



ANNA UNIVERSITY: : CHENNAI - 25

**FACULTY OF ARCHITECTURE AND
PLANNING**

**Approved Special Electives for
M.S. / Ph.D. Degree Programs
(upto 17th AC 27.04.2012)**

ANNA UNIVERSITY CHENNAI : CHENNAI – 600 025.

SPECIAL ELECTIVES FOR FACULTY OF ARCHITECTURE AND PLANNING

COURSE CODE	COURSE TITLE	L	T	P	M/C
FA 1911	Traditional-Vernacular Residential Architecture And Its Cultural Aspects	3	0	0	3
FA 1913	Church Architecture	3	0	0	3
FA 1914	Digital Tools for Environmental Architecture	3	0	0	3
FA 1915	Lighting Design For Work Environment	3	0	0	3
FA 1916	Raditional Water Management Systems	3	0	0	3
FA 1917	User - Environment –Behavior Studies and Agent Based Systems	3	0	0	3

FA 1911 TRADITIONAL-VERNACULAR RESIDENTIAL ARCHITECTURE AND ITS CULTURAL ASPECTS**Course Objective****3 0 0 3**

Study on traditional-vernacular residential architecture, its definition, characteristic and its possibility to be used as mode of understanding cultural interactions and interlinkage among different and various regions and countries.

- 1 Cultural Studies for Architecture 8**
 1. Defining Culture and Architecture
 2. Understanding discourses and problems in definition of Architecture
 - Encyclopedic/ technical definition
 - Anthropological
 - Historical
 3. Socio-Cultural attribute of Architecture based on various scholar work
 - Vernacular approach
 - Architectural Anthropology approach
 - Symbolism approach
 - Holistic approach

- 2 Traditional and Vernacular Architecture 8**
 1. Defining and understanding “Traditional” and “Vernacular”
 2. Architectural understanding of traditional and vernacular architecture (William Noble Knapp, Amos Rappoport, Paul Oliver)
 3. The cultural role of traditional and vernacular architecture study
 4. Concept or object of traditional and vernacular architecture
 5. Attribute and characteristic of traditional and vernacular architecture

- 3 Cultural and Historical interlinkage between culture in Different Region in , South-Asia and South-India 9**
 1. History of Southeast Asia, South-Asia and South-India
 2. Modes of cultural exchange and dynamic
 - Assimilation
 - Transformation
 - Acculturation
 - Diffusion
 - Cross Culture
 3. Defining Asia, Southeast Asia, South-Asia and South-India
 4. Discourses of Cultural interlinkage in Asia
 - *Indianized* Southeast Asia
 - Austronesian and Austro-Asiatic Maritime Exploration
 - Aryan Infiltration into India
 - Spread of Buddhism
 - European Colonization

- 4 Southeast Asian Architecture and Dwelling Culture 10**
 1. Origin and Dynamic
 2. Attribute and Characteristic
 3. Geo-political boundary (mainland, archipelago, islands)
 4. Discussion Cases (Architecture in Malay peninsula, Thailand, Sumatera Vietnam, Cambodia, Java and Lesser Sunda, Polynesia and Melanesia)

5	South Indian Architecture and Dwelling Culture	10
	1. Origin and Dynamic	
	2. Attribute and Characteristic	
	3. Geo-political boundary (Kerala, Tamil Nadu, Karnataka and Andhra Pradesh)	
	4. Discussion Cases (Architecture in Kerala, Tamil Nadu, Karnataka, Andhra Pradesh)	

Total 45

REFERENCES:

1. Knapp, Ronald G, (2003), *Asia's Old Dwellings – Tradition, Resilience, and Change*, Singapore: Oxford University Press.
2. Oliver, Paul, (1997), *Encyclopedia of Vernacular Architecture*, volume 1,2,3. Oxford : Blackwell Publishers
3. Rapoport, Amos, (1969), *House Form and Culture*, Prentice-Hall, Englewood-Cliffs.
4. Coedes, Goerge, (1968), *Indianized States of Southeast Asia*; Honolulu: East West Centre;
5. Groslier, Bernard Philippe, (2002); "*Indocina – Persilangan Kebudayaan*" ("*Indochina The Cross Culture - Pusat Penelitian Arkeologi dan Forum Jakarta Paris & Ecole Francaise d'Extreme-Orient*", Jakarta : KPG
6. Schefold, Reimar, (2004) "*The Southeast Asian House – Common Features and Local Transformation of an Ancient Architectural Tradition*" in Reimar Schefold, (et al); *Indonesian House*, Singapore : Singapore University Press
7. Waterson, Roxana, (1990). ***The Living House – Anthropology of Architecture in Southeast Asia***, New York : Oxford University Press
8. Acharya, Prasanna Kumar, (1998), *Architect of Manasara*, New Delhi : DK Publisher Distributor P.Ltd
9. Kak, Subhash; *Early Indian Architecture and Art*; "*Migration & Diffusion - An international journal*", Vol.6/Nr.23, 2005, pages 6-27
10. Thampuran, Ashalatha, (2001), *Traditional Architectural Forms of Malabar Coast*, Calicut : Vastuvidyaprasthanam

FA 1913**CHURCH ARCHITECTURE****3 0 0 3****OBJECTIVE**

The old pictorial approach to Church Architecture still persists almost unchallenged. The objective of this course is to understand the characteristic features of churches in various parts of the world right from its origin.

UNIT I INTRODUCTION**9**

History and origin of Christianity. Guiding principles for the design of churches according to the spirit of Roman Liturgy. The theological basis of Church Architecture. Church Architecture and liturgy.

UNIT II CHURCH BUILDING PLANS- THROUGH AGES**10**

Origin and development of churches in various parts of the world. Northern Europe, Middle East countries, England. Characteristic features of churches in Early Christian, Byzantine, Romanesque, Gothic, Renaissance and Rococo periods.

Churches before Constantine- the Basilica- Origin of Basilica- Different types of Basilica. The Western churches and Eastern orthodoxy. Different church plans, the round plan, the octagonal plan, the pendentive and domed Basilica, the cruciform plan, the free standing cross, the cross in square.

UNIT III CHRISTIANITY IN INDIA**6**

Religious life in Indian churches, the church and cultural life, the Church and social life- Early Indian churches- their origin and establishment.

UNIT IV CHURCH ARCHITECTURE IN KERALA**10**

History and Origin of Christianity in Kerala, Early Syrian influence. Church Architecture in Kerala in early periods- Comparison with Hindu temple and Jain palli. Interior spaces and plan of indigenous churches of Kerala.

UNIT V EUROPEAN INFLUENCE IN CHURCH ARCHITECTURE OF KERALA**10**

The Portuguese in India. The Portuguese influence in Goan church Architecture. The British period in India and their influence on church buildings. Influence of European styles in Indian Church Architecture.

TOTAL:45 PERIODS**REFERENCES**

1. The Origin and Development of Early Christian Church Architecture , JG Davies, SCM Press Ltd. Bloomsbury street, London
2. Churches in India- Thomas P -Publication Division Ministry of Information and Broadcasting, Govt. of India.
3. Historic Architecture source Book- Cyril.M.Harris, Professor of Architecture, Columbia University.
4. World Architecture- an illustrated History-Hitchcock H.R - Paul Hamlyn West Book house, Fullham, Broadway London.
5. An Architectural interpretation of History-Gloag John- Adam Chales block London.
6. India and Portugal cultural interactions, Pereira Jose Pal- Mang Publications, Mumbai

FA 1914 DIGITAL TOOLS FOR ENVIRONMENTAL ARCHITECTURE

OBJECTIVE: To provide exposure to environmental performances & analysis tool based on climatic data models and data structure.

1. ENVIRONMENTAL FACTORS

Thermal performances of buildings; Comfort factors and measurements; Climatic design; Solar Control and shading devices, Louvre design; ventilation; introduction to lighting; units of light, colour, lamps, luminaries, Daylight design of general lighting schemes; Energy management and lighting

2. SOLAR PASSIVE ARCHITECTURE

Heat transmission in buildings - bioclimatic classification - passive heating concept: direct heat gain - indirect heat gain - isolated gain and sunspaces-passive cooling concepts: evaporative cooling – radiative cooling - thermal comfort- concept of solar temperature and its significance -calculation of instantaneous heat gain through building envelope.

3. PERFORMANCE ANALYSIS TOOL

Introduction to ECOTECT, an environmental prediction software package in architecture. to study the simple and intuitive 3D modeling interface and to explore the range of analysis functions

4. SOLAR THERMAL ANALYSIS OF MODELS

Use of analytic tools and environmental design software (ECOTECT) for studying solar, thermal and lighting processes in and around real or virtual buildings.

5. SIMULATION STUDIES

Generate and analyse climate data for any geographic location, predict microclimatic conditions on urban sites, perform shading, daylighting, airflow, heating and cooling simulation studies, predict indoor temperatures and other environmental conditions, calculate energy requirements and assess environmental impact and life costs of buildings.

REFERENCES:

1. Garg H P., Prakesh J., Solar Energy: Fundamentals & Applications, Tata McGraw Hill, 2000.
2. Duffie, J.A. and Beckman, W.A., Solar Engineering of Thermal Processes, John Wiley, 1991.
3. Alan L Fahrenbruch and Richard H Bube, Fundamentals of Solar Cells: PV Solar Energy Conversion, Academic Press, 1983
4. Autodesk Ecotect Analysis 2010 Bible.

UNIT I BASICS OF LIGHT AND LIGHTING 9

Fundamentals of light – spectrum of sunlight, spectral energy distribution, laws of illumination, photometry and colorimetric quantities and systems. Eye and vision – visibility -visual acuity, visual activity, contrast sensitivity. Factors governing illumination –glare, diffusion, direction, composition, distribution, visual performance and lighting quality. Types of Lighting- day light, artificial lighting

History of lighting- Architects and lighting designers – Richard Kelly, Louis Kahn, Mies van der Rohe, Philip Johnson, Eero Saarinen, Jonathan Speirs and Mark Major, Claude R. Engle

UNIT II LIGHTING EQUIPMENT AND SYSTEMS 9

Lighting systems – Incandescent lamps. Discharge lamps, Fluorescent lamps, LED, HID. Luminaries and control gear. Conventional and electronic ballasts. Lamp and ballast as a system and electrical characteristics. Power factor correction and harmonic compensation.

UNIT III LIGHTING AND ENVIRONMENT 9

Vision and human factors. Visual performance and its assessment. Lighting criteria. Effect of lighting on health, physiology of the circadian system, seasonal affective disorder (SAD), alertness, performance, and jet-lag. Visual cognition - Cognitive approach of Vision & Illumination Design-color vision, Measurement of Visual acuity , Aging Eye, Illumination at work, mental Image ability - Characteristics of Mental Images – Imagery and Rotation, size , angle, Shape , and Part -whole Relationship ,Imagery and Interference Imagery & Memory , Cognitive maps.

UNIT IV LIGHTING DESIGN & CALCULATION 9

Light measuring equipments. Illuminance Meter, Luminance Meter, Lighting Software, Chroma Meter, Colour Analyser, Data Management Software, Design objectives and criteria. Design calculations: Illuminance due to point, line and area sources. Lumen method. Calculation of utilization factors. Point-by-point and flux transfer methods

UNIT V CHOICE OF LIGHTING SYSTEM 9

Lamp and luminaires. Integrated ceiling system and heat recovery. Integration of electric light and daylight. Benefits-Energy Savings-Green House Gas Emission- Social Prospective- Deferred from Mercury- Clean disposal options-Discount-Rational Economic Factor- Pay Back Formula. Cost of Light- Energy Cost –Usage hours- Replacement Cost. Trade –off among alternative technology-Daily Lighting Load Curves- Annual Cost of White LED's-Better investment

REFERENCES

1. Lighting design basics, Mark Karlen, James Benya , John Wiley and Sons
2. Architectural lighting design By Gary R. Steffy, John Wiley and Sons, 2002
3. Ergonomics and Health Aspects of Work with Computers: International Conference, EHAWC 2009, Held as Part of HCI International 2009, San Diego, CA, USA, July 19-24, 2009, Proceedings
4. Building technology:mechanical and electrical systems, Benjamin Stein, McGuinness, William J. John Wiley and Sons, 1997

Suggested Reading

- R. Winston, J. C. Minano, P. Benitez, Nonimaging Optics, Elsevier Academic Press, (2004).
- J. Chaves, Introduction to Nonimaging Optics, CRC Press (2008).
- V. Arecchi, T. Messadi, and R. J. Koschel, Field Guide to Illumination Optics, SPIE Press (2007).
- Coaton, J.R. and Marsden, A.M. Lamps and Lighting. 4th Ed. Arnold (1997)

FA1916

TRADITIONAL WATER MANAGEMENT SYSTEMS

L T P C
3 0 0 3

OBJECTIVE:

To explore the various aspects of traditional water management systems and their components. To also identify relevance to today's context.

UNIT I INTRODUCTION

9

Introduction to concept of water management as a system as distinct from water harvesting. Importance of studying on a regional and watershed scale as the basis for water management systems. Introduction to traditional water management systems in India and the world. Types of traditional water management systems based on landform, vegetation and climate.

UNIT II GLOBAL PERSPECTIVES

9

Traditional water management systems of other parts of the world, specifically, study of those in Asia. Case studies of conservation, preservation and restoration of such systems in Srilanka, Indonesia, China and Australia.

UNIT III COMPONENTS AND PROCESSES

9

Components of traditional water managements systems, Role of communities in these, including regulation of use, conservation of water storage areas, religious protection and practices. Community participation, role of hereditary regulators, and agricultural practices.

UNIT IV NORTH INDIAN SCENARIO	9
Detailed study of water management systems of North India, that is those located in mountains, plateaus, desert and plains. Opportunities, challenges and issues.	
UNIT V SOUTH INDIAN SCENARIO	9
Detailed study of water management systems of South India, that is those located in plains and coastal plains. Opportunities, challenges and issues.	
Total number of periods	45

REQUIRED READING :

1. Kalyan Kumar Chakravarty, [Gyani Lal Badam](#) & Vijay Paranjpye,. Traditional Water Management Systems of India, 2006, Aryan Books International & Indira Gandhi Rashtriya Manav Sangrahalaya.
2. Nitya Jacob, Jalyatra : Exploring India's traditional water management systems, 2008, Penguin publications.
3. Village Tanks of South Asia, Papers and proceedings of the Regional workshop, Madurai, India, 2002.
4. S.M. Ratnavel, P.Gomathinayagam, In search of Ancient wisdom –Irrigation Tanks, 2006, DHAN foundation.
5. A.Vaidyanathan, Tanks of South India, 2001, Centre for Science and Environment.

REFERENCES:

1. Community and watershed
2. Asit K.Biswas, R.Rangachari, Cecilia Tortajada, Water Resources of the Indian Subcontinent, 2009, Oxford, India.

FA 1917	USER- ENVIRONMENT –BEHAVIOR STUDIES AND AGENT BASED SYSTEMS	L T P C 3 0 0 3
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UNIT I ENVIRONMENTAL PSYCHOLOGY 8
 Definition- - system oriented-space over time orientation- -Place identity-place attachment-Environmental consciousness- Behavior settings-Cognitive mapping- Environmental stress- Personal space-Territoriality-Spatial Behavior.

UNIT II INFORMATION ENVIRONMENTS 7
 Definition-information environments- information and environments in past,present and future contexts –information ecology-information society-.- Information in communities and environments and technologies used for mediation. Information environments and its relationship with human behavior.- new strategies for viewing and managing information in a spatial perspective.

UNIT III USER TRACKING SYSTEMS AND BEHAVIORAL PATTERNS 10

Observation methods and interview method to study User –Environment behavior- methods for analysis of behavior –setting data-Mapping the behavior settings. Digital observation Methods for Human tracking and interaction detection – Visual sensors and radio frequency sensors- Learning behavioral pattern –comparing behavior. Comparison of digital versus traditional observation methods.

UNIT IV USER BEHAVIORAL MODELING 10

Need for agent based modeling-ABMS -Agent based modeling in User environment context-applications of agent based modeling in supply chain management, sociology, pedestrian, crowd behavior, shopping and other environments.

UNIT V AGENT - APPLICATIONS 10

Agent –definition- ABM- (Agent based Modeling) ABS,(Agent based systems)IBM – (individual-based modeling)and ABMS ((Agent based Modeling and simulation) and its applications- Case studies of Agent applications as modeling ,generating and operational tool in various fields.

TOTAL: 45 PERIODS

REFERENCES

1. Enclosing Behavior- Robert B.Bechtel (Environment Research and Development foundation)TUCSON,Arizona, by Dowden Hutchinson&Ross,Inc.Pennsylvania.
2. Environmental Psychology by Francis T.Mc.Andrew,Brooks/Cole Publishing company,Pacific Grove,California.
3. Human Behavior Understanding: Second International Workshop, Hbu 2011 Amsterdam,Netherlands,2011 By Albert Ali Salah, Bruno Lepri(Eds.)
4. <http://www.informs-sim.org/>
5. <http://www.ddss.nl/>
6. <http://www.biothing.org/>