preparing hazard zone maps, Predictability/ forecasting &warning, Community preparedness, design against the disasters, retrof Population reduction in vulnerable areas, Awareness, Capacity building.

Disaster Management; Community health and casualty management; Disaster Manage role of various agencies; Relief measures; Post disaster- Recovery, Reconstruction and Rehabilitation. Remote- sensing and GIS applications in real time disaster monitoring.

References

1. Goel.S.L, 'Encyclopaedia of Disaster Management'
2. Government of India, (2004), 'Disaster Management in India' – A Status Report, Ministry o Affairs (Disaster Management Division), New Delhi.
3. Zebrowski, Ernest Jr, (1997)-, 'Perils of a Results Planet: Scientific Perspectives on Natural D Cambridge University Press, Cambridge.
4. Guha-Sapir D., Hargitt, D and Hoyois P. (2004), 'Thirty Years of Natural Disasters: 1974- 200 Numbers, UCL Presses, De Lou vain.
5. Ministry of Home Affairs (MHA), (2004)-, 'National Programme for Capacity Building of Ar Earthquake Risk Management (NPCBAERM)', National Disaster Management Division (Go of India), New Delhi.
6. Hewitt, K (1983), 'Interpretation of a Calamity', Allen &Unwin Inc., London.
7. Heide, Auf der E (1989)-, 'Disaster Response: Principles of Preparation and Coordino C.V.Mosby, Baltimore.
8. Amarnath Chakrabarti, Devdas Menon, Amlan K. Sengupta, 'Handbook on Seismic buildings'

AR407 URBAN DESIGN

Need for urban design. The scope and objectives of urban design. The relationship bet Architecture, Urban Design and City Planning. Brief history of urban design.

Urban land use population density and transportation and their relationship between urban urban environment. The causes and consequences of chaotic and disorderly urban environment of today with special emphasise to CBD.

Visualisation of image of the city and its elements. Perception of urban environment: Kevin Lynch's Principles.

Understanding the organisation and articulation of urban spaces. Urban spaces and urban activities. Elements of townscape.

Techniques of urban design. Urban renewal - the scope, need and procedure. Urban conservation.

REFERENCES

1. Lynch, Kevin, "The Image of the City", MIT Press, Cambridge, Mass, 1960.
2. Krier, Rob, "Urban Space", Academy Editions, London,1967.

AR409 BUILDING CONSTRUCTION & MATERIALS - VI

Modular Co-ordination Module - basic module - multimodules - horizontal & vertical multi modules and submodules. Modular space grid. Modular dimensioning and modu drawing.

Preferred sizes for horizontal and vertical coordinating and controlling dimensions. Con dimensions for widths of building components & controlling zones. Controlling dimer heights of building components & controlling zones. Storey heights & room heights.

Space structures. Skeleton frame works (space frames) - single layer grids (two way, three way & four way) and double layer grids (lattice grids & true space grids). Offset grids c differential grids.

Study of prefabricated commercially available systems - Space Deck System, Triodetic System, Mero System & Nodus System. Geodesic Domes.

Introduction to System Building / Method Building. Closed System & Open System. Anc building elements / components for introduction of prefabrication in India context. Classification of prefabricated components.

REFERENCES

1. Makowski, "Analysis, Design and Construction of Double - Layer Grids", Applied Scienc 1981.
2. Heki, K., (ed.), "Shells, Membranes and Space Frames", Elsevier, New York, 1986.

AR411 ARCHITECTURAL DESIGN -VII

Projects introduced should provide opportunities to understand and learn how to solv environmental needs for multi-faceted public activities in an urban context. Examples c include air port, bus terminal, railway station, cinema complex, exhibition hall, indoor sports complex and campus planning. Design

problems involving high density and / or large scale housing.

Complete set of Working Drawings are to be prepared for one of the Architectural Design Projects.

Display of competence in the application of knowledge gained from the following will be an essential requirement for all the design projects:

Materials & Structures, Theory of Architecture, Environmental Science and Behavioural Science.

REFERENCES

1. Edward. D., Mills, "Planning the Architects Hand Book - Butterworth, London, 1985.
2. De. Chiara and Callender, Time Saver Standards for Building types, McGraw - Hill Co., N.

SEMESTER – VIII

AR402 PROFESSIONAL TRAINING

The students are required to undergo Practical Training in a qualified, registered and compe Architect's Office. Students will be trained in the various practical aspects of Architecture, Construction & Professional practice.

Maintenance of personal diary, recording important observations, architectural detail, t data, site visit particulars, presentation of drawings and reports done during the training pe the essential submission requirements. Marks will be awarded on the basis of student's mo progress reports, work diary, drawings & reports done during the training period and the Architect's certificate.

SEMESTER – IX

AR501 BUILDING BYE-LAWS AND CODES OF PRACTICE

Meaning and significance of key terms with appropriate examples: Act, Rules, Regula Bye-laws. Overview of Bureau on Indian Standards (BIS) and its role in publishing standards to architecture and construction in terms of specifications, codes of practice and handbooks.

National Building Code (NBC) of India 2005 and its significance. Salient features of the various parts of NBC - integrated approach, definitions, administration, development contro general building requirements.

Features of NBC covering fire & life safety, building materials, structural design, constru practices & safety, building services, plumbing services and landscaping, signs & outdoor display structures.

Building Bye - Laws & Regulations. Examples of building bye-laws covering aspects such as plot coverage, floor area ratio (FAR), height restrictions, parking norms and minimum stc habitable spaces. Exposure to the contents of the
various forms an architect is required to submit to the statutory authorities.

Overview of Municipal Acts, Corporation Acts, Consumer Act & their implications. Introduction to Heritage Act and its importance.

References

1. National Building Code of India 2005
2. Krishnamurthy, K.V. and Ravindra S.V. Professional Practice, (Eastern Economy Editio Prentice Hall India, New Delhi, 2014.
3. Summaries of Indian Standards for building materials
4. Handbook on Functional Requirements of Buildings (Other than Industrial Buildings)
5. Handbook on Functional requirements of Industrial Buildings (Lighting& Ventilation)
6. Handbook on Building Construction Practices
7. Handbook on Methods of Measurement of Building Works

AR503 ENVIRONMENT AND BEHAVIOUR

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

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

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

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

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

REFERENCES:

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

AR505 URBAN PLANNING

Urban Areas – characteristics, categories of a town, Classification of settlement based on fc scale etc., densities of a town.

Planning process. Various stages of the planning process with relevant examples. Surv planning, Physical characteristics, utilities, population, employment and
industry, Housing, commercial and transportation, land use.

Plans: Regional plan, Master plan, Zonal development plan, Structure plan and Transp plan. Regional plan types and delineation of regions. Land use plan,
local development plans and their components.

Contemporary Concepts in Town Planning: Role and contribution of the following tow contemporary town planning thought - Patrick Geddes, Patric Abercrombie, Daniel Burnha Mata, Frederick Olmstead, Henry Wright, Ebenezer Howard,
Clarence Perry, Clearance stein, CA Doxiadis, Le Corbusier, Frank Lloyd Wright.

Urban renewal - Necessity and Advantages of urban renewal- various steps in urban renewal programme. Development control: Issues, Aims, Form, and Contents. Plan Standards.

REFERENCES

1. Burn, Stanly& Williams, Jack, "Cities of the world – World Regional Urban development", Harper & Row, New Delhi, 1983.
2. Keeble, Lewis, "Principles of Town and Country Planning", The Estates Gazette ltd., Londo
3. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
4. Arthur B. Gallion and Simon Eisner, The Urban Pattern – City planning and Design, Van No Reinhold company
5. N.V.Modak, V.N.Ambedkar, Town and country planning and Housing, orient longmo

AR507 ARCHITECTURAL DESIGN –VIII

Design problems at urban or metropolitan scales and environment, multi-use com including functions such as residential, public services, industrial, commercial, transportation, cultural and civic.

The focus should essentially be on an urban design exercise with emphasis on design to suit the surrounding environment in relation to both traffic and planning control.

Application in design: The design output should clearly indicate the application of theory o architecture, materials & structural systems, environmental sciences and behavioural sciences.

REFERENCES

1. Edward. D., Mills, "Planning the Architects Hand Book," - utterworth, London, 1985.
2. De. Chiara and Callender, "Time Saver Standards for Building types", McGraw - Hill Co., N

AR509 DISSERTATION – I (Seminar)

Dissertation is seen as a culmination of the development of the student's knowledge, attituc skills over the course of studies of Architecture.

Student is expected to develop a subject of his or her own choice and to demonstrate the use effectively the tools of independent investigations and judgement to evolve design crit application of these may be original design or research oriented work.

In Dissertation - I the initial project proposal and the literature review of the project chosen f Dissertation shall be carried out. Students can choose the topic of special study relevant chosen project. Independent detailed study and documentation of chosen topic s carried out. Submission of report with oral
and visual presentation.

SEMESTER – X

AR502 BUILDING ECONOMICS & CONSTRUCTION MANAGEMENT

Cost price and value. Factors controlling the cost of urban real properties, Valuation, Depre Rent and its implications. Economic life of buildings.

Project management functions, planning process. Project work breakdown, Modelling and analyzing networks and work scheduling process. Bar charts and Mile stone c

Network analysis fundamentals, CPM Network analysis procedure. PERT - Network, Time estimates, Probability Distribution, Critical Path, Slack and Probability of achieving com date.

Project cost analysis - Cost versus time, Contracting the Network etc., Resource Allocation - Resource Smoothing and Resource Levelling.

Updating the network based on the project progress. Computer applications in construction management – using MS Projects software for project planning, sche and control.

REFERENCES:

1. Stevens, James D., "Techniques for Construction Network Scheduling", McGraw - Hill Pub Company, New York, 1990.
2. Mukhopadhyay, S. P., "Project Management for Architects and Civil Engineers", Firma K Ltd., Calcutta, 1981.
3. Srinath, L. S., "PERT and CPM - Principles and Applications", Affiliated East - West Press F New Delhi, 1989.
4. M. Mohsin, Project Planning and Control, Vikas Publishers, New Delhi, 1983
5. Gurcharan Singh, "Building, Planning, Designing and Scheduling", Standard Public 2009.

AR504 PROFESSIONAL PRACTICE

Architects ACT 1972 and its implications. Council of Architecture and its role. The Indi of Architects and its role. Code of Professional conduct as laid down by Council of Architecture. Purpose of architectural competitions. Council

Architecture's Guidelines on Architectural Competitions. Types and classifications of competitions.

Comprehensive Architectural services. Conditions of Agreement. Scope of work and schedule of services - as per the Council of Architecture. Standard Terms for Urban

Design work – Scope of work, Schedule of services – Preliminary evaluation stage, Concept design stage, detailed design stage and Implementation stage.

Tender - its meaning & significance. Invitation to tender – Private invitation, Public Noti Negotiation. Tender Notice and its characteristics. Opening of Tender. Acceptance of Types of Tender. Characteristics, advantages & disadvantages of various types of tenders.

Social Role / Social Responsibilities of Architects, Architect and Office- Office and its manag Architects duties to his employees under labour welfare provisions. Duties and Liabilitie Architect. Legal responsibilities of architects towards Statutory Bodies.

General Conditions of the Contract as put forward by the Indian Institute of Architects. Prim Materials & workmanship, Inspection. Defects. Damages for non- completion, Virtual completion and defects liability period, Determination by the owner and determination by the contractor.

REFERENCES:

1. Documents published by the Council of Architecture in their web http://www.coa.gov.in
2. Krishnamurthy, K.V. and Ravindra S.V. Professional Practice, (Eastern Economy Editio Prentice Hall India, New Delhi, 2014.
3. Indian Institute of Architects, "Handbook on Professional Practice", Architects Publish Corporation of India, Mumbai.

AR506 DISSERTATION -II

Dissertation is seen as a culmination of the development of the student's knowledge, attituc skills over the course of studies of Architecture.

Student is expected to develop a subject of his or her own choice and to demonstrate the
use effectively the tools of independent investigations and judgment to evolve design crite
application of these may be original design or research
oriented work.

In Dissertation – II, the candidate shall carry out the detailed Architectural design of the pro
incorporating structural concept, services and application of chosen special study. The
submission shall include detailed architectural presentation drawings including rendered
views3D, physical models and report with copies of
drawings.

ELECTIVES

AR351 ADVANCED COMPUTER APPLICATIONS

Introduction to 3Dstudion Max / Max user interface / Modeling / Applying Materials to geom
Creating lights / Photo realistic Rendering / Simple Animations / Exporting
files from Auto CAD to 3D studio Max

Introduction to Rhino / Precision Modelling/ Draw with absolute, relative rectangular, and p
ordinates/ Distance and angle constraints / Viewports and construction
planes / Model in 3-D space/ Elevator mode/ Rectangle command and its options

Point selection with object snaps / Analysis commands: length, distance, angle, radius
/ Draw circles and arcs/ Draw ellipses and polygon curves / Rhino render and render colour
free-form curves/ Create helix and spiral curves

Intermediate Edit and Surfacing Commands / Introduction to NURBS modelling concep
terminology /Free-form curves / Control point editing of curves and surfaces /Rebuild curv
surfaces /Use the nudge modelling aid /Create deformable shapes /Blend between t
surfaces /Symmetry Tool/ Lighting and
rendering /Make 2D drawings from 3D Objects /Page Layouts

Advanced Surfacing and Solids Model with solids and solid text. Use Boolean tools to shape
model. Extrude, loft, and revolve curves into surfaces. Use sweeps to create additiona
Use advanced surfacing techniques like blend, match, and surface from network of curves.
model primitives and solid text / Model
with pipe and extrude /Extrude and loft surfaces / Revolve curves into surfaces

REFERENCES

1. Rhino NURBS 3D Modeling by McNeel& Associates, New Riders; Pap/Cdr edition (Aug 19
2. Learning to use Rhino - Tutorials Collection – web reference: https://www.rhino3d.com/learn
3. Mastering Autodesk 3ds Max 2013, by Jeffrey Harper, Sybex; First edition (Sept 2012)

AR353 GRAPHIC DESIGN

Fundamentals of Graphic Design: Introduction to Graphic Design – its history, career options prominent designers & the graphic design process. Overview of design basics – colour, rhythm, balance, proportion etc.Visual perception & graphical thinking.

Tools of Graphic Expression. Styles of expression–an overview; Illustrations - developing manu presentation skills Computer graphics - overview of current packages, their potentials &applications

Designing for printing. Lettering & Typography Design of books, posters, promotional materials, stationery etc..

Developing trade marks & Corporate logos. Evolving a comprehensive corporate iden program; Developing environmental graphics / signage; Brand promotion – including pack design & ad-making for both the print & electronic media
Multimedia design - E books / interactive CD Roms; animation design; Web design

REFERENCES

1. White, Alex W, "The Elements of Graphic design",AllworthPress,2011
2. Lupton, Ellen, "Thinking with type", Princeton architectural press, 2004.
3. Wheeler, Alina, "Designing brand identity", Jon Wiley and sons, 2012
4. Rand, Paul, "A designer's art", Yale University press, 2001.

AR355 PHOTOGRAPHY, ART AND VISUAL COMMUNICATION

Pencil and charcoal sketching, mixed media rendering, water color compositions and prim acrylic / oil colours; alternative media work such as glass painting, earthen pot painting.

Advanced aspects of visual cognition, psychological responses of humans; Art, design, architecture and cinema appreciation; Image doctoring and manipulation using c software for graphics and animation (Photoshop and Flash).

Study of the fundamentals of still photography and the camera – Lens types, Aperture and exposure, shutter speed, depth of field, focus, light conditions, light comper Comparative assessment of traditional SLR and digital photography.

Basic movie camera shooting, traditional analog and digital methods, conversion of analog digital, memory manipulation and software compatibility exercises; Elementary film e video and audio clips, merging, morphing, transitions (with Adobe Premiere).

REFERENCES

1. Adithya Kuber et al., Jasubhai Digital Media Fast Track to digital Photography, Ma 2005.
2. Ambrose G. and Harris P., The Fundamentals of Graphic Design, AVA Publist 2009.
3. JosephCiaglia, Barbara London et. Al., Absolute Beginner's Guide to Digital Photog Que Publishing, 2004.
4. Julie A. K., Shoot like a pro! Digital photography techniques, McGraw-Hill / Osborn
5. Lnada R., Graphic Design Solutions, Wadsworth, New York, 2003.
6. Matthew Banberg, New Image Frontiers: Defining the Future of Photography, Cours Technology, a part of Cengage Learning, 2012.

AR357 SEMINAR ON CONTEMPORARY ARCHITECTURE

Prerequisite: Students should have successfully completed the theory subject on Conte Architecture. In this subject it is envisaged that greater theoretical understanding is ob about the professional works on Contemporary Architects.

In this subject students are encouraged

a) To study the works of contemporary architects through an evaluative and/or theoretical framework,

b) To understand the works of contemporary architects in contemporary vocabul by well-known writers of Architecture projects,

c) To describe and interpret the works through a written essay thereby invoking the studen in critical/analytical reading, writing of essays, and carryout basic research about conte architecture,

d) To present their understanding through seminars and discussions.

The faculty are expected to encourage/help the students discover their innate abilitie inculcate reading, writing, discussion, debate and presentation skills about contemporc architectural practice.

AR352 VERNACULAR ARCHITECTURE

Vernacular architecture - introduction - factors contributed to its evolution with exam advantages of studying it and possible application today.

Vernacular architecture – around the world -factors that contributed to their evolution. Few examples

Vernacular architecture in India - Factors that contributed to its evolution. Few examples

Vernacular architecture of Tamil Nadu - factors that contributed to its evolution. Few examples; Settlement planning strategies, Regional and occupation wise variation.

Influence on modern architecture, examples from the works of Frank Lloyd Wright, Green Hasan Fathy, Geoffery Bawa. Possible applications of vernacular architectural techniques today.

REFERENCES

1. Oliver, Paul, "Encyclopedia of vernacular Architecture of the world (3 Vol. Set)", Cambric University Press, U.K., 1997.
2. Tipnis, Aishwarya, "Vernacular traditions: contemporary architecture", TERI public India, 2012.

AR354 BARRIER FREE ENVIRONMENT

Barrier Free Design – need &concerns; Definition and dimensions of Barrier – physical, psych and social. Types of Disability; Approaches towards Disability a Medical Model and Social Model.

Universal Design - principles and aspects; Study of Human - environment interaction system.

History of development of barrier free initiatives taken across the globe. Norms and standards for barrier free design.

Design elements within buildings, site planning, parking, approach to plinth levels, corr entrance and exit, windows, stairways, lifts, toilets, signage, guiding and warning systems, floor materials.

Design elements outside the building – kerb at footpath, road crossing, public toilet, bust stop, toilet booth, and signage.

Provision in residential building, auditorium, parks, restaurants, railway station. Constitutional and statutory provisions to implement barrier free design; barrier free transpor barrier free tourism; access audit and design solution to one building.

REFERENCES

1. Accessibility for disabled – A design manual for a barrier free environment by unit nation [available online] http://www.un.org/esa/socdev/enable/designm/index.html.
2. Bednar M. J., Barrier free Environments.
3. Harkness S., Building without Barriers for the Disable.
4. Manual on Barrier free Environment, CPWD.
5. The persons with disabilities (Equal opportunities, protection of rights and full partici act. 1995.

AR356 FACILITIES PLANNING

Flexibility and facilities planning; Optimal space planning and cost minimization throug layout; Knowledge based facility planning and decision support system; Application of intelligence; Graph theoretic approach to multi-floor building design; Facility layout algorith graphics; Simulation in facility planning and efficiency analysis; Computerized space mana Computer methods in facility layout; Computer graphics and facility layout generat Database management systems for multifunctional building project; Integrated approa specialized building design; Multi-criteria approach in building design; Project engineering management of specialized or large scale buildings

AR451 PRODUCT DESIGN

An brief introduction to Product Designing – Various elements – History of Product Des Definition of Product Design, understanding of Product Design - Purpose of Product Design – Role of Product Designers.

Definition of human factors, Application of human factors data. Human activities, their natu effects. Man-machine system and physical environment. Human performance and s reliability. Information input and processing. Human control systems. Applied anthropometry – Human response to climate.

Aspects of Product Design: Visual, Auditory, Tactual, Olfactory human mechanisms, Physica and arrangement. Visual display, process of seeing, visual discrimination, quantitativ qualitative visual display, Alphanumeric and related displays, Visual codes and symbols.

Product Design: Form, Colour, Symbols, User specific criteria, Material, Technology and recyclability, Packaging. Multiple Utility oriented approach to Product Design.

Design of Household elements, tools and devices, Design of furniture, Design of Industrial Products. Element design for the physically and mentally disabled people.

REFERENCES

1. Time Saver Standards for Interior Design
2. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGrawhill Co., USA, 1
3. Francis D.K.Ching, Interior Design Illustrated, VNR Publications, New York, 1987.
4. An invitation to Design, Helen Marie Evans.

AR453 ENVIRONMENTAL CONTROL AND DESIGN WORKSHOP

To consolidate the theoretical inputs of subjects Climatically Responsive Architecture and Architectural Acoustics through application of the principles learnt from the subjects.

To expose the students to the Climatic, Lighting and Acoustic problems and issues in the Built Environment.

To effectively link the above mentioned subjects to the prevailing Climatic, Lighting and Acoustic issues in the Practice of Architectural Design.

The course intends to take up a small hypothetical or live project and attempts to work out solutions to the same. It may involve one or two project/s from Climatic or Lighting or Ac issues from the field.

The projects may also take up previous design problems of the students and consciously apply climatic principles to improve the quality of design.

AR455 LANDSCAPE DESIGN

Design exercise where outdoor spaces will be designed and details of various elemer components of the design will be worked out.

Study oriented work will be given which will involve study of the use of outdoor spaces by different user groups, landscape elements, street furniture, etc.

REFERENCE

1. Simonds, J. O., "Earthscape: A Manual of Environmental planning", McGrc Book Co., New York, 1978.
2. Motloch, J. L., "Introduction to Landscape Design", Van Nostrand Reinhold Publishi New York, 1991..

AR551 SUSTAINABLE ARCHITECTURE

Concepts of sustainability : Energy and Global environment, Energy use and Climate chang impact, Types of Energy systems, Concept of Sustainability - Principles of conservation -syne nature, Bioregionalism - community basis shelter technology within bioregional pa and scales, Ethical- environmental degradation.

Sustainable planning & Design: Sustainable Development -Sustainable approach to site plc and design - site inventories- relationships between site factors - development impacts area of the site on the other areas - Model ecosystem of the site, environmental monitoring and testing during construction- phasing of

development - limits of change - Design facility within social and environmental thresholds.

Sustainable Building Materials and Construction: Properties, Uses and Examples of -Primary, secondary and Tertiary Sustainable Materials, Principles to improve the energ efficiency - siting and vernacular design, shade, ventilation, earth shelter, thermal iner air lock entrances. Techniques of sustainable construction - technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: sola heating panels; photovoltaic electricity generation; use of local materials and on site food, fuel and building materials.

Recycling and Reuse: Pre building, Building, Post building stages - Architectural Reuse, Wast prevention, Construction and Demolition recycling- Conservation of natural and buildin resources Energy and material savings – types of wastes - Elimination of waste and minimize various Decomposing methods – Innovative reuse of various wastes Case Studies and Ra systems: Sustainable Development Case Studies: illustrated examples of the planning, development, and construction.

Green architecture and various international and national rating systems for susta
EAM (UK), CASBEE (Japan), LEED (US), Green Star (Australia), etc.
– Indian systems – TERI GRIHA rating, LEED India rating, IGBC

REFERENCES

1. Dominique Gauzin – Muller "Sustainable Architecture and Urbanism: Concepts, Tect and examples", Birkhauser, 2002.
2. Slessor, Eco-Tech: "Sustainable Architecture and High Technology", Thames and Hudson
3. Ken Yeang, "Ecodesign : A manual for Ecological Design", Wiley Academy, 2006.
4. Arian Mostaedi , "Sustainable Architecture : Low tech houses", CarlesBroto, 2002.
5. Sandra F.Mendler & Willian Odell, "HOK Guidebook to Sustainable Design", John willey a 2000.
6. Richard Hyder, "Environmental brief: Pathways for green design", Taylor and Francis
7. Brenda Vale and Robert Vale, "Green Architecture: Design for a sustainable future and Hudson 1996.
8. Fuller Moore, "Environmental control systems Heating, Cooling, Lighting". McGraw Hill, N
9. Caring A.Langston, Grace K.C.Ding, "Sustainable practices in built environment", secon Butterworth-Heinmann Linacre House Jordanhill Oxford.
10. R.N.Trivedi, "Environmental Sciences", Anmol Publications Pvt Ltd, New Delhi

AR553 COST EFFICIENT CONSTRUCTION TECHNIQUES

Cost effective techniques: Need, Planning aspects, construction aspects, maint and longevity aspects.

Choice of materials in Indian conditions, indigenous building materials, organic and inorgar building materials, alternative building materials, use of industrial and agricultural waste of such materials development by research organizations
like CBRI, SERC etc.

Significance of construction technology: Relevance of improving of traditional technol relevance of innovative technology/alternate technology, survey of
such technologies by various research institutes.

Critical analysis (in terms of initial investment, maintenance cost and longevity of buildings) of the local adaptation of the innovative technologies by various agencies.

REFERENCES

1. G.C. Mathew, 'Low cost housing in development countries'
2. Publication of CBRI, SERC, RRL, NBO, COSTFORD.

AR555 INDUSTRIAL ARCHITECTURE

Role of architects in the design of modern industrial buildings. A basic knowledge of industri respect of type and category. Planning considerations in the development of mas including site selection and site layout. Design for loading / unloading area.

Design considerations in development of industrial buildings considering: Flexibility; Adaptability; Structural selection; Integration of structure and services; Industrial lighting circulation and material handling.

Working environment for industrial workers - Work space and ergonomics; Use of color; Illumination; Light and Glare; Noise and vibration; Temperature, Humidity and Ventilc Visual environment and landscaping.

Health, welfare and childcare in Industrial Premises. Safety security and warning controls.

Consideration facilities like Rest room, Locker room, Sanitary, Changing room, Cafeteria, Recreational etc.

REFERENCES

1. Adam J., Hausmann K., and Juttner F., A Design Manual – Industrial Buildings.
2. Blum M. L., and Naylor J. C., Industrial Psychology, CBS, Delhi.
3. Drury J., Factories – Planning, Design and Modernization.
4. Hansen D., Indoor Air Quality Issues.
5. Munce, J. F., Industrial Architecture – an Analysis of International Building Practice,
F. W. Dodge Corporation, New York.
6. Philips A., The Best in Industrial Architecture.
7. Reid K., Industrial Buildings; The Architectural Record of a Decade; F. W. Dodge Corporc
York.
8. Sinha, R. K. and Heart, S., Cleaner Production – Greening of Industries for Sustainal
Development.

AR557 BUILDING AUTOMATION AND MANAGEMENT SYSTEMS

Concept and application of automation and management system; design issues relat building automation and its effect on functional efficiency; components of building auton system; HVAC electrical, lighting security, fire-fighting, communication etc.; inte approach in design, maintenance and management system; current trend and inno building automation systems;
impact of information technology; concept of artificial intelligence; knowledge base

and decision support systems and building automation and management system; app expert system in building automation; stages in development of expert system, expert sy application in architecture; computerizing building
management information.

REFERENCES

1. Atkins B., Intelligent Building, Springer, 2007.
2. Atkins B., Total Facilities Management, Springer, 2009.
3. Carlson R. A. and Giaudomenico R. A., Understand Building Automation System, Amazor
4. Merz H., Building Automation, Springer, 2012.
5. Wang S., Intelligent Building and Building Automation, Taylor & Francis, (4th Ed.), 2009.

AR559 CONSTRUCTION TECHNOLOGY

Planning - pre-stressed, concrete constructions pre-cast concrete and pre- fabricc system - Modular coordination.

Modern Construction Materials - Manufacture, storage, transportation and erection of pre- component forms, moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

Construction equipment's: Tractors, bulldozers, shovels draglines, cableways and belt conve batching plants - Transit mixers and agitator trucks used for ready mix concrete pump Guniting equipment's - Air compressors - welding equipment - cranes and other lifting c Choice of construction equipment for different types of works.

Planning and scheduling for high rise building: Scheduling- Simulation – Typical Floor Construction Cycle – Appropriate working schedule.

Overview of construction management topics including estimating, cost control, quality control, safety, productivity, value engineering, claims, and legal issues.

REFERENCES

1. R. Chudley, Construction Technology, Pearson, 2005.
2. R. Barry, The Construction of Buildings, The English Language Book Society and Crc Lockwood, Staples, London, 1976.
3. Construction Planning equipment and Methods by RL Peuriboy Tata McGraw Hill, 1979
4. Modern Construction and Management. Frank Harris John Wiley and Sons, 1983.

AR561 ENVIRONMENTAL PLANNING

Resources: Man, biosphere, ecosystems, resource identification and its implications for deve soil, water, land, plants, animals, renewable energy and nonrenewable energy. Preparation and analysis of resource inventories.

Environmental Impact Assessment: Methodologies and techniques

Environmental Legislation: Significance of law and its relationship to development, evolution of planning legislation. National environmental policy.

Planning Techniques: Essence of good planning, integration of environmental asse and planning options, Priorities and strategies for development on urban, coastal and hilly ecosystems.

Evaluation Techniques: Cost benefit analysis, planning balance sheet and goal achievement matrix.

REFERENCES

1. Earth scape - A Manual of Environmental Planning and Design, John Ormsbee Sim Nostrand Reinhold Company 1978
2. Richard P. Dober – Environmental Design – VNR company - New York, 1969
3. Albert J. Rutledge – Anatomy of a park – McGraw Hill book Co., - USA 1971
4. Harvey M. Rubenstein – A guide to Site and Environmental planning, 3rd vol. – John Wile New York, 1987.

AR552 HOUSING

Qualitative and quantitative needs in the field of housing at the global level. Problem in th housing in developing countries (Third world countries) with special emphasis to India.

The peculiarities of urban housing land for urban housing - problems and possible solutions. The relationship between place of work and home.

Assessing the housing deficit of a region projecting the number of houses to be cons therein, the future plan period, in order to remove deficit. Public sector and private sector h the need for housing policy and the role of HUDCO and State Housing Boards.

Slums - Definitions, Causes and consequences. Attempts made to solve the problem of slums.

Low - cost housing: Ways and means of controlling the cost of houses. A few low cost constr
techniques and material tried out in India and in developing countries.
Current income and economically weaker sections.

REFERENCES

1. Abrams, Charles, "Housing in the Modern World", Faber, London, 1964.
2. Allen, W.A., Happold, E., Word, A.M., & Courtney (Ed.) "A Global strategy for Housi
third millennium E & FN Spon, London, 1992.

AR554 ARCHITECTURAL CONSERVATION

Understanding Heritage. Types of Heritage. Heritage conservation- Need, Debate and
Defining Conservation, Preservation and Adaptive reuse. Distinction between Architectu
Urban Conservation. International agencies like ICCROM,
UNESCO and their role in Conservation.

Museum conservation – monument conservation and the role of Archeological Survey of In
of INTACH – Central and state government policies and legislations – inventories and proje
case studies of sites such as Hampi, Golconda,
Mahabalipuram - craft Issues of conservation.

Listing of monuments- documentation of historic structures- assessing architectural char
historic structure report- guidelines for preservation, rehabilitation and adaptive re-use o
structures- Case studies of Palaces in Rajasthan, Chettinad and Swamimalai dwellings, seism
and disabled access/ services additions to
historic buildings-heritage site management .

Over view of urban history of India and Tamil Nadu, understanding the character and
issues of historic cities, historic districts and heritage precincts.

Conservation as a planning tool, financial incentives and planning tools such as Trans
Development Right (TDR), urban conservation and heritage tourism, case studies of sites lik
Cochin, Pondicherry French town, conservation project
management.

REFERENCES

1. Donald Apple yard, "The Conservation of European Cities", M.I.T. Press, Mass 1979.
2. James M. Fitch, " Historic Preservation: Curatorial Management of the Built World" Univer of Virginia; Reprint edition, 1990
3. Robert E. Stipe, A Richer Heritage: Historic Preservation in the Twenty-First Century", Univ. Caroling press, 2003.
4. Conservation Manual, Bernard Fielden; INTACH Publication, 1989.
5. A.G. K. Menon ed. "Conservation of Immovable Sites", INTACH Publication, N.Delhi.

AR556 ARCHITECTURAL JOURNALISM

Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, report writing, editing, photography, columnists, public relationships, criticism.

Interviewing techniques, Argument and debate as a technique in the investigation of socia problems; evidence, proof, refutation, persuasion; training in argumentative speaking.

Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and televis

Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspap magazines - Text preparation, Mode of presentation, Standards and Guidelines for docume Code of ethics, Basic knowledge on Press laws, Press
Council of India, Multimedia/online journalism and digital developments.

Regional, National and International discussion forums, Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural jc Analysis of recent historical and contemporary examples of written and journalistic criticism architecture, including selected writings by Indian and overseas critics; discursive technique of major critical themes, thematic
categories in architectural writing.

REFERENCES

1. Edward Jay Friedlander and John Lee, "Feature Writing for Newspapers and Magc edition, Longman, 2000.
2. Fuller, David & Waugh, Patricia eds., "The Arts and Sciences of Criticism", Oxford: Oxford Press, 1999
3. Foust, James, Online Journalism, "Principles and Practices of News for the Web", Holcom Hathaway Publishers, Scottsdale, AZ, 2005
4. M. Harris, "Professional Architectural Photography", Focal Press, 2001.
5. M. Harris, "Professional Interior Photography", Focal Press, 2002
6. Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Jou Developing Countries. UNESCO/Thomson Foundation/ Common wealth Broadcasting Ass 2005.
7. Ward, S. J. A. "Philosophical Foundations of Global Journalism Ethics." Journal of Mass Me Ethics., Vol. 20, No. 1, 3-21, 2005
8. M . Heinrich, "Basics Architectural photography", BikhauserVerlag AG, 2008. 4. Gerr "Architectural Photography: the professional way", 2007

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