

**DETAILED SYLLABUS**  
**M.ARCH (ADVANCE DESIGN)**  
**2018-2019 BATCH**

<b>18MARS111</b>	<b>RESEARCH METHODOLOGY - I</b>							<b>SEMESTER-I</b>		
<b>Marks</b>	<b>Internal</b>	<b>40</b>	<b>External</b>			<b>60</b>	<b>Total</b>	<b>100</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>1</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>2</b>	<b>Credits</b>		<b>2</b>	

**COURSE OBJECTIVE:**

- To learn the importance of research methodology
- To understand the Research application in architectural design.
- To understand the different methods and techniques as relevant to the design profession
- To apply the research concepts in evaluation and appraisal of architectural design projects.
- To Analyse the Various methodologies of Field Survey
- To Develop the skill of preparation of report and Documentation

**COURSE OUTCOME:**

1. Student will understand the methods of research
2. Student will be able to develop the Skill of field study and experimentation
3. Student will understand the research application in the field of Architectural Design
4. Student will understand about the collection of data and Analyse the data
5. Student will develop the skill of documentation of various Survey and Research
6. Student will be able to prepare documents, report writing and publish in journals

**UNIT-I INTRODUCTION TO RESEARCH**

Importance, Purpose and Scope of Research and Field Studies. Application in architecture in terms of design, technology, environment, economic and behavioral areas.

**UNIT-II RESEACRH OBJECTIVES AND METHODOLOGY**

Sequence and Methods of Research. Identification of Problem, Hypothesis Formulation, Objectives and Methodology.

**UNIT-III APPLICATION OF RESEARCH**

Understanding and Applying Qualitative, Analytical, Interpretative, Correlational, Quasi- Experimental, Experimental, Simulation and Modelling techniques in Architectural Design.

**UNIT-IV FIELD STUDIES**

Pilot Studies, Field Surveys and Collection of Samples - Physical, Architectural, Environmental, Organizational. Preparation and Analysis of Data Sheets and Questionnaires.

**UNIT-V ANALYSIS, PREPARATION AND DOCUMENTATION**

Preparation and Analysis of Data Sheets and Questionnaires. Arriving at conclusions from the Research at Field Studies. Report Writing and Publications.



**SUGGESTED READINGS:**

- 1.Knight, A. and Ruddock., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
- 2.Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
- 3.Gibbs, J.P., " Urban Research Methods", (rev.ed.) Von Nostrand. 1988.
- 4.Kothari, C.R., "Research Methodology- Methods and Techniques", New Age International. 2004.

<b>18MARS112</b>	<b>DESIGN SYSTEMS</b>							<b>SEMESTER-I</b>			
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>				<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>			<b>4</b>	

**COURSE OBJECTIVE:**

- To understand various design systems
- To Understand the different civilizations in different parts of the world through study of their source,
- To Understand the origin, context, grammar, intent and application in architectural design.
- To Understand the Contemporary design process and relevant case studies
- To Understand & develop the skill of Design thinking as per the Current change in Architectural Style
- To understand the Concept of design Systems by various literature/case studies.

**COURSE OUTCOME:**

1. Student will be able to understand the various design systems in the Architecture era
2. Student will be able to understand the vernacular architecture and its importance
3. Student will Understand the contemporary design process
4. Student will develop the skill of Design thinking as per the Current situation
5. Student will develop the skill of presentation of his ides by Seminar and presentation
6. Student will be able to envision the futuristic architecture

**UNIT-I HISTORIC DESIGN SYSTEMS**

Pragmatic, Iconic, Analogic and Canonic systems. Relationship between mathematics and architecture and hierarchies of geometry in design. Design systems through the middle ages to the renaissance period.

**UNIT-II VERNACULAR DESIGN SYSTEMS**

Vernacular architecture of the world and relevance of the climate in which they have evolved. Enduring nature of the vernacular in contemporary times, De-coding vernacular narratives regarding the cultures they represent.

**UNIT-III CONTEMPORARY DESIGN SYSTEMS**

Evolution of design systems since the modern period following industrial revolution to the advent of the digital age and representation of design.

**UNIT-IV FUTURISTIC DESIGN SYSTEMS**

Evolution of futuristic ideas since the 1960s in the field of design. Emerging areas of programming, expert systems and 3-D printing in design. New materials, technologies and bio mimicry oriented design evolutions of future.

**UNIT – V SEMINAR**

Seminar on all the design systems -vernacular architecture – futuristic ideas and discussions

**SUGGESTED READINGS:**

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997
2. Bernard Rudofsky, 'Architecture without Architects', MoMA, 1964.
3. Geoffrey Broadbent - Design in Architecture - Architecture and the human sciences - John Wiley & Sons, New York, 1981
4. Francis D.K. Ching et al; A global history of Architecture; John Wiley's sons, 2nd edition 2010
5. Weber.W & Yannas.S, 'Lessons from Vernacular Architecture', Routledge, 2014.
6. Vernacular Architecture – contemporary traditions – Aiswarya Tipnis – TERI

<b>18MARS113</b>	<b>DESIGN RESEARCH AND FIELD STUDIES</b>						<b>SEMESTER-I</b>			
<b>Marks</b>	<b>Internal</b>	<b>40</b>	<b>External</b>			<b>60</b>	<b>Total</b>	<b>100</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>1</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>2</b>	<b>Credits</b>			<b>2</b>

**COURSE OBJECTIVE:**

- To comprehend the importance of research in design
- To understand the methods of field survey/study in terms of context like sustainability, Housing etc
- To Understand the survey by analysis of results as the basis of research.
- To Develop the Art of data collection and Collection of Samples
- To Undertake field study of the core subject and learn from research-based publications
- To refer reputed journals/magazines and gain the skill & Importance of good presentation methods.

**COURSE OUTCOME:**

1. Student will be able to collect data and information as per the context
2. Student will understand the methods of Field Survey
3. Student will understand the method of collection and compilation of Data of Survey & Field Study
4. Student will be able to format all the data into types and to prepare and publish
5. Student will be able to critically find solutions with the analytical skills of research
6. Student will develop the Skill of Report Writing

**UNIT-I DESIGN RESEARCH**

Design as an area for research. Theorising on causal relationships and factors, the scientific method, behavioural methods. Approaches to the design, and research problem – need and importance of study.

**UNIT-II FORMATION OF RESEARCH**

Formation of design hypothesis and concepts, and their relevance. Understanding ideas of creativity in design. Behavioural basis for design and research.

**UNIT-III DATA COLLECTION**

Data - types, collection methods, comprehension. Literature study – previous publication, information sources - Areas of the research - frame work and methodology of study, outcome of the results. Field study – by means of survey/questionnaire – by equipment/instruments, etc. – Manual readings/reports. Compilation of data – organizing the collected data – analysis, inference, conclusions. Types of analytical methods.

**UNIT-IV REPORT WRITING**

Reports - authentication of sources. Document styles, formats – figures, charts, tables.

**UNIT-V EDITING AND PUBLISHING**

Publication of papers / articles in reputed magazines/journals. Preparing, editing and publishing reports, dossiers, documents, and portfolio of masters' course work, off/on-line dissemination of information in media - web, blogs, etc.

**SUGGESTED READINGS:**

1. Knight, A. and Ruddock,L., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
2. Groat, L. and Wang D., "Architectural Research Methods" second edition, John Wiley & Sons. 2013.
3. Gibbs, J. P., "Urban Research Methods", (rev.ed.) Von Nostrand. 1988.
4. Booth, Wayne C., Gregroy G. Colomb, and Joseph M. Williams. 2008. The Craft of Research, 3rd edition. Chicago: University of Chicago Press.
5. Zeisel, J., "Inquiry by Design", Revised edition. New York: Norton, 2006.
6. Joo-Hwa Bay and Boon- Lay ong, "Tropical Sustainable Architecture", Elsevier Ltd,2006.



<b>18MARS114</b>	<b>ADVANCED DESIGN STUDIO-I</b>							<b>SEMESTER-I</b>		
<b>Marks</b>	<b>Internal</b>	<b>160</b>	<b>External</b>			<b>240</b>	<b>Total</b>	<b>400</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	3	<b>T</b>	0	<b>P/S</b>	9	<b>Credits</b>		<b>8</b>	

**COURSE OBJECTIVE:**

- To learn the importance of and undertake the design process at advanced level t
- To learn the design aspects and considerations in large scale projects
- To understand the Urban Reformation and Renewal systems through Design
- To Categorize the Physiological and Psychological aspects in advanced level of Design
- To understand the various design systems, guidelines and considerations as undertaken in the research and field studies and apply them in architectural design.
- To understand the future need for the city & design accordingly.

**COURSE OUTCOME:**

1. Student will be able to design complex structures with advanced level planning principles
2. Student will be able to understand the Urban Renewal and urban level design
3. Student will be able to Design large scale projects
4. Student will understand the Physiological and Psychological aspects in advanced level of Design
5. Student will be able to give a wholesome product of design in all aspects
6. Student can give futuristic proposals for the urban Architecture.

**CONTENT:**

Design of advanced and complex built environments having strong linkages with the urban scale and focusing on architectural, spatial, landscape, environmental, structure, services and technology features. Examples: Campus Design, Urban Centers, Mixed Use Development etc.

**SUGGESTED READINGS:**

1. Agkathidis, A., Hudert, M. and Schillig, G., "FormDefiningStrategies:ExperimentingArchitecturalDesign", Wasmuth International. 2007.
2. Ching, F.D.K., "Architecture: Form, Space and Order", 3rd ed., John Wiley & Sons. 2007.
3. Morgan, C.L., "Jean Nouvel - The Elements of Architecture", Thames and Hudson. 1998. Neufert, P., "Architects' Data", 3rd ed., Blackwell Science. 2000.

<b>18MARS211</b>	<b>RESEARCH METHODOLOGY - II</b>							<b>SEMESTER-II</b>		
<b>Marks</b>	<b>Internal</b>	<b>40</b>	<b>External</b>			<b>60</b>	<b>Total</b>	<b>100</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>1</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>2</b>	<b>Credits</b>		<b>2</b>	

**COURSE OBJECTIVE:**

- To learn the importance of research methodology
- To understand the Research application in architectural design.
- To understand the different methods and techniques as relevant to the design profession
- To apply the research concepts in evaluation and appraisal of architectural design projects.
- To Analyse the Various methodologies of Field Survey in focus area such as Sustainability, housing etc
- To Develop the skill of preparation of report and Documentation in the focus area

**COURSE OUTCOME:**

1. Student will understand the methods of research
2. Student will be able to develop the Skill of field study and experimentation
3. Student will understand the research application in the field of Architectural Design
4. Student will understand about the collection of data and Analyse the data
5. Student will develop the skill of documentation of various Survey and Research
6. Student will be able to prepare documents, report writing and publish in journals

**CONTENT:**

Importance, Purpose and Scope of Research methodology specific to the focus area. Understanding and Applying Qualitative, Analytical, Interpretative, Correlational, Quasi- Experimental, Experimental, Simulation and Modelling techniques in the focus area of Architectural Design.

Focus area and specialization specific Pilot Studies, Field Surveys and Collection of Samples - Physical, Architectural, Environmental, and Organizational. Preparation and Analysis of Data Sheets and Questionnaires. Preparation and Analysis of Data Sheets and Questionnaires. Arriving at conclusions from the Research at Field Studies. Report Writing and Publications.

**SUGGESTED READINGS:**

- 1.Knight, A. and Ruddock,L., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
  - 2.Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
  - 3.Gibbs, J.P., " Urban Research Methods", (rev.ed.) Von Nostrand. 1988.
  - 4.Kothari, C.R., "Research Methodology- Methods and Techniques", New Age International. 2004.
  - 5.Khanzode, V.V., "Research Methodology -Techniques and Trends", APH Publishing. 1995.
- Books and Magazines/Journals specific to the focus area.

<b>18MARS212</b>	<b>DOCUMENTATION AND PRESENTATION</b>							<b>SEMESTER-II</b>		
<b>Marks</b>	<b>Internal</b>	<b>40</b>	<b>External</b>			<b>60</b>	<b>Total</b>	<b>100</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>1</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>2</b>	<b>Credits</b>		<b>2</b>	

**COURSE OBJECTIVE:**

- To understand importance of data collection and documentation methods
- To develop the skill of reading the case studies and comparison with the own experiments
- To develop skills of formal learning through participation in seminars, workshops and conferences.
- To undertake research-based publications in reputed magazines /journals as outcomes of the courses.
- To make a Broad groundwork for dissertation/thesis.
- To formulate / frame the research-based topic for the Dissertation / Thesis

**COURSE OUTCOME:**

1. Student will be able to review the literature and analyse every aspect of the study
2. Student will understand the importance and method of Experimentation.
3. Student will be able to organize formal seminars
4. Student will be able to present with technical ideas and analysis
5. Student will be able to do paper presentation in journals, magazines and write review.
6. Student will be able to make a good frame work of his Dissertation / Thesis

**UNIT-I DESIGN RESEARCH PROCESS**

Importance of design and research processes to understand/identify issues and factors of significance.

**UNIT-II LITERATURE REVIEW ANALYSIS**

Literature review and sources of information; analysis of documents and data; scope and limitations of design and research. Documentation of differing data and information

**UNIT-III PRESENTATION TECHNIQUES**

Effective presentation techniques of oral / written material and information, for professionals in the design field.

**UNIT-IV PRESENTATION AND SEMINAR**

Paper Presentation - organizing & participating in technical seminars, exhibitions, workshops, conferences related to architecture & allied fields. Publication and dissemination of analysis/inferences from experiments/surveys.

**UNIT-V PUBLICATION**

Preparing and publication of technical papers /articles in reputed journals /magazines. Preparing, editing and publishing reports, dossiers, documents, magazines and portfolios of masters' course work. On/off-line dissemination of information in media - web, blogs, etc.; familiarity with information systems and current media/methods.

**SUGGESTED READINGS:**

1. Knight, A. and Ruddock,L., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
2. Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
3. Gibbs, J.P., " Urban Research Methods", (rev.ed.) Von Nostrand. 1988.
4. Denzin, N. K., and Lincoln, Y. S. eds. 2000. Handbook of Qualitative Research. 2nd ed. Thousand Oaks, California: Sage Publications.
5. Creswell, J. W., "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches". Thousand Oaks, Sage. 2009.
6. Related journals

<b>18MARS213</b>	<b>ADVANCED DESIGN STUDIO- II</b>							<b>SEMESTER-II</b>		
<b>Marks</b>	<b>Internal</b>	<b>160</b>	<b>External</b>			<b>240</b>	<b>Total</b>	<b>400</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>3</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>9</b>	<b>Credits</b>		<b>7</b>	

**COURSE OBJECTIVE:**

- To learn the importance of and undertake the design process at advanced level t
- To learn the design aspects and considerations in large scale projects
- To understand the Urban Reformation and Renewal systems through Design
- To Categorize the Physiological and Psychological aspects in advanced level of Design
- To understand the various design systems, guidelines and considerations as undertaken in the research and field studies and apply them in architectural design.
- To understand the future need for the city & design accordingly

**COURSE OUTCOME:**

1. Student will be able to design complex structures with advanced level planning principles
2. Student will be able to understand & design as per the Sustainability aspects
3. Student will be able to Design large scale projects
4. Student will understand the Physiological and Psychological aspects in advanced level of Design
5. Student will be able to give a wholesome product of design in all aspects
6. Student can give futuristic proposals for the urban Architecture.

**CONTENT:**

Design of advanced and complex built environments having strong linkages with the urban scale and focusing on architectural, spatial, landscape, environmental, structure, services and technology features. Examples: Campus Design, Urban Centers, Mixed Use Development etc.

**SUGGESTED READINGS:**

1. Agkathidis, A., Hudert, M. and Schillig, G., "Form Defining Strategies: Experimenting Architectural Design", Wasmuth International. 2007.
  2. Ching, F.D.K., "Architecture: Form, Space and Order", 3rd ed., John Wiley & Sons. 2007.
  3. Morgan, C.L., "Jean Nouvel - The Elements of Architecture", Thames and Hudson. 1998.
  4. Neufert, P., "Architects' Data", 3rd ed., Blackwell Science. 2000.
- Any other books, documents and standards relevant to the focus area.

<b>18MARS311</b>	<b>DISSERTATION-I</b>							<b>SEMESTER-III</b>			
<b>Marks</b>	<b>Internal</b>	<b>160</b>	<b>External</b>				<b>240</b>	<b>Total</b>	<b>400</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>		<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>10</b>	<b>Credits</b>			<b>7</b>

**COURSE OBJECTIVE:**

- To Learn and show advanced understanding and application of the knowledge of Architectural design
- To Understand the Sustainability & housing in general or to any specific focus area through the culmination in a dissertation.
- To develop the skill of Unique research-based application through various Literature study
- To develop knowledge by own experimentation as per the chosen topic
- To do an in- depth study and analysis for a chosen topic of interest
- To present a Wholesome Technical Study report based on Experimentation and Research

**COURSE OUTCOME:**

1. Student will be able to identify the thrust area of research
2. Student will understand and develop his own dissertation topic with research -oriented study
3. Student will know the basis of experimentation, methods and applications
4. Student will understand the core ideas of Application design through the experimental research
5. Student will be able to analyse and synthesize a defined context with in-depth study and scientific approach
6. Student will be able to provide innovative and practical solutions for the future architecture.

**CONTENT:**

Identification of Dissertation Topic and Area, Hypothesis Formulation, Objectives and Methodology. Importance, Purpose and Scope of the Dissertation in architecture in terms of design, technology, environment, economic and behavioral areas.

Related Research, Literature and Field Studies. Submission of the above in report form.

**SUGGESTED READINGS:**

1. Knight, A. and Ruddock,L., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
2. Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
3. Kothari, C.R., "Research Methodology- Methods and Techniques", New Age International. 2004.
4. Wayne C Booth, Joseph M Williams, Gregory G. Colomb, 'The Craft of Research', 2nd Edition, University of Chicago Press, 2008.
5. Ranjith Kumar, 'Research Methodology- A Step by Step Guide for Beginners', Sage Publications, 2005.
6. John W Creswell, 'Research Design: Qualitative, Quantitative and Mixed Methods Approaches', Sage Publications, 2002.



18MARS411	DISSERTATION-II							SEMESTER-IV		
Marks	Internal	320	External			480	Total	800	Exam Hours	6
Instruction Hours /week	L	16	T	0	P/S	20	Credits		7	

**COURSE OBJECTIVE:**

- To Learn and show advanced understanding and application of the knowledge of Architectural design
- To Understand the Sustainability & housing in general or to any specific focus area through the culmination in a dissertation.
- To develop the skill of Unique research-based application through various Literature study
- To develop knowledge by own experimentation as per the chosen topic
- To do an in- depth study and analysis for a chosen topic of interest
- To present a Design report based on previous Experimentation and Research

**COURSE OUTCOME:**

1. Student will be able to identify the thrust area of research
2. Student will understand and develop his own dissertation topic with research -oriented study
3. Student will know the basis of experimentation, methods and applications
4. Student will understand the core ideas of Application design through the experimental research
5. Student will be able to analyse and synthesize a defined context with in-depth study and scientific approach
6. Student will be able to provide innovative and practical solutions for the future architecture by Design

**CONTENT:**

Identification of Dissertation Topic and Area, Hypothesis Formulation, Objectives and Methodology. Importance, Purpose and Scope of the Dissertation in architecture in terms of design, technology, environment, economic and behavioral areas.

Related Research, Literature and Field Studies. Submission of the above in report form.

**SUGGESTED READINGS:**

1. Knight, A. and Ruddock,L., "Advanced Research Methods in Built Environment", John Wiley & Sons. 2008.
2. Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
3. Kothari, C.R., "Research Methodology- Methods and Techniques", New Age International. 2004.
4. Wayne C Booth, Joseph M Williams, Gregory G. Colomb, 'The Craft of Research', 2nd Edition, University of Chicago Press, 2008.
5. Ranjith Kumar, 'Research Methodology- A Step by Step Guide for Beginners', Sage Publications, 2005.
6. John W Creswell, 'Research Design: Qualitative, Quantitative and Mixed Methods Approaches', Sage Publications, 2002



<b>18MARESS1</b>	<b>INTRODUCTION TO SUSTAINABLE ARCHITECTURE</b>	<b>SEMESTER-I</b>
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LIST OF ELECTIVES		
FOCUS AREA: SUSTAINABLE ARCHITECTURE		
Elective 1	Introduction to Sustainable Architecture	18MARESS1
Elective2	Building Performance Analysis	18MARESS2
Elective 3	Sustainable Design Strategies	18MARESS3
Elective 4	Sustainable Building Systems	18MARESS4
Elective 5	Sustainable Trends and Theories	18MARESS5
FOCUS AREA: HOUSING DESIGN		
Elective 1	Introduction to Housing Design	18MARESH1
Elective2	Housing Policies and Schemes	18MARESH2
Elective 3	Sustainable Housing	18MARESH3
Elective 4	Community Participation in Housing	18MARESH4
Elective 5	Special Types of Housing	18MARESH5

<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>				<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>			<b>4</b>	

**COURSE OBJECTIVE:**

- To orient towards the United nations Sustainable Development goals
- To Understand the environmental impact of building as well as to safeguard the environment
- To Understand the Sustainable Design principles in Architecture
- To Understand the Climatic impacts due to urbanization and ways for mitigation.
- To Understand & work for the health & well- being of the building and its occupants.
- To Understand the broad guideline of various green Building Systems

**COURSE OUTCOME:**

1. Student will understand the fundamentals of sustainable concepts and applications
2. Student will understand the Site planning principles and its applications
3. Student will understand the climate and its impacts in indoor thermal comfort
4. Student will understand the energy usage ratio and the effective steps of conservation and utilization of energy.
5. Student will understand the Green building Rating Systems in a Broader context
6. Student will understand the Effective methods to propose green buildings through Case Studies

**UNIT-I INTRODUCTION TO SUSTAINABILITY**

Sustainable Design Concepts and Strategies - Energy and Environment in Architecture, Green building systems, Energy efficiency. Relevant Literature/Case studies.

**UNIT-II SUSTAINABLE DESIGN PRINCIPLES**

Sustainable Design Principles - Site planning, Resources, Built form, Climate responsiveness, Energy usage, Occupant behaviour and comfort. Relevant Literature/Case studies.

**UNIT-III CLIMATE AND BUILT ENVIRONMENT**

Climate and Built Form - Overview of Passive techniques for Day lighting, Ventilation, Solar Control and Thermal Comfort. Modelling methods and simulation for assessing building performance. Relevant Literature/Case studies.

**UNIT-IV ENERGY AND ITS IMPACTS**

Zero Energy and Zero Waste - Methods to achieve zero energy and zero waste in buildings, life cycle assessments and energy audits, renewable energy technologies, integrated energy design. Relevant Literature/Case studies and codes such as ECBC.

**UNIT-V GREEN BUILDING SYSTEMS**

Green buildings systems - GRIHA, LEED, BREEAM, GREEN STAR. Comparative Studies and analysis, relevance to India.

**SUGGESTED READINGS:**

- 1.Mili Majunder, Teri - Energy - Efficient Bldg in India - Thomson Press, New Delhi. 2001.
- 2.Arvind Krishnan & Others - Climate Responsive Architecture, Tata Mcgraw -Hill New Delhi. 2001.
- 3.Ralph M. Lebens - Passive Solar Architecture in Europe - 2, Architecture Press, London. 1983.
- 4.Charles. J. Kibert, 'Sustainable Construction' John Wiley and sons Inc, USA. 2004.
- 5.N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi. 2006
- 6.GRIHA manuals, TERI press
- 7.Norbert Lechner, "Heating, Cooling, Lighting", John wiley and sons
8. Mark Dekay and G.Z. Brown, "Sun, Wind and Light- Architectural Design Strategies", John Wiley and Sons
9. Szokolay, Koenigsberger," Manual of Tropical Housing and building" 2014

<b>18MARESS2</b>	<b>BUILDING PERFORMANCE ANALYSIS</b>							<b>SEMESTER-II</b>		
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>			<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>			<b>4</b>

**COURSE OBJECTIVE:**

- To Understand the principles of Sustainable building through Simulation process
- To learn the simulation techniques with digital applications, and to get quantifiable results by usage of various building simulation analysis software.
- To Understand the Effective methods of Daylighting through Simulation
- To Understand the Effective methods of Reduction of Solar Radiation through Simulation
- To Understand the effects of Indoor thermal comfort through Simulation.
- To Understand the Energy performance Index of a Building

**COURSE OUTCOME:**

1. Student will understand the effects of indoor comfort through software simulation and analysis
2. Student will be able to achieve a quantitative result of thermal analysis by software simulations
3. Student will be able to effectively use the modelling tools and techniques
4. Student will be able to design a building with good thermal comfort with optimum design solutions
5. Student will be able to give quantitative results of Daylighting and Ventilation of a building
6. Student will be able to give an energy performance index of a building.

**UNIT-I BUILDING PERFORMANCE-DATA FILES**

Building Performance Analysis - Design Optimization and Visualization using Building Information Modelling. - use of Epw file – TMY data extraction – IMD files

**UNIT-II DAYLIGHTING, IRRADIATION AND WIND ANALYSIS**

Building Performance Analysis - Daylighting, Shading and Ventilation.

**UNIT-III ENERGY ANALYSIS**

Building Performance Analysis - Whole building energy analysis.

**UNIT-IV MODELLING TOOLS**

Building Performance Analysis - Modelling Tools and Techniques.

**UNIT-V SIMULATION TOOLS**

Building Performance Analysis - Simulation Tools and Techniques.

Suggested software: ECOTECH, SKETCHUP – OPEN STUDIO, CLIMATE CONSULTANT, HEED, SBEEED, OPAQUE, OPTIVENT, ENERGY PLUS, DAYSIM -RADIANCE, COOLVENT, RHINO-GRASSHOPPER-LADY BUG, DIVA, DRAGONFLY, SEFAIRA, IES-VE and recent software.

**SUGGESTED READINGS:**

1. Autodesk Manuals for BIM tools such as CAD, REVIT, ECOTECT
2. Rhino tutorials
3. Sefaira tutorials
4. Climate consultant Tutorials
5. IES tutorials
6. Computational fluid Dynamics – Tutorials
7. Open Studio – Tutorials

<b>18MARESS3</b>	<b>SUSTAINABLE DESIGN STRATEGIES</b>							<b>SEMESTER-II</b>			
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>				<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>			<b>4</b>	

**COURSE OBJECTIVE:**

- To understand the sustainable strategies and its principles in the design.
- To focus on passive means, reduction of active methods in building Function
- To gain a broad understanding of hybrid strategies and Mixed mode building
- To Understand in depth the green building Rating Systems all over India & Abroad
- To Understand the Design Aspects of Daylighting techniques for large scale projects
- To Understand the Design Aspects of heating & Ventilation techniques for large scale projects

**COURSE OUTCOME:**

1. Student will be able to apply the Sustainable design strategies in architecture, Design and environment
2. Student will be able to give design solutions of Thermal comfort for various climatic locations
3. Student will understand the application of Passive, Active and Hybrid Design strategies.
4. Student will become expertise in terms of green building aspects and applications.
5. Student will understand the in – depth Analysis of Daylighting
6. Student will understand the In- depth analysis of Ventilation technique.

**UNIT-I DAYLIGHTING AND VENTILATION STRATEGIES**

Sustainable Strategies - Day lighting and Ventilation.

**UNIT-II SOLAR CONTROL AND SHADING STRATEGIES**

Sustainable Strategies - Solar Control and Thermal Comfort.

**UNIT-III STRATEGIES ASSESMENT BY SIMULATION**

Sustainable Strategies - Modelling methods and simulation for assessing building performance.

**UNIT-IV GREEN BUILDING SYSTEM APPLICATIONS**

Sustainable Strategies - Green buildings systems such as GRJHA, LEED, BREEAM, and GREEN STAR.

**UNIT-V CASE STUDY AND COMPARITIVE STUDIES**

Sustainable Strategies - Comparative Studies of the different rating systems and their analysis with relevance to India.

**SUGGESTED READINGS:**

1. GRIHA, LEED, BREEAM and GREEN STAR manuals.
2. Mark deKay and G. Z. Brown, "Sun Wind and light – Architectural Design Strategies", John Wiley and Sons, New York. 2013
3. Norbert Lechner, 'Heating, cooling and Lighting', 2011
4. Edward Allen, "How Buildings Work-The Natural Order of Architecture", Oxford University Press
5. Mili Majumder, Teri - Energy - Efficient Bldg in India - Thomson Press, New Delhi. 2001.
6. Arvind Krishnan & Others - Climate Responsive Architecture, Tata McGraw -Hill New Delhi. 2001.
7. Ralph M. Lechner - Passive Solar Architecture in Europe - 2, Architecture Press, London. 1983.

<b>18MARESS4</b>	<b>SUSTAINABLE BUILDING SYSTEMS</b>						<b>SEMESTER-III</b>			
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>			<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>			<b>4</b>

**COURSE OBJECTIVE:**

- To Understand the low Energy Building Concepts with case studies
- To Understand the Indoor Environmental Quality aspects through survey & Case studies
- To Gain understanding & knowledge about the green Materials
- To learn & provide a comfortable, healthy, and productive environment and landscape with minimal energy and better environmental impact.
- To Gain Understanding about the Smart technologies for the Energy management
- To Gain Understanding & Knowledge about the Energy & Cost Audit

**COURSE OUTCOME:**

1. Student will be able to gain knowledge and application of low energy building design
2. Student will understand the thermal quality standards and its importance in various countries
3. Student will understand the use of green materials and products for a sustainable future.
4. Student will be able to calculate the energy consumption features and the cost audits.
5. Student will be able to understand the integrated building management systems for a controlled environment.
6. Student will be able to understand the energy and cost audits

**UNIT-I LOW ENERGY BUILDING**

Sustainable Building - Low energy building design and operation. -types of energy – consumption-renewable/ non-renewable-Hybrid design strategies-

**UNIT-II INDOOR ENVIRONMENTAL QUALITY**

Indoor Environment - Quality and Standards, Indoor Air Quality-indoor thermal comfort- levels – activity analysis- carbon emissions etc

**UNIT-III GREEN MATERIALS**

Building Systems - Green Materials and green Products- Manufacture- reuse- reduce-recycled materials

**UNIT-IV SMART TECHNOLOGIES**

Building Systems – Smart Materials and systems- Integrated buildings- Energy saving – Automations

**UNIT-V ENERGY AND COST AUDITS**

Building Services - Energy and Cost audits.

**SUGGESTED READINGS:**

1. Mili Majunder, Teri - Energy - Efficient Bldg in India - Thomson Press , New Delhi. 2001.
  2. Charles. J. Kibert, 'Sustainable Construction' John Wiley and sons Inc, USA. 2004.
- N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi. 2006



18MARESS5	SUSTAINABLE TRENDS AND THEORIES						SEMESTER-III			
Marks	Internal	80	External			120	Total	200	Exam Hours	6
Instruction Hours /week	L	2	T	0	P/S	4	Credits		4	

**COURSE OBJECTIVE:**

- To Understand the various Sustainable Policies & mechanisms
- To Gain in-depth knowledge about vernacular & traditional practices
- To Gain knowledge about biomimicry and applications in building design
- To Gain Knowledge about Adaptive reuse & Urban regeneration
- To Understand about Resource Optimisation – Water Efficiency- Operational procedure
- To familiarize with the historic, contemporary and futuristic trends of sustainable building.

**COURSE OUTCOME:**

1. Student will be able to understand the policy level mechanisms and design process and product accordingly.
2. Student will understand the vernacular / traditional building types and its applications to the modern context by its systems and materials.
3. Student will understand to use the site in an optimum manner and know about the operational and maintenance practices.
4. Student will gain knowledge about biomimicry and its importance in sustainable design
5. Student will gain knowledge about futuristic design systems and new material applications.
6. Student will Understand about the Adaptive Reuse & urban Generation

**UNIT-I POLICY AND REGULATORY MECHANISMS**

Sustainable Design: Policies and regulatory mechanisms, Design practices

**UNIT-II VERNACULAR AND TRADITIONAL PRACTICES**

Sustainable Trends: Vernacular ways of sustainable building, Preservation of the regional and cultural identity, documentation and continuity of vernacular/traditional ways of building and detailing

**UNIT-III RESOURCE OPTIMISATION**

Sustainable Trends: Contemporary ideas and trends, Optimization Of site potential, Minimization of energy consumption, Protection and conservation of water resources, Use of environmentally friendly materials and products, Provision of a healthy and convenient indoor climate, Optimization of operational and maintenance practices

**UNIT-IV DIGITAL APPLICATIONS AND FUTURISTIC APPROACH**

Sustainable Trends: Futuristic thoughts and approaches, New materials and technologies, Application of digital technologies

**UNIT-V ADAPTIVE REUSE AND URBAN REGENERATION**

Sustainable Theories: Biomimicry, Adaptive Reuse, Urban regeneration

**SUGGESTED READINGS:**

- Eco-Tech : Sustainable Architecture and High Technology by Slessor© - Thames and Hudson 1997
- Sustainable Architecture : Low tech houses by Mostaedi (A) – Carles Broto 2002
- Ecodesign : A manual for Ecological Design by Yeang(K) – Wiley Academy 2006
- O.H. Koenigsberger and others (2014), Manual of Tropical Housing and Building –Part I - Climate design, Orient Longman, Madras, India ,
- “Sun wind and light”- Mark Dekay , G. Z. Brown, Feb 2014

<b>18MARESH1</b>	<b>INTRODUCTION TO HOUSING DESIGN</b>						<b>SEMESTER-I</b>			
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>			<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>			<b>4</b>

**COURSE OBJECTIVE:**

- To Gain Knowledge about the Housing Typologies all over the world
- To Understand the principles of Community living & Neighbourhood
- To Understand the social, economic, environmental, and psychological implications of housing process and products.
- The goal is to familiarize with housing as a process and a product in the context of the individual, the family, and the community.
- To introduce various stakeholders involved in the housing scenario.
- To Understand about the Housing Finance

**COURSE OUTCOME:**

1. Student will be able to gain knowledge about housing typologies
2. Student will understand about the theories and concepts of community and Neighbourhood
3. Student will understand about the emerging trends in housing
4. Student will understand about the housing finance schemes and management
5. Student will understand the relation of housing and real estate management in the global and local scenario.
6. Student will Understand the Basis of Housing Demand all over the world

**UNIT-I HOUSING TYPOLGY**

Housing typologies - Identification of stakeholders, roles responsibilities of various stakeholders, classification of various typologies.

**UNIT-II COMMUNITY AND NEIGHBOURHOOD**

Community and neighborhood - Theories and concepts, Understanding the scale of housing.

**UNIT-III CONTEMPORARY HOUSING**

Architectural styles and preferences - Trends in contemporary housing types, greater role for the architect in housing.

**UNIT-IV HOUSING FINANCE**

Housing finance - Economic consideration and feasibility studies. Various housing financial institutions

**UNIT-V HOUSING AND REAL ESTATE**

Housing markets - Real estate scenario, Land availability & Acquisition, suburban and rural trends.

**SUGGESTED READINGS:**

1. Merrill, J.L. (Ed.). Introduction to Housing. Upper Saddle River, NJ:Pearson Prentice Hall. 2006
2. Joseph DeChiara, Julius Panero. Time-Saver Standards for Interior Design and Space Planning, McGraw-Hill Education, 2001
3. Robert E. Stevens, Philip K. Sherwood. How to prepare a feasibility study Prentice-Hall, 1982
4. Susan S. Fainstein, Scott Campbell, Readings in Planning Theory, Wiley, 2011  
Doris Kohn, J. D. von Pischke, "Housing Finance in Emerging Markets: Connecting Low-Income Groups to Markets"Springer

18MARESH2	HOUSING POLICIES AND SCHEMES						SEMESTER-II			
Marks	Internal	80	External			120	Total	200	Exam Hours	6
Instruction Hours /week	L	2	T	0	P/S	4	Credits		4	

**COURSE OBJECTIVE:**

- To learn about the housing schemes and policies
- To learn about the Urban housing scenario
- To learn about the Rural housing scenario
- To explore about the stakeholders in the housing
- To gain knowledge about the Central government schemes
- To gain Knowledge about the State Government Schemes

**COURSE OUTCOME:**

1. Student will learn and gain knowledge the housing schemes and policies
2. Student will gain knowledge about the urban housing scenario
3. Student will gain knowledge about the rural housing scenario
4. Student will gain knowledge about the stakeholders in the housing
5. Student will gain knowledge about the systematic approach for the future housing demand.
6. Student will gain knowledge about the Schemes of Central & State government

**UNIT-I HOUSING POLICY IN INDIA**

Housing Policy in the India - Government policies on housing, Government Agencies in housing sector, Classification of housing Stock

**UNIT-II CENTRAL GOVERNMENT SCHEMES**

Central Government Schemes - Identification and review of schemes with housing component.

**UNIT-III STATE GOVERNMENT SCHEMES**

State government Schemes - Identification and review of schemes with housing component.

**UNIT-IV URBAN HOUSING**

Urban housing Scenario - Housing scenario, Housing typology, Housing Stock & shortage, Demand and supply, emerging trends.

**UNIT-V RURAL HOUSING**

Rural Housing Scenario - Housing scenario, Housing typology, Housing Stock & shortage, Demand and supply, emerging trends.

**SUGGESTED READINGS:**

- 1.National Urban Housing and habitat policy, 2007
- 2.<http://www.tnhb.gov.in/dept.aspx>
- 3.<http://mhupa.gov.in/policies/>
- 4.[http://nhb.org.in/Urban\\_Housing/HousingjDolicies.php](http://nhb.org.in/Urban_Housing/HousingjDolicies.php)

<b>18MARESH3</b>	<b>SUSTAINABLE HOUSING</b>						<b>SEMESTER-II</b>			
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>			<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>		<b>4</b>	

**COURSE OBJECTIVE:**

- To Understand about the Site Analysis
- To gain Knowledge about Affordable housing
- To gain Knowledge about Resource Mapping
- To gain Knowledge about advanced level of Building services for housing
- To learn and understand the current interventions in housing sector and propose a sustainable approach towards the housing.
- To learn about High Performance Housing

**COURSE OUTCOME:**

1. Student will be able to understand the sustainable site planning with site inventory and analysis
2. Student will understand about Affordable housing techniques
3. Student will learn about cost effective techniques in housing.
4. Student will be able to understand the resource mapping
5. Student will be able to understand the advance level building services
6. Student will be able to understand & design high performance houses

**UNIT-I SITE ANALYSIS**

How Site and climate related issues affect the design parameters and decisions. -Site Inventory and Analysis- Location, Access- Circulation, Traffic, Climate, Sensory – Analysis

**UNIT-II AFFORDABLE HOUSING**

Exploring the social and economic choices, options and decision of housing, various technologies available.

**UNIT-III RESOURCE MAPPING**

Identifying the resources (construct techniques & technology, Manpower & Material) predominant in that area. Understanding the Availability and Cost implication of the resources.

**UNIT-IV BUILDING SERVICES**

An in depth understanding of building system, how houses work as a system.

**UNIT- V HIGH PERFORMANCE HOUSING**

Exploring the science and technology required to build high performance houses.

**SUGGESTED READINGS:**

1. Thomas Russ, Site Planning and Design Handbook, Second Edition, McGraw-Hill Education, 2009
2. Joseph De Chiara, Julius Panero Time-Saver Standards for Interior Design and Space Planning, McGraw-Hill Education, 2001.
3. Clayton Bennett Greening Your Home: Sustainable options for every system in your house McGraw-Hill Professional 2008
4. Global Green USA, "Blueprint for Greening Affordable Housing" Island Press. 2007
5. Jessica Kellner Housing Reclaimed: Sustainable Homes for Next to Nothing New Society Publishers 2011

<b>18MARESH4</b>	<b>COMMUNITY PARTICIPATION IN HOUSING</b>						<b>SEMESTER-III</b>			
<b>Marks</b>	<b>Internal</b>	<b>80</b>	<b>External</b>			<b>120</b>	<b>Total</b>	<b>200</b>	<b>Exam Hours</b>	<b>6</b>
<b>Instruction Hours /week</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>0</b>	<b>P/S</b>	<b>4</b>	<b>Credits</b>		<b>4</b>	

**COURSE OBJECTIVE:**

- To gain knowledge about the Community participation in Housing
- To gain deep understanding about the Planning Aspects in Housing
- To gain knowledge about the planning process
- To Learn and determine the involvement end users in various stage of housing process across.
- To learn about the community participation for various typologies
- To learn about various best practices in community Housing Through Case studies

**COURSE OUTCOME:**

1. Student will be able to develop a model for both the end user and the service provider
2. Student will be able to involve in planning in design stages
3. Student will be able to understand the intricacies of Community participation in Housing
4. Student will be able to give design solution for the future community housing
5. Student will gain Knowledge about the best practices in Community housing
6. Student will know about various typologies of community housing

**UNIT-I COMMUNITY PARTICIPATION PLANNING**

Awareness and importance of Community participation, Planning and design stages - Zoning studies, spatial analysis, customs & cultural practices and user -based studies

**UNIT-II PLANNING ASPECTS**

People-based planning - Identifying & incorporating Aspiration, Needs & Affordability, incorporating special needs of the elderly and children, concept of better living. Degrees of customizations

**UNIT-III PLANNING PROCESS**

Familiarization with development and planning process of various agencies (Public, Private (Multifamily), Private (single family), Co-operative, NGO), view on community participation, organizational structure, Project and product brief, Identification of beneficiaries.

**UNIT-IV COMMUNITY PARTICIPATION MODELS AND CASE STUDIES**

Existing models of community participation across various typologies, best practices, Case studies.

**UNIT-V TYPOLOGY**

Developing models for community participation for various typologies and stages.



**SUGGESTED READINGS:**

- 1.Sylvia J.T. Jansen, Henny C.C.H. Coolen and Roland W. Goetgeluk, "The Measurement and Analysis of Housing Preference and Choice" Springer 2011
- 2.Andrew Beer, Debbie Faulkner, Chris Paris, Terry Clower - Housing transitions through the life course: Aspirations, needs and policy 2011
- 3.Groat, L. and Wang D., "Architectural Research Methods", John Wiley & Sons. 2002.
- 4.Merrill, J.L. (Ed.). Introduction to Housing. Upper Saddle River, NJ:Pearson Prentice Hall. 2006
- 5.Juilenne Hanson, Decoding Homes and Houses Cambridge University Press 20

18MARESH5	SPECIAL TYPES OF HOUSING							SEMESTER-III		
Marks	Internal	80	External			120	Total	200	Exam Hours	6
Instruction Hours /week	L	2	T	0	P/S	4	Credits		4	

**COURSE OBJECTIVE:**

- To gain Knowledge about the Vernacular housing in Chettinad Region
- To Gain knowledge about the Vernacular housing in Hill region
- To understand the Various techniques involved in the vernacular construction
- To understand about Disaster prone areas and methodologies for housing in those regions
- To learn about the influences of social, economic and environmental factors in housing
- Exploring housing typologies which tends to lean more on a aspect more than the rest.

**COURSE OUTCOME:**

1. Student will learn and understand the Vernacular Architecture of various regions of world
2. Student will learn and understand the Vernacular Architecture of various regions of India
3. Student will learn and understand the Vernacular Architecture of various regions of Tamilnadu
4. Student will learn about design aspects and historical methods of construction which can be adopted for a particular context
5. Student will learn and understand the types of housing in disaster prone areas
6. Student will be able to Propose the housing trend for the Future

**UNIT-I VERNACULAR- CHETTINAD REGION**

Vernacular Architecture - Typology 1 - Chettinad region - Social factor influencing Architectural features, Location characteristics, Climatic consideration.

**UNIT-II VERNACULAR-HILL REGION**

Vernacular Architecture - Typology 2 - Hill region - Social factor influencing Architectural features, Location characteristics, Climatic consideration.

**UNIT-III VERNACULAR – DESERT REGION**

Vernacular Architecture - Typology 3 - Desert region - Social factor influencing Architectural features, Location characteristics, Climatic consideration.

**UNIT-IV HOUSING – DISASTER PRONE AREAS**

Housing in Disaster prone areas - Classification of Disaster, Disaster Management Cycle, Housing interventions.

**UNIT-V HOUSING – FUTURE CONCEPTS**

Future concepts - Development trends, Product categories, material trends, People preferences

**SUGGESTED READINGS:**

1. Richard Hyde, Bioclimatic Housing: Innovative Designs for Warmer Climates, Earthscan
2. Willie Webber, Simos Yannas (ed.) Lessons from vernacular Architecture, Earthscan
3. Ilay Cooper, Traditional Buildings of India, Thames and Hudson, 1998
4. Monisha Bharadwaj, India Style, Bay Soma Publishing -2003