BRIEF SYLLABI

FOR

B.ARCH. DEGREE PROGRAM

(Applicable from 2010 Admission onwards)

Total Credits = 200 [194+6(OT)]

(Approved by the Senate in the 26th Meeting as Item No. 26.2.12)

DEPARTMENT OF ARCHITECTURE



NATIONAL INSTITUTE OF TECHNOLOGY CALICUT

MARCH 2010

FIRST SEMESTER

MA 1001 - MATHEMATICS - I

Pre-requisite: NIL

Partial differentiation, Minima and Maxima of functions of two or more variables, Convergence and divergence of infinite series, absolute convergence, Taylor's and Maclaurin's series, First order ordinary differential equations: Methods of solution, Applications of first order differential equations, Linear second order equations: fundamental system of solutions, Wronskian, Non homogeneous equations, Fourier series, Harmonic analysis, Complex Fourier Series, Fourier Integrals, Fourier Cosine and Sine Transforms, Fourier Transforms, Gamma and Beta functions, Laplace Transforms, Inverse Laplace Transforms, Convolution, Unit step function, Laplace

Total Hours: (42L+14T)

MS 1001 - PROFESSIONAL COMMUNICATION

Pre-requisite: NIL

Oral Communication - Purpose and Audience - Using Graphics - Oral Presentations - Readin Reference skills - Reading Strategies- Written Communication- Paragraph writing - Short Ess Writing Report - Description of Processes and Product - Editing and Proof Reading .

Total Hours: 42L

ZZ 1001- ENGINEERING MECHANICS

Pre-requisite: NIL

Part A--Statics

Fundamentals of mechanics, Important vector quantities, Equivalent force systems, Equations of equilibrium - problems of equilibrium, static indeterminacy. Applications of Equations Equilibrium - Trusses, Friction forces - laws of Coulomb friction, simple contact friction problems - Properties of surfaces - related concepts, concept of second order tensor transformation.

Part B—Dynamics

Kinematics of a particle, rectangular components, cylindrical coordinates simple kinematical relations and applications. Particle dynamics: Introduction, rectangular coordinates, cylindrical coordinates Newton's law for rectangular and cylindrical coordinates. Energy and momentum methods for a particle, alternative form of work-energy equation, Linear momentum and angular momentum concepts. Vibrations: Single degree of freedom systems, introduction to multi degree of freedom systems.

Total Hours: 42L

AR 1001 - ARCHITECTURAL GRAPHICS – I

Pre-requisite: NIL

Basic geometric constructions – scales – special curves – orthographic projections – first angle projections projection of points, lines, planes and solids in various positions with respect to the reference planes – auxiliary projection and projection of sectioned solids.

Total Hours: (14L+42D)

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ays –Essay	Writing –

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AR 1002 - INTRODUCTION TO ARCHITECTURAL DESIGN -I

Pre-requisite: NIL

Perception of Space- Architectural Spaces and characteristics, Properties and Scale as measure of architectural spacesquality and interrelationships. Colour, lines, texture and dimensions as elements in Architecture. Design of simple spaces such as utility spaces, transitional Spaces, thresholds and interfaces, Control of spaces; Application of proportion and scale. Modulation of space through light, colour, lines, texture etc.

Total Hours: 56D

AR 1091 - BASIC DESIGN -I

Pre-requisite: NIL

Visual study - identify various elements - principles of two-dimensional composition; to experim potentials of various media- observation of settings of singular/multiple objects. Three-dimensional compositions of various forms, outdoor sketching of objects, colour studies.

Total Hours: 42P

AR 1092 - WORKSHOP -- I

Pre-requisite: NIL

Hands on working on carpentry, model making, plumbing and sanitary fittings- electric wiring and bar bending. Group Projects involving design and fabrication of articles like furniture, lamp shades, table lamps etc.

Total Hours: 42P

SECOND SEMESTER

AR 1003 - BUILDING MATERIALS

Pre-requisite: NIL

Properties, classification, manufacturing process, durability and micro-structural aspects of building materials- testing methods and codes for material such as stones, timber, steel, cement and concrete, mortars, paints, glass and composites materials for finishes and miscellaneous materials

Total Hours: 42L

AR 1004 - ARCHITECTURAL GRAPHICS - II

Pre-requisite: AR 1001 – Architectural Graphics - I

Development of surfaces of solids - intersection of solids - pictorial projections - isometric projection - perspec	ctive
projections; principles of sciography and its application on perspective and other presentation drawings.	

Total Hours: (14L + 42D)

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AR 1005 - HISTORY OF ARCHITECTURE - I

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Introduction- factors shaping architectural character of a region; Egyptian Architecture; West Asian architecture, Sumerian, Assyrian, Persian, Sassanian Architecture; Greek architecture; Roman architecture; Early Christian architecture; Byzantine architecture; Early Islamic architecture, Ummayud, Abbasid, Tulunid, Nasrid, Aglabid, Fatimid, Samanid Architecture; Indus Valley, Vedic, Buddhist, Jain, Hindu architecture-Dravidian style.

Total Hours: 42L

AR 1006 THEORY OF STRUCTURES

Pre-requisite: ZZ 1001 – Engineering Mechanics

L	Т	P/D	С
3	1	0	3

Structure and form - comparison of structural systems; types of loads on structures – structural response to loads – force - response of statically determinate structures - internal forces in beams, trusses, arches and frames – principles of virtual work – energy methods - static indeterminacy – force method of analysis - analysis of fixed beams, continuous beams, rigid frames and pin jointed trusses - kinematic Indeterminacy – slope deflection method, moment distribution method, Kani's method - rigid frames of different geometry- frames with sway and without sway – substitute frame method - application to 2D multistory frame analysis - introduction to matrix analysis - definition of flexibility and stiffness influence coefficients – development of flexibility and stiffness matrices by physical approach - introduction to theory of software used for analysis.

Total Hours: (42L+14T)

AR 1007 - INTRODUCTION TO ARCHITECTURAL DESIGN - II

Pre-requisite: AR 1002 – Introduction to Architectural Design - I

L	Т	P/D	С
0	0	4	3

Plan - volume dichotomy and form- spatial quality, elements of visual design in architecture- representational methods and symbols in architectural design, concept development and nurturing creativity.

Architectural documentation of a simple buildings-design of utilitarian spaces-waiting Spaces, living spaces, working spaces, design of simple structure- additive and subtractive forms.

Total Hours: 56D

AR 1093 - BASIC DESIGN - II

Pre-requisite: AR 1091 – Basic Design - I

L	Т	P/D	С
0	0	3	2

Study on development of three dimensional compositions through exercises on three-dimensional models using various media; to form the background for architectural design in the subsequent semesters.

Pre-requisite: AR 1092 – Workshop - I

L	Т	P/D	С
0	0	3	2

Training on various types of masonry construction using bricks, blocks and stones - arch construction using bricks - concrete construction – testing of construction materials and their properties-group projects involving design and construction of articles like street furniture, containers, bins etc.

Total Hours: 42P

THIRD SEMESTER

AR 2001– BUILDING CONSTRUCTION - I

Pre-requisite: AR 1003– Building Materials

Foundations - shallow and deep foundations - wall foundation - foundation for framed buildings, Raft, Pile foundation -
Underpinning and foundation strengthening - masonry construction - stone masonry - types - decorative stone work -
stone slabs on vertical surfaces -Brick masonry - various types of bonds - reinforced brick work - composite walls and
cavity walls - arch construction - various types - formwork for arches- roofing - pitched and flat roofs of timber and
steel - various types - roof trusses, roof covering- thatching, tiling, various types of roofing sheets - modern roofing -
RCC slab over walls, reinforcement detailing - doors, windows and ventilators - various types of doors, casement
windows and ventilators of timber and rolled steel - construction details.

Total Hours: (14L+42D)

AR 2002 - THEORY OF DESIGN

Pre-requisite: NIL

Architectural theory in historical perspective- definition of design, architecture, scope of design-behavioral aspects of the user- deterministic methods and models; concept of creativity, issues of creative design. visual design principles-functional, structural and spatial systems; principles of visual design, relation of form and space, architectural programming principles- functionalism, organic architecture and contemporary movements in architecture; design Process-design approaches, new techniques in analysis of spatial relations, decision-making; history & principles of visual simulation, value engineering concepts and its application in design evaluation; interiors and exteriors-building envelope as a space definer -design of visual sequences of spaces.

Total Hours: 28L

AR 2003 - HISTORY OF ARCHITECTURE - II

Pre-requisite: AR 1005- History of Architecture - I

Christian Architecture-Romanesque (Central Europe, Italy and France); Gothic (Germany, France, England and Italy and Renaissance Architecture(Italy, France, Germany and Britain); cross cultural influences across India and secular architecture of princely states- Rajput, Sikh, Vijayanagara &Mysore; Mughal and Colonnial Architecture- Mughals in India- Hindu-Muslim culture, outline of Mughal cities and gardens under the Mughal rulers; Colonnial style in India under Portuguese, Dutch, French, and English- forts, Railway stations, Churches. Modern Architecture -Art movements-Art Nouveau, Eclectism; contribution of modern architects-Peter Behrens, Antonio Gaudi, Victor Horta, Louis Sullivans &Frank Lloyd Wright. Organic Architecture, European Modern Architecture, Auguste Peret, Adolf Loos; Post modern Architecture-Influence of other visual arts on architecture

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1	0	3	3

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2	0	0	2

L	Т	P/D	С
3	0	0	3

AR 2004 - STRUCTURAL DESIGN-I

Pre-requisite: AR 1006 – Theory of Structures

L	Т	P/D	С
3	1	0	3

Reinforced Concrete Design - mix design - Methods of RC design - working stress method, ultimate load method and limit state methods – limit state of collapse – flexure, shear and torsion - analysis and design of singly and doubly reinforced sections – design of shear reinforcement – design for torsion - design for bond and anchorage - limit state of collapse – compression - short and long columns - biaxial bending – analysis of portal frames - Pre-stressed concrete Fundamentals - principles of pre stressing, -analysis of simple pre-tensioned and post tensioned beams

Total Hours: (42L+14T)

AR 2005 - BUILDING CLIMATOLOGY & SOLAR ARCHITECTURE

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Climatic information &data- earth's rotation – seasonal variations -thermal balance of earth –global winds – elements of climate – data representations and measurements, equipments and representation-classification and characteristics of tropical climate & building design in various climatic zones- review of vernacular architecture-factors affecting site climate, urban climate, global warming and its effects; design criteria – comfort indices - detailed comfort analysis-tropical summer index and effective temperature nomogram-heat exchange of buildings – calculation of heat loss and heat gain – thermal gradients – periodic heat flow- day lighting , natural ventilation and dampness control; day light factor concept- day lighting systems - daylight design for various occupancies (SP 41);functions of ventilation –concepts of ventilation- ventilation design- effect of courtyards dampness and prevention methods, climate responsive design and solar architecture-passive controls -designs of shading devices – thermal performance index. Thermal efficiency of buildings- Energy efficiency in buildings and passive controls- utilization of solar energy in buildings

Total Hours: 42L

AR 2006 - ARCHITECTURAL DESIGN AND FIELD TOUR - III

Pre-requisite: AR 1007 - Introduction to Architectural Design - II

L	Т	P/D	С
0	0	6	5

Viewing built form as physical manifestation of relationships and built form as systems consisting of various subsystems and components; learning built form-site response and presentation techniques in 3D imaging, perspectives and model making. To be aware of the climatic context of a building and to arrive on solutions that responds to climatic aspects; basics of anthropometry and ergonomics as required for the design of functional spaces- two projects.

Total Hours: 84D

AR 2091- COMPUTER AIDED ARCHITECTURAL DESIGN LABORATORY

Pre-requisite: NIL

L	Т	P/D	С
0	0	3	2

Introduction to CAAD, Commands for drawing basic elements, Modification commands; introduction to parametric modeling, introduction to Autodesk Revit, project setup, placing and editing elements like walls, door, window, floor, roof, handrails etc. massing, project phasing, schedules, detailing, plotting orthographic projections, rendering views, component/ family creation. Introduction to development of 3D, 3D creation commands, modification commands, UCS manipulations etc. creating & modifying of basic geometries, polygon modeling, Boolean operations, modifiers, creating and applying materials, UVW mapping.

Total Hours: 42P

FOURTH SEMESTER

AR 2007 - BUILDING CONSTRUCTION -II

Pre-requisite: AR 2001 - Building Construction - I

L	Т	P/D	С
2	0	3	4

Doors, windows and ventilators - steel and aluminium - sliding and folding and fire resistant doors – Steel and aluminium casement and sliding windows and aluminium ventilators - floors and flooring - various types of floor systems - timber and different types of RCC floors – light weight floors and floors using hollow blocks - floor finishes - types and laying techniques – partitions - various types of partitioning using timber, steel and aluminium - vertical transportation - planning and detailing of various types of stairs, lifts escalators and ramps – special requirements for barrier free access - framed construction - framed construction in concrete, timber and steel- tools and techniques of fabrication and erection

Total Hours: (28L+42D)

AR 2008 - WATER SUPPLY AND SANITATION

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Estimation of water supply, source of water and treatment process; plumbing fixtures and hydrant systems; water distribution systems; specialised services, waste classification, solid waste, drainage, waste water treatment and techniques.

AR 2009 - STRUCTURAL DESIGN-II

Pre-requisite: AR 2004 – Structural Design - I

L	Т	P/D	С
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Design of steel structures - properties of structural steel - design of riveted and welded connection - design of simple and compound beams - design of compression members – design of column bases - steel roof systems - design of roof trusses – analysis for dead loads and wind loads – wind bracings – timber design - design of beams for flexure, shear and bearing – formwork design - masonry design - analysis and design of brick masonry - design of masonry foundations and stepped footings.

Total Hours: (42L+14T)

CE 2011 - LAND SURVEYING

Pre-requisite: NIL (Concurrent Course: CE 2096 – Surveying Practical)

General principles and classification of surveying - chain survey - compass survey - plane table survey - two and three
point problems and solutions - leveling - plotting of L.S. and C.S - contouring and plotting - theodolite surveying -
theodolite traverse procedure - calculation of coordinates - plotting -tacheometric surveying - heights and distances -
single plane method -measurement of Areas and Volumes - trapezoidal and prismoidal formulae for volumes -
determination of quantities for excavation and capacities of reservoirs – modern surveying instruments – autolevel – total
station.

Total Hours: 42L

AR 2010 - ARCHITECTURAL DESIGN AND FIELD TOUR - IV

Pre-requisite: AR 2006 – Architectural Design and Field Tour - III

L	Т	P/D	С
0	0	6	5

This studio will emphasize on the study of functional requirements of a building such as lighting ventilation and thermal comfort. It will also provide the basics of orientation of building with respect to sun and wind. It shall also explore the basics of passive design methods in order to create passive architecture. It aims to provide skills to analyze and present design through graphical techniques and to demonstrate understanding of building rules and other regulatory rules. Two projects will be done.

Total Hours: 84D

CE 2096 - SURVEYING PRACTICAL

Pre-requisite: NIL Concurrent Course: CE 2011 – Land Surveying

L	Т	P/D	С
0	0	3	2

Chain Survey - Traversing and Plotting using chain - compass surveying -traversing and plotting using chain and compass - plane table survey - radiation, intersection methods - solving two – point and three - point problem - traversing using plane table – levelling - fly levelling -contour surveying -surveying with theodolite - measurement of horizontal and vertical angles and solution of triangles - heights and distances by stadia tacheometry -total station – demonstration.

Total Hours: 42P

FIFTH SEMESTER

AR 3001 - BUILDING CONSTRUCTION -III

Pre-requisite: AR 2007 - Building Construction - II

L	Т	P/D	С
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Long span and light weight construction - space structures in steel and concrete - methods of construction - Construction Equipment - for excavation, hauling, hoisting and compaction etc. -fire protection and damp proofing -fire design of buildings – means of escape and their design - damp proofing – causes, effects and prevention– methods and materials used - expansion joints and construction joints and their water proofing - roof tanks and roof gardens – construction details - mud construction - stabilized mud blocks – mud wall construction–structural considerations and durability - cladding systems - curtain wall construction and wall cladding for steel and concrete structures – false ceilings and wall panelling - repair and retrofitting of structures - smart materials - study on scaffolding system – types and applications.

Total Hours: (28L+42D)

AR 3002 – SOCIOLOGY AND HUMAN SETTLEMENT

Pre-requisite: NIL

Sociology-An Introduction, Architecture as an extension of a social life of man, Orgin and types of settlements, Socio cultural influence on built forms ,Community Planning principles, reasons for urbanization, its socio-cultural impacts, Slums and Squatter settlements, principles of planning based on social considerations.

AR 3003 – ARCHITECTURAL ACOUSTICS

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Introduction to architectural Acoustics – characteristics and measurements of sound; design criteria of sound for various architectural spaces ,Noise criteria curves , acoustical problems. Free propagation of sound – geometrical spreading – air absorption – effect of landscape elements application of these principles in the design of open air theatre and planning of buildings. Behaviour of sound in enclosed spaces – principles of geometrical acoustics –Sabine's formula and its interpretation Auditorium acoustics – design criteria for speech and music – Acoustic design for reverberation control – sound amplification, Principles of noise control – noise sources – sound field determination – sound transmission through walls and partitions, Vibration isolation – damping of noise – noise transmission through ducts – planning considerations, General description on the manufacture and properties of acoustical materials – selective behaviour of acoustic materials – Construction details of acoustic treatment on walls, ceiling and floors – floating floor construction

Total Hours: 42L

AR 3004 - ENVIRONMENTAL STUDIES FOR ARCHITECTURE

Pre-requisite: NIL

The course	provides	basics	of envi	ronmer	nt and its	componen	its, and cover	rs land u	se and u	ırban j	plannin	g is	sues of
environmen	ital signifi	icance;	basics	of En	vironmenta	d Impact	Assessment	process-	method	s and	tools	for	impact
quantificati	on and ana	alysis- c	ase stud	lies of l	EIA signifi	cance.							

Total Hours: 42L

AR 3005 - ARCHITECTURAL DESIGN AND FIELD TOUR - V

Pre-requisite: AR 2010 – Architectural Design and Field Tour - IV

L	Т	P/D	С
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Study of various building services -water supply, drainage, sanitation, electrification, vertical transportation and fire safety; quantification the requirements-device strategies for optimum distribution of these services; various design and construction techniques to implement these services strategically-two projects

Total Hours: 84D

AR 3091 - INTERACTIVE MEDIA DESIGN LAB

Pre-requisite: AR 2091 – Computer Aided Architectural Design Laboratory

L	Т	P/D	С
0	0	3	2

Advanced techniques in rendering: using ambient, sunlight and artificial lighting to produce realistic renderings, techniques to fine tune the scenes and renderer to reduce the processing time., Animation and walkthrough, simulating gravity, wind etc. in the scene, distributed rendering, Application of videography in architecture, video making process, Video editing, Multimedia presentations, Print media preparation, Creating interactive presentations, basics of developing and hosting websites.

Total Hours: 42P

SIXTH SEMESTER

AR 3006 - ESTIMATION, COSTING AND VALUATION

Pre-requisite: NIL

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Quantity surveying - basics for different types and parts of building, standard data sheets, rate analysis basics, abstract and detailed estimates - standard specifications for different items of building work, need and the art of making specifications - valuation of land and buildings, principles involved, valuation tables - building cost analysis and cost modeling basics - comparison of cost parameters and time-cost index.

Total Hours: 42L

AR 3007-ARCHITECTURAL ILLUMINATION

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Fundamentals of Electrical Engineering, Types of wires and Wiring system, Wiring circuits, Service connections, Distribution system in houses, Electrical installation in different type of buildings, LAN and WAN in building design, Preliminary estimation of wiring systems, Electrical safety, Earthing and ELCB, safety regulations in, Kerala Cinema Regulation Act relating to electrical systems in cinema theater. Terms & units associated with illumination, The laws of illumination, different type of lamps and their properties, Criteria and Standards of illumination for different activity areas. Design calculation of interior lighting, Illumination for sports and recreational facilities, choice of luminaires, Street lighting.

AR 3008 - WORKING DRAWING

Pre-requisite: NIL

L	Т	P/D	С
0	0	3	2

Plans: Setting out Plan, Foundation plan; Ground Floor Plan; Upper Floor Plans; Terrace or Roof plan including roof drainage; Site Plan / Service Plan, layout plan showing different buildings, internal roads, water supply, and sewerage including area drainage plan. Elevations of all sides (front, back and both the sides) Sections: Transverse and Longitudinal sections. Sections through Staircase and Lift, Structural drawings for foundation and floors showing structural grid and column-beam position. Working drawings for interiors, Tile lay out, scheduling the fixtures and detailing of toilets and kitchen etc. Layout of sanitary and plumbing lines and duct detailing Layout of electrical lines and fixtures. Detailing of air-conditioning systems. Landscape detailing, Pavement, etc Details of Plinth, Masonry, Doors, windows, staircases (Wood and Concrete), Partition walls, curtain walls, Acoustic and thermo-insulating wall paneling with different materials, suspended ceiling, Special doors and windows, Different types of resilient and vibration resistive floors, wall cladding and exterior paneling.

Total Hours: 42D

AR 3009 - INTERIOR DESIGN

Pre-requisite: NIL

Characteristics of indoor space: Effect of enclosures on space perception - modulation of space - Symbolism and meaning in interiors – principles of interior design: Back ground for applied decoration - Modulation of interior space with art objects and modulating thermal and sonic environment, space modulation through artificial and natural lighting, emphasizing of focal points – Unity in interior design – furniture design: evolution of furniture styles, functional classification, barrier free design, application of semiotics to furniture design – structural treatments: Architectural materials for interiors, interior landscape: problems of containerization - design, detailing and construction of Interior landscape.

Total Hours: (14L+42D)

AR 3010 - ENERGY, SUSTAINABILITY AND SITE PLANNING

Pre- requisites: AR 1003- Building Materials & AR 2005- Building Climatology and Solar Architecture

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The course aims to make the student conscious of the principles of environmental sustainability and the role of sustainable architecture in achieving a sustainable environment. It has a module on relevance and applicability of concept of energy efficient buildings. It shall help the student to explore the concepts and practice of sustainability in Architecture to create successful models of sustainable architecture and to educate the clients. It has a module that covers the techniques of site analysis and planning to evolve site responsive design solutions.

AR 3011 - ARCHITECTURAL DESIGN AND FIELD TOUR - VI

Pre-requisite: AR 3005 – Architectural Design and Field Tour - V

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The course is aims to study the relation between built and open spaces and their meaningful integration to communicate with the users. Also it aims help the student to learn the site planning tools and techniques to study, analyze and visualize large extent of land and develop capability to meaningfully respond to the climatological and geographical features of the land. It has the extended aim to impart basics of sustainable architecture; the means, methods and strategies .It also aims to study and demonstrate understanding in effective 'topography and land management' and 'water harvesting' methods in architectural projects.

Total Hours: 84D

SEVENTH SEMESTER

AR 4001 – HEATING VENTILATION AND AIR CONDITIONING

Pre-requisite: NIL

Basics of heat transfer and thermodynamic principles; psychometric properties and human comfort parameters. Air
conditioning load estimation fundamentals- systems of air condition- their comparison for different parameters; ducting
systems and room air conditioning basics- duct design and air handling systems.

Total Hours: 42L

AR 4002 - LANDSCAPE ARCHITECTURE

Pre-requisite: NIL

1 0 3 3Landscape and garden architecture through history - Design process in landscape architecture - Elements of landscape -Energy saving Landscapes and passive climatic design strategies in landscapes - Design, development and details of landscapes for various functions - Landscape services. Introduction to ecological landscapes - Interior landscape architecture - Interior Landscape services - Case studies on various types of landscapes.

Total Hours: (14L+42D)

AR 4003 – HOUSING

Pre-requisite:	NIL
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The course provides background basics on the housing problem in India and the various policies and agencies in operation. It has a module on the market analysis and various funding agencies in the country. A module on Hosing design and evaluation follows. It also covers the various aspects of implementation of housing schemes which covers the techniques' part as well for mass housing.

Total Hours: 28L

AR 4004 – URBAN AND REGIONAL PLANNING

Pre-requisite: NIL

Origin, evolution and history of human settlements - planned cities in India and the world - town definitions and classifications, Terminologies, Urban design concept and theories, Physical, Environmental, Infrastructure, Housing aspects of urban planning, Planning theories, Master plans and development plans, survey and analysis in town planning, planning standards - resource allocation, Agencies involved in Planning, Legal aspects of Planning, Acts and Policies.

Total Hours: 42L

AR 4005 - ARCHITECTURAL DESIGN AND FIELD TOUR-VII

Pre-requisite: AR 3011 – Architectural Design and Field Tour - VI

Study and expression of understanding of structural and service aspects of multi storied building design. Study and demonstrate understanding in earthquake responsive architecture in designing multi-storied building. Study and demonstrate understanding of disaster-rehabilitation architecture; the methods and strategies including knock-down architecture for transient accommodations. Two projects will be done.

Total Hours: 126D

AR 4091 - BUILDING SCIENCE LABORATORY

Pre-requisite: AR 2005-Building Climatology and Solar Architecture & AR 3003-Architectural Acoustics

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movement, wind, ill	imination, acous	tics, therm	al insu	lation	

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Various Experiments on: Solar radiation, temperature, air movement, wind, illumination, acoustics, thermal insulation and study of shading devices – comfort parameters and comfort indices – evaluation of thermal comfort using Architectural Evaluation System.

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L	Т	P/D	С
2	0	0	2

EIGHTH SEMESTER

AR 4006 - COMPUTER APPLICATIONS IN ARCHITECTURE

Pre-requisite: AR 2091 – Computer Aided Architectural Design Laboratory

L	Т	P/D	С
3	0	0	3

This course introduces various domains of computer application in architecture and the rationale behind. It also covers the techniques of data organization and analysis in architecture for effective computerization of tasks and the various step/techniques for computerizing architecture allied process. It covers modern computational tools such as geographical information system and decision support system and the avenues for their potential architectural application as well.

Total Hours: 42L

AR 4007 ARCHITECTURAL SPECIFICATIONS

Pre-requisite: NIL

L	Т	P/D	Cr
2	0	0	2

Role of specifications in contract documents & tender documents, Types of specifications specification in context, Systems building & performance specifications, drafting Specification, interlocking work scopes, accuracy & clarity in specification writing, work of other sections, grandfather clauses, residuary legatee, imperative mood, specification for simple building materials writing clause by clause detailed specification for different items of work in building construction, detail specification for item rate contract, preparation of tender documents and bill of quantities for different types of construction works

Total Hours: 28L

AR 4008 - ARCHITECTURAL DESIGN AND FIELD TOUR - VIII

Pre-requisite: AR 4005 - Architectural Design and Field Tour - VII

L	Т	P/D	С
0	0	9	6

This studio shall emphasize the urban scale of design development as applicable to the context of neighborhood /cluster of buildings/ urban streets' designs, redevelopment etc. It also shall consider the socioeconomic environmental and behavioral aspects of design and shall introduce various survey techniques. Submission may include presentation drawings, UD models including block models and use of CAAD techniques-two projects

Total Hours: 126D

AR 4009 - SEMINAR

Pre-requisite: NIL

L	Т	P/D	С
0	0	0	2

Seminar aims to encourage students to conduct independent research on a topic of interest relevant to Architecture, to learn formulation of research methodology, data gathering methods and analytical techniques, to work in a structured focused manner, to develop skills in Audio-video and multimedia presentation and to develop logic and communication skills to defend the concept during evaluation. Each student shall choose a topic of interest with original research content related to Architecture and work on the topic and present it in the form of a seminar for evaluation.

NINTH SEMESTER

AR 5001 - OFFICE TRAINING

Pre-requisite: AR 4005 – Architectural Design and Field Tour - VII

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Students are required to undergo compulsory internship training in the office of a competent practicing architect registered with the Council of Architecture or in the architectural wing/ department of an governmental, private or non-governmental voluntary organization for the duration of one semester as per the rules/guidelines listed in the Internship manual; students are required to be involved in the works produced in the office; evaluation shall be through a seminar presentation using hard copy of the endorsed works undertaken in the office.

AR 5002 - CRITICAL APPRAISAL OF BUILDINGS

Pre-requisite: AR 4005 – Architectural Design and Field Tour - VII

L	Т	P/D	С
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Students are required to choose any interesting completed project and trace its development from the early design concepts till the occupancy stage. The building should be assessed with respect to the building type, compliance to building regulations, indoor and outdoor spatial quality, functional, visual, structural, material, maintenance, eco friendliness, environmental, circulation, and service aspects for the performance and efficiency as part of post occupancy evaluation. Evaluation shall be through a seminar presentation as per the rules/guidelines listed in the Internship manual.

AR 5003 - CONSTRUCTION SITE STUDY

Pre-requisite: AR 4005 – Architectural Design and Field Tour - VII

L	Т	P/D	С
			1

Students are expected to gather from observation on site, activities involved in different stages of construction of a building project. They are required to record the methods used, sequence of activities, construction details, time involved at different stages etc., as observed from the site. This shall be undertaken strictly as per the rules/guidelines listed in the Internship manual; evaluation shall be through a seminar presentation.

AR 5004 - DOCUMENTATION OF INNOVATIVE DETAILS

Pre-requisite: AR 4005 – Architectural Design and Field Tour - VII

L	Т	P/D	С
			1

The student is expected to document at least twenty details that may include historical or contemporary details of any kind used in buildings, interiors, landscaping, services etc. The innovative details and observations should be documented and evaluated for the purpose intended and performance achieved. This shall be undertaken strictly as per the rules/guidelines listed in the Internship manual prepared by the department; evaluation shall be through a seminar.

AR 5005 - THESIS I

Pre-requisite: All Core Courses, upto the Eighth Semester including Architectural Design

L	Т	P/D	С
			3

Thesis provides the students an opportunity to pursue their interest in Architecture through design, research, theoretical, or experimental approach related to traditional or modern architecture, architectural theory, providing services, large built environment projects, urban morphology, typology, urban form studies, urban design, urban planning, developing architectural/environmental/educational software of relevance. In thesis I, the student identifies a topic of interest from those listed and a special topic and completes the work of undertaking literature studies, case studies, data collection, feasibility studies, and site selection and analysis and present the same as specified by the department. the students are expected to demonstrate their ability to formulate and develop a research or design proposal/hypothesis considering the contextual, behavioral, sociological, economic, cultural factors, and aesthetic factors and to effectively communicate the same.

TENTH SEMESTER

AR 5006 CONSTRUCTION MANAGEMENT

Pre-requisite: AR 3006 - Estimation Costing and Valuation

L	Т	P/D	Cr
3	0	0	3

Construction planning, project management – bar charts and activity charts, resource levelling – network planning methods, critical path method – probabilistic techniques, concepts of uncertainty, optimization techniques and optimization models – Cost estimation techniques and concepts of value engineering.

AR 5007 - PROFESSIONAL PRACTICE

Pre-requisite: NIL

L	Т	P/D	С
2	0	0	2

Role of Council of Architecture ,duties and responsibilities in the profession, standards and norms of professional conduct, setting up an office, introduction to building contract laws, powers and duties of architect in a contract, Indian Contract law , tender , invitation, preparation, different types, Arbitration, Role of architect in arbitration, award publication, Architectural competitions, types, guidelines by CoA & IIA Copyright protection.

Total Hours: 28L

AR 5008 - THESIS II

Pre-requisite: AR 5005 Thesis - I

L	Т	P/D	С
0	0	15	10

This course is a continuation of AR 5006 Thesis I in which the student had identified a topic of interest from those listed and a special topic and completed the preliminary work as stated. In this course the student is expected to develop comprehensive solution to the issues identified in the previous course AR 5006 Thesis I in keeping with the kind of approach already identified in the previous semester viz., design, research, theoretical, or experimental; and to meet the requirements as stated in the project brief. The student should demonstrate the ability to synthesize the results of the detailed analytical studies conducted, lay down validity and design criteria, interpret the results for application to the problem, develop the concept & detailed design solution / prove the hypothesis, and to effectively communicate the thesis rationale.

Total Hours: 210D

ELECTIVES

AR 2051 - ERGONOMICS

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Applied ergonomics – gross human anatomy, anthropometry, muscle and work physiology - Environmental condition including thermal, illumination, noise and vibration - research techniques in Ergonomic – visual ergonomics, ergonomics as applied to visual-legibility studies - user-centered design – advanced ergonomics, electrophysiology and its application in product design, ergonomics of human energy expenditure and its application.

Total Hours: 42L

AR 2052 - ART IN ARCHITECTURE

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Role of the Arts in Architecture, Theory and Philosophy of Aesthetics; Basic principles-; History of arts in ancient, Middle ages; Study of Anatomy & perspective; Renaissance artists- Romanticism, Realism, Impressionism, Pre-Raphaelitism; Post impressionism; Cubism, Dadaism, Surrealism, Expressionism, International Style; Post modernism; Islamic Art, Indian and Far East Art; Indian Arts-Traditional Texts-Artist, Tools and Materials-Role of the Arts in Indian Architecture; Different Indian Schools; Influence of colonialism, Modern Indian Art & artists.

Total Hours: 42L

AR 2053 - ADVANCED THEORY OF ARCHITECTURE

Pre-requisite: AR 2002 - Theory of Design

L	Т	P/D	С
3	0	0	3

Theory- Definition, The Theoretical position- Definition of Architecture- Totality of Architecture; Power Structures and the Architect- Benefactors & Beneficiaries of Architecture; Professional attitudes, Ethics and Architecture- Ethics applied in Architecture; Ordering Architecture, General and composite theories, principles of architecture. Governing Concepts of Architecture-Architectural beliefs systems, Esthetics in Architecture, Vitruvian categories Greek, medieval, modern , Form and formalism, Function and functionalism. Meaning and historicism, Construction and constructivism, Context and contextualism, will and modernism. Issues and challenges facing contemporary architects

AR 2054 - VERNACULAR ARCHITECTURE

Pre-requisite: NIL

L	Т	P/D	С
n	0	0	3

Theories and principles of vernacular architecture - influence of climate, geographical features, occurrences of disasters and social cultural setup - vernacular architecture in different regions of - vernacular style of Asia, evolution of form, construction materials and techniques of regional architecture.

Total Hours: 42L

AR 3051 - ARCHITECTURAL PHOTOGRAPHY

Pre-requisite: NIL

L	Т	P/D	С
2	0	2	3

Photography as an Art and Science of Photography, History and development of photographic processes, Contributions of pioneers, Evolution from pinhole to Digital cameras, Development of processing technology; Principles and Technology involved in digital camera, Parts of a camera and their function, Types of simple & compound lenses, Depth of field & focus, Shutter speed, Aperture & F stop, Exposure, ISO-Shutter speed-Aperture triangle, HDRI photography, Electronic flash Direction, Types of Flashes, Studio lighting schemes, Filter factors, Camera accessories, photo editing software, Principles of Photo Composition, Importance of Photography for Architects and applications, Photographing Interiors, exteriors and details.

Total Hours: (28L+28P)

AR 3052 - TRADITIONAL KERALA ARCHITECTURE

Pre-requisite: AR 2003 - History of Architecture - II

L	Т	P/D	С
3	0	0	3

Pre- historic architectural forms-factors influencing traditional Kerala Architecture- geological, geographical, political, climatic and religious influences-environmental factors and cultures –result of various invasions. Kerala temple Architecture- principles of planning and design- traditional principles of Vastu-vidya- plan and form- materials and techniques- -early church architecture- and early mosque architecture- architectural influences and features- Residential Architecture- vernacular architectural forms of Kerala- appropriate techniques in housing for various regions- Planning of old towns in Kerala- Heritage zones, traditional settlements in Kerala and case studies.

AR 3053 – BEHAVIORAL STUDIES IN BUILT ENVIRONMENT

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Understand the concept of personal space and related theories and also the relation between environment and behavior; it will also help the student to understand personal/social-behavioral issues as related to built environments and to develop skills in behavioral research methods; it covers the history and theory of behavioral design, behavioral settings, social aspects and the research methods in behavioral design.

Total Hours: 42L

AR 3054 - SOIL MECHANICS AND FOUNDATION DESIGN

Pre-requisite: AR 2009 – Structural Design - II

L	Т	P/D	С
3	0	0	3

Т

0

L

3

P/D

0

Cr

3

Soil and its classification - three phase system - classification of soils - permeability of soils - factors affecting permeability – laboratory determination - consolidation - coefficient of compressibility - compaction – compaction tests – concept of OMC - Effect - Shear strength - Mohr's strength and stress circles - Earth pressure - active and passive - earth pressure for cases of with and without surcharge - Bearing capacity - methods of improvement of soil bearing capacity - settlement analysis - functions of foundations – different types of foundations – selection of type of foundation – design considerations

Total Hours: 42L

AR 3055 - RESEARCH METHODS

Pre-requisite: NIL

Introduction to research methods: models and concepts in research - introduction to social research - information about data sources as well as ethics and politics - planning for research - issue of measurement in research - generation of data and data management - design and conduct of surveys – analysis and recording research: various research methods and analysis of data gathered - statistical analysis and reasoning; interpretation of results - tools and techniques for effective presentation - research publishing - designing and writing reports.

AR 4051 - DISASTER MANAGEMENT AND EARTHQUAKE RESISTANT BUILDINGS

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Concept of disaster management and mitigation - types of disasters – causes and impact - hazard and vulnerability assessment - tools and techniques - pre-disaster mitigation safety management system - strategies for implementation - community based disaster management - remote-sensing and GIS applications - post disaster recovery & rehabilitation - Introduction to Earthquake - Seismic zones - Major earthquake case studies - causes and consequences of earthquake - magnitude and intensity scales - Design of buildings for earthquake resistance - Structural Systems - Seismic Design Code Provisions - design of nonstructural elements.

Total Hours: 42L

AR 4052 - ARCHITECTURE AS A CULTURAL SYSTEM

Pre-requisite: NIL

Concepts, methods of cultural anthropology - Culture and communication, Symbolism and Architecture - Study of Ideational and formal relationships – Structure of ideal social order and its refraction in the material world - Cosmological models and architectural form - Buddhist models and examples. Hindu Models and Examples. Traditional Kerala Architecture - Cosmological models and cosmic spatial expressions of Africa - Culture change, Counter culture and the manifestations in Built forms.

Total Hours: 42L

AR 4061 - INDUSTRIAL ARCHITECTURE

Pre-requisite: AR 3005 – Architectural Design and Field Tour V

Industrial Estates - requirements of factory act and codes – classification of industrial occupancy – patterns of industrial estates – integrated aspects of design – general requirements of different types of industries -

history of factory buildings – functional planning of spaces - plant layout - flexibility of design and future expansion - Industrial Structures - steel structures and concrete structures – requirements of various finishing works - Environmental Design for Industries - aspects of external environments such as noise control regulations, pollution levels, sewage disposal and hygiene - factory and landscape – layout and organisation of industrial townships.

Total Hours: 42L

AR 4062 - URBAN DESIGN

Pre-requisite: AR 4004 – Urban and Regional Planning

Introduction to Urban Design, History - Basic functions - Scope and Criteria ,theories involved, Urban Design Principles, - Various surveying techniques and analysis. Urban Design at various scales, terminologies in urban design, case studies, Execution of Urban Design Projects, legal aspects, Agencies involved, project funding and financing

29

L	Т	P/D	С
3	0	0	3

L	Т	P/D	С
3	0	0	3

L	Т	P/D	С
3	0	0	3

AR 4063 – TRADITIONAL INDIAN ARCHITECTURE

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Concepts of Vastuvidya-definition -resource materials, silpis and their roles and duties, evolutionary of the discipline, basic unit of measurements- purushapramanam, hastham, padmam, angulam and yavam; vertical proportioning and Thalam concept; concept of Vastu- Vastu of basic geometry- adaptability of the basic concept of vastu for town planning; Planning and design of temples and halls; temple construction; secular building- -Investigation of land- tests for suitability; determination of cardinal direction; classification of villages and towns; types of planned settlements, Landuse pattern of settlements; position of temples and other uses, street pattern and width -residential buildings-Planning of residential buildings, evolution of residential types from the vastupurusha mandala-technology in Vastuvidya-classification of materials, brief description of the characteristics and uses of sila, istaka, daru, loha, mrilsna, sudha; technology of assembly and joinery; construction methods- foundations, walls, columns, utharams and roof structure, the system of proportional measurements and thumb rules

Total Hours: 42L

AR 4064 – INTELLIGENT BUILDINGS

Pre-requisite: AR 3010 Energy, Sustainability & Site Planning

L	Т	P/D	С
3	0	0	3

Introduction to Intelligent Buildings - definitions – building elements - descriptions, definitions and components - historical overview - Energy and Intelligent Buildings - Energy consumption in buildings – micro climate – human comfort in buildings - energy conservation in buildings – active and passive systems - advanced building energy management systems - Building Automation - Intelligent control of building components – automating building services – system integration and optimization with building envelope – communication systems and safety and security systems - Performance Evaluation and Standards - Building performance evaluation and intelligent building standards.

Total Hours: 42L

AR 4071 - ARCHITECTURAL CONSERVATION

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

Introduction of conservation in Architecture - Agencies involved in conservation - ICCROM, ICOMOS - various approaches to conservation- Value and Ethics-Cultural Heritage- techniques of documentation, works and procedures of ASI conservation- investigation of deterioration -methods and principles- deterioration and causes of decay - Documentation/ Assessment of damages; repair and restoration methods -strengthening methods; modern repair methods; elements, materials and techniques for conservation/ documentation; study of various types of mortars and protection; policies and models for conservation development, economics of conservation: Tourism development and heritage conservation- sustainable development of heritage cities and natural sites. Integrated conservation: planning for conservation of heritage buildings and documentation of historic monuments and site

AR 4072 ENVIRONMENTAL IMPACT ASSESSMENT

Pre-requisite: NIL

L	Т	P/D	С
3	0	0	3

The course provides basics of Environment and its components, and covers landuse and urban planning issues of environmental significance. It also covers the basics of Environmental Impact Assessment Process and the methods and tools for impact quantification and analysis. As part of the course, a module on case studies of EIA significance is also included.

Total Hours: 42L

AR 4073 – URBAN LAND MANAGEMENT

Pre-requisite: AR 4004 – Urban and Regional Planning

L	Т	P/D	С
3	0	0	3

The course aims to make the student to understand urban land markets and issues of access to land for the poor. And also to understand issues related to property rights and land tenure. It covers the role of land use controls in land management and also the role of land policy, registration and information systems in management. It has a module that covers the land management as practiced in India.

Total Hours: 42L

AR 4074 - REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM

Pre-requisite: AR 4004 - Urban & Regional Planning

L	Т	P/D	С
3	0	0	3

Basic concepts of remote sensing – platforms and sensors – fundamentals of aerial photograph – satellite images – Photogrammetry – stereo vision – aerial triangulation control and mapping - principles of stereo photogrammetry - Image processing and Image interpretation - digital image processing - image enhancement - image interpretation – visual interpretation – digital image interpretation - Geographic Information System - GIS technology and applications – spatial and non-spatial information - Hardware and software requirements – GIS Analysis - spatial data analysis – vector and raster based spatial analysis – Network analysis – Overview of GIS Packages