KALASALINGAM SCHOOL OF ARCHITECTURE
Anand Nagar, Krishnankoil
SRIVILLIPUTTUR – 626 126, Virudhunagar Dist, TN.

Bachelor of Architecture
(B. Arch)
CURRICULUM & SYLLABUS
2012

KALASALINGAM UNIVERSITY
(Kalasalingam Academy of Research and Education)
Anand Nagar, Krishnankoil
SRIVILLIPUTTUR – 626 126, Virudhunagar Dist, TN.

Semester - I

Code No.	Course Title	L	S	C
THEORY				
MAT111	Mathematics	3	0	3
HSS111	Communicative English	3	0	3
ARC101	History of Architecture and Culture – I	3	0	3
ARC102	Building Materials – I	3	0	3
THEORY CUM STUDIO				
ARC103	Art Studio	1	3	3
ARC104	Architectural Drawing – I	1	3	3
STUDIO				
ARC105	Basic Design	0	12	6
	Total	14	18	24

Semester – II

Code No.	Course Title	L	S	C
THEORY				
ARC106	History of Architecture and Culture – II	3	0	3
ARC107	Mechanics of Structures - I	3	0	3
ARC108	Building Materials – II	3	0	3
ARC109	Theory of Architecture	3	0	3
THEORY CUM STUDIO				
ARC110	Construction Techniques – I	1	3	3
ARC111	Architectural Drawing – I	1	3	3
STUDIO				
ARC181	Architectural Design – I	0	12	6
	Total	14	18	24

Note: Tutorial classes can be conducted in any Theory course by the staff depending on the input required.

Semester – III

Code No.	Course Title	L	S	C
THEORY				
ARC201	History of Architecture and Culture – III	3	0	3
ARC202	Building Materials – III	3	0	3
ARC203	Mechanics of Structures - II	3	0	3
ARC204	Theory of Design	3	0	3
ARC205	Environmental Sciences	3	0	3
THEORY CUM STUDIO				
ARC206	Construction Techniques– II	1	3	3
STUDIO				
ARC281	Architectural Design – II	0	12	6
	Total	16	15	24

Semester – IV

Code No.	Course Title	L	S	C
THEORY				
ARC207	History of Architecture and Culture – IV	3	0	3
ARC208	Building Materials – IV	3	0	3
ARC209	Design of Structures - I	3	0	3
ARC210	Building Services – I	3	0	3
ARC211	Survey Theory and Site Analysis	3	0	3
THEORY CUM STUDIO				
ARC212	Construction Techniques– III	1	3	3
STUDIO				
ARC282	Architectural Design – III	0	12	6
	Total	16	15	24

Note:

Tutorial classes can be conducted in any Theory course by the staff depending on the input required.

Semester – V

Code No.	Course Title	L	S	C
THEORY				
ARC301	History of Architecture and Culture – V	3	0	3
ARC302	Building Materials -V	3	0	3
ARC303	Design of Structures - II	3	0	3
ARC304	Building Services – II	3	0	3
ARC305	Estimation and Specification	3	0	3
THEORY CUM STUDIO				
ARC306	Construction Techniques– IV	1	3	3
STUDIO				
ARC381	Architectural Design – IV	0	14	7
	Total	16	17	25

Semester – VI

Code No.	Course Title	L	S	C
THEORY				
ARC307	History of Architecture and Culture – VI	3	0	3
ARC308	Climate and Built Environment	3	0	3
ARC309	Design of Structures – III	3	0	3
ARC310	Building Services – III	3	0	3
ARC31x	Elective – I	3	0	3
THEORY CUM STUDIO				
ARC 311	Architecture Detailing– V	1	3	3
STUDIO				
ARC382	Architectural Design – V	0	14	7
	Total	16	17	25

Note: Tutorial classes can be conducted in any Theory course by the staff depending on the input required.

Semester – VII

Code No.	Course Title	L	S	C
STUDIO (Off Campus)				
ARC481	Practical Training - I*	-	-	10

Semester – VIII

Code No.	Course Title	L	S	C
STUDIO (Off Campus)				
ARC482	Practical Training – II*	-	-	10

* Training is undertaken by student in any one of the Architects office, Institutions, organizations headed by an Architect with minimum Five Years of Standing.

Semester – IX

Code No.	Course Title	L	S	C
THEORY				
ARC501	Human Settlement Planning	3	0	3
ARC502	Sociology and Building Economics	3	0	3
ARC503	Dissertation	-	-	3
ARC51x	Elective – II	3	0	3
ARC51x	Elective – III	3	0	3
STUDIO				
ARC581	Architectural Design – VI	0	18	9
	Total	15	18	24

Semester – X

Code No.	Course Title	L	S	C
THEORY				
ARC 504	Professional Practice	3	0	3
ARC 52x	Elective – IV	3	0	3
STUDIO				
ARC 599	Architectural Thesis	0	28	14
	Total	6	28	20

Note: Tutorial classes can be conducted in any Theory course by the staff depending on the input required.

TOTAL CREDITS **210**

LIST OF ELECTIVES

SIXTH SEMESTER (One Elective)

ARC 312	Theory of Interior Design.	3	0	3
ARC 313	Energy Efficient Architecture.	3	0	3
ARC 314	Vernacular Architecture.	3	0	3
ARC 315	Principles of Traditional Architecture – I	3	0	3

NINETH SEMESTER (Two Electives)

ARC 510	Structure and Architecture	3	0	3
ARC 511	Industrial Building system	3	0	3
ARC 512	Art Appreciation	3	0	3
ARC 513	Urban Housing	3	0	3
ARC 514	Sustainable Planning and Architecture	3	0	3
ARC 515	Computer Applications in Architecture	3	0	3
ARC 516	Construction Technology	3	0	3
ARC 517	Urban Design	3	0	3

TENTH SEMESTER (One Elective)

ARC 520	Earth Quake Resistant Architecture	3	0	3
ARC 521	Architectural Conservation	3	0	3
ARC 522	Safety Systems and Building Management	3	0	3
ARC 523	Landscape and Ecology	3	0	3

SEMESTER-I

		L	P	C
MAT111	**MATHEMATICS**	**3**	**0**	**3**

1. MATRICES

Review of Linear algebra-Matrix operations - Addition, Scalar Multiplication, Multiplication, Transpose, Adjoint and their properties- Special types of matrices - Null, Identity, Diagonal, Triangular, Symmetric, Skew-symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary, Normal- Rank- consistency of a system of linear equations- Solution of the matrix Equation Ax = b - Row-reduced Echelon form.

2. EIGEN VALUE PROBLEMS

Eigen value and Eigen vector of real matrix – properties of Eigen values and Eigen vectors – Cayley- Hamilton theorem – Orthogonal transformation of a real symmetric matrix to diagonal form – reduction of quadratic form to canonical form by orthogonal transformation – index, signature and nature of quadratic form.

3. DIFFERENTIAL CALCULUS

Review of limits - continuity and differentiability - Curvature – Cartesian and Parametric Co-ordinates – Centre and radius of curvature – Circle of curvature-evolutes - involutes - envelopes - partial differentiation –Euler's theorem for homogeneous functions-total differential – Taylor's expansion (two variables) - Maxima / Minima for functions of two variables – Method of Lagrangian multiplier – Jacobians.

4. THREE DIMENSIONAL ANALYTICAL GEOMETRY

Direction cosines and ratios – Angle between two lines – Equations of a plane – Equations of straight line – coplanar lines – shortest distance between two skew lines – sphere – tangent plane – plane section of a sphere – orthogonal spheres.

5. ORDINARY DIFFERENTIAL EQUATIONS

Solutions of second and higher order linear Ordinary Differential Equations with constant coefficients – Cauchy's and Legendre's linear equations - Simultaneous first order linear equations with constant coefficients - Method of variation of parameters.

Total - 45 Pds

TEXT BOOKS

1. Kreyszig, E., Advanced Engineering Mathematics, John Wiley and Sons (Asia) Limited, Singapore, 8th Edition, 2001.
2. Arumugam, S., Thangapandi Isaac, A., Somasundaram, A., Engineering Mathematics Volume I, Scitech Publications (India) Pvt. Ltd., Chennai, 2nd Edn., Reprint 2000.

REFERENCES

1. Grewal, B.S., Grewal, J.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 37th Edition, 5th Reprint 2004.
2. Venkataraman, M. K., Engineering Mathematics First Year, The National Publishing Company, Chennai, 2nd Edition, Reprint 2001.

HSS111	COMMUNICATIVE ENGLISH	L	P	C
		3	0	3

1. FOCUS ON LANGUAGE

Parts of speech - Nominal compounds, noun phrases - Relative pronoun - Adjective - numerical, comparison and contrast, collocation and word combinations - Verb - Preposition and relative - Conjunction- connectives, expressions of purpose and function, cause and effect - Articles - adjectives - Sentence pattern - Tenses - Voice - Rewriting the sentences in impersonal/abbreviated passive grammatical structures - Concord - sentence level verb noun agreement - Gerund - rewriting infinitive into gerund - Imperative - rewriting imperative into recommendation using should - Word formation - varied grammatical function of the same word - Affixes - prefix and suffix, number prefix, negative prefix - Reported speech - Editing strategies - Conditional structures - real, unreal, no possibility, zero condition - Writing formal definition - Abbreviation and acronym - Idioms and phrases - Varieties of English - British versus American.

2. LISTENING SKILLS

Comprehension practice - Vocabulary development - Familiarity to varied types of spoken English and accents - Developing ability to understand audio and video media - Aiming at overcoming barriers to listening - Listening to documentaries, radio news broadcasts, TV news telecasts - Active listening in discussions and to lectures - Taking notes while listening - Extracting information from listening.

3. SPEAKING SKILLS

Oral practice - Role play - Interplay - Seminar - Transcoding visual into oral - Participating in short and longer conversation - Voice record, replay, correction of intonation, pronunciation and flow of speech - Phonemes - vowels, consonants, stress, rhythm, intonation - Group discussion - Participative learning - Acquiring proficiency, fluency, accuracy in oral communication - Speaking practice - Developing confidence - Extempore speech - Learning professional/conversational etiquette.

4. READING SKILLS

Vocabulary Extension - Improving vocabulary - Intensive reading - Reading Strategies - identifying topic sentence - guessing meaning from content - picking out specific information - professional reading - Reading practice - Predicting the content, critical and analytical reading - Reading articles in English newspapers, sports magazines, encyclopedias - Reading aloud, use of stress and intonation - Reading and comprehending technical materials - Cloze reading.

5. WRITING SKILLS

Discourse cohesion - Improving writing skills, avoiding common grammatical errors in academic writing - Extending the hints - Writing shorter sentences - Punctuation - Dialogue writing - Paragraph writing, problems and solutions, achieving coherence, transition words, sequence words - Essays of descriptive and argumentative - Writing instructions, use of imperatives - Jumbled sentences into sequential paragraph using linguistic clues - Report writing - technical reports, industry visit reports, events reports - Writing recommendations - Letter writing - formal and informal letters - job application and resume, permission for in-plant training, business correspondence letters, calling for quotation, placing order, lodging

complaint, persuasive letters - Assignment writing - Mini-project - Transcoding - transferring of information from text to pictorial/graphical representation and vice versa.

Total - 45 Pds

TEXT BOOK

1. Rizvi M Ashraf, Effective Technical Communication, Tata McGraw-Hill, New Delhi, 2005.

REFERENCES

1. Daniel Jones, English Pronouncing Dictionary, Universal Book Stall, New Delhi, 17th Edition, 2000.
2. Geoffrey Leech, Fan Svartvik, A Communicative Grammar of English, Pearson Education Asia, 1994.
3. Hornby, AS, Oxford Advanced Learner's Dictionary of Current English, OUP, 7th Edition, 2005.
4. Manivannan G, English for Engineers - A Book on Scientific and Technical Writing, Govi Publications, 2005.
5. Martin Cutts, Plain English Guide - How to Write Clearly and Communicate Better, Oxford University Press, 1999.

ARC101	HISTORY OF ARCHITECTURE AND CULTURE - I	L	P	C
		3	0	3

1. PREHISTORIC AGE

Concepts of culture and civilization - Paleolithic and Neolithic culture - art forms and evolution of shelter - megaliths - agricultural revolution and its impact on culture and civilization.

2. ANCIENT RIVER VALLEY CIVILIZATIONS: EGYPT

Landscape and culture of Ancient Egypt- history, religious and funerary beliefs and practices - monumentality – tomb architecture: evolution of the pyramid from the mastaba - temple architecture: mortuary temples and cult temples.Great Pyramid of Cheops, Temple of Ammon Ra, Karnak -Temple of Abu Simbal (Rock Cut).

3. ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA

Urbanization in the Fertile Crescent - Sumerian, Babylonian, Assyrian and Persian culture - evolution of city-states and their character- law and writing - theocracy and architecture - evolution of the ziggurat - palaces. Ziggurat of Ur, Urnamu - Palace of Sargon, Khorsabad - Palace at Persepolis

4. CLASSICIAL PERIOD: GREECE

Landscape and culture of Greece- Minoan and Mycenaean cultures- Hellenic and Hellenistic cultures – Greek character- Greek polis and democracy – Greek city planning- - architecture in the archaic and classic periods – Domestic architecture; Public Buildings: Agora, stoas, theaters, bouletrion and stadias – Greek temple: evolution and classification- Parthenon and Erecthion- orders in architecture: Doric, Ionic, Corinthian - optical illusions in architecture.

5. CLASSICAL PERIOD: ROME

Roman history: Republic and Empire – Roman religion and the Roman temple- Roman character-lifestyle- Roman urban planning – art and architecture as imperial propaganda: forums and basilicas-domestic architecture – structural forms, materials and techniques of construction - orders in architecture: Tuscan and Composite. Rome: Forum Romanum and other Imperial Forums, Enclosure and manipulation of space: Pantheon- Public buildings: Colloseum, Circus Maximus, Thermae of Caraculla.

TOTAL: 45 Pds

TEXT BOOKS

1. Sir Banister Fletcher, A History of Architecture, University of London, The Antholone Press, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.
3. Henri Stelerlin – The Pharaohs – Plerre Terrail – 2001.
4. G.K.Hiraskar, Great Ages of World Architecture, Dhanpat Rai & Sons, Delhi

REFERENCES

1. Marco Bussagli, Rome Art and Architecture, Konemann Publications, 2004.
2. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986
3. Gosta, E. Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.

ARC102	BUILDING MATERIALS I	L	P	C
		3	0	3

1.SOILS

Fundamentals of soil science – Types of soils – Principles of Soil Stabilization – Charactertics of core – Types of Stabilizers – Requirements – Types of mud wall building and surface protection.

2.LIME

Types of lime – Classification of lime – Comparison between fat lime and hydraulic lime – Manufacturing process slaking – Hardening – Testing and Storage – Lime putty – Precautions in handling and uses of lime.

3.BAMBOO AND OTHER MATERIALS

Bamboo – Bamboo as plant classification, species, geographical distribution – Anatomy of Bamboo – Properties, strength, processing, harvesting, working of Bamboo tools – Treatment -Preservation of Bamboo and uses of Bamboo. Cane, gate, coir, coconut – Growth, Form, Shape, Leaves, Flowering, Propagation. Roofing materials – Thatch, grass, Bamboo, reeds – Basics

4.STRAW BALES

Straw as a building material – Basics, fire, moisture, insects and pests proof.

5.ROCKS AND STONES

Classification of rocks – Classification – Sources – Seasoning – Quarrying of stones – Dressing, Characteristics of stones – Testing of stones – Common building stones and their uses – Preservation of stones -Deterioration of stones – Durability – Preservation – Selection of stones – Artificial stones.

TEXTBOOKS

1. Varghese, P.C., “Building Materials”, Prentice Hall of India, 2010.
2. Rangwala, S.C., “Engineering Materials”, Character Publishing House, 2008
3. Dunkelberg, K., “Bambus – Bamboo, Bamboo as a Building Material”, Karl Kramer Verlag , 2005.

REFERENCE BOOKS

1. Duggal, S.K., “Building Materials”, Oxford and IBH Publishing Co, 2007.
2. Spencke, R.F. and Cook, D.J., “Building Materials in Developing Countries”, John Wiley and Sons, New Delhi,1983.
3. Chris Magword and Petermack, “Straw Bale Building”, New Society Publishers, 2003.

ARC103	ART STUDIO	L	P	C
		1	3	3

1. FREE HAND DRAWING

Free hand sketching in Bird's eye view, worms eye view & normal eye view for the following: City scape, Sea scape, Wild scape, Sky scape, Street views and Heritage areas. Sketching human forms (Knowledge of anatomy) expressions, graphic representations. Understanding depth, light & shade, Sciography etc.

2. PAINTING

Understanding depth, light & Shade sciography etc with different media light water colours, postal colours, water soluble colour pencil, pen and ink, oil pastels, dry crayons etc of campus buildings designed by internationally famous architects.

3. MODEL MAKING

Study of linear forms – Creating wire sculptures, mobile sculptures, atrium sculptures, space sculptures, geodesic domes etc. For outdoor and indoor architectural spaces using card board, form boards, match sticks, steel wires, bamboo splits etc.

Study of planar forms – creating abstract sculptures out of mount board, metal foils or any other planar material and also exploring the adoptability of these sculptures to architectural functions-Study of paper forms-exploration of various folded paper forms and its possible use in architectural spaces.

Study of primary solids – Making mount board models of cubes, cuboids, square pyramid, cylinder and cone

Study of solids and voids – creation of abstract and semi abstract symbolic sculptural forms and spaces-Study of Fluid/Plastic forms- use of clay, plaster or any other moldable material and create plastic and free flowing sculptural forms.

Study of textures – vitiating a cube by way of textures, texture applicability in murals and interior decoration- Origami/Tessellations. Models using clay, plaster of Paris, wax, wire, match sticks etc.

4. PHOTOGRAPHY

Introduction to photography, exercises on presenting the created models using photography as a technique.

TOTAL : 60 Pds

TEXT BOOK

1. Jim Legitt – Drawing Shortcuts – John Wiley & sons InC – 2010.

REFERENCES

1. Webb, Frank, "The Artist guide to Composition, "David & Charles, U.K., 1994.
2. Moivahuntly, "The artist drawing book", David & Charles, U.K., 1994.
3. Drawing a Creative Process", Ching Francis, Van Nostrand Reinhold, New York, 1990.
4. Arundell (Jan) Exploring sculpture, Mills and Boon, London/Charles, T. Brand Ford Company, U.S.A.

ARC104	ARCHITECTURAL DRAWING – I	L	P	C
		1	3	3

1. **INTRODUCTION**

Basic principles of drawing - scale conversion etc. – Practices in lettering.

2. GEOMETRICAL DRAWING

Introduction to Plane geometry – Exercise in construction of Straight lines, Circles, Tangents and Regular polygons. Description of Plane Curves: Ellipse, Parabola and Hyperbola. Solid Geometry : Simple Projections – Projection of solids – Development of surfaces.

3. ISOMETRIC & AXONOMETRIC

Isometric View: Isometric Views of Objects, building components such as Steps, Canopy etc. Axonometric view: Axonometric view of objects, interior view of rooms etc.

4. MEASURED DRAWING

Understanding of different scales and their uses in practice - Drawings to scale. Examples of Measured drawing - Furniture, Class room plan, Doors, Windows, Entrance Gate, building etc.

5. SKETCHING

Indoor objects - still Life – Furniture, Equipment - Understanding Depth, light, Shade , Shadow Etc., Outdoor sketching: Natural Forms/ Built Forms, Understanding variety in Forms. Sketching Human Form: Anatomy and Expressions - Graphical Representations.

TOTAL : 60 Pds

TEXT BOOKS

1. M.S.Kumar, Engineering Drawing, DD publications, Chennai 600 048- 2005.
2. Francis D.K.Ching &Steven P Juroszek, Design drawing, John Wiley & Sons, USA, 1998
3. Douglas Cooper – Drawing and Perceiving – John Wiley & Sons, 2007.

REFERENCES

1. I.H. Morris, Geometrical Drawing for Art Students, Orient Longman Chennai, 2004.
2. Rayeuans, Drawing and Painting Architecture, Van Nostrand Reinhold Company, New York. 2002.
3. Ralph W. Liebing, Architectural Working Drawing, John Wiley & Sons, 2000.
4. Jim Leggitt, Drawing Short Cuts, John Wiley & Sons, 2010.

ARC105	BASIC DESIGN	L	P	C
		0	12	6

1. BASIC DESIGN -1

An introduction to various design elements such as line, shape , mass ,colour etc including the theoretical aspects such as properties of line compositions, family of shapes, analysis of forms and colour theory - making two dimensional and three dimensional works using the basic design elements of art.

Understanding the principles of design such as Repetition, Harmony, Contrast, Dominance, Balance, Dynamism, etc.,through design compositions, collage works , logos, murals, & Models. Conversion of intangible emotions like music, smell, sound in to models. Understanding the design as a next step continues to the evolutionary process of nature & from nature through Exercises involving natural forms and various approaches to art such as – Representation, Abstraction, and Non-Representational/ Non-Objective compositions. Understanding & creating awareness on environmental impacts on the nature by the daily use materials by exploring lateral thinking to use the recycling materials in to usable models and create a new product.

2. WORKSHOP

Use of hand tools and materials in carpentry, Glass models, masonry and model making involving basic design principles & exposure to different mediums & materials of model – making which involves making three dimensional sculptures involving the basic platonic solids and abstract sculptures using various techniques/ materials such as POP, wire/ matchstick, soap, clay etc.,

TOTAL : 210 Pds

REFERENCE BOOKS

1. Paul Zelanski & Mary Pat Fisher, Design principles & Problems , 2nd Ed, Thomson & Wadsworth,USA,1996.
2. Owen Cappleman & Michael Jack Kordan, Foundations in Architecture: An Annotated Anthology of beginning design projects, Van Nostrand Reinhold, New York, 1996.
3. Paul Laseau, Graphic Thinking For Architects and Designers, John Wiley & Sons, New York, 2001.
4. Francis D.K.Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canada), 1979.
5. John W.Mills, The Technique of Sculpture,B.T.Batsford Limited, New York - Reinhold Publishing Corporation, London,1966.
6. Charles Wallschlaeger & Synthia Busic Snyder, Basic Visual Concepts & Principles for artists, architects & designers, McGraw Hill, USA, 1992.

SEMESTER - II

ARC106	HISTORY OF ARCHITECTURE AND CULTURE II	L	P	C
		3	0	3

1. ANCIENT INDIA I

Indus Valley Civilization: culture and pattern of settlement.- Aryan civilization – theories and debates of origin- origins of early Hinduism - Vedic culture - Vedic village and rudimentary forms of bamboo and wooden construction - origins of Buddhism and Jainism**.**

2. BUDDHIST ARCHITECTURE

Evolution of Buddhism, Buddhist thought, art and culture – Hima yana and Mahayana Buddhism - interaction of Hellenic & Indian Ideas in Northern India - evolution of building typologies- the stupa, vihara and the chaitya hall - symbolism of the stupa - architectural production during Ashoka's rule Ashokan Pillar, Sarnath - rock cut caves at Barabar - Sanchi Stupa- rock cut architecture in Ajanta and Ellora - Karli - viharas at Nasik - Rani gumpha, Udaigiri - Takti Bahai, Gandhara.

3. EVOLUTIONOF HINDU TEMPLE ARCHITECTURE

Hindu forms of worship – evolution of temple form - meaning, symbolism, ritual and social importance of temple - categories of temple - elements of temple architecture - early shrines of the Gupta and Chalukyan periods igawa temple - Ladh Khan and Durga temple, Aihole - Papanatha, Virupaksha temples,Pattadakal - Kailasanatha temple, Ellora.

4.TEMPLE ARCHITECTURE - SOUTHERN INDIA

Brief history of South India - relation between Bhakti period and temple architecture - of temple towns - Dravidian Order - evolution and form of gopuram Rock cut productions under Pallavas: Shore temple, Mahabalipuram and Kailasanatha temple, Kanchipuram - Chola Architecture: Nartamalai, Brihadeeswara, Gangaikonda Cholapuram andDarasuram temples - – temple gateways of Madurai and Chidambaram - temple towns: Madurai,Srirangam and KanchipuramHoysala architecture: Belur and Halebid.

5. TEMPLE ARCHITECTURE -NORTHERN INDIA

Temple architecture of Gujarat, Orissa, Madhyapradesh and Rajasthan - their salient features Lingaraja Temple, Bhuvaneswar - Sun temple, Konarak. - Somnatha temple, Gujarat, Suryakund, Modhera Khajuraho, Madhyapradesh - Dilwara temple, Mt. Abu.

Total - 45 Pds

TEXT BOOKS

1. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983.
2. Satish Grover, The Architecture of India (Buddhist and Hindu Period), Vikas Publishing Housing Pvt. Ltd., New Delhi, 2003.
3. Christoper Tadgell, The History of Architecture in India from the Dawn of civilization to the End of the Raj, Longmon Group U.K. Ltd., London, 1990.

REFERENCES

1. A.Volwahsen, Living Architecture - India (Buddhist and Hindu), Oxford and IBM, London, 1969.
2. George Michell, The Hindu Temple, BI Publishers, Bombay, 1977.
3. Stella Kramrisch, The Hindu Temple, Motilal Banarsidas Publishers, New Delhi, 2002.
4. George Michell Ed, Temple Towns of Tamil Nadu, Marg Publications, Mumbai, 1993.
6. History of Indian Philosophy, Dasgupta, Motilal Banarsidas Publishers, New Delhi, 1997.

ARC107	MECHANICS OF STRUCTURES I	L	P	C
		3	0	3

1. FORCES AND STRUCTURAL SYSTEMS

Fundamental principles and concepts - vector algebra, Newton's laws, gravitation, force external and internal, transmissibility - velocity and acceleration - Couple- Moment about point and about axis - Varignon's theorem - resultant of concurrent and non-concurrent coplanar forces - static equilibrium, free body diagram, reactions - Problem formulation concept in 2-D and 3-D statics.

2. TRUSSES AND FRAMES

Trusses - assumptions, rigid and non-rigid trusses- simple trusses in plane and space- analysis by method of joints and by method of sections- compound trusses-statically determinate, rigid, and completely constrained - analysis of frames.

3. PROPERTIES OF SECTION

Centroids of lines - areas, volumes, composite bodies - center of mass - Moment of Inertia - Section modules – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis –- area moment of Inertia - mass moment of inertia - principal moment of inertia.

4. DYNAMICS OF PARTICLES

Displacements, velocity and acceleration, their relationship - relative motion - Curvilinear motion - Newton's law - work Energy equation of particles - impulse and momentum - impact of elastic bodies.

5. STRESS, STRAIN AND DEFORMATION IN SOLIDS

Tension, compression and shear stresses - Hooke's law - Stress-strain diagram for mild steel - Ultimate stress and working stress -Elastic constants and relationships between them - Composite bars -Temperature stresses - Strain energy due to axial load -Stresses due to suddenly applied load and impact load.

Total - 45 pds

TEXT BOOK

1. Beer, F.P., and Johnson, E.R., Vector Mechanics for Engineers - Statics and Dynamics, Tata McGraw Hill, New York, 2004.

REFERENCES

1. Merriam, J.L., Engineering Mechanics, Volume I - Statics, and Volume - II, Dynamics 2/e, Wiley International,1998.
2. Irving, H., Shames, Engineering Mechanics, Statics and Dynamics, Third Edition, Prentice Hall of India Pvt. Ltd., 1993.
3. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989.
4. R.K. Rajput, Strength of Materials, S. Chand & Company Ltd. New Delhi 1996.
5. Timoshenko & Young, Strength of Materials, D. Van Nostrand, 1962.

ARC108	BUILDING MATERIALS II	L	P	C
		3	0	3

1. BRICKS

Classification of bricks, characteristics, ingredients of bricks – Manufacture of bricks. Forms of bricks – Special types of bricks- Hollow blocks-Testing of bricks – Bonding in bricks and its types.

2. CLAY PRODUCTS

Manufacture of burnt clay bricks, paving bricks, hollow bricks – terracotta, porcelain, stoneware, earthenware and glazing and their uses. Roofing materials - Manufacture and uses of Mangalore tiles, pot tiles, pan tiles, case – studies.

3. TIMBER AND TIMBER PRODUCTS

Classification of trees, structure of trees, Defects in timber, characteristics, seasoning of timber ,Defects, Decay of timber, Preservation, Fire resistance, Conservation of timber, Storage of timber, Uses of timber of properties - case studies.

4. TIMBER PRODUCTS

Market forms of timber, Industrial timber, - Veneers, Ply woods, Laminates, advantages and Blackboard uses - case studies.

5. PAINTING AND VARNISHING IN TIMBER

Composition, characteristics, preparation, painting different surfaces Enamels, Varnishing, Miscellaneous paints, defects, uses and cost of materials.

Total - 45 Pds.

TEXT BOOKS

1. S. C. Rangwala, Engineering Materials, Character Publishing house, Anand, 2002.
2. S.K. Duggal, Building materials, Oxford and IBH publishing Co, put, Ltd, New Delhi,1997

REFERENCES

1. P.C. Varghese, Building Materials, Prentice Hall of India put Ltd, New Delhi 110001, 2005.
2. R.J. Spencke and S.J. Cook, Building materials in developing countries, John Wiley and sons. 1983.

ARC109	THEORY OF ARCHITECTURE	L	P	C
		3	0	3

1. INTRODUCTION TO ARCHITECTURE AND MEANING IN ARCHITECTURE

Definitions of Architecture- context for architecture as satisfying human needs- functional, aesthetic and psychological –architecture as a discipline- introducing the various functional aspects of architecture: site, structure, skin, services, use, circulation etc. Introduction to the factors that lend meaning to architecture- architectural expression and symbolism- character and style- movements, philosophies, ideologies and theories- meaning and interpretation of architecture.

2. ORDERING ELEMENTS AND PRINCIPLES OF ARCHITECTURE

Point, line, plane, form, shape, pattern, light, colour, texture – understanding the elements with respect to architecture Exercises involving the above. Detailed study of the visual and emotional effects of geometric forms and their derivatives. Sphere, cube, pyramid, cylinder and cone – Transformation of forms, Articulation of forms –mass-space/solid-void effects, articulation of edges, corners, surfaces. Case studies - Proportion, scale, balance, rhythm, axis, symmetry, hierarchy, datum, unity, harmony, dominance with respect to architecture.

3. ORGANISATION OF FORM AND SPACE

Spatial relationships: space within space, interlocking spaces, adjacent spaces, space linked by a common space - spatial organization: centralized, linear, radial, clustered, grid - form-space Relationships- Case studies**.**

4. CIRCULATION AND INTOTALITY

Circulation as organizing element: building approach, building entrance, configuration of the path, path space relationship, form of circulation space – Case studies.

5. EXPERIENCING ARCHITECTURE

Understanding architecture in totality in terms of the various aspects through first hand experience, analysis and interpretation using the case of a building, architectural style, work(s) of contemporary architects of International fame. Seminar.

Total - 45 pds

TEXT BOOKS

1. Francis D.K.Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, Analysing Architecture, Rouledge, London, 2003.
3. V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Private Ltd., New Delhi, 1973.

REFERENCES

1. Leland M.Roth - Understanding Architecture, its experience history and meaning, Craftsman house, 1994.
2. Steen Eiler Rasmussen - Experiencing architecture, MIT Press, 1964
3. Peter von Meiss -Elements of architecture - from form to place, Spon Press 1992.
4. Rudolf Arnheim, The Dynamics of Architectural form, University of California Press, 1977.
5. Neils Prak, The language of Architecture, Mounton & Co, 1968.
6. Paul Alan Johnson - The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co., New York, 1994.
7. Helen Marie Evans and Carla David Dunneshil, An invitiation to design, Macmillan Publishing Co. Inc., New York, 1982.

ARC110	CONSTRUCTION TECHNIQUES I	L	P	C
		1	3	3

1. INTRODUCTION

Functional requirements of building and its components, introduction to concept of load bearing and framed structures. Exercises.

2. SOILS

Design and construction techniques- Foundations – basic rules, design details, Base courses – basic rules, design details walls –basic principles – Design of openings arches vaults, floors and roofs. Design of buildings – using rammed earth, Adobe blocks, Compressed blocks – Exercises.

3. BAMBOO

Design and Construction Techniques Foundations – Basic rules, design details, Base courses – Basic rules, design details. Design of walls, openings, floors and roofing- Thatch, grass, bamboo, reed. Exercises using bamboo for building components, structural application of bamboo – Arched, Barrel vaults, weave structures.

4. STRAW BALES

Design and Construction Techniques Load bearing, Post and Beam systems, Foundations systems, Roofing options. Doors, Window details – stacking and plastering. Exercises using straw bales for building components.

5. STONE

Stone foundation, Masonry (Ashlar, rubble, cavity composite walls) flooring, coping, sills, lintels,corbels, arches, cladding. Exercises – Using stone for building for floor, walls and ceilings.

Total – 60 Pds

TEXT BOOKS

1. S.P Arora and S.P. Bindra, Text book of Building Construction, Dhanpat Rai Publications (P) Ltd New Delhi, 2005.
2. Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany, 2000.

REFERENCES

1. Don A. Watson Construction Materials and Processes Megraw Hill 1972,
2. WB Mckey, Building construction vol 1,2, Longman UK 1981.
3. Barry, The Construction of Buildings, Affiliated East West Press (P) Ltd, New Delhi 1999.
4. Francisa D.K. Ching Building Construction illustrated John Wiley & Sons 2000.

ARC111	ARCHITECTURAL DRAWING II	L	P	C
		1	4	3

1. SCIOGRAPHY

Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sociography on building, shadows of architectural elements.

2. PERSPECTIVE: SCIENTIFIC METHOD

Characteristic of perspective drawing. Concepts and methods of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes, simple one, two and three-point perspective of building interiors and exteriors. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

3. PERSPECTIVE: SHORT CUT METHOD

Introduction to short cut perspective method. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

4. MEASURED DRAWING: HISTORIC DOCUMENT STUDY

Combined study of historic document along with small building by using simple measuring tools like tapes, photograph etc.

5. MEASURED DRAWING: DOCUMENTATION

Documentation of a complete building of a special interest in terms of history, building construction, architectural excellence or technology.

Total - 75 Pds

TEXT BOOKS

1. Robert W.Gill, Basic Perspective, Thames and Hudson, London, 1974.
2. C.Leslie Martin, Architectural Graphics, Macmillan Company, New York, 1964.
3. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, New York, 1975

REFERENCES

1. Claude Batley, Indian Architecture, D.B.Taraporevale Sons and Co., Ltd., Bombay
2. William Kirby Lockard, Drawing as a Means to Architecture, Van Nostrand, Reinhold Company, New York.
3. George A Dinsmore, Analytical Graphics – D.Van Nostrand, Company Inc., Canada.
4. Interiors: Perspective in Architectural Design Graphic - SMA Publishing Co. Ltd., Japan, 1967.
5. Ernest Norling, Perspective drawing, Walter Fostor Art Books, California, 1986.
6. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.
7. Rober W.Gill, Advanced Perspective, Thames and Hudson, London, 1974.

ARC181	ARCHITECTURAL DESIGN I	L	P	C
		0	12	6

- Scale and Complexity: projects involving organization of single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale; passive energy Areas of focus:
- Architectural form and space
- Aesthetic and psychological experience of form and space in terms of scale, colour, light, texture, etc.,
- Function and need: user requirements, anthropometrics, space standards, circulation image and symbolism
- Typology/ project: bedroom, bathroom, kitchen, shop, exhibition pavilion, children's environment, snack bar, residence, petrol bunk, fire station.

Total - 210 Pds

TEXT BOOKS

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001.
2. Julius Panero, Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design, 1975
3. Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2001.
4. Ernst Neuferts Architects Data, Blackwell 2002
5. Ramsey et al, Architectural Graphic Standards, Wiley 2000

REFERENCES

1. Hideaki Hareguchi, A Comparative analysis of 20th century houses, Academy Editions, 1988
2. Robert Powell, Tropical Asian House, Select Books, 1996
3. Terence Conran, The Essential House Book, Conran Octopus, 1994
4. Sam F. Miller, Design Process: A Primer for Architectural and Interior Design, Van Nostrand Reinhold, 1995

SEMESTER - III

ARC201	HISTORY OF ARCHITECTURE AND CULTURE III	L	P	C
		3	0	3

1. EARLY CHRISTIANPERIOD

Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial.Church planning – basilican concept: St. Clement, Rome; St. Peters Rome, - Centralized plan concept: S, Vitale, Ravenna; S. Hagia Sophia, Constantinople; St. Marks, Venice – Illustrations.

2. EARLY MEDIEVAL PERIOD

The Carolingian Renaissance – Feudalism and rural manorial life – Papacy – Monasticism –Craft and merchant guilds.Medieval domestic architecture – Medieval monasteries- Monastery of Cluny III, Cluny -Romanesque churches – Development of vaulting – Pisa Group – Abbaye aux Hommes – Durnham cathedral – Illustrations.

3. LATE MEDIEVAL PERIOD

Political and social changes: Re-emergence of the city – Crusades, - Scholasticism. Development of Gothic architecture Church plan, structural developments in France and England – Notre Dame, Amiens; Notre Dame, Paris; Salisbury Cathedral; Westminster Abbey –wooden roofed churches – domestic architecture – Illustrations.

4. RENAISSANCE AND MANNERIST

Idea of rebirth and revival – Humanism – Development of thought – the Renaissance patron – Urbanism Renaissance architecture: Brunelleschi and rationally ordered space – ideal form and The centrally planned church: Alberti and Donato Bramante – Merchant Prince palaces: Palazzo Ricardi – Villas of Palladop : Villa Capra Vicenza – Mannerist architecture : The Renaissance in transition – Michaelangelo : Library at S. Lorenzo, Florence, Capitoline Hill – Inigo Jones – Illustrations.

5. BAROQUE AND ROCOCO

Protestantism – Counter Reformation – French Revolution – Monarchy and growth of nations. Roman Baroque churches: The central plan modified – St. Peters, Rome; French Baroque: Versailles – English baroque – Sir Christopher wren; St. Paul's London – Domestic Architecture in England. Rococo Architecture – Interiors**.**

Total – 45 Pds.

TEXT BOOKS:

1. Sir Banister Fletcher, A History of Architecture, University of London, The Antholone Press,1986.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press,London, 1985.

REFERENCES:

1. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,Inc.Pub., New York, 1972.
2. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.,London, 1986.
3. Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Publications, 1991.
4. Leland M Roth; Understanding Architecture: history and meaning; Craftsman House, 1994

ARC202	BUILDING MATERIALS III	L	P	C
		3	0	3

1. CEMENT
Definition – Varieties of cements – Portland, Pozolona, Hydraulic setting, Expanding – Composition of these – Properties and uses – study of manufacturing Portland cement - Tests for cements – applications in construction industry.

2. PROPERTIES OF INGREDIENTS
Cement- **C**omposition, strength, properties, manufacture, test for cement, types of cement.
Sand- sources, impurities, classification, tests for bulking of sand, quality of sand – Grain and size-Alternatives. Coarse aggregate-Sources, shape, size, grading, sampling and analysis, impurities. Water- sources, requirements, water quality, tests, Mixing and proportion.

3. CEMENT CONCRETE AND ITS MANUFACTURE
Definition, properties, specification, proportioning, water-cement ratio, workability, curing, waterproofing, guniting, special concretes-manufacture, construction of formwork, placing, quality assurance testing, fabrication, incorporation of steel in concrete. Lightweight aggregates, aerated concrete, no-fines concrete, polymer concrete, RCC, prestressed concrete, fibre-reinforced concrete, ready-mixed concrete

4. SURFACE FINISHING AND FLOORING
Smooth finishes, textured finishes, ribbed, etched, exposed aggregate finish- weathering of finishes-external renderings- roughcast, dry dash, textured, stucco, gypsum and POP applications, protective and decorative coatings. Materials for damp-proofing and water-proofing concrete structures - Hot and cold applications, emulsified asphalt, vinyl, epoxy resins, chemical admixtures, bentonite clay etc.- properties, uses and cost of materials. Types of flooring- laying methods for marble, mosaic, and terrazzo, plain cement flooring, flooring stones & tiles.

5. PAINTS AND VARNISHES
Types of paints – Manufacture, Specifications, External, internal application – cement based, enamel based, distempers and plastic emulsions, - Colours and shades available – Special paints for corrosion, salienity, fire, Textural effects.

Total – 45 Pds.

TEXT BOOKS:
1. M.S.Shetty, Concrete Technology, S.Chand & Co.ltd,New Delhi,1986.
2. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
3. S.K Duggal, Building Materials, Oxford and IBM Publishing Co, Pvt Ltd.,

REFERENCES:
1. Arthur Lyons - Materials for Architects and Builders - An introduction Arnold, London, 1997.
2. Don A.Watson, Construction Materials and Process, McGraw Hill Co., 1972.

ARC203	MECHANICS OF STRUCTURES II	L	P	C
		3	0	3

1. SHEAR FORCE AND BENDING MOMENT

Basic concepts Types of beams - Types of supports - Types of loads – shear force and bending moment diagrams for cantilever and simply supported beams subjected to various types of loadings– Over hanging simply Supported beams – Point of contraflexure. Relationship between load, shear force and bending moment.

2. STRESSES IN BEAMS

Theory of simple bending – Analysis for bending stresses - Bending stress distribution – Strength of sections – Beams of composite sections (Flitched beams) – Shearing stress distribution in beam sections.

3. DEFLECTION OF BEAMS

Governing differential equation - Slope and deflection at a point – Double Integration method and Macaulay's method Moment area method - Conjugate beam method - Newmark's method.for simply supported and cantilever beams.

4. COLUMNS

Short and long columns – Concept of Elastic stability – Euler's theory – Assumptions and Load carrying capacity of Columns with different end conditions – Concept of Effective length – Slenderness ratio – Limitations of Euler's theory – Rankine's formula – Eccentric loading – Core of a column section.

5. STATICALLY INDETERMINATE BEAMS

Static and Kinematic indeterminacy - Propped cantilever and fixed beams - Theorem of three moments - Analysis of continuous beams - Shear force and bending moment diagrams for continuous beams.

Total – 45 Pds

TEXT BOOKS

1. Negi, L.S., and Jangid, R.S., Structural Analysis, Tata McGraw-Hill Publications, New Delhi, Sixth Edition, 2003.
2. R.K. Bansal, Strength of Materials – Laxmi Publications, New Delhi, 2002.
2. B.C. Punmia, SMTS-I, Strength of Materials – Laxmi Publications, New Delhi, 1994.

REFERENCES

1. Timoshenko, S.P. and D.H. Young, Elements of Strength of Materials, Fifth Edition, EastWest Press, 1993.
3. A.R. Jain and B.K.Jain, Theory and analysis of structures, Vol. 1, Nemchand and Bros, Roorkee, 1987.
4. R.K. Rajput "Strength of Materials", S.Chand & Company Ltd., New Delhi 1996.

ARC204	THEORY OF DESIGN	L	P	C
		3	0	3

1. BASICS
Definition and understanding of design – historical evolution – changing role of a designer – and classification involving scale, process, mode of production.

2. DESIGN METHODOLOGY:
History of design methodology movement – theories and philosophy of first generation and second generation design methodologists – analysis of design problems – case studies.

3. CREATIVE THINKING:
Concept of the term 'creativity' – theories of thinking as a cerebral activity – convergent and divergent thinking – lateral and vertical thinking – logical and rational thinking – blocks in creative thinking – techniques to generate creativity.

4. ARCHITECTURE AS CREATION AND DESIGN:
Approaches to generate ideas for architectural design – types of concepts – philosophies and strategies of architects like L.I.Khan – Form, space, order – silence and light – B.V. Doshi – learning from tradition - Charles correa – Form - Follows – climate- Case Studies.

5. DESIGN APPLICATIONS:
Concept of pattern language – participatory approach – architecture as evolutionary and revolutionary process – review of case studies.

Total: 45 Pds

TEXT BOOKS

1. Bryan Lawson – How Designers Think – Architectural Press London, 1980.

REFERENCES

1. Christopher Alexander – Pattern language – Oxford university press – 2003.
2. Tom Heath, Methods in Architecture, John Wiley and sons, New York, 1984.

ARC205	ENVIRONMENTAL SCIENCES	L	P	C
		3	0	3

1.NATURAL RESOURCES

Definitions - Scope of Environmental Sciences - Forest Resource - Food Resource - Land Resource - Water - Mineral resources - Utilization of Natural Resource, Impact on Environment - Conservation of Natural Resources

2.ECOSYSTEM AND BIODIVERSITY

Concept - structure and function - energy flow in ecosystem - ecological succession - food chain - food web, ecological pyramids - biodiversity, definition, values, threats to biodiversity, conservation of biodiversity

3.ENVIRONMENTAL POLLUTION

Definition, causes, effects and control measures of air, water and soil pollution - thermal and nuclear pollution

4.MANAGEMENT OF ENVIRONMENTAL POLLUTION

Solid waste management - treatment methods adopted for municipal sewage and industrial effluent - hazardous and biomedical waste management

5.TOOLS FOR ENVIRONMENTAL MANAGEMENT

Environment impact assessment - precautionary and polluter pay principle - constitutional provision - (air, water and forest) - waste minimization techniques, cleaner technology options, bioremediation

TEXT BOOK

1. Dhameja, S.K., Environmental engineering and Management, S. K. Kataria and sons, New Delhi, 1st edition 2004

REFERENCES

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad, 1st edition, 2001
2. Miller, T.G. Jr., Environmental Science, Wadsworth Publishing Co. USA, 2nd edition, 2004.
3. Trivedi, R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media., New Delhi, 2nd edition, 2004
4. Masters, G. M., Introduction to Environmental Engineering and Science, Prentice Hall, New Delhi, 2nd edition, 1997
5. Henry, J. G., Heike, G. W., Environmental Science and Engineering, Prentice Hall International Inc., New Jersey, 2005.

ARC206	CONSTRUCTION TECHNIQUES - II	L	P	C
		1	3	3

1. BRICKS

Design and construction of various structural components using bricks – basics of brick bonding principles, types of bonding, foundations, load bearing walls, cavity walls, lintels, arches, corbels, piers, flooring etc. Exercises of the above and application of the design details of brick construction in single or (Ground+1) buildings – small house, community hall, snack bar etc. and understanding the same through case studies. Methods of construction of various non-structural building components such as partition walls, screens, compound walls, parapets, coping.Exercises through case studies and drawings**.**

2. CLAY PRODUCTS

Clay block partition walls, screen walls, clay blocks for flooring and roofing. Roofing methods using Mangalore tiles, pot tiles, pan tiles. Exercises through drawing and case studies.

3. TIMBER JOINERY, PARTITIONS, PANELLING, FALSE CEILING

Methods of construction using natural timber in joinery works including methods of fixing and options for finishing. Window types: paneled, pivoted, top hung, louvered, glazed, windows, French windows, corner windows, bay windows. Door types**:** ledge-braced, paneled, glazed, sliding, sliding/folding, louvered. Ventilators: top hung, bottom hung, pivoted, louvered, glazed. Hardware: For doors, windows and ventilators-Exercises involving the above through drawings and application for a single or (G+1) building with schedule of joinery. Timber Partitions, paneling, false ceiling. Methods of construction using man-made timber products such as ply woods, block boards, and laminated wood and gypsum products in fixed partitions, sliding/folding partitions, wall paneling, false ceiling. Exercises through drawings and case studies.

4. TIMBER STAIRCASES

Types of timber staircases. Methods of construction of timber staircases- basic principles and design details including detailing of handrail and baluster- Exercises through drawings.

5. TIMBER WALLS, FLOORS AND TRUSSES

Methods of construction using natural timber in various structural components of the building such as walls, floors, roof trusses (lean to couple roofs, collar roof, king post, queen post and other trusses) Exercises through drawings.

Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 60 Pds

TEXT BOOKS

1. Don A. Watson, “Construction Materials and Processes”, McGraw Hill, 1972.
2. W.B. McKay, “Building Construction” Vol, 1 and 2, Longmans, UK, 1981.
3. S.C Rangwala “Building Construction” Charotar Publishing House, India, 2000
4. S.K.Sharma, “A Text book of Building Construction”, S.Chand & Co Ltd., New Delhi, 1998.

REFERENCES

1. American Institute of Timber Construction (AITC), Timber Construction Manual, Wiley Publishers, 2004.
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2000.
3. Wills H Wagner, Howard Bud, Modern Carpentry, Good Heart – Wilcox publishers, Portland, 2003
4.Barry, Construction of Buildings, Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005.

ARC281	ARCHITECTURAL DESIGN II	L	P	C
		0	12	6

1.Scale and Complexity : Project involving organization of multiples of single unit space with predominantly horizontal movement as well as single use public buildings of small scale; passive energy.

Areas of focus:

- form-space relationships
- spatial organization
- behavioral aspects especially those relating to children
- site planning aspects
- appropriate materials and construction

Suggested projects: Residential buildings, Institutional buildings: Nursery or Primary schools, Schools for children with specific disabilities, Primary Health Center, Banks, Market, Library.

TOTAL:210 Pds

TEXT BOOKS:

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001.
2. Julius Panero, Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design, 1975
3. Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2001.

REFERENCES

1.Kevin Lynch, Site planning, MIT Press, Cambridge, 1967
2. Sam F. Miller, Design Process: A Primer for Architectural and Interior Design, Van Nostrand. Reinhold, 1995.
3. Ernst Neuferts Architects Data, Blackwell, 2002.
5. Ramsey et al, Architectural Graphic Standards, Wiley 2000.

SEMESTER - IV

ARC207	HISTORY OF ARCHITECTURE AND CULTURE IV	L	P	C
		3	0	3

1. INTRODUCTION TO ISLAMIC ARCHITECTURE

History of Islam: birth, spread and principles - Islamic architecture as rising from Islam as a socio-cultural and political phenomenon- evolution of building types in terms of forms and functions: mosque, tomb, minaret, madarasa, palace, caravanserai, market - character of Islamic architecture: principles, structure, materials and methods of construction, elements of decoration, colour, geometry, light.

2. ISLAMIC ARCHITECTURE IN INDIA & ARCHITECTURE OF THE DELHI SULTANATE

Advent of Islam into the Indian subcontinent and its impact including the change in the architectural scene- overview of development based on political history and the corresponding

Classification of architecture - Islamic architecture in India: sources and influences Establishment of the Delhi Sultanate- evolution of architecture under the Slave, Khalji, Tughlaq, Sayyid and Lodhi Dynasties – tombs in Punjab- important examples for each period.

3. ISLAMIC ARCHITECTURE IN THE PROVINCES

Shift of power to the provinces and evolution of regional architecture with their own unique influences: geographic, cultural, political, etc., - Bengal, Gujarat, Jaunpur, Malwa, Kashmir, Deccan (Gulbarga, Bidar, Golconda and Bijapur) - important examples for each region.

4. MUGHAL ARCHITECTURE

Mughals in India- political and cultural history- synthesis of Hindu-Muslim culture, Sufi movement - evolution of architecture and ouline of Mughal cities and gardens under the Mughal rulers: Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangazeb- important examples- decline of the Mughal empire.

5. CROSS-CULTURAL INFLUENCES

Cross cultural influences across India and secular architecture of the princely states: Oudh, Rajput, Sikh, Vijayanagara, Mysore, Madurai- important examples.

TOTAL: 45 Pds

TEXT BOOKS

1. George Mitchell, Architecture of the Islamic World - its history and social meaning, Thames and Hudson, London 1978.
2. Robert Hillenbrand, Islamic Architecture- Form, Function and Meaning, Edinburgh University Press 1994.
3. Brown Percy, Indian Architecture (Islamic Period), Taraporevala and Sons, Bombay 1983.
4. Satish Grover, Islamic Architecture in India, CBS Pub, New Delhi

REFERENCES

1. Christopher Tadgell, The History of Architecture in India, Penguin Books (India) Ltd, NewDelhi 1990.

2. R.Nath - History of Mughal Architecture Vols I to III - Abhinav Publications - New Delhi,1985.
3. Catherine Asher, Architecture of Mughal India, Cambridge University Press 2001
4. Architecture in Medieval India: Forms, Conte

ARC208	BUILDING MATERIALS - IV	L	P	C
		3	0	3

1. IRON AND STEEL

Brief study of manufacture of iron – various types of ores – Forms of iron – cast iron, wrought iron, pig iron and steel – anti – corrosive properties – mechanical and heat treatment of steel – Forms of steel – structural steel – stainless steel – steel alloys – their properties – current developments – uses of iron and steel – current costs.

2. NON – FERROUS METALS

Aluminium – ores – manufacturing process – properties – industrial and building applications – characteristics of foils, castings, sheets etc, - study of other non – ferrous metals – copper, Bronze, Brass, Tin and Lead – chemical composition – Properties – current development and costs.

3. APPLICATIONS IN CONSTRUCTION AND BUILDING

Conversion of material for industrial applications – different forms available – Walling system – flooring system – roofing system – partition walls – false ceiling – architectural detail applications – use in conjunction with painting, enamels, Anodizing, powder coating – recent by – products – costs.

4. GLASS

Composition of glass – manufacturing process – treatments – properties – special types of glasses – characteristics and manufacture of – Sheet glass, safety glass, reinforced glass, bullet proof glass, tinted glass, and coated glass. Manufacture of glass blocks – properties – application in construction industry – current development and costs involved.

5. PLASTICS :

Chemical composition – manufacturing process – properties – Thermoplastics and Thermosetting plastics – structural plasties – Reinforces plasties – applications as decorative laminates – industrial applications as coatings, adhesives, sealants - plasticizers, - fabrication process of plastics, -industrial applications – costing patterns.

TOTAL: 45 Pds

REQUIRED READING :

1. S.C. Rangwala – Engineering Materials – Character Publishing House, India 2000
2. Arthus Lyons – Materials for Architects and Builders – An Introduction – Arnold, London 2001.
3. Don. A. Watson – Construction Materials and Process – Mc Graw Hill Co – 1972.

ARC209	DESIGN OF STRUCTURES I	L	P	C
		3	0	3

1. TIMBER STRUCTURES

Structure of timber – cross section of timber - defects in timber – seasoning- Grading of Timber – Permissible Stresses – Design of timber beams – Madras terrace roof – Design of timber columns.

2. STEELSTRUCTURES RIVETED AND WELDED JOINTS

Assumptions – failure of Riveted joints – Strength and Efficiency of Riveted Joints – Types – Design of Riveted Joints for Axially Loaded Members (Excluding eccentric connections)Types of welded joints – Advantages and disadvantages – Design of Fillet welds (Excluding eccentric connections).

3. TENSION MEMBERS

Introduction – Gross sectional area-Net sectional area – permissible stresses. Design of Axially loaded Tension member – Lug angle – code provision – tension splices.

4. COMPRESSION MEMBERS

Introduction – various sections – built up section – Design of columns, Lacing, Battening and other connections.

5. STEEL BEAMS

Introduction – Behaviour of steel beams- section properties – design concepts-laterally supported and unsupported beams – Design of laterally supported beams.

TOTAL: 45 Pds

TEXT BOOKS:

1. L.S. Negi, Design of Streel Structures – Tata McGraw Hill Publishing Company Ltd, New Delhi, 1997.
2. S. Ramachandra, Design of Steel Structures, Standard Book House, New Delhi, 1984.

REFERENCES

1. A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee,2006.
2. IS 883 – 1996, Code of Practice for Design of Structural Timber in Buildings
6. IS 800 – 2000, Code of Practice for use of Structural Steel in General Building Construction, BIS, New Delhi.

ARC210	BUILDING SERVICES I	L	P	C
		3	0	3

1. WATER SUPPLY SYSTEM

Water quality, purification and treatment – surface and ground water sources, water/quality nature of impurities, treatments - sedimentation, Rapid sand filters, pressure filters – sterilization and disinfection.

2. WATER DISTRIBUTION SYSTEM

Distribution systems in small towns, layouts – cold water lines, hot water lines, Design criteria for daily water requirements based on occupancy, various kinds of meters, Tank capacity - Pumping plant capacity, Testing of water hardness - calculation of water consumption for Residential/Multistoried buildings Piping systems/piping materials/plumbing fixtures/selection –Domestic hot water systems solar water heating systems, application and installation.Different methods of harvesting rain water from roofs and paved areas Waste water treatment –conventional, modern systems. Mandatory provision with respect to plumbing arrangements in apartment buildings.

3. SANITARY WASTE AND SEWERAGE SYSTEM

Basic Principles of sanitation and disposal of waste matter from buildings, various systems of sewerage disposal and their principles-Model bye-Laws in regard to sanitation of buildings specifications of various sanitary fittings for buildings. Planning of bathrooms, Toilets in domestic and multistoried buildings. Standard type of sanitary fittings, Caulking compounds, traps, joints. Flushing cisterns, manholes, septic tanks in relation to buildings. Intercepting Chambers, inspection Chambers and their location and ventilation of sewers. Layout of simple drainage system for small buildings, apartments, commercial buildings – gradient used in laying of drains and sewers, size of drain pipes and materials used.

4. WASTE MANAGEMENT CONCEPT

Sewerage disposal - Primary, secondary treatment, activated sludge, intermittent and trickling sand filters, sewage treatment plant – layout for residential/commercial buildings - Solid waste disposal:Refuse disposal, collection, and conveyance disposal of town refuse. Sanitary land fills, incineration, vermiculture, aerobic digestion for compost, anaerobic digestion for energy and organic filler (Bio gas) and rural energy systems.

5. EQUIPMENTS FOR DISPOSAL

Space requirements, Configuration and Sizing of motors and deep well, centrifugal, submersible, reciprocating pumps and their location in building types.

Total - 45 Pds

TEXT BOOKS:

1. Manual of water supply and treatment, Second edition, CPHEEO, Ministry of works and housing, New Delhi 1977
2. AFE Wise, JA Swaffied Water, Sanitary & Waste Services in buildings – Mitchell Publishing Co. Ltd. – 2002, V Edition

REFERENCES:

1. G.M. Fair, J.C. Geyer and D.Okin, Water and Waste water engineering Volume II, John Wiley & Sons, Inc. New York, 1968
2. Manual on sewerage and sewerage treatment, CPHEEO – Ministry of works and housing, New Delhi, 1980
3. S.C.Rangwala, Water supply and sanitary engineering, Chartar publishing house, Anand 3888601, 1989, Lecture notes compiled by Chaman.L.Gupta
4. Renewable energy, basics and technology, supplement volume on integrated energy systems) Solar Agni systems, Sri Aurobindo Ashram, Pondicherry 605002 India

ARC211	SURVEY THEORY AND SITE ANALYSIS	L	P	C
		3	0	3

1. INTRODUCTION
Definition of plot, site, land and region, units of measurements, reconnaissance and need for surveying.

2. SITE SURVEYING
Chain survey and Triangulation – Instruments used method of survey and plotting into survey drawing, plain table, Compass and Theodolite Surveys, method, instruments used and application. Computation of area by geometrical figures and other methods. Marking plans, layout plans and centerline plans – Importance, procedure for making these drawings and dimensioning. Setting out the plan on site – Procedure and Precautions.

3. SITE ANALYSIS
Importance of site analysis; on site and off site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects; Preparation of site analysis diagram.
Site selection criteria for housing development, commercial and institutional projects.

4. DETAILED ANALYSIS AND TECHNIQUES
Context of the site. Introduction to existing master plans land use for cities, development control Rules. Preparation of maps of matrix analysis & composite analysis. Study of contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations.

5. SITE PLANNING AND SITE LAYOUT PRINCIPLES
Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections Study of microclimate; vegetation, landforms and water as modifiers of microclimate.

TOTAL: 45 Pds

TEXT BOOKS;
1. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
2. B.C.Punmia - Surveying Vol.I - Standard Book House, New Delhi - 2006.
REFERENCES:
1. Edward. T. Q. Site Analysis – Architectural Media, 1983.
2. P.B.Shahani - Text of surveying Vol.I, Oxford and IBH Publishing Co – 1980
3. Storm Steven, Site engineering for landscape Architects, John wiley & Sons Ine, 2004.

ARC212	CONSTRUCTION TECHNIQUES - III	L	P	C
		1	3	3

1. CONCRETE CONSTRUCTION
Construction of simple framed buildings using RCCTypes of foundations (strip foundation, raft, isolated, combined, and continuous) construction details.

Construction details of RCC frames- beams, columns, slabs, precast frames. Construction details of apertures- concrete lintels, sunshades, arches, shading devices, screen walls, pergolas. - Construction principles and details for RCC slabs- one way slabs, 2-way slab, continuous, flat slab, waffle slab, coffer slab etc. - Construction details of concrete blocks-for walls, lintels, floors and roofs.Exercises through drawings and case studies**.**

2. WATER-PROOFING AND DAMP-PROOFING

Construction methods for water-proofing, damp-proofing for concrete walls, roofs. Construction methods for water-proofing and damp proofing basements, retaining walls, swimming pools etc. Exercises through case studies and drawings.

3. DESIGN AND CONSTRUCTION METHODS

Staircases- basic principles, types of staircase- straight flight, dog-legged, quarter-turn, spiral, helical and other types. Support conditions for stairs and details of handrail, baluster etc. and finishes for stairs. - Exercises through case studies and drawings

4. ADVANCED CONSTRUCTION SYSTEMS IN INDIA

Design and detailing of building materials and components developed by research organizations like CBRI, SERC, NBO, BMTPC. Special construction details for materials like brick, concrete, other materials developed by Building research organization**.** Exercises through case studies and drawings.

5. GLASS

Construction methods using glass for single storey all glass structures like pavilions, green houses, staircases. Construction methods using glass for single/multi-storey buildings including curtain walling details. Exercises through case studies and drawings**.**

Note: Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 60 Pds

TEXT BOOKS

1. M.S.Shetty, Concrete Technology, S.Chand & Co.ltd,New Delhi,1986.
2. Dr. B.C.Punmia, A Text book of Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 2001.
3. 3.T.D Ahuja and G.S. Birdie, Fundamentals of Building Construction, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996
4. S.P Arora and S.P Bindra, A Text Book of Building Construction - Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1990.

REFERENCES

1. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2000
3. W.B. McKay, “Building Construction” Vol, 1 and 2, Longmans, UK, 1981.
4. Barry, Construction of Buildings, Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005
5. R. Chudley**,** Construction Technology, Richard Clay, Chanur Press, 1980

ARC282	ACHITECTURTAL DESIGN III	L	P	C
		0	12	6

Scale and Complexity: Projects involving public and community oriented buildings -multi room, single use, small span, multiple storied, horizontal and vertical movement; active cum passive energy; comprehensive analysis of rural settlement in a hierarchical manner.
Area of focus:

- Rural settlements and architecture
- Community oriented design
- Simple public buildings (not more than Ground+ 2 floors)

Suggestive Typologies/ projects: Rural projects that involve studies and design at settlement and building level- noon meal centre, market, primary health centre; department store, higher Secondary school, campus students centre.

TEXT BOOKS;

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001.
2. Julius Panero, Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design, 1975
3. Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2001.
4. Ernst Neuferts Architects Data, Blackwell 2002
5. Ramsey et al, Architectural Graphic Standards, Wiley 2000

TOTAL: 210 Pds

REFERENCES

1. Richard P. Dober, Campus Planning
2. Kanvinde, Campus Planning in India
3. Kevin Lynch, Site planning, MIT Press, Cambridge, 1967
4. Sam F. Miller, Design Process: A Primer for Architectural and Interior Design, Van 0ostrand Reinhold, 1995

SEMESTER - V

		L	P	C
ARC301	HISTORY OF ARCHITECTURE AND CULTURE - V	3	0	3

1. LEADING TO A NEW ARCHITECTURE

Beginnings of modernity –Origin and development of Neo Classicism- Structural Neo classicists: Laugier, Soufflot, Schinkel, Labrouste - Romantic Neo classicists: Ledoux , Boulle, Durand, Jefferson- Industrialization and its impact- Urbanization in Europe and America- split of design education into architecture and engineering streams- Emergent new building / space types- Growing need for mass housing- Development of Industrial material and construction technologies- concrete, glass and steel- structural engineering, standardization-Industrial exhibitions- Chicago School and skyscraper development.

2. REVIEWING INDUSTRIALISATION

Opposition to industrial arts and production - Arts and Crafts in Europe and America: Morris, Webb- Art Nouveau: Horta, Van De Velde, Gaudi, Guimard, Mackintosh - Vienna secession: Hoffman, Olbrich- Wright's early works

3. MODERN ARCHITECTURE: DEVELOPMENT AND INSTITUTIONALISATION

Adolf Loos and critique of ornamentation- Raumplan: Peter Behrens - Werkbund – Modern architecture and art - Expressionism: Mendelsohn, Taut, Polzeig- Futurism- Constructivism, Cubism - Suprematism- De–Stijl Bauhaus- Gropius, Meyer and Mies -CIAM I to X and its role in canonizing architecture- growth of International Style Ideas and works of Gropius, Le Corbusier, Aalto, Mies, later works of Wright

4. MODERN ARCHITECTURE: LATER DIRECTIONS

Post WW II developments and spread of international style – Later works of Corbusier: Brasilia, Unite- Works of later modernists: Louis Kahn, Paul Rudolph, Eero Saarinen

5. COLONIAL ARCHITECTURE IN INDIA

Colonialism and its impact- early colonial architecture: forts, bungalows, cantonments – Stylistic transformations: Neo- classicism, Gothic Revival and Indo Saracenic - PWD and institutionalization of architecture - Building of New Delhi showcasing imperial power.

Total: 45 PDS

TEXT BOOKS:

1. Kenneth Frampton, Modern Architecture: A Critical History, Thames & Hudson, London, 1994
2. Catherine Slessor – Contemporary Architecture – Images Publishing – 2003.
3. Leonardo Benevolo, History of Modern Architecture, 2 Vols. Routledge & Keganpaul, London, 1971
4. Miki Desai et. al., Architecture and independence, Oxford University Press, 2000

REFERENCES:

1. Thomas Metcalf, An imperial Vision, Faber & Faber/ Electa, 1980.
2. Christian Norburg Schulz., Meaning in Western Architecture, Studio Vista.
3. Xiangbiao Zhao – Global Architecture – Hong Kong Scientific and cultural Publishing – 2008.
4. Sigfried Giedion, "Space Time and Architecture: The Growth of a New Tradition", Harvard University Press, 1978.

ARC302	BUILDING MATERIALS - V	L	P	C
		3	0	3

UNIT I - INNOVATIONS IN STEEL INDUSTRIES
Structural steel-definition and protection, fire protection of steel - Corrosion of ferrous metals (Causes, factors of corrosion and prevention).
Steel sheeting- types of sheeting. Stainless steel in building Industry - innovations , Design and construction parameters developed by INSDAG.

UNIT II – LIGHT ROOFING MATERIALS
Light-roofing materials - Recent trends in roofing materials like Corrugated GI Sheets, Pre-coated metal sheets, Polycarbonate sheeting, Teflon coated sheets, PTFE Steel alloys properties and uses

UNIT III - SPECIAL CONCRETE AND CONCRETING METHODS
Lightweight, highdensity, fibre reinforced, polymer concrete - outline of manufacture,properties and uses of the above - ready mixed concrete - guniting - cold weather and underwater concreting - current developments in concrete products and methods of concreting.

UNIT IV - VENEERS AND LAMINATES
Basic characteristics, advantage, uses, types : Resin bonded plywood, laminated wood, insulating boards and other miscellaneous Boards.

UNIT V OTHER MATERIALS- Adhesives, Sealants and joint fillers
Relative movement within buildings, Asphalt & Bitumen: Natural and artificial products, forms of asphalt, emulsion, cement mastic bitumen felt, their properties and uses
Types of sealants- elasto-plastic, elastic sealants- joint design- fire resistant sealants- gaskets- adhesives, epoxy, bitumen, plastic pipe)
Rubber: Natural rubber, latex, coagulation, vulcanizing synthetic rubber.

Total: 45 PDS

REFERENCES:

1. S.C.Rangwala, "Engineering Materials", Charotar Publishing House, India, 1997.
2. S.K Duggal, "Building Materials", Oxford and IBM Publishing Co, Pvt. Ltd., 1997.
3. P.C Varghese, "Building Materials", Prentice Hall of India Pvt. Ltd., New Delhi, 2005
4. M.S.Shetty, Concrete Technology, S.Chand & Co.ltd,New Delhi,1986.
5. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
6. Dr.B.C.Punmia, Building Construction, Laxmi Publications Pvt.Ltd., New Delhi, 1993.
7. Arthur Lyons - Meterials for Architects and Builders - An introduction Arnold, London,1997.
8. Don A.Watson, Construction Materials and Process, McGraw Hill Co.,1972.

ARC303	DESIGN OF STRUCTURES- II	L	P	C
		3	0	3

1. GENERAL FEATURES OF REINFORCED CONCRETE: Introduction, Design Loads, Materials for Reinforced Concrete and Code requirements. Design Philosophy – Different methods of Design-Limit State Design principles. Philosophy of limit state design, Principles of limit states, Factor of Safety, Characteristic and design loads, Characteristic and design strength.

2. PRINCIPLES OF LIMIT STATE DESIGN AND ULTIMATE STRENGTH OF R.C. SECTION: General aspects of Ultimate strength, Stress block parameters for limit state of collapse, Ultimate flexural strength of singly reinforced rectangular sections, Ultimate flexural strength of doubly reinforced rectangular sections, Ultimate flexural strength of flanged sections,

3.SHEAR, TORSION, BOND ANCHORAGE LENGTH AND SLABS: Ultimate shear strength of RC sections, Ultimate torsional strength of RC sections, Concepts of development length and bond stress design of simply supported slabs: General consideration of design of slabs, Rectangular Slabs spanning one direction, Rectangular slabs spanning in two directions for various boundary conditions.

4.COLUMNS: General aspects, effective length of column, loads on columns, slenderness ratio for columns, minimum eccentricity, design of short axially loaded columns, design of column subject to Combined axial load and uniaxial moment and biaxial moment using SP – 16 charts.

5.FOOTINGS: Introduction, load for footing, Design basis for limit state method, Design of wall footing, Design of isolated rectangular footing for axial load and uniaxial moment,

TEXT BOOKS:

1.Bhandopadya, Design of Concrete Structures, Prentice hall India, 2008
2. Gambir, M.L. Fundamentals of Reinforced Concrete Design

REFERENCES

1. Varghese, P.C., Limit State Design of Reinforced Concrete, Prentice Hall of India, Pvt. Ltd,NewDelhi,2002.

2. Krishna Raju, N., Pranesh, R.N., Reinforced Concrete Design Principles and Practice, New Age International Publishers, New Delhi, 2003.

3. Jain, A.K., Limit State Design of RC Structures, Nemchand Publications, Roorkee, 2002.

4. Sinha, S.N., Reinforced Concrete Design, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.

5. Unnikrishna Pillai, S., Devadas Menon, Reinforced Concrete Design, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2003.

ARC304	BUILDING SERVICES - II	L	P	C
		3	0	3

1. ELECTRICAL AND ELECTRONIC SYSTEMS: ELECTRICAL WIRING SYSTEMS

Laws of electrical circuits: Ohms and Kichoffs LawsBasics of electricity – Single/Three phase supply. Earthing for safety – types of earthing – ISI specifications- Electrical wiring systems in domestic and commercial buildings. - Conduits, Types of wiring Diagram for connection.

Bus way, Bus Bars, lighting track and conduits (Aluminum metallic, non metallic) arrangements. Power handling, equipment, switch board, panel boards.

Lighting conductors: Purpose, materials, fixing, earthing arrangements.

Electronic and Communication systems

Communication and data systems- communication spaces, pathways, cabling systems, voice and data, communication, Electronic security systems, computer labs/server, Rooms etc. Electrical Installations in Buildings. Main and distribution boards – transformers – switch gears –substations – space requirement and Layout of the same in building types.

2. FUNDAMENTALS OF LIGHTING

Principles of light – Electromagnetic radiation, waves, nature of vision, measurement of lighting. Principles of illumination: definitions, Visual tasks, Factors affecting visual tasks Units of light,

Definitions of flux, solid angle, luminous intensity –utilization factor – depreciation factor- MSCP– MHCP, brightness, glare.

3. ILLUMINATION AND LIGHTING

Electric light sources: brief description, characteristics and application of different types of lamps, methods of mounting and lighting control Luminaries classification/ - Lumen method for design – Room reflectance/ Glare –manufacturer's data on luminaries / luminaries cost.

4. LIGHTING DESIGN: INSTALLATION AND APPLICATION INBUILDINGS

Artificial light sources, spectral energy distribution, Luminous efficiency- color temperature – color rendering, Additive, subtractive color and their application areas and out door lighting. Lighting for Office, Schools, Libraries, Residential, Hospital, Parking, Outdoor.

Elementary ideas of special features required and minimum level of illumination for the physically handicapped and elderly in building types. Solar energy systems for lighting – Photovoltaic systems for Residential/Commercial buildings, reducing electric loads, installation and maintenance.

5. LIGHTING DESIGN: CONVEYING SYSTEMS

Basic design Principles, criteria for planning sizing, selection and layout of vertical distribution systems –lifts, Escalators and moving walkways) along with mechanical, dimensional details.

Elevators- types of elevators - design criteria, capacity, frequency, car size, speed, number and size of elevators, layout of banks of elevators, planning and locating service cores in buildings, types of elevators – pit, machine room details – NBC code Escalators and Conveyors parallel and crisis cross escalators, horizontal belt conveyors, horizontal moving walkways – design criteria, speed size, capacity, number. Detailing for comfort, convenience of users- special features for physically handicapped and elderly.

TOTAL : 45 PDS

TEXT BOOKS:

1. E.P.Ambrose, Electric Heating, John Weley & Sons Inc., New York, 1968
2. Philips Lighting in Architectural Design, McGraw Hill. New York, 1964
3. R.G.Hopkenson & J.D.Kay, The lighting of Buildings, Faber & Faber, London, 1969

Conveying systems

1. Elevators, Escalators, Moving Walkways – Manufactures catalogues
2. National Building Code.

REFERENCES;

Electrical Systems:
1. Handbook of building Engineers in metric systems, New Delhi 1968
2. National Building Code.

ARC305	ESTIMATION AND SPECIFICATION	L	P	C
		3	0	3

1. SPECIFICATIONS
Technical specifications writing for items of works based on CPWD / MASTER FORMAT – CSI computer specifications Institute, US. For different types of buildings - for the purpose of calling tenders –different works like Civil / structure, Interior / fabrication, Electrical / plumbing etc.

2. ESTIMATION:
Types– Approximate & Detailed, for simple buildings & interiors
Brief Estimate - Plinth Area Method, budgeting & percentage
Based.

Detailed estimate: Quantity take off (QTO) from REVIT & Items of work based estimate & tender preparation EXCEL.

3. RATE ANALYSIS:
Analysing Schedule of rates based on CPWD/ software aided for various items of works- materials / labour , Profit & overheads, Utilities- power/ water / tools etc.

4. BUDGETING:
Capital budgeting for reports, Market / techno-economic feasibility report, Financing of projects – cash flows, Value engineering, POE- Post occupancy evaluation, Operations & maintenance cost, Life cycle costing- demolition & replacement cost.

TOTAL : 45 PDS

TEXT BOOKS:
1. Dutta, Estimating and Costing, S.Dutta and Co., Lucknow
2. S.C.Rangwala, Elements of Estimating and Costing, Charoter Publishing House, India.

REFERENCES:
1. W.H.King and D.M.R.Esson, Specification and Quantities for Civil Engineers, The English University Press Ltd.
2. T.N.Building Practice, Vol.1, Civil, Govt. Publication.
4. P.W.D. Standard specifications, Govt. Publication

ARC306	CONSTRUCTION TECHNIQUES – IV	L	P	C
		1	3	3

1. STEEL CONSTRUCTION **15**

Structural steel sections- construction methods, methods of connections, steel in foundations, column-beam connections.

Steel roof trusses: Design and detailing. Types of trusses- north-light, butterfly truss, bowstring truss, space frames, portal frames, spacer decks- construction details of the above and the context in which they are used.

Steel roof covering. Types of roof covering using steel, aluminium, asbestos, and other sheets.

Exercises of the above through drawings and case studies.

Steel staircases: basic principles, types of staircase- straight flight, dog-legged, spiral and other types. Support conditions for stairs and details of handrail, baluster etc. and finishes for stairs.

Exercises of the above through case studies and drawings. **10**

2. STEEL DOORS, WINDOWS AND ROLLING SHUTTERS **10**

Types of doors, windows – operable, sliding etc., methods of construction using steel.

Design and detailing of steel rolling shutter, collapsible gate, strong room, safe vault doors.

Exercises of the above through case studies and drawings.

3. ALUMINIUM DOORS AND WINDOWS **10**

Brief study of aluminium products- market forms of aluminium, aluminium extrusionssketches of the above.

Aluminium doors and windows- design details. Doors- operable, sliding, pivoted, fixed.

Windows- operable, sliding, fixed, louvered. Ventilators- top hung, bottom hung, pivoted, louvered.

Exercises of the above through case studies and drawings.

4. ALUMINIUM PARTITIONS, STAIRS, CURTAIN WALLING, ROOFING **15**

Partitions- fixed partitions, false ceiling, shopfront, using aluminium – construction methods and details.

Aluminium staircase- design and construction details- including detailing of handrail and baluster.

Aluminium roofing- Northlighting, glazing bar, roofing sheets - construction details including gutter details

Aluminium Curtain walling- design and construction details.

Exercises of the above through case studies and drawings.

5. PLASTICS **15**

Primary plastic building products for walls, partitions and roofs - design and construction details.

Secondary building products for windows, doors, rooflights, domes, and handrails- design and construction details.

Exercises of the above through case studies and drawings.

Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 75 PERIODS

TEXT BOOKS:

1. Dr. B.C.Punmia, A Text book of Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 2001.
2. T.D Ahuja and G.S. Birdie, Fundamentals of Building Construction, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996

REFERENCES:

1. Alan Blanc, Architecture and Construction in Steel, E&FN Spon, London, 1993
2. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999
3. W.B. McKay, "Building Construction" Vol. 1 and 2, Longmans, UK, 1981.
4. Barry, Introduction to Construction of Buildings, Blackwell Publishing Ltd., Oxford, 2005
5. Barry, Introduction to Construction of Buildings Vol. 3, Blackwell Publishing Ltd., Oxford, 2005
6. Allan Brookes, Cladding of Buildings, E&FN Spon, London, 1998
7. R.M. Davis, Plastics in Building Construction, Battersea College of Technology, Blackie, London, 1966

ARC381	**ARCHITECTURE DESIGN - IV**	**L**	**P**	**C**
		0	**14**	**7**

FOCUS: Multi use space and multi level planning- complex circulation– intensive site level planning, design of open spaces– massing of built forms.

SUGGESTIVE TYPOLOGIES/ PROJECTS: Commercial buildings like commercial/shopping centre, residential projects like group housing, apartments, Institutional projects like nursing homes, public buildings like auditoriums etc.

TOTAL: 210 PDS

REQUIRED READING

1. De Chiara Callender, Time Saver Standard for Building Types, McGraw Hills Co., 1973

Reference Books:

1. National Building Code IST
2. Richard P. Dober, Campus Planning
3. Kanvinde, Campus Planning in India
4. Kevin Lynch, Site planning, MIT Press, Cambridge, 1967
5. John L.Motloch, Introduction to landscape design, John Wiley and Sons, 2000.
6. Richard Untermann & Robert Small, Site Planning for Cluster Housing, Van Nostrand Reinhold Company, London/New York, 1977.

SEMESTER - VI

ARC307	**HISTORY OF ARCHITECTURE AND CULTURE - VI**	**L**	**P**	**C**
		3	**0**	**3**

1. CRITIQUING MODERNISM

TEAM X- Brutalism- projects of Smithsons and Aldo Van Eyck – writings of Jane Jacobs, Robert Venturi, Aldo Rossi and Christopher Alexander.

2. AFTER MODERNISM – I

Conditions of Post Modernity- various postmodern directions in architecture– canonization of Post Modernism– works of Graves, Venturi, Moore- postmodern classicism- ideas and works of urbanism: Soleri, Archigram and Metabolism- Neo Rationalism.

3. AFTER MODERNISM – II

High Tech architecture: Works of Stirling, Rogers and Piano – Deconstructivist theory and practice-Eisenmann, Hadid, Gehry, Libeskind, Tschumi

4. ALTERNATIVE PRACTICES AND IDEAS

Critical Regionalism- Ideas and works of Baker, Fathy, Ralph Erskine, Lucien Kroll, Ando, Bawa, Barragan, Siza.

5. POST INDEPENDENT ARCHITECTURE IN INDIA

Architectural debates associated with nation formation– early modernist architecture- post independence city planning: Chandigarh and Bhuvaneswar- influences on post independence architects-Architecture of Kanvinde, Raje, Doshi, Correa, Nari Gandhi, Raj Rewal- PWD architecture – new directions after 1960s- post- independent architecture of Chennai

TOTAL : 45 PDS

TEXT BOOKS:

1. Kenneth Frampton , Modern Architecture: A Critical History , Thames & Hudson, London, 1994.
2. Diane Ghirardo , Architecture after Modernism, Thames & Hudson, London, 1990.
3. Miki Desai et. al., Architecture and independence, Oxford University Press, 2000
4. Bill Risebero, “Modern Architecture and Design”, MIT Press, 1985

REFERENCES:

1. Christopher Alexander, Pattern Language, Oxford University Press, Oxford.
2. Robert Venturi, Complexity and Contradiction in Architecture, 1977.
3. Aldo Rossi, The Architecture of the City, MIT Press, Massachusetts, 1982.
4. Michael Hays ed., Architecture Theory since 1968, CBA, 1999
5. Charles Jencks, “The Language of Post Modern Architecture”, Rizzoli, 1984.
6. William Jr. Curtis, Balkrishna Doshi, An Architecture for India, Rizzoli
7. Brian Brace Taylor, Geoffrey Bawa, Thames & Hudson

ARC308	CLIMATE AND BUILT ENVIRONMENT	L	P	C
		3	0	3

1. CLIMATE AND HUMAN COMFORT

Factors that determine climate of a place – Components of Climate – Climate classifications for building designers in tropics – Climate characteristics. Human body heat balance – Human bodyheat loss – Effects of climatic factors on human body heat loss – Effective temperature – Human thermal comfort – Use of C.Mahony’s tables.

2. DESIGN OF SOLAR SHADING DEVICES

Movement of sun – Locating the position of sun – Sun path diagram – Overhead period– Solar shading–Shadow angles – Design of appropriate shading devices.

3. HEAT FLOW THROUGH BUILDING ENVELOPE CONCEPTS

The transfer of heat through solids – Definitions – Conductivity, Resistivity,Specific heat,Conductance, Resistance and Thermal capacity – Surface resistance and air cavities– Air to air transmittance (U value) – Time lag and decrement.

4. IMPACT OF AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS

The wind – The effects of topography on wind patterns – Air currents around the building – Air movement through the buildings – The use of fans – Thermally induced air currents – Stack effect, Venturi effect – Use of court yard.

5. CLIMATE AND DESIGN OF BUILDINGS

Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates – Climate responsive design exercises.

TOTAL : 45 PDS

TEXT BOOKS:

1. O.H. Koenigsberger and others (1993), Manual of Tropical Housing and Building –Part I - Climate design, Orient Longman, Madras, India.
2. Bureau of Indian Standards IS 3792 (1987), Hand book on Functional requirements of buildings other than industrial buildings, (Part I – IV), Manakbhavan, 9, Bahadur Shah Zafar Marg, New Delhi – 110002

REFERENCES:

1. Martin Evans (1980), Housing Climate and Comfort – Architectural Press, London
2. B.Givoni (1981), Man, Climate and Architecture, Architectural Sciences Series - Applied Science Publishers Ltd., London
3. B.Givoni (1994) Passive and Low Energy Cooling of building,Van Nortrand Reinhold New York, USA..
4. Galloe, Salam and Sayigh A.M.M. (1998) “Architecture, Comfort and Energy”, Elsivier Science Ltd. , Oxford, U.K.

ARC309	DESIGN OF STRUCTURES – III	L	P	C
		3	0	3

1. LIMIT STATE DESIGN OF BEAMS

Concept of Elastic method, Ultimate load method and limit state method – Advantages of limit state method over other methods

Estimation of loads on beams – transfer of load from slab to beam – design of singly, doubly reinforced – design of simply supported beams – Design of continuous beams using codal coefficients – detailing – use of SP – 16 for the design.

2. LIMIT STATE DESIGN OF SLABS

Behavior of one way slab and two way– design of one way slab and two way slab by direct design method as per BIS code.

3. LIMIT STATE DESIGN OF COLUMNS

Estimation of loads on columns – load transfer from slab and beams to columns – long and short columns – rectangular and circular columns – columns subjected to uni-axial and bi-axial bending – design of columns using column interaction diagrams – use of SP – 16 – detailing.

4. LIMIT STATE DESIGN OF FOUNDATION

Types of R.C.C. foundation – individual, combined, strip footing – Design of individual column footings – Rectangular sloped footing – design of combined footings.

5. R.C.C ARCHES

R.C.C Arches – Introduction, types & Analysis of Two & three Hinged Arches – Introduction to shells & Folded plates – structural Action.

TOTAL : 45 PDS

TEXT BOOKS:

1. S.N. Sinha, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd.,New Delhi,1998.
2. Shah, Reinforced Concrete, Vol. 1 and 2 – Charotar Publishing House, Anand, 1998.

REFERENCES:

1. P.Dayaratnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co.,1983.
2. C. Sinha and S.K. Roy, Fundamentals of Reinforced Concrete, S.Chand & Co., New Delhi, 1983.
3. Dr. B.C. Punmia, Reinforced Concrete Structures, Vol, 1 & 2 Laxmi publication, Delhi, 1994.
4. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
5. S. Unnikrishnan Pillai and Devados Menon, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1999.

ARC310	BUILDING SERVICES - III	L	P	C
		3	0	3

1. INTRODUCTION TO AIR CONDITIONING

Introduction to A/C conditions - basic of refrigeration systems - components of refrigeration system - compressor,condenser - control devices, evaporator - filters cooling tower - Vapour compression cycle - Concepts of cooling load - calculation of cooling load – conductivity, transmission heat load - internal heat gain - concepts of zoning - room air distribution – types of outlets.

2. AIR CONDITIONING SYSTEMS AND ITS APPLICATIONS

Air conditioning system for small buildings – window types, evaporative cooler, packaged terminal units and through the wall units split system b) Systems for large building – Chilled water plant – All Air system, variable air volume, All water system Configuring/ sizing of mechanical equipment, equipment spaces and sizes for chiller plant, cooling tower, Fan room, Circulation Pumps, Pipes, ducts.

3. FIRE SAFETY : DESIGN AND GENERAL GUIDELINES OF EGRESS

Principles of fire behavior, Fire safety design principles _ NBC Planning considerations in buildings – Non- Combustible materials, egress systems, Exit Access – Distance between exits, exterior corridors – Maximum travel distance, Doors, Smoke proof enclosures . General guidelines for egress design for Auditoriums, concert halls, theatres, other building types, window egress, accessibility for disabled- NBC guidelines – lifts lobbies, stairways, ramp design, fire escapes and A/C, electrical systems.

4. FIRE DETECTION AND FIRE FIGHTING INSTALLATION

Heat smoke detectors – sprinkler systems , Fire fighting pump and water requirements, storage – wet risers, Dry rises, Fire extinguishers & cabinets ,Fire protection system – CO2 & Halon system, Fire alarm system, snorkel ladder.

5. SPACE PLANNING & FACILITY MANAGEMENT
Space requirements – Space planning for various air conditioning components both indoor & out door units. space requirements for the different fire fighting equipments

TOTAL : 45 PDS

REFERENCES:
1. William H.Severns and Julian R Fellows, Air conditioning and Refrigeration, John Wiley and Sons, London, 1988
2. Fire Safety: nAtional Building Code of India 1983 published by Bureau of Indian Standards…
3.A.F.C. Sherratt, Air conditioning and Energy conservation, The Architectural Press, London, 1980
4. Design for fire safety (Andrew H Buchanan, John Wiley & Sons Ltd., New York)

ARC 311	ARCHITECTURAL DETAILING	L	P	C
		1	3	3

1. INTRODUCTION TO CURRENT DEVELOPMENTS IN BUILDING INDUSTRY

Smart Materials: Characteristics, classification, properties, energy behaviour, intelligent environments. Recycled and ecological materials and energy saving materials: Straw-bale, card board, earth sheltered structures, recycled plastics, recycled tyres, paper-crete, sandbags, photovoltaic, solar collectors, light-pipes, wind catchers.

Exercises of the above through case studies and drawings.

2. DETAILING OF WALLS, ROOFS AND FLOORING FOR INSTITUTIONAL BUILDINGS
a) Detailing of a residence - selected spaces. b) Detailing of classrooms, library (in school, college) c) Detailing of lecture hall, auditorium, exhibition spaces
Exercises of the above through case studies and drawings.

3. DETAILING OF WALLS, ROOF, FLOORING FOR COMMERCIAL BUILDINGS

a) Detailing of shop-fronts, office spaces for commercial buildings including detailing of crucial elements such as entrance porches, main doors, staircases, show-windows, enclosed and air-conditioned atrium spaces.
b) Detailing of façade and selected spaces for apartment buildings, hotels and hostels.
Exercises of the above through case studies and drawings.

4. DETAILING OF BUILT-IN FURNITURE AND FITTINGS
Detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting.
Exercises of the above through case studies and drawings.

5. DETAILING OF EXTERIOR AND INTERIOR ARCHITECTURAL ELEMENTS
Detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces.

Detailing of interior architectural elements in existing buildings (e.g. Staircase in bookshops, restaurants, playpen in restaurants, reception areas in hotel lobbies etc.)
Exercises of the above through case studies and drawings.

TOTAL: 75 PERIODS

TEXT BOOKS:

1. De Chiara and Callendar, Time Saver Standard Building Types, McGraw Hill Co,1980.
2. Richardson Dietruck, Big Idea and Small Building, Thames and Hudson, 2002
3. Edward D Mills, Planning – The Architecture Handbook, British Library Cataloguing in Publication Data, 1985

REFERENCES:

1. Susan Dawson, Architect's Working Details(Volume 1-10), 2004
2. Swimming Pools, Lane Book Company, Menlo Park, California
3.Nelson L Burbank, House Carpentry Simplified, Simmons-Board- Man Publishing Corporation, New York,
4. Landscape Construction Grant W. Reid , Landscape Graphics, Whitney Library of Design, 1987

ARC382	ARCHITECTURE DESIGN - V	L	P	C
		0	14	7

1.DESIGN STUDIO

Small complexes - concept of multi planning and circulation analysis – grouping of buildings Involving services integration, Design and detailing for movement of physically handicapped and Elderly persons within and around buildings.

Examples: office buildings such as Bank corporate offices, BPO Centers, School of Management, film institute, Art Centre, Museums

Total : 210 PDS

REFERENCES:

1. S. Macmillan, "Designing Better Buildings" . Routledge, 2003.
2. Digital Workflows in Architecture: Design – Assembly – Industry / Scott Marble- 2012
3. Masterpieces: Office Architecture + Design Lara Menzel - 2009
4. National Building Code and Bureau of Indian standard publications.2005

SEMESTER - VII

ARC481	PRACTICAL TRAINING -I	L	P	C
		-	-	10

OBJECTIVES:

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings,

development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

The Practical training program would be done in Architecture offices empanelled by the Institution and in firms registered under the Council of Architecture.

The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The students would be evaluated based on the following criteria:

1. Adherence to time schedule, Discipline.

2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.

3. Ability to work as part of a team in an office.

4. Ability to participate in client meetings and discussions.

5. Involvement in supervision at project site.

At the end of the Internship program a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

SEMESTER -VIII

		L	P	C
ARC482	**PRACTICAL TRAINING -II**	**-**	**-**	**10**

OBJECTIVES:

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

The practical training program would be done in Architecture offices empanelled by the Institution and in firms registered under the Council of Architecture.

The progress of practical training shall be assessed internally through submission of logbooks supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The students would be evaluated based on the following criteria:

1. Adherence to time schedule, Discipline.

2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.

3. Ability to work as part of a team in an office.

4. Ability to participate in client meetings and discussions.

5. Involvement in supervision at project site.

At the end of the training program a portfolio of work done during the period of training along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

SEMESTER IX

ARC 501	**HUMAN SETTLEMENT PLANNING**	**L**	**P**	**C**
		3	**0**	**3**

1. INTRODUCTION
Elements of Human Settlements – human beings and settlements – nature shells& Net work – their functions and Linkages – Anatomy & classification of Human settlements – Locational, Resource based, Population size & Occupational structure.

2. FORMS OF HUMAN SETTLEMENTS
Structure and form of Human settlements – Linear, non-linear and circular –Combinations – reasons for development – advantages and disadvantages – case studies – factors influencing the growth and decay of human settlements.

3. PLANNING CONCEPTS
Planning concepts and their relevance to Indian Planning practice in respect of Ebenezer Howard – Garden city concepts and contents – Patrick Geddes – Conservative surgery – case study – C.A. Perry – Neighborhood concept Le Corbusier – concept and case studies

4. URBAN PLANNING
Scope and Content of Master plan – planning area, land use plan and Zoning regulations – zonal plan – need, linkage to master plan and land use plan – planned unit development (PUD) – need, applicability and DCR

5. URBAN RENEWAL AND RGIONAL PLANNING

Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – Regional Plan – Area delineation, Land utilization plan, hierarchical system of settlements, their sizes and
functions

TOTAL: 45 PERIODS

TEXT BOOKS:

1. C.L.Doxiadis, Ekistics, 'An Introduction to the Science of Human Settlements', Hutchinson,
London, 1968.
2. Andro D.Thomas, 'Housing and Urban Renewal, George Allen and Unwin, Sydney, 1986.
3. Ministry of Urban Affairs and Employment, Government of India, New Delhi, 'Urban Development Plans: Formulation & Implementation' - Guidelines - 1996.

REFERENCES:

1. Madras Metropolitan Development Authority, 'Master Plan for Madras Metropolitan Area, Second Master Plan - 1995.
2. Government of India, 'Report of the National Commission on Urbanisation', 1988.
3. Hansen N., 'Regional Policy and Regional Integration' Edward Elgar, UK, 1996.

ARC 502	SOCIOLOGY AND BUILDING ECONOMICS	L	P	C
		3	0	3

1.Economics

Brief introduction of general economics through an introductory survey of concepts in micro and macro economics as applicable to building industry as follows. Micro Economics: The market, budget constraint, choice, demand and supply, uncertainties, equilibrium, technological constraints, profit maximization and cost minimization, monopoly and oligopoly, production welfare and public good. Macro Economics: GNP, NNP, demand and supply, inflation, interest rate, employment, saving and investment, monitory and fiscal systems and policies.

2. General discussions on various economic issues such as public versus private participation, equity, labour intensive versus capital intensive projects. General economics of the basic inputs into building construction- land, labour, capital and materials. Financing for projects, sources costs and utility in financing. Agencies and institutions directly and indirectly influencing economic aspects of project.

3.SOCIOLOGY

Family as the basic unit of „Society". Differences in lifestyles due to regional background, religion, caste, income group, etc. and their implication in Architectural design of the housing units. Sociological aspects in the history of the evolution of housing / shelter forms.

4.Sociological problems of interaction, isolation, privacy, accessibility, conflict, alienation related to the planning and design of different buildings with the references to the people of different age group/population groups.

5. Power structures in society – local self government, administrative structures – structure of decision making processes related to building projects at various government and private organizations levels.

TEXT BOOKS:

1. **Amos Rappoport,** House Form and Culture
2. **Wallis, Wilson D and Willey, M.M** , Text book of Sociology, 1st ed., Khel Sahitaya Kendra,New Delhi, 2001.
3. **Charon, Joel M.** The Meaning of Sociology, 6th ed., Prentice Hall, New Jersey, 1999.
4. **Thio, Alex.** Sociology: a brief introduction, 4th ed. Allyn and Bacon, Boston, 2000.
5. **Schaefer, Richard T.** Sociology: a brief introduction, 4th ed. McGraw Hill, Boston, 2002.
6. **Bilton, Tony and Oth** . Introductory Sociology, 3rd ed. Palgrave, New York, 1997.
7. **Stone, P.A** . Building Economy: Design Production and Organisation a synoptic view, 2nded., Pergamon Press, Oxford, 1976.
8. **Koutsoyiannis, A.** Modern Microeconomics, 2nd ed., ELBS with MacMillan Press, 1994.
9. **Nobbs, Jack and Hopkins, Ian** . Economics: a core text, 4th ed. McGraw-Hill, London,1995.
10. **Teck, Hoon Hian and Oth.** Economics: theory and applications, McGraw-Hill, Taiwan,1998.
11. **Dewett, K.K.** Modern Economic Theory, Shyam Lal Charitable trust, New Delhi, 2005

ARC 503	DISSERTATION	L	P	C
		0	0	3

- Dissertation offers an opportunity to look at architecture, history and design primarily through textual. However, like design, dissertation involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest. They may range from analyzing the works of an architect, history, typological changes, writing, design process and many more. The dissertation should state its objectives, followed by exhaustive documentation and arguments. The emphasis however, could vary according to the topic. The dissertation proposal in about 1500 words stating the topic issues to be explored and the scope must be submitted. After approval the work would be periodically reviewed. A well written report of a minimum 15,000 words must be submitted in the prescribed format, by the University. The student would subsequently make a presentation of his/her work and defend them.

ARC 581	ARCHITECTURAL DESIGN-VI	L	P	C
		0	18	9

AIM:

To explore the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning

OBJECTIVES:

- To understand the various components and aspects of the urban environment as well as
  - their interrelationships
- To understand in specific components/issues such as public spaces, physical infrastructure, socio-cultural aspects- heritage, gender, class, dynamics of urban growth
- To understand people as users of the urban environment in various scales.
- To explore techniques of mapping and diagramming to understand the dynamic urban
- environment.
- To take design decisions in a comprehensive manner understanding their implications in the larger context.

CONTENT:

Scale and Complexity: projects involving the urban context and architecture in the urban context

with a thrust on understanding interdependencies and formulating appropriate design directions.

Areas of focus/ issues:

- exploration of relationship between building and larger context
- contemporary processes in design
- appropriate architecture
- addressing issues in urban areas – transportation, sustainability, heritage, sprawl, place making, identity, collective memory
- Mixed use programming Typology/ project: those involving large scale urban interventions as well as large scale projects which have impact on the urban context- revitalization and renewal of urban fragments, evolving guidelines for heritage areas, adaptive reuse, urban waterfront development, transportation nodes, new communities, multi-use urban complexes.

TOTAL: 240 PERIODS

TEXT BOOKS:

1. Jonathan Barnett, An Introduction to Urban Design
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. I. Jawgeih, Life between Buildings,- Using Public Space, Arkitektens Forleg 1987
4. Time Savers Standard for Urban Design
5. Urban design Futures

REFERENCES:

1. Edmund Bacon , Design of Cities , Penguin, 1976
2. Gordon Cullen, The Concise Townscape, The Architectural Press, 1978
3. Lawrence Halprin, Cities, Reinhold Publishing Corporation, New York, 1964
4. Gosling and Maitland, Urban Design, St. Martin's Press.

SEMESTER X

ARC 504	PROFESSIONAL PRACTICE	L	P	C
		3	0	3

AIM:

To provide the students a general understanding of the architectural profession and the importance of ethics in professional practice.

OBJECTIVES:

- To give an introduction to the students about the architectural profession.
- To enable the students to grasp the elementary issues concerning professional practice.
- To teach the students about the role of professional and statutory bodies in the conduct of professional practice.
- To teach the students about the importance of code of conduct and ethics in professional practice.
- To expose the students some of the important legislation which have a bearing on the
  - practice of architectural profession.

1. INTRODUCTION TO THE ARCHITECTURAL PROFESSION

Importance of Architectural Profession – Role of Architects in Society – Alternatives open on entering the profession – Registration of Architects –Architect's office and its management (location, organization structure, responsibility towards employees, consultants and associates,
elementary accounts, tax liabilities).

2. PROFESSIONAL ETHICS AND CODE OF CONDUCT

Role of Indian Institute of Architects – Architects Act 1972 (intent, objectives, provisions with regard to architectural practice) – Council of Architecture (role and functions) – Importance of ethics in professional practice (Council of Architecture guide lines) – Code of conduct for architects as prescribed by Council of Architecture, punitive action for professional misconduct of an architect.

3. ARCHITECT'S SERVICES & SCALE OF FEES

Mode of engaging an architect – Comprehensive services, partial services and specialized services – Scope of work of an architect – Schedule of services – Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement.

4. ARCHITECTURAL COMPETITIONS

Importance of Architectural competitions – Types of competitions (open, limited, ideas competition) – Single and two stage competitions – Council of Architecture guidelines for conducting Architectural competitions –International Competitions (case studies).

5. LEGAL ASPECTS & LEGISLATION

Copy rights and patenting – (provisions of copy right acts in India and abroad, copy right in architectural profession) – Easement – (meaning, types of casements, acquisition, extinction and protection) – Development Regulations in Second master plan for Chennai Metropolitan Area, Chennai Corporation Building rules 1972 – The Panchayat rules 1940 – Persons with Disabilities Act (provisions, responsibilities of architect and local body on creating barrier free environment).

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Architects Act 1972.
2. Publications of Handbook on Professional practice by IIA.
3. Publications of Council of Architecture-Architects (Professional conduct) Regulations 1989, Architectural Competition guidelines
4. Roshan Namavati, Professional practice, Lakhani Book Depot, Mumbai 1984.

REFERENCES:
1. J.J.Scott, Architect's Practice, Butterworth, London 1985.
2. Ar. V.S. Apte, Architectural Practice and Procedure, Padmaja Bhide, Pune, 2008.
3. Development Regulations of Second Master Plan for Chennai Metropolitan Area – 2026.
4. Chennai City Corporation Building Rules 1972.
5. Persons with Disabilities Act.
6. T.N.D.M. Buildings rules, 1972.

ARC 599	ARCHITECTUTAL THESIS	L	P	C
		0	28	20

OBJECTIVE:
All the five years of architectural design culminate in the thesis Project to motivate students to involve in individual research and methodology. This is to train them in handling projects independently.

TOPICS OF STUDY
The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design including urban-infill, rural settlements, environmental design, conservation and heritage precincts, landscape design, housing etc. However, the specific thrust should be architectural design of built environment.

METHOD OF SUBMISSION
The Thesis Project shall be submitted in the form of drawings, project report, models, slides and
reports**.**

TOTAL:510 PERIODS

TEXT BOOKS:
1. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002

REFERENCES:
1. Donald Appleyard, The Conservation of European Cities, M.I.T. Press, Massachusetts
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. Richard Kintermann and Robert small site planning for cluster Housing van nastrand reinhold company, Jondon/New York 1977.
4. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
5. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
6. Geoffrey And Susan Jellico, The Landscape of Man, Thames And Hudson, 1987.
7. Arvind Krishnan & Others, Climate Responsive Architecture, A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001

ELECTIVE - I

ARC312	THEORY OF INTERIOR DESIGN	L	P	C
		3	0	3

1. HISTORY Of INTERIOR DECORATION & DESIGN

Introduction to traditional styles of decoration and the development of Interior Design trends in later part of the 20th century. Impact of different movements of architecture / design on interiors.

2. THEORY OF INTERIOR DESIGN

A. **INTERIOR SPACE** Definition of Geometric elements, transition of architectural & interior elements, shaping by structural / enclosure / environmental systems , Spatial forms & element relationships- floors, walls , ceiling, windows/ doors, stairs & ramps.

B. **DESIGN PROCESS** Programming– analyze, Concept development- synthesis, Design decisions- evaluate, Implementation. Design Criteria- Function, economy, style & image. Human factors- Functional dimensions & personal space. Activity relationships- plan arrangements & strategies. Graphic representations.

C. **DESIGN VOCABULARY** Perception of Form, Shape, Color, Texture, Light, Proportion, Scale, Balance, Harmony, Unity & variety, Rhythm, Emphasis ; relate to visual characteristics of objects & aesthetic quality of visual environments.

3. INTERIOR BUILDING ELEMENTS

Selection & manipulation of elements like Floors, Walls- forms/ articulation/ texture/ color, Ceilings- height/ scale/ forms/ lighting / acoustics, Windows- operation/ views/ day-lighting / natural ventilation / space planning, Doors- operations / space planning, Stairs & ramps,

4. INTERIOR BUILDING SYSTEMS

Design & integration of MEP systems with interior building spaces & elements-` Mechanical systems like AC & fire suppression systems, Electrical lighting & switches, plumbing fittings & fixtures, furniture & interior landscaping

5. INTERIOR FINISH MATERIALS & CONSTRUCTION

Introduction to planning, design & application of materials for Residential spaces- Kitchen, toilet, bedroom & living rooms. Study of various types of materials for Flooring, walls, ceiling, doors & windows, stairs & ramps

Total : 45 PDS

TEXT BOOKS:

1. Interior Design Illustrated,3rd edition, Francis D.K. Ching, John Wiley & Sons,(E-BOOK), 2012

2. Time Saver Standards for Interior Design & space planning, Joseph De Chiara, McGraw Hill, 2001.

REFERENCES

1. History of interior design, 4th edition, JOHN PILE, john wiley & sons, 2013
2. Classic interior design, Henrietta Spencer-Churchill, CICO books,2009
3. Colour in interior Design, JOHN PILE , Mc Graw Hill Company, 1998,
4. Lighting design basics, II edition, MARK KARLEN, (E-book) john wiley & sons, 2012
5. Building systems for interior designers, 2nd edition (E-BOOK), CORKY BINGELLI, 2009
6. Materials for Interior environments, 2nd edition, CORKY BINGGELI, john wiley & sons, 2013

ARC313	ENERGY EFFICIENT ARCHITECTURE	L	P	C
		3	0	3

1. CLIMATE & SHELTER

Historic buildings – preindustrial and modern architecture – examples from different climatic zones.

2. SOLAR ENERGY & BUILDINGS

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

3. PASSIVE SOLAR HEATING

General principles – Direct Gain – Thermal storage wall – Sunspace – Convective air loop – related examples.

4. PASSIVE COOLING

General principles – Ventilation – Radiation – Evaporation and Dehumidification – Mass effect – related examples.

5. SITE PLANNING AND DEVELOPMENTS

Land form – vegetation type and pattern – water bodies - open spaces and built spaces – urbanscape – design strategies.

TOTAL : 45 PDS

TEXT BOOKS

1. Fuller Moore, Environmental Control Systems, McGraw Hill Inc., New Delhi, 1997.
2. Climatically Responsive Energy Efficient Architecture, PLEA/SPA, New Delhi – 1998.

REFERENCES:

1. A.Konya, Design Primer for Hot Climates, Architectual Press, London, 1988.
2. Ms.Sudha, N.K.Bansal and M.A.S.Malik – Solar Passive Building – Pergamon.
4. V.Gupta – Energy and Habitat – Wiley Eastern Limited, New Delhi.

ARC314	VERNACULAR ARCHITECTURE	L	P	C
		3	0	3

1. INTRODUCTION TO VERNACULAR ARCHITECTURE

Definition of Vernacular Architecture. Importance and factors determining the Character of vernacular architecture. Approaches and concepts used in vernacular Architecture - Aesthetic, Anthropology, Architectural, Geographical, spatial, Ecological, Behavioral and Developmental.

2. VERNACULAR ARCHITECTURE OF NORTHERN INDIA

Cultural aspects, symbolism, colour, art, materials of construction and construction techniques of Northern India

- Deserts of Rajasthan; Havelis of Rajasthan, Shekawathi Havelis
- Geographical regions of Kashmir; dwellings,
- House boats of Kashmir – Dhoongas, Bahats.
- Settlement planning of Jaipur
- Introduction to Planning features of forts in Jodhpur, Jaipur, Jaisalmer

3. VERNACULAR ARCHITECTURE OF KUTCH REGION

Wooden Houses and Mansions of Gujarat – Muslim Havelis and Hindu Havelis – Bohra Houses
Their primitive form, Materials, Ornamentation and Construction details
Banni Houses in Kutch regions - Materials and construction details

4. VERNACULAR ARCHITECTURE OF KERALA AND TAMILNADU

Wooden houses , palaces and theatres in Kerala. Nair houses of Kerala - Nallukettu house
Padmanabapuram palace, Thackalai. Koothambalam, Introduction to Boat houses in Kerala
Tribal Architecture in Tamil Nadu-Irula, Kurumba, Todas.
Introduction to Chettinad Architecture, Architectural significance of Chettinad houses and palaces in Chettinad regions. Agraharams of Tamil Nadu- settlement Planning and materials and construction details.

5. VERNACULAR ARCHITECTURE OF COLONIAL INDIA

Colonial influences on the Traditional House, Goa,
Change from Bangla & Bungalow, Bengal and Victorian Villas - Planning Principles, materials & methods of construction
House Typologies, settlement planning in Pondicherry & Cochin.

TOTAL : 45 PDS

TEXT BOOKS

1. Minakshi, J., & Khulbushan, J. (1992.). Mud Architecture of the Indian Desert. Ahmedabad: Aadi Centre.
2. Randhawa, T. S. (1999). The Indian courtyard house. Prakash Books.

REFERENCES

1. G.H.R.Tillotsum. (1989). The tradition of Indian Architecture Continuity, Controversy Change since 1850. New Delhi: Oxford University Press.
2. Meenakshi, M., Muthiah, S., Visalakshi, R., & Muthuraman, V. (2006). The Chettiar Heritage. Chennai: Chettiar Heritage.
3. Oliver, P. (1998). Encyclopedia of Vernacular Architecture of the World. Cambridge: Cambridge University Press.

4. V.S.Pramar. (1989). Haveli - Wooden Houses & Mansions of Gujarat. Ahmedabad: Mapin Publishing Pvt. Ltd.

ARC315	PRINCIPLES OF TRADITIONAL ARCHITECTURE – I	L	P	C
		3	0	3

1. INTRODUCTION:
Definitions of traditional architecture of India, Western and Eastern countries – concept of existence and manifestation – planatory influence on earth.

2. CONCEPT OF SITE BUILDING RELATIONSHIP
Features of good building site, good building shapes – influence of geometry – relationship between built space and human beings – concept of universal space and its impact.

3. TRADITIONAL CONCEPT OF MEASUREMENT
Units of measurements – human as a unit of measure – spatial and musical measurements – architectural applications of these measurements –- examples from history.

4. INTERFACE OF TIME, VIBRATION AND RHYTHM
Theory of vibration and energy transfer – equation of time and space – manifestation in living organism – human beings – measurement of the energy – Kirlian energy of various forms-documentation of objects – filaments and streamers.

5. COSMOGRAM (CELESTIAL GRID) INFLUENCE ON SITE
Importance of orientation – building, site, layout and settlements – positive and negative energies – impact of carditional and ordinal directions – concept of energy grids – types and applications.

TOTAL- 45 PDS

TEXT BOOKS:

1. Dr. V. Ganapati sthapati : Sthapatya Veda" Dakshina Publishing House, Chennai – 41, India, 2001.

2. Stella Kramrisch The Hindu Temple Vo.I Motital Banarsidass Publishers Pvt. Ltd., Delhi 1991.

REFERENCES:

1. Bruno Dagens Mayamatam, Vol. I & II IGNCA and Motilal Bamarsidars Publishers Pvt. Ltd., Delhi 1994.
2. Dr. V. Ganapati Sthapati Vastu Purusha Mandalam, Dakshina Publishing House, Chennai, 1998
3. Ananda Kentish Coomaraswamy, Symbolism of Indian Architecture" – Historical Research Documentation Programme, Jaipur, 1983.

ARC 510	STRUCTURE AND ARCHITECTURE	L	P	C
		3	0	3

1. HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA 9

Development of monolithic and rock cut structures- trabeated construction-accurate construction vaults and flying buttresses- tents and masted structures and bridges through ancient and medieval history.

2. HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD

Post Industrial modular construction of large span and suspension structures in steel and concrete- projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.

3. CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – I

The select case studies could include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Normal Foster and Standsted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw

4. CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – II

The select case studies could include Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Reno Piano Building Workshop

5. SEMINAR

Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.

TOTAL: 45 PERIODS

REFERENCES:

1. “Paper Arch” and Japan Pavilion at Expo 2000 in Hannover by Shigeru Ban
2. Greene King Draught Beer Dept and Schlumberger Cambridge Research Centre, UK by Michael Hopkins
3. Design Center, Linz, Austria and Two Family House in Pullach Thomas Herzog
4. King Abdul Aziz International Airport, Haj Terminal by SOM
5. Pavilion of the Future, Expo 92, Seville by Martorell, Bohigas & Mackay (MBM)
6. Daring Harbour Expo Center, Sydney Australia by P. COX

7. Olympic Archery Building by Enric Miralle & Carme Pinos
8. Eagle Rock House by Ian Ritchie
9. Le Grande Arche de La Defense by J O Spreckelsen

ARC 511	INDUSTRIAL BUILDING SYSTEM	L	P	C
		3	0	3

1. INTRODUCTION
Five year plans and thrust in housing – Issues in Urban Housing – use of modern building materials – application of modern technology – meaning of industrial building system.

2. APPLICATION OF INDUSTRIAL BUILDING SYSTEM
Feasibility of using industrial building system in Residential and Non-Residential buildings – manufacturing of building components – Technology requirements for industrial building system – use of Industrial building system as an option for disaster mitigation.

3. MODULAR CO-ORDINATION AND INDUSTRIALISED SYSYEM
Concept and definition of Modular dimensional discipline – Advantages and Limitations of modular principle – Components of residential buildings – precast elements.

4. PRE-FABRICATION SYSTEM
Objective and necessity – Off site on site prefabrication elements and construction joints – architectural and technical limitations.

5. PROCEDURES AND ORGANISATION
Equipments used – manufacturing processes – transportation of components – assembly and finishing – Structural, social and economic issues related to industrial building system.

TOTAL: 45 PERIODS

REFERENCES:
1. Industrial Building and Modular Design Henrik Missen – C & CK, UK 1972.
2. Albert G.H.Dietz, Laurence Secotter – "Industrialized Building Systems for Housing" – MIT, special summer session, 1970 USA.
3. "Industrialized Building Construction" – Proceedings of National Seminar, Nov-17-18, 2000, Indian Concrete Institute, Mumbai.
4. "Innovative Construction Materials" – Proceedings of Seminar, Jan 20-21,2001, Veermata Jeejabai Technical Institute, Mumbai.

ARC 512	ART APPRECIATION	L	P	C
		3	0	3

1. INTRODUCTION TO ART
Definition of art - need for art – role of art – art reality, perception, representation- categories of art in terms of media and technique - appreciating art: form, content and context

2. VOCABULARY OF ART

Introducing the vocabulary of art constituted by elements (line, shape, form, space, colour, light, value, texture) and principles (unity, variety, harmony, rhythm, balance, proportion, emphasis, (contrast, movement)

3. APPRECIATING ART – BEGINNINGS TO MODERN ART

Appreciating art through the study of art production in the West from the beginnings to the birth of modern art. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Prehistoric Art - Egyptian and Mesopotamian art Greek and Roman art– Medieval art - Renaissance and Baroque art - Neoclassicism - Romanticism - Realism

4. APPRECIATING ART- MODERN ART AND AFTER

Appreciating art through the study of art production in the West over history from modern art till the present. Important works from the following art traditions will be studied and analysed in terms of their form, content and context : Context for new directions in art in the late 19th and early 20th century - Impressionism – post Impressionism – Fauvism- Expressionism- Cubism – Dadaism – Surrealism - abstract art – Futurism - Constructivism – Suprematism –- De Stijl - Abstract Expressionism - Pop art – Op art- new forms and media of art

5. APPRECIATING ART- INDIAN ART

Appreciating art through the study of art production in India over history. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Indus Valley Art - Hindu Buddhist and Jain art - Mughal and Rajput miniatures - art during the colonial period - modern Indian Art.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Fred, S. Kleiner, Gardener's Art through Ages, Harcourt College Publishers, 2001
2. Bernard S. Myers, Understanding the Arts, Holt,Rinehart and Winston Inc, 1964
3. Edith Thomory- a History of Fine Arts in India and the West, Orient Longman Publisher's Pvt. Ltd, New Delhi
4. H.H. Arnason, History of Modern Art, Thames and Hudson, 1977

REFERENCES:

1. The Penguin Dictionary of Art and Artists - Peter and Linda Murray - Penguin books 1989.
2. E.H. Gombrich, The Story of Art, Phaidon 2002
3. E.H.Gombrich, Art and Illsuion, Phaidon, 2002
4. Indian Art since the early 1940s- A Search for Identity- Artsists Handicrafts Association of Cholamandal Artists Village, Madras,1974
5. A.K.Coomaraswamy, Fundamentals of Indian Art, Historical Research Documentation Programme, Jaipur, 1985

ARC 513	URBAN HOUSING	L	P	C
		3	0	3

1. INTRODUCTION TO HOUSING AND HOUSING ISSUES – INDIAN CONTEXT 9

Housing and its importance in Architecture and its relationship with neighbourhood and city

planning. Housing demand and supply – National Housing Policy – Housing agencies and their role in housing development – impact of traditional life style – Rural Housing, Public, private sector housing.

2. SOCIO-ECONOMIC ASPECTS

Social economic factors influencing housing affordability – equity in housing development sites and services/-slum upgradation community participation – Indira Awas Yojana Crime prevention, Health principles in Housing.

3. HOUSING STANDARDS

UD PFI – guide lines, standard and regulations – DCR – performance standards for housing.

4. SITE PLANNING AND HOUSING DESIGN

4.a) Site Planning Selection of site for housing, consideration of physical characteristics of site, locational factors, orientation, climate, topography – Landscaping.

4.b) Housing design Traditional housing, row housing, cluster housing – apartments and highrise housing relating to Indian situations – case studies in India – integration all types of services, parking, incorporation of green sustainable practices –prefabrication in housing.

5. HOUSING PROCESS

Various stages and tasks in project development –community participation and housing management – Environmental aspects and national calamities and disaster mitigation**.**

TOTAL: 45 PERIODS

REFERENCES:

1. Richard Kintermann and Robert small site planning for cluster Housing van nastrand reinhold company, Jondon/New York 1977.
2. Joseph de Chiara and others – Time saver standards for Housing and Residential development, Mcgraw Hill Co, New York 1995.
3. Forbes Davidson and Geoff Payne, Urban projects Manual. Liverpool University press, Liverpool 1983.
4. Christopher Alexander, A pattern Language, Oxford University press, New York 1977
5. HUDCO publications – Housing for low income, sector model.

ARC 514	SUSTAINABLE PLANNING AND ARCHITECTURE	L	P	C
		3	0	3

1.Concept of Sustainability – Carrying capacity, sustainable development – Bruntland report –
Ethics and Visions of sustainability.

2. Eco system and food chain, natural cycles – Ecological foot print – Climate change and Sustainability.

3.Selection of materials Eco building materials and construction – Biomimicry, Low impact construction, and recyclable products and embodied energy. Life cycle analysis. Energy sources – Renewable and non-renewable energy.

4.Green building design – Rating system –LEED, GRIHA, BREEAM etc., case Studies.

5.Urban ecology, social and economic dimensions of sustainability, urban heat Island effects, sustainable communities – Case studies.

TEXT BOOKS:

1. Sustainable Architecture : Low tech houses by Mostaedi (A) – Carles Broto 2002.
2. HOK guide book to sustainable design by Mendler (S) & Odell (W) – John willey and sons 2000.
3. Environmental brief : Path ways for green design by Hyder(R) – Taylor and Francis 2007.
4. Green Architecture: Design for a sustainable future by Brenda and Vale (R) – Thames and Hudson 1996.

REFERENCES:

1. Sustainable Architecture and Urbanism: Concepts, Technologies and examples by Gauzin-Muller(D) – Birkhauser 2002.
2. Eco-Tech : Sustainable Architecture and High Technology by Slessor© - Thames and Hudson 1997.
3. Ecodesign : A manual for Ecological Design by Yeang(K) – Wiley Academy 2006.

AR2077	COMPUTER APPLICATIONS IN ARCHITECTURE	L	P	C
		3	0	3

1. VIDEO EDITING

Importing avis and mpegs, sequencing, cutting trimming, decrease and increase the speed of the movie, filters, transitions, output settings, saving the output.

2. IMAGE EDITING & VECTOR EDITING

Using tools, transparency, layers, masking, effects, image adjustments, transform, text, history,
gradient (fill types), cropping, image size, resolution, keyboard shortcuts, etc. image editing (pixel image types) using tools. Vector characters, bizer and grip editing, transform, fill types, text formatting, colour overlays, etc.

3. PIXEL AND VECTOR ANIMATION

GIF animation and other various animation types, morphing etc. vector animation – using time
line, understanding sequencing, using symbols (library), shape and motion TweeninG

4. WEB

Web presentations, understanding links & navigation, creating web pages, creating 'folder tree'

5. NON LINEAR PRESENTATION (FLASH & DIRECTOR)

Importing files using standard and linking options. Using scripts and behaviors, understanding
stage, cast and time line, using cast library, Tweening, using swf movie, presentation using voice over and presentation demos, creating auto run Cd-rooms

TOTAL: 60 PERIODS

TEXT BOOKS:

1. Photoshop 7 Bible Professional Edition, Wiley John & Son INC, New York, DekeMcClelland, 2000.
2. Flash Web Design, The Art of Motion Graph, Curtis Hillman, New Riders Publishing, Indianapolis, IN. U.S.A, 2000

REFERENCES:

1. M.E. Morris, and R.J. Hinrichs, Web Page Design, Prentice Hall, 1996.
2. Mark Von Wodtke, Mind over Media : Creative Thinking Skills for Electronic Media, McGraw- Hill, New York, 1993

AR2078	CONSTRUCTION TECHNOLOGY	L	P	C
		3	0	3

1. GENERAL BUILDING REQUIREMENTS

Classification of buildings - Sites and Services - Requirements of parts of buildings.

2. CONSTRUCTION SYSTEMS

Planning - Cast in situ construction (ready mixed pumped etc.) Reinforced concrete and prestressed concrete constructions precast concrete and pre- fabrication system – Modular coordination – Structural schemes.

3. CONSTRUCTION PRACTICE

Manufacture, storage, transportation and erection of precast component forms, moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

4. CONSTRUCTION EQUIPMENT

Uses of the following: Tractors, bulldozers, shovels draglings, cableways and belt conveyors, batching plants - Transit mixers and agitator trucks used for ready mix concrete pumps Guniting equipments - Air compressors - welding equipment - cranes and other lifting devices Choice of construction equipment for different types of works.

5. CONSTRUCTION MANAGEMENT

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

TOTAL: 45 PERIODS

TEXT BOOKS:

1. R. Chudley, Construction Technology, Longman Group Limited, England, 1985
2. R. Barry, The Construction of Buildings, The English Language Book Society and Crosby Lockwood, Staples, London, 1976

REFERENCES:

1. National Building Code of India, 1983
2. Frank R. Dagostino, Materials of Construction – Details given Reston Publishing Company, nc.Virginia, 1976.
3. M. Mohsin, Project Planning and Control, Vikas Publishers, New Delhi, 1983

ARC 517	URBAN DESIGN	L	P	C
		2	2	3

1. INTRODUCTION TO URBAN DESIGN

Components of urban space and their interdependencies- outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline

2. HISTORIC URBAN FORM

Western: morphology of early cities- Greek agora- Roman forum- Medieval towns- Renaissance place making- ideal cities – Industrialization and city growth- the eighteenth century city builders Garnier's industrial city- the American grid planning- anti urbanism and the picturesque- cite industrielle- citte nuovo-radiant city . Indian: evolution of urbanism in India- Temple towns- Mughal city form- medieval cities – colonial urbanism- urban spaces in modernist cities: Chandigarh, Bhuvaneshwar and Gandhi Nagarsubsequent directions

3. THEORISING AND READING URBAN SPACE

Ideas of Imageability and townscape: Cullen, Lynch- place and genius loci- collective emoryhistoric reading of the city and its artefacts: Rossi- social aspects of urban space: life on streets and between buildings, gender and class, Jane Jacobs, Wiiliam Whyte

4. ISSUES OF URBAN SPACE

Understanding and interpreting of urban problems/ issues- place-making and identity, morphology: sprawl, generic form, incoherence, privatized public realm- effects/ role of real estate, transportation, zoning, globalisation - ideas of sustainability, heritage, conservation and renewal- contemporary approaches : idea of urban catalyst, transit metropolis, community participation.

5. BEST PRACTICE IN URBAN DESIGN

Contemporary case studies from developing and developed economies that offer design guidelines and solutions to address various issues/ aspects of urban space

TOTAL: 45 PERIODS

TEXT BOOKS:

1. A.E.J. Morris, History of Urban Form before the Industrial Revolution, Prentice Hall 1996
2. Edmund Bacon , Design of Cities , Penguin, 1976
3. Gordon Cullen, The Concise Townscape, The Architectural Press, 1978
4. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
5. Time Saver Standards for Urban Design
6. Kevin Lynch, Image of the City

REFERENCES:

1. Jonathan Barnett, An Introduction to Urban Design
2. Lawrence Halprin, Cities, Reinhold Publishing Corporation, New York, 1964
3. Gosling and Maitland, Urban Design, St. Martin's Press, 1984
4. Urban Design Futures
5. Geoffrey Broadbent, Emerging Concepts in Urban Space Design

ARC 520	EARTHQUAKE RESISTANT ARCHITECTURE	L	P	C
		3	0	3

1. Fundamentals of earthquakes

a) Earths structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.

b) Predictability, intensity and measurement of earthquake

c) Basic terms- fault line, focus, epicentre, focal depth etc.

2. Site planning, performance of ground and buildings

a) Historical experience, site selection and development

b) Earthquake effects on ground, soil rupture, liquefaction, landslides.

c) Behaviour of various types of building structures, equipments, lifelines, collapse patterns

d) Behaviour of non-structural elements like services, fixtures in earthquake-prone zones

3. Seismic design codes and building configuration

a) Seismic design code provisions – Introduction to Indian codes

b) Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings like short stories, short columns etc.

4. Various types of construction details

a) Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures.

b) Seismic design and detailing of RC and steel buildings

c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components

5. Urban planning and design

a) Vulnerability of existing buildings, facilities planning, fires after earthquake, socioeconomic impact after earthquakes.

b) Architectural design assignment- Institutional masonry building with horizontal spread and height restriction, multi-storeyed RC framed apartment or commercial building .

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Guidelines for earthquake resistant non-engineered construction, National Information centre of earthquake engineering (NICEE, IIT Kanpur, India)

2. C.V.R Murthy, Andrew Charlson. “Earthquake design concepts”, NICEE, IIT Kanpur India.

REFERENCES

1. Ian Davis (1987) Safe shelter within unsafe cities” Disaster vulnerability and rapid urbanisation, Open House International, UK

2. Socio-economic developmental record- Vol.12, No.1, Jan-Feb 2005

3. Learning from Practice- A review of Architectural design and construction experience after recent earthquakes- Joint USA-Italy workshop, Oct.18-23, 1992, Orvieto, Italy.

ARC 521	ARCHITECTURAL CONSERVATION	L	P	C
		3	0	3

1. INTRODUCTION TO CONSERVATION **9**

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

2. CONSERVATION IN INDIA

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

3. CONSERVATION PRACTICE

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

4. URBAN CONSERVATION

Over view of urban history of India and Tamil Nadu- understanding the character and issues of historic cities – select case studies of towns like Srirangaram, Kumbakonam and Kanchipuram - historic districts and heritage precincts.

5. CONSERVATION PLANNING

Conservation as a planning tool.- financial incentives and planning tools such as Transferable Development Right(TDR)-urban conservation and heritage tourism-case studies of sites like for Cochin, Pondichery French town.- conservation project management

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Donald Appleyard, The Conservation of European Cities, M.I.T. Press, Massachusetts
2. James M. Fitch, Historic Preservation: Curatorial Management of the Built World by University Press of Virginia; Reprint edition (April 1, 1990)
3. A Richer Heritage: Historic Preservation in the Twenty-First Century by Robert E. Stipe
4. Conservation Manual , Bernard Fielden; INTACH Publication

REFERENCES:

1. B.K. Singh, State and Culture, Oxford, New Delhi
2. A.G. K. Memon ed. Conservation of Immovable Sites, INTACH Publication, N.Delhi.
3. Seminar Issue on Urban Conservation.

ARC 522	SAFETY SYSTEMS AND BUILDING MANAGEMENT	L	P	C
		3	0	3

1. SAFETY REQUIREMENTS

Minimum safety requirements for a building, particularly for a high rise building as per the National Building Code.

2. FIRE ALARM SYSTEMS

Objectives of a Fire Alarm System, Essential components of a Fire Alarm System, Technology of detection, Type of Statutory Standards followed in direction, Explaination on the essential clauses, various types of technologies employed in the Fire Alarm System, basic knowledge on how a Fire Alarm System is designed and installed

3. FIRE SUPPRESSION SYSTEMS

Objectives of a Fire Suppression System, Explanation on fire triangle,Essential components of a Fire Suppression System, different types of Fire Suppression Systems, Type of Statutory Standards followed in Suppression, Explanation on the essential clauses and basic knowledge on how a Fire Suppression System is designed and installed.

4. SECURITY SYSTEMS

Introduction to different types of Security Systems and why they are required. Introduction to Access Control, CCTV, Intruder Alarm and Perimeter protection Systems, Essential components of each system, various types of technologies employed in these Systems, basic knowledge on how they are designed and installed.

5. INTEGRATED BUILDING MANAGEMENT SYSTEM

The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Building Automation Systems – A Practical Guide to selection and implementation – Author : Maurice Eyke
2. National Building Code of India 1983 (SP 7:1983 Part IV) – Published by Bureau of Indian Standards
3. IS 2189 – Selection, Installation and Maintenance of Automatic fire Detection and Alarm System – Code of Practice (3rd Revision) – Published by Bureau of Indian Standards.

REFERENCES:

1. The Principles and Practice of Closed Circuit Television – Author: Mike Constant and Peter Turnbull
2. Rules of Automatic Sprinkler Installation – 2nd Edition – Published by Tariff Advisory Committee.
3. Fire Suppression Detection System – Author : John L. Bryan
4. Design and Application of Security/Fire Alarm system – Author: John E. Traister.

5. CCTV Surveillance – Author: Herman Kruegle
6. Security Systems and Intruder Alarm Systems – Author: Vivian Capel

ARC 523	LANDSCAPE AND ECOLOGY	L	P	C
		3	0	3

1. INTRODUCTION
Introduction to landscape architecture, ecology, ecological balance, landscape conservation, reclamation and landscaping of derelict lands, environmental impact assessment.

2. ELEMENTS IN LANDSCAPE DESIGN
Hard and soft landscape elements; Plant materials - classification, characteristics, use and application in landscape design; Water and Landform,

3. GARDEN DESIGN
Landscape and garden design in history - Japanese, Italian Renaissance and Moghul gardens in India, Study of notable examples, Spatial development in landscape design.

4. SITE PLANNING
Organisation of spaces - circulation, built form and open spaces, site planning and micro climate, site planning for neighbourhood parks, children's play area and campus development.

5. LANDSCAPING OF FUNCTIONAL AREAS
Urban open spaces and principle of urban landscape; Street landscaping, landscape design for waterfront areas and functional areas in urban centers; green roofs

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Michael Laurie, An Introduction to Landscape Architecture, Elsevier, 1986.
2. Geoffrey And Susan Jellico, The Landscape of Man, Thames And Hudson, 1987.

REFERENCES:
1. T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995
2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company , 1993.
3. Brian Hacket, Planting Design, Mc Graw Hill, Inc, 1976
4. Handbook of urban landscape, Cliff Tandy, Architectural press, 1973
5. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers, Calcutta, 1991.