

<b>Course No.</b>	<b>Course Name</b>	<b>L-T-S-P/D</b>	<b>Credits</b>	<b>Year of Introduction</b>
<b>ART 402</b>	<b>HUMAN SETTLEMENTS PLANNING</b>	<b>3-0-0-0</b>	<b>3</b>	<b>2021</b>

**Course Objectives:**

- To expose students to the basics of human settlements planning. The students will be able to understand the process of urban and rural planning in India and analyze various concepts and interventions in the field of human settlements planning.

**Course Outcomes:**

After the completion of this course, the students will be able to

<b>Course Outcome</b>	<b>Description of Course Outcome</b>	<b>Prescribed learning level</b>
CO-1	Understand the concept of human settlements planning, its elements and classification.	Understanding
CO-2	Differentiate factors influencing the growth and decay of human settlements	Analyze
CO-3	Understand the terms, processes and programmes involved in urban, rural and regional planning in India.	Analyze
CO-4	Appreciate different concepts and current trends in human settlements planning in India.	Understanding, Analysing, Evaluating

**Mark distribution:**

<b>Total marks</b>	<b>Continuous internal evaluation marks</b>	<b>End semester examination marks</b>	<b>End semester examination duration</b>
100	40	60	3 hours

**Continuous internal evaluation pattern:**

Attendance	:	4 Marks
Continuous assessment tests (2 nos.)	:	20 Marks
Assignment/Quiz/Course project	:	16 Marks

**End semester examination pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4 marks for each question. Students should answer all the questions (5x4=20marks). Part B contains 2 questions from each of the 5 modules, of which the student should answer any one. Each question carries 8 marks (Total 5x8=40). Part B questions can have subdivisions.

**Syllabus:**

Introduction, Forms of human settlements, Rural and regional development in India, Urban Planning and urban renewal, Aspects in Contemporary Urban Planning in India.

**Course Plan:**

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of hours</b>
I	Definition of Human Settlements, Brief discussion of evolution of settlements. Elements of human settlements - Nature, Man, Society, Shells and Networks- their functions and linkages. Anatomy and classification of human settlements- locational, resource-based, population size and occupational	CO1	8

	structure.		
II	Structure and form of human settlements- Linear, non-linear and circular, Combinations- reasons for development-advantages and disadvantages. Factors influencing the growth and decay of human settlements – urbanization and its impacts	CO2	8
<b>FIRST INTERNAL TEST</b>			
III	Introduction to planning as a discipline - Need, issues and potentials. Census classification of towns in India. Urban, Rural and Regional Planning in India with examples. Planning machinery in India –levels of planning, Development control regulations.	CO3	8
IV	Types of plans and planning process. Master Plan, Structure plan, DDP, planned unit development. Urban Renewal, redevelopment, rehabilitation and conservation. Urban Development projects- case studies.	CO3	9
<b>SECOND INTERNAL TEST</b>			
V	Globalization and its impact on cities. Sustainable planning concepts. New forms of development, to include self-sustained communities, SEZ, transit-oriented development, (TOD), integrated townships, smart cities. Case studies.	CO4	12
<b>END SEMESTER EXAMINATION</b>			

**Textbooks:**

1. C.L. Doxiadis, Ekistics, ‘An Introduction to the Science of Human Settlements’, Hutchinson, London, 1968.
2. Thooyavan K R, ‘Human Settlements- A Planning guide to Beginners’, M.A. Publications, 2005.
3. Ministry of Urban affairs and Employment, Government of India, New Delhi, Urban

Development Plans: Formulation and Implementation-Guidelines, 1996.

4. Andrew D Thomas, 'Housing and Urban Renewal', Harper Collins, 1986.

**Reference books:**

1. S. B. Golahit, 'Rural Development Programmes In India', Neha Publishers and Distributors, 2010.
2. V. Nath, 'Regional Development And Planning In India', Concept Publishing Company, 2011.
3. Government of India, 'Report of the National Commission on Urbanisation', 1988.
4. Hansen N., 'Regional Policy and Regional Integration', Edward Elgar, UK, 1996
5. Giuseppe T. Cirella, 'Human Settlements: Urbanization, Smart Sector Development, and Future Outlook'. Singapore: Springer Nature Singapore, 2021.
6. Astrid Ley, Josefine Fokdal, Md Ashiq Ur Rahman, 'Housing and Human Settlements in a World of Change', Germany: transcript Verlag, 2020.
7. United Nations Human Settlements Programme, 'Planning Sustainable Cities: Global Report on Human Settlements 2009'. United Kingdom: Earthscan, 2009.
8. Bowen, William M, Gleeson, Robert E. 'The Evolution of Human Settlements: From Pleistocene Origins to Anthropocene Prospects'. Germany: Springer International Publishing, 2018.

<b>Course No.</b>	<b>Course Name</b>	<b>L-T-S-P/D</b>	<b>Credits</b>	<b>Year of Introduction</b>
<b>ART 404</b>	<b>RESEARCH METHODOLOGY</b>	<b>2-1-0-0</b>	<b>3</b>	<b>2021</b>

**Course Objectives:**

- The students will be equipped with the knowledge to formulate the basic framework of the research process and apply the research strategies to prepare and present a comprehensive research proposal.

**Course Outcomes:** After the completion of this course, the students will be able

<b>Course Outcome</b>	<b>Description of Course Outcome</b>	<b>Prescribed learning level</b>
CO-1	To develop a foundational understanding of research methodologies in architecture.	Understanding
CO-2	To do critical thinking and analysis in the evaluation of architectural literature.	Understanding, Analyzing
CO-3	To acquire hands-on experience in conducting literature reviews and case studies.	Analyzing, Evaluating
CO-4	To be equipped with the skills to structure and write a research paper.	Analyzing, Creating
CO-5	To develop and present a well-structured research proposal for an architecture dissertation.	Creating

**Mark distribution:**

<b>Total marks</b>	<b>Continuous internal evaluation marks</b>	<b>End semester examination marks</b>	<b>End semester examination duration</b>
100	40	60	3 hours

**Continuous internal evaluation pattern:**

Attendance	:	4 Marks
Continuous assessment tests (2 nos.)	:	20 Marks
Assignment/Quiz/Course project	:	16 Marks

**End semester examination pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4marks for each question. Students should answer all the questions (5x4=20marks). Part B contains 2 questions from each of the 5 modules, of which the student should answer any one. Each question carries 8marks (Total 5x8=40). Part B questions can have subdivisions.

**Syllabus:**

Introduction, Aims, Types of research, Ethics in research, Research methods and process, Significant areas of research in architecture, Structure of a Research Paper and Research, Research proposal writing

**Course Plan:**

<b>Module</b>	<b>Content</b>	<b>Course outcomes</b>	<b>No. of hours</b>
<b>I</b>	<b>Introduction to research:</b> Introduction to “research” and its significance in architecture, Aims and characteristics of research; Criteria of good research; Research paradigms; Basic types of research; Role of the researcher; Ethics in research: quality	CO1	5

	criteria, Plagiarism, ways to tackle plagiarism, ethical use of AI tools		
<b>II</b>	<p><b>Research Design and areas of research in architecture:</b></p> <p>Research Design: Components of research design – formulating the research questions, and hypothesis.</p> <p>Defining the scope and limitations of a research plan, significance of the research outcome.</p> <p>Various areas of research-Interpretative research, historical research, Qualitative Research, Correlational Research, Experimental and Quasi-Experimental Research, Simulation, and Modelling Research, Logical Argumentation.</p>	CO1	10
<b>FIRST INTERNAL TEST</b>			
<b>III</b>	<p><b>Literature Study and Research</b></p> <p>Significance of literature study in research, different sources of information such as books, journals, newspapers, internet, magazines, audio recordings, etc.</p> <p>Referencing and documenting the bibliography.</p> <p>Assignment: After faculty consultation, students identify a topic/literature in architecture/design or related domains. They need to write a review of a minimum of five standard peer-reviewed articles, concluding with their observations.</p>	CO2, CO3	8
<b>IV</b>	<p><b>Methods of Research in Architecture:</b></p> <p>Data Documentation and Analysis: Understanding the nature of data collected and methods of analysis suitable for that data (graphical / numerical / descriptive). Converting data into numerical form for data analysis.</p> <p>Interview Techniques: Questionnaires /Face to face Interviews / Internet survey. Designing a Questionnaire / Interview schedule. Visual Techniques: Observations</p>	CO4	10

	(participant / nonparticipant / direct), activity mapping, accession/erosion trace observations, cognitive maps, etc. Content Analysis: Secondary data analysis. Understanding the relative advantages, disadvantages and application of various methods mentioned above and choosing a method appropriate for research to achieve its objectives. Introduction to the simple statistical methods of analysing numerical data and statistical softwares.		
<b>SECOND INTERNAL TEST</b>			
<b>V</b>	<b>Structure of a Research Paper and Research Proposal:</b> Introduction; Method section, Result, and Discussion. Different styles: APA, MLA, Chicago, etc. Citation: Cross citation, intext citation, reference list, use of any one tool for citation (Google Scholar, Mendeley, Zotero, Endnote, etc.). <i>Project:</i> Preparation and Structure of the Research Proposal for an architecture dissertation, including Introduction, Literature Review, Proposed Methodology, Expected Results/Outcomes, and Deadlines.	CO4, CO5	12
<b>END SEMESTER EXAMINATION</b>			

**References:**

1. Dawson, Catherine, Practical Research Methods, New Delhi, UBS Publishers 'Distributors, 2002.
2. Groat L and Wang D, Architectural research methods, John Wiley & Sons Ltd, 2002.
3. Knight A and Ruddock L, Advanced research methods in the built environment, Wiley Blackwell publishers, 2008.
4. Kothari, C.R., Research Methodology- Methods and Techniques, New Delhi, Wiley Eastern Limited, 1985.

5. Kumar, Ranjit, *Research Methodology-A Step-by-Step Guide for beginners*, (2nd.ed.), Singapore, Pearson Education, 2005.
6. Lucas R, *Research methods for Architecture*, Lawrence King Publishing, 2016.
7. Sanoff H, *Visual research methods in design*, New York, Routledge Publications, 2016.
8. Van den Brink, A., Bruns, D., Tobi, H., & Bell, S. (Eds.) *Research in landscape architecture: Methods and methodology*. Routledge, 2016.
9. Niezabitowska, E. D. *Research methods and techniques in architecture*. Routledge, 2018.
10. Kamalipour, H., Aelbrecht, P., & Peimani, N. (Eds.). *The Routledge handbook of urban design research methods*. Routledge, 2024.
11. Pallasmaa, J. *The eyes of the skin: Architecture and the senses*. John Wiley & Sons 2024.

<b>Course No.</b>	<b>Course Name</b>	<b>L-T-S-P/D</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>ART406</b>	<b>BUILDING ECONOMICS AND SOCIOLOGY</b>	<b>3-0-0-0</b>	<b>3</b>	<b>2021</b>

**Course Objectives:**

- To understand the relevance of sociology and economics in architecture
- To analyse the internal and external factors that affect the economics of a project
- To analyse the role of communities in shaping built environment and architecture

**Course Outcomes:** After the completion of this course, the students will be able

<b>Course Outcome</b>	<b>Description of Course Outcome</b>	<b>Prescribed learning level</b>
CO-1	To understand the basic concepts in economics that find application in architecture	Understand
CO-2	To analyse economic implications of land, building and project costs	Understand Analyse
CO-3	To understand the basic concepts of sociology that is relevant to the built environment	Understand
CO-4	To analyse the role of communities in shaping environment and architecture and vice versa	Understand Analyse Evaluate
CO-5	To discern the differences in urban and rural communities and the issues related to various classes and densities of people living there.	Apply Analyse Evaluate

**Mark distribution:**

<b>Total marks</b>	<b>Continuous internal evaluation marks</b>	<b>End semester examination marks</b>	<b>End semester examination duration</b>
100	40	60	3 hours

**Continuous internal evaluation pattern:**

Attendance	:	4 Marks
Continuous assessment tests (2 nos.)	:	20 Marks
Assignment/Quiz/Course project	:	16 Mark

**End semester examination pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4marks for each question. Students should answer all the questions (5x4= 20 marks). Part B contains 2 questions from each of the 5 modules, of which the student should answer any one. Each question carries 8marks (Total 5x8=40). Part B questions can have subdivisions.

**Syllabus**

Introduction to Economics, Economics and the Market, Concepts of Economics, Urban Land Values, Building Economics, Project Economics of building construction projects, Economic Analyses of Projects Cost, Introduction to Sociology, Communities, Urban and Rural Communities, Cities and Society

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of hours</b>
<b>I</b>	<p><b>Introduction to Economics</b>  Definition of economics: Definitions of terms – Goods, Utility, Value, Price and Wealth, micro and macroeconomics;  Economics and the market: Consumption, characteristics of wants and needs  Concepts of Economics: Theory of supply and demand, Opportunity cost</p>	CO-1	6
<b>II</b>	<p><b>Urban Land Values</b>  Factors affecting the value of urban land.  <b>Building Economics</b>  Building Efficiency and cost reduction through planning and design of building components.  Total cost of building, Initial cost, Operational cost, maintenance cost. Life cycle cost.  <b>Project Economics of building construction projects -</b>  Land, labour, capital and Material. Labour intensive v/s capital intensive projects.  Financing for projects, sources of capital, Agencies and Institutions influencing project economics, public private participation.</p>	CO-2	12
<b>FIRST INTERNAL TEST</b>			
<b>III</b>	<p><b>Economic Analyses of Projects Cost –</b>  Control, Cash - Flow Analyses, Cost – Projection, Cost – Benefit, Feasibility, Estate Investments &amp; returns, Valuation, Law relating to properties and buildings – undivided share, super built up area, carpet area.</p>	CO-2	9
<b>IV</b>	<p><b>Introduction To Sociology</b>  Definition of sociology, Nature and scope and utility in architecture and the built environment  Definitions of sociological terms: society, community, family, culture. Relation between culture and built form.</p>	CO-3 CO-4	9

<b>SECOND INTERNAL TEST</b>			
<b>V</b>	<p><b>Communities:</b></p> <p>Origin, growth and nature of settlements and communities. Their characteristics and spatial patterns.</p> <p>Urban and Rural Communities: Definitions of the terms “urban” and “rural”. The social, economic and spatial characteristics associated with urban and rural settlements</p> <p>Cities and Society: Urbanization – definition; causes. Effects of urbanization on rural areas. Impact of growing urbanization on urban life, viz. health, housing, transportation. The origin and characteristics of slums in Indian cities. Governmental and non-governmental approaches to engaging with issues regarding spatial issues in slums of Indian cities with the following examples – Aranya Housing Project, Indore; slum rehabilitation housing in Mumbai, India. Role of KSHB and TNSCB in up-lifting the quality of life in slums</p>	CO-5	9

**Text Books:**

1. Danny Myers, ‘Construction Economics – A new Approach’, Taylor and Francis Publication, 2022.
2. C N Shankar Rao – ‘Sociology- Principles of Sociology with an Introduction to Social Thought’, S Chand and Company Ltd ,1990.

**Reference Books:**

1. Panneerselvam, ‘Engineering Economics’, Prentice Hall India Learning Private Limited, 2013.
2. Paul B Horton and Chester L Hunt –Sociology, Tata Mc Graw Hill, 2004.
3. Vikram Bhatt et.al., ‘How the Other Half Builds’, Centre for Minimum Cost Housing, McGill University, 1984.

<b>Course No.</b>	<b>Course Name</b>	<b>L-T-S-P/D</b>	<b>Credits</b>	<b>Year of Introduction</b>
<b>AET 402</b>	<b>ENVIRONMENTAL SCIENCE FOR ARCHITECTURE</b>	<b>3-0-0-0</b>	<b>3</b>	<b>2021</b>

**Course Objectives:**

- To provide students with the knowledge and understanding necessary to design and construct environmentally responsible buildings.
- To impart basic knowledge about the environment and its allied problems.

**Course Outcomes:**

After the completion of the course, the students will be able to

<b>Course Outcome</b>	<b>Description of Course Outcome</b>	<b>Prescribed Learning Level</b>
CO-1	Define and explain the key concepts related to environmental science and architecture	Understanding
CO-2	Analyze the environmental, economic, and social benefits of environmentally responsible buildings and policies and critically assess environmental impact of real-world projects.	Analyzing and evaluating
CO-3	Critically assess emerging and existing sustainable building materials and technologies with respect to their suitability for different contexts	Analyzing and applying
CO-4	Evaluate the performance of an existing building using various simulation software	Analyzing, applying and evaluating

**Mark Distribution:**

<b>Total Marks</b>	<b>Continuous Internal Evaluation Marks</b>	<b>End Semester Examination Marks</b>	<b>End Semester Examination Duration</b>
100	40	60	3 Hours

**Continuous internal evaluation pattern:**

Attendance	:	4 Marks
Continuous assessment tests (2 nos.)	:	20 Marks
Assignment/Quiz/Course project	:	16 Marks

**End Semester Examination Pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4marks for each question. Students should answer all the questions (5x4= 20marks). Part B contains 2 questions from each of the 5 modules, of which the student should answer any one. Each question carries 8marks (Total 5x8=40). Part B questions can have subdivisions.

**Syllabus:**

Introduction to Environmental Science, Environmental Regulations and Policies in Architecture: Environmental Impact Assessment, Sustainability and related concepts, Building Modelling (BEM) and Simulation for environment-responsive designs

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of Hours</b>
1	<b>Introduction to Environmental Science</b>  Definition, scope, and relevance of environmental science in architecture, Historical perspective and evolution of environmental awareness in architecture, global and local environmental challenges affecting the built environment (Climate Change, Resource Depletion, Pollution, Biodiversity Loss), architectural projects that exemplify environmental consciousness. Historical and Contemporary examples	CO-1	5

2	<p><b>Environmental Regulations and Policies in Architecture:</b></p> <p>National and international environmental regulations, Compliance and legal responsibilities of architects Implementation of environmental policies in different countries: Germany's Energiewende (energy transition) policy, India's National Clean Air Program, Australia's Murray-Darling Basin Plan Introduction to green building certifications (LEED, IGBC, GRIHA, BREEAM etc.), Case studies of relevant environmentally certified buildings</p>	CO-1, CO-2	10
<b>FIRST INTERNAL TEST</b>			
3	<p><b>Environmental Impact Assessment</b></p> <p>Definition and purpose of EIA, Understanding the EIA process and its stages, Components of an EIA report EIA procedures-Screening, Scoping, Impact Prediction, Mitigation, Reporting, Public Hearing, Monitoring Methods for conducting EIA, Live/Literature case study of real-world architectural projects and their EIA processes.</p>	CO-2, CO-3	10
4	<p><b>Sustainability and related concepts</b></p> <p>Definition of sustainability, Overview of the three pillars of sustainability: environmental, social, and economic; Conceptual understanding of embodied energy and embodied carbon, Life cycle analysis, Cradle to cradle design, Practical Applications.</p>	CO-3	10
<b>SECOND INTERNAL TEST</b>			
5	<p><b>Building Energy Modelling (BEM) and Simulation for environment-responsive designs</b></p> <p>Energy Simulation-Suggested Tools: Energy Plus, EQuest, Open Studio, Daylighting and Shading Simulation - Suggested Tools: Ecotect, Design Builder, Ladybug. Exercise: Each student can choose a previously done design or any design of a space of their choice and assess its energy performance using simulation software.</p>	CO-3, CO-4	10
<b>END SEMESTER EXAM</b>			

## References:

1. Isenberg, Andrew C. The Oxford Handbook of Environmental History, Oxford Handbooks, (2014; online edn, Oxford Academic, 2 Oct. 2014).
2. Saksida, Lisa M. Sustainable Built Environments: Principles and Practice. Oxford: Wiley, 2016.
3. Peter Wathern "Environmental Impact Assessment: Theory and Practice", 1st Edition - 14 June 1990.
4. "Our Common Future (The Brundtland Report)" by the World Commission on Environment and Development (WCED)
5. David MacKay "Sustainable Energy – Without the Hot Air", (Cambridge, England: UIT Cambridge Ltd., 2009.
6. William McDonough and Michael Braungart "Cradle to Cradle: Remaking the Way We Make Things", New York, North Point Press, 2002.
7. Joseph Clarke, "Energy Simulation in Building Design" 1st Edition – 1, January 1985.
8. "ASHRAE Handbook - HVAC Applications" 2019.
9. LEED Reference Guide for Building Design and Construction, Edition by U.S. Green Building Council, 2023.
10. BREEAM Manual SD207: Code for Sustainable Homes, Edition by BRE Global, 2023.
11. GRIHA Version 5: Green Rating for Integrated Habitat Assessment, Edition by GRIHA Council, 2023.
12. Francis D. K. Ching, Ian M. Shapiro, 'Green Building Illustrated' (PDF), 2014.

## Academic Papers:

1. Ali M. Malkawi and Godfried Augenbroe, 'Environmental Science and Sustainable Design: An Overview for the Built Environment', 2004.
2. Anshu Sharma and S. K. Goyal, "Assessment of Urban Environmental Issues in India", 2007.
3. "Global Status Report for Buildings and Construction" by UN Environment Program (UNEP), 2022.

<b>Course No.</b>	<b>Course Name</b>	<b>L-T-S-P/D</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>ARD 402</b>	<b>ARCHITECTURAL DESIGN - VI</b>	<b>0-0-10-0</b>	<b>10</b>	<b>2021</b>

**Course Objectives:**

- To develop a master plan with a focus on the vision of the campus and include architectural character, composition, typology of future buildings, groups of buildings and exterior spaces on campus.
- To evolve a campus design in terms of universal design, sustainability, function, aesthetic value and microclimate.

**Course Outcomes:**

- After the completion of this course, the students will be able-

<b>Course Outcome</b>	<b>Description of Course Outcome</b>	<b>Prescribed Learning Level</b>
CO-1	To understand campus planning principles	Understanding
CO-2	To perform in-depth analysis of the campuses studied. To develop a deep understanding of campus planning principles.	Analysing
CO-3	To evolve a master plan for a large campus.	Applying
CO-4	To design a campus with considerations of universal design principles and sustainability aspects.	Creating

**Mark Distribution:**

<b>Total Marks</b>	<b>Continuous Internal Evaluation Marks</b>	<b>End Semester Jury Examination Marks</b>	<b>End Semester Jury Examination Duration</b>
100	50	50	2-3 days

**Continuous internal evaluation pattern:**

Attendance : 5 Marks

Design Assignments/ Reviews/Tests : 45 Marks

**Syllabus:**

Study campus planning principles – study large campuses that are present all over India – Analyse the campuses with respect to campus planning principles – evolve a vision for the campuses – Evolve master plans with future growth also considered - Propose interventions/ design for campuses based on sustainability, accessibility, aesthetics and functional requirements.

**Course Plan:**

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of hours</b>
I	<b>Introduction to campus planning</b>  Campus planning principles, Study/presentation of campus planning principles.  Students may be assigned topics related to the same and make detailed reports and presentations.	CO1	20
II	Case studies on designed campus projects all over India and analysis based on campus planning principles.	CO2	40
<b>FIRST INTERNAL TEST</b>			
III	<b>Introduction to project-</b>  Preparation of master plan focusing on architectural vocabulary, composition, functionality, groups of buildings and exterior spaces, services, typology of future buildings on campus.  Examples: Hospital, Educational institutions, sports facility buildings, housing projects, hotel and hospitality projects etc.	CO3, CO4	30
IV	Development of the design based on site planning principles, Context, Infrastructure, Services and Aesthetics.	CO3, CO4	30
<b>SECOND INTERNAL TEST</b>			
V	Preparation of detailed architectural drawings and models.	CO4	30
<b>END SEMESTER EXAM/JURY</b>			

## References

1. Jonathan Coulson, Paul Roberts, Isabelle Taylor: University Planning and Architecture: The Search for Perfection, 2010
2. Mitchell WJ, 'Imagining MIT: Designing a campus for the 21st century', MIT Press, 2007.
3. Richard P. Dober , Campus Architecture: Building in the Groves of Academe, 1996.
4. Scott Van Dyke, Form, Line to Design, Publisher-Van Nostrand Reinhold, 1990
5. Neuferts' Architect's data
6. Time Saver Standards for Architectural Design Data
7. Sustainable Architecture Principles, Paradigms and Case Studies, James Steele,Mc Graw-Hill Education, 1997.

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ARS 402	INTERIOR DESIGN	1-0-2-0	3	2021

**Course objectives:**

- To introduce students to the design of interior spaces and provide a basic understanding of the various realms of Interior Design and the specific skill sets required.
- To develop interior design skills in students and introduce to the construction and fabrication systems employed in the contemporary interior design profession
- To make students aware of the relevance of sustainable best practices in Interior design

**Course Outcomes:**

After the completion of this course, the students will be able

Course Outcome	Description of Course Outcome	Prescribed learning level
CO1	To comprehend the relationship between spaces, design elements and human perception in terms of volume, form, colour and texture.	Understanding
CO2	To gain knowledge on importance of ergonomics in interior design and equip them to design furniture using ergonomic principles.	Understanding, Creating
CO3	To understand the importance of sustainability and environment control in interiors	Understanding Analysing
CO4	To involve in an interior design project which has simple space planning, understanding the functional aspects of good design, and be sensitized to intelligent planning responsive to the principles of sustainability in interior design	Analysing Creating

**Mark distribution:**

<b>Total marks</b>	<b>Continuous internal evaluation marks</b>	<b>End semester examination marks</b>	<b>End semester examination duration</b>
100	50	50	3 hours

**Continuous internal evaluation pattern:**

Attendance	:	5 Marks
Continuous assessment tests (2 nos.)	:	15 Marks
Assignment/Quiz/Course project	:	30 Marks

**End Semester examination pattern:**

There will be three parts; Part A, B, and C. Part A will contain 5 questions with 1 question from each module, having 3 marks for each question. Students should answer all the questions. Part B will contain 2 questions from each module, of which the student should answer any one. Each question carries 4 marks. Part C will have one schematic drawing question either from the 2nd module or the 5th module which can be answered in a normal answer booklet. The question carries 15marks

**Syllabus:**

Fundamentals in Interior Design–Materials, Construction & Fabrication, Sustainability

**Course plan:**

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of Hours</b>
I	<p><b>Interior Design Theory:</b>  Interior design spaces, Materials, Colour, Light, Texture:  Space as raw material.  Surfaces- Functions of surfaces. Floors, walls, ceiling, dividers.  Various materials like wood, stone, fabric, and finishes like paint, wall paper, murals etc and their properties and application</p>	CO1	9

	Interior lighting. Various functions of lighting. Human factors and relationship between colour, finish/texture and lighting		
II	<p><b>Introduction to role of Furniture in Interior Design</b></p> <p>Furniture- types of furniture based on function, design and materials. Introduction to ergonomics</p> <p>Furnishings- Soft furnishings: textiles &amp; fabrics, various furnishings-types and functions. Types and various design variations in furnishing item – bed, sofa, cushion, curtains &amp; trimmings, carpets, rugs etc.</p> <p>Designing of a furniture based on understanding of anthropometrics, ergonomics and human scale</p>	CO1 CO2	12
<b>FIRST INTERNAL TEST</b>			
III	<p><b>Introduction to natural elements</b></p> <p>Incorporating natural elements in interiors- use of water, air &amp; natural light in interiors.</p> <p>Interior plant scaping and current trends.</p>	CO3	3
IV	<p><b>Sustainable Best Practices in interior Design through case studies</b></p> <p>Environmental design &amp; sustainable design practices.</p> <p>Reduce, reuse &amp; recycle in interior design.</p> <p>Innovation and research in materials and technology.</p>	CO3 CO4	6
<b>SECOND INTERNAL TEST</b>			
V	<p><b>Typical presentation &amp; rendering techniques</b></p> <p>Mood-boards, finishes' boards, interior perspectives and sketches</p> <p>Interior design of a simple architectural space (Kitchen/Office/Workstations etc) incorporating natural elements in interiors- use of water, air &amp; natural light.</p> <p>Lighting design &amp; furnishings experiencing spatial quality with all required drawings- Working drawings &amp; Shop drawings</p>	CO4	15
<b>END SEMESTER EXAMINATION</b>			

### **Text Books:**

1. Andrea Simitch, Val Warke, “The Language of Architecture 26 Principles Every Architect Should Know”, Rockport Publishers, 2014.
2. Francis D. K. Ching, Corky Binggeli, “Interior Design Illustrated”, John Wiley & Sons, 2018.

### **Reference Books**

1. Juhani Pallasmaa, “The Eyes of the Skin- Architecture and the Senses”, Wiley, 2012.
2. Kate Nesbitt (editor), “Theorizing a new agenda for architecture - an anthology of architectural theory, 1965-1995, Princeton Architectural Press, 1996.
3. Sian Moxon, “Sustainability in Interior Design “, Laurence King Publishing, 2012.
4. Leon Krier, “The Architecture of Community”, Island Press, 2011.
5. Steen Eiler, “Rasmussen - Experiencing Architecture”, MIT Press, 1964.
6. Anthony C. Antoniades, “Poetics of Architecture: Theory of Design”, Wiley, 1992.

### **Course materials, Guidance and Evaluation methods**

- Books, research papers, e-books, videos etc. to be provided to the students by the faculty and ensure that they read it, by initiating discussions.
- Representing architecture through drawing, painting, photography, sculpting, printing, physical models etc. can be given as class exercises
- The students can be encouraged to visit architecture through study tours and develop the skill of architectural appreciation by documenting. Each student should be encouraged to have a sketchbook with notes, graphical interpretations, and sketches of all the topics cover

<b>Course No.</b>	<b>Course Name</b>	<b>L-S-T-P/D</b>	<b>Credits</b>	<b>Year of introduction</b>
<b>ECT- 402(1)</b>	<b>ARCHITECTURAL CONSERVATION</b>	<b>3-0-0-0</b>	<b>3</b>	<b>2021</b>

**Course Objectives:**

- To familiarize with architectural conservation philosophy, theory and its history.
- To introduce the process of conservation of heritage structures and best practices through case studies and on-site work.
- Develop sensitivity to heritage and interventions in heritage structures and precincts.

**Course Outcomes:**

At the end of the course the student will be able

<b>Course Outcome</b>	<b>Description of Course Outcome</b>	<b>Prescribed learning level</b>
CO-1	To understand the philosophy and science of architectural conservation	Understanding
CO-2	To conduct the process of methodical study of a historic building through documentation and assessment	Applying, Analysing
CO-3	To distinguish and comprehend the appropriate methods of intervention in a historic building and context	Evaluating
CO-4	To comprehend the concept of Urban heritage	Analysing, Evaluating

**Mark Distribution:**

<b>Total Marks</b>	<b>Continuous Internal Evaluation marks</b>	<b>End Semester Examination marks</b>	<b>End Semester Examination Duration</b>
100	40	60	3 hours

**Continuous internal evaluation pattern:**

Attendance	: 4 Marks
Marks Tests (2 numbers)	: 20 Marks
Assignment/Quiz/Course project	: 16 Marks

**End semester examination pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4 marks for each question. Students should answer all the questions. Part B contains 2 questions from each module, of which the student should answer any one. Each question carries 8 marks. One or two questions can have subdivisions. Some questions can be framed in such a manner to assess the student's capacity for analyzing the topics and linking it with other courses.

**Syllabus:**

Introduction to Conservation, Key concepts, Process of Conservation, Need for Conservation, Urban conservation

<b>Module</b>	<b>Contents</b>	<b>Course Outcome</b>	<b>No of Hours</b>
I	<b>Introduction to Conservation</b> Heritage – Definitions and Classification of Heritage Conservation – Need, scope and meaning. Meaning of Heritage and conservation in the Indian Context, Principles and Ethics of Conservation Development of the theories of conservation: an overview of the history of conservation in the west and Indian Context Various International (UNESCO, ICOMOS, ICROM) and National Agencies (ASI, INTACH) involved in conservation and their roles AMASR ACT, National Monuments Authority	CO-1	9

II	<p><b>Key Concepts</b></p> <p>Approach to conservation: Changes in approach through an overview of milestone Charters like the Venice Charter, Florence Charter, Burra Charter, Nara Document</p> <p>Concept of Values, Significance, Authenticity and Integrity</p> <p>World heritage: Nomination process and listing through case studies of World heritage sites. Examples of World heritage sites in India and other countries.</p>	CO-1	6
<b>FIRST INTERNAL TEST</b>			
III	<p><b>Process of Conservation</b></p> <p>Overview of the process of conservation</p> <p>Importance of Research in Conservation, Sources of information like archival material, books, Photographs, maps, oral traditions and memories. Buildings as sources of information- styles, character.</p> <p>Documentation of Historic buildings: Surveys, Inventory and listing. Tools and techniques for measured drawings for historic structures (latest techniques like Photogrammetry, Laser Scanning to be introduced).</p> <p>Drawing and presentation for historic structures.</p> <p>Condition assessment of Historic structures: Causes of Decay including climate, biological, natural disasters and manmade causes. Methods for condition assessment.</p>	CO-1, CO- 2	15
IV	<p><b>Degrees of Intervention</b></p> <p>Degrees of Intervention in Historic structures: Prevention, Preservation, Consolidation, Restoration, Rehabilitation, Reproduction and reconstruction. Case studies of the above.</p> <p>Guidelines for Adaptive reuse of historic structures.</p> <p>Research and analyze a historic building, record its</p>	CO-1, CO- 3	9

	issues, and identify the appropriate intervention for conservation		
<b>SECOND INTERNAL TEST</b>			
V	<p><b>Urban Conservation</b></p> <p>Historic precincts: Meaning; character of Historic precincts; various layers in a precinct; Issues in historic precincts; Case studies of historic precincts</p> <p>Concepts of Historic precincts, Cultural Landscapes, Historic Urban Landscapes through case studies</p> <p>Concepts of Imitation, Inspiration, Innovation, Influence, Evolution, New Design through case studies.</p>	CO- 3, CO-4	6

**Reference books:**

1. Bernard M. Fielden- 'Conservation of Historic Buildings' –, Architectural Press, 2003.
2. Jukka Jokilehto, Butterworth - Heinemann – 'A History of Architectural Conservation', 1999.
3. Letellier, Robin, "Recording, Documentation, and Information Management for the Conservation of Heritage Places- Guiding Principles" by Getty Conservation Institute, Los Angeles, 2007.
4. Salvador Munoz-Vinas, "Contemporary Theory of Conservation", Elsevier, 2005.
5. Orbasli, A., "Architectural Conservation: Principles and Practice", Wiley Blackwell. 2007.

**Further reading:**

1. Asian Heritage Management - Contexts, Concerns, and Prospects, 1st Edition, Edited by Kapila D. Silva, Neel Kamal Chapagain, Routledge Contemporary Asia Series, Taylor & Francis Group New York, USA, 2013
2. Robert E. Stipe, 'A Richer Heritage: Historic Preservation in the Twenty-First Century, University of North Carolina Press, 2003.
3. John H. Stubbs and Emily G Makas; Architectural Conservation in Europe and the Americas, John Wiley & Sons, 2011.
4. ICOMOS, ICCROM and Getty websites have resources on conservation theory and practice.

**Course Guidance and Evaluation methods:**

- A case study-based approach is recommended for this course, where students can be encouraged to look at reports, videos or documentaries on various aspects.
- A historic building from the area can be chosen for documentation and condition assessment exercises. The students can also be encouraged to suggest appropriate adaptive re-use of the structure and submit as an assignment at the end of the course.
- Preparing a list of heritage buildings in a historic area within the city can be taken up as an exercise. Students can also be encouraged to plan heritage walks within the historic area.

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ECT 402(2)	CONTEMPORARY ARCHITECTURE AND DESIGN	3-0-0-0	3	2021

### Course Objectives:

- To introduce the large-scale changes from 1960s as context for new thought in architecture and provide exposure to the critiques of modern architecture.
- To introduce architectural approaches across the world from late 20th century
- To provide understanding of the trajectory of post-independence architecture of India till the present.

### Course Outcome

At the end of successful completion of the course students will be able-

Course Outcome	Description of Course Outcome	Prescribed learning level
CO-1	To create an awareness of the spread influence of modern architecture across the world.	Understand, Analyse
CO-2	To understand of architectural production from the 1960s as driven by large scale changes across the world.	Understand, Analyse
CO-3	To create familiarity with contemporary forces and directions in architecture across the world.	Understand, Analyse
CO-4	To evaluate & understand post-independence architecture in India contemporaneous with the rest of the world, along with its own particular influences.	Understand, Analyse and evaluate

### Mark distribution:

Total marks	Continuous internal evaluation marks	End semester examination marks	End semester examination duration
100	40	60	3 hours

**Continuous internal evaluation pattern:**

Attendance	:	4 Marks
Continuous assessment tests (2 nos.)	:	20 Marks
Assignment/Quiz/Course project	:	16 Marks

**End semester examination pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4 marks for each question. Students should answer all the 5 Questions (5x4=20marks). Part B contains 2 questions from each of the 5 modules of which the student should answer any one. Each question carries 8 marks (Total 5x8=40). Part B questions can have subdivisions.

**Syllabus:**

The Postmodern world - critique and theories, Technology and Architecture, Postmodernism and Deconstructivism, Context and Modern Architecture, Contemporary Architecture.

**Course Plan:**

Module	Contents	Course outcome	No. of hours
I	<p><b>The postmodern world - critique and theories</b></p> <p>Introduction to Contemporary architecture, Contemporary architecture in terms of history, culture and geography</p> <p>Postmodern world and multiple world views- to include the realms of literature, economics, technology, culture, society, environment.</p> <p>Poststructuralism, Deconstructivism and Phenomenology</p> <p>Neo rationalism, Semiology.</p> <p>Critique of modernist cities by Jane Jacobs.</p> <p>Theories and works of Christopher Alexander, Charles Jencks, Denise Scott Brown. Aldo Rossi's ideas on the city</p> <p>Writings of Robert Venturi and Umberto Eco</p>	CO-1, CO-2, CO-3	8
II	<p><b>Technology and Architecture</b></p> <p>Urban ideas/works of Soleri</p> <p>Archigram and Metabolism. High Tech architecture, works of Frei Otto, James Stirling, Richard Rogers and Renzo Piano</p>	CO-1, CO-2, CO-3	6

<b>FIRST INTERNAL TEST</b>			
<b>III</b>	<p><b>Postmodernism and deconstructivism</b></p> <p>Postmodernism. Works of Venturi Scott Brown, Michael Graves and Charles Moore. Deconstructivism as new architectural movement.</p> <p>Ideas and works of Peter Eisenman, Zaha Hadid, Frank Gehry, Daniel Libeskind, Bernard Tschumi.</p>	CO-1, CO-2, CO-3	9
<b>IV</b>	<p><b>Context and modern architecture</b></p> <p>Critical Regionalism as a category of architecture. Ideas and works of Hassan Fathy, Tadao Ando, Geoffrey Bawa, Luis Barragan, Álvaro Siza. Evolution of the architecture of Anant Raje, B V Doshi, Charles Correa, Raj Rewal. Philosophy and works of Nari Gandhi, Laurie Baker. Outline of contextual approaches in Indian architecture after the 60s.</p>	CO-1, CO-2, CO-3, CO-4	10
<b>SECOND INTERNAL TEST</b>			
<b>V</b>	<p><b>Recent developments in contemporary Architecture</b></p> <p>Nature of contemporary society. Architectural responses and movements today -parametric design and digital processes, sustainability, globalization, phenomenology, complexity.</p> <p>Women in contemporary architecture practice- Anne Lacaton, Yvonne Farrell, Shelley McNamara, Carme Pigem, Kazuyo Sejima, Zaha Hadid</p> <p>Bjarke Ingels and BIG, OMA and Rem Koolhaas, Steven Holl, William McDonough, Ken Yeang, Peter Zumthor, Juhani Pallasmaa, Glenn Murcutt</p> <p>Outline of contemporary architecture in the non-Western world. Outline of post 1990s architecture of India.</p>	CO-1, CO-2, CO-3, CO-4	12
<b>END SEMESTER EXAMINATION</b>			

### **Text Books:**

1. Bahga, Bahga and Bahga, "Modern Architecture in India", Galgotia Pub. Co, 1993.
2. Kenneth Frampton, 'Modern Architecture: A Critical History', Thames and Hudson, London, 2007.
3. William J. Curtis, 'Modern Architecture since 1900', Phaidon Press, 1996.
4. Diane Ghirardo , 'Architecture after Modernism', Thames and Hudson, London, 1996.
5. Elie G. Haddad, David Rifkind, 'A Critical History of Contemporary Architecture: 1960-2010', Routledge, 2016.
6. Bhatt and Scriver, 'Contemporary Indian Architecture- After the Masters', Grantha Corporation, 1999.
7. Miki Desai et. al., 'Architecture and Independence', Oxford University Press, 2000.
8. Harry Francis Malgrave and David Goodman, 'An Introduction to Architectural Theory 1968 to the Present', Wiley Blackwell, 2011.
9. Rahul Mehrotra, 'Architecture in India since 1990', Hatje Cantz, 2011.
10. Morgan, Ann Lee & Taylor Colin, "Contemporary Architecture", 2nd Edition, St.James Press, 2009.

### **Reference Books:**

1. Jane Jacobs, 'Deaths and Life of Great American Cities', Modern Library, 2011.
2. Robert Venturi, 'Complexity and Contradiction in Architecture', 1977.
3. Kate Nesbitt, Ed, 'Theorising a New Agenda for Architecture', Princeton University Press, 1996.
4. Jagan Shah, 'Contemporary Indian Architecture', Lustre, 2008.
5. Francis D. K. Ching, Mark M. Jarzombek, Vikramaditya Prakash, 'A Global History of Architecture', John Wiley and Sons, 2017.
6. K.R.Sitalakshmi, 'Architecture of Indian Modernity- The Case of Madras', Palaniappa Brothers, 2015.
7. Bipin Chandra et al, 'India After Independence', Penguin, 2017.

### **Course materials, Guidance and Evaluation methods:**

- Books, research papers, e-books, videos etc. to be provided to the students by the faculty and ensure that they read it, by initiating discussions.
- Book Reviews are to be part of assignments.
- Students are to be encouraged to watch movies and documentaries which give information about culture and architecture and prepare reviews/ reports and have discussions in class.
- Each student should be encouraged to have a sketchbook with sketches of all the topics covered.

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
<b>ECT402(3)</b>	<b>GREEN BUILDINGS AND RATING SYSTEM</b>	<b>3-0-0-0</b>	<b>3</b>	<b>2021</b>

### Course Objectives

- To provide students with the knowledge and skills necessary to design and construct sustainable buildings.
- To create awareness in providing a comprehensive assessment of the environmental performance of buildings, thus limiting the negative impact on the environment.
- To inform about the need to use alternative sources of energy in view of the depleting resources and climate change and get awareness on rating system.

### Course Outcome

After the completion of the course, the students will be able to

Course Outcome	Description of Course Outcome	Prescribed Learning Level
CO-1	Define and explain the key concepts related to green buildings and rating systems	Understanding
CO-2	Analyze the environmental, economic, and social benefits of green buildings.	Analysing
CO-3	Critically assess emerging and existing green building technologies and practices with respect to their suitability for different contexts	Analysing and applying
CO-4	Evaluate the performance of an existing building using green rating systems.	Analysing and evaluating

## Mark Distribution

<b>Total Marks</b>	<b>Continuous Internal Evaluation Marks</b>	<b>End Semester Examination Marks</b>	<b>End Semester Examination Duration</b>
<b>100</b>	<b>40</b>	<b>60</b>	<b>3 Hours</b>

### Continuous internal evaluation pattern:

Attendance	:	4 Marks
Continuous assessment tests (2 nos.)	:	20 Marks
Assignment/Quiz/Course project	:	16 Marks

### End Semester Examination Pattern

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4marks for each question. Students should answer all the questions (5x4= 20marks). Part B contains 2 questions from each of the 5 modules, of which the student should answer any one. Each question carries 8marks (Total 5x8=40). Part B questions can have subdivisions.

### Syllabus

Introduction to Green Buildings, Concepts related to green buildings, Green Building Rating Systems, Application of Rating Systems, Application of Rating Systems

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of Hours</b>
I	<b>Introduction to Green Buildings:</b> Introduction: Why Green Buildings- Climate Change, Energy Demand, Sustainable Development Goals, India's National Action Plan on Climate Change (NAPCC); Convention on Climate Change (COP) 25 to 28	CO-1	5
II	<b>Concepts related to green buildings:</b> Conceptual Understanding of Embodied energy and embodied carbon, Life cycle cost, Cradle to cradle design	CO-2, CO-3	5

	Practical application of Context-specific resource mapping of environmentally preferable materials and construction techniques		
<b>FIRST INTERNAL TEST</b>			
III	<b>Green Building Rating Systems:</b> Introduction to green rating systems and certifications: Need and use of green rating systems - Structure of the rating systems- Design parameters that affect green building - LEED, IGBC, GRIHA	CO-3, CO-4	10
IV	<b>Application of Rating Systems:</b> Overview of Energy Conservation Building Code (ECBC) Live/Literature case study of an existing green-rated building from the Indian Context and comparative analysis based on ECBC and LEED/GRIHA	CO-2, CO-3	10
<b>SECOND INTERNAL TEST</b>			
V	<b>Green Building Design Project:</b> Retrofit of the chosen field study case- Green Retrofit solutions based on cost-benefit analysis using an energy modelling software.  Each Student can choose the research areas listed and develop retrofit solutions - Resource Mapping; Sustainable Site Design and Management; Rainwater Management; Water Efficiency; Energy Efficiency; Indoor Environmental Quality, Waste Management; Lifecycle Analysis; Building Modelling and energy Analysis; Cost Benefit Analysis	CO-3, CO-4	15
<b>END SEMESTER EXAMINATION</b>			

## References

1. Arvind Krishnan: Climate responsive architecture: a design handbook for energy efficient buildings, Tata McGraw-Hill Pub. Co, 2001.
2. Energy conservation building codes – BEE star rating systems
3. Majumdar M, 'Energy efficient building in India', TERI Press, 2000.
4. TERI, Sustainable design manual – Volume 2, TERI Press, 2004.
5. Ljubomir Jankovic, Designing Zero Carbon Buildings Using Dynamic Simulation Methods, Taylor & Francis, 2017.
6. LEED Reference Guide for Building Design and Construction, Edition by U.S. Green Building Council, 2023.
7. BREEAM Manual SD207: Code for Sustainable Homes, Edition by BRE Global, 2023.
8. GRIHA Version 5: Green Rating for Integrated Habitat Assessment, Edition by GRIHA Council, 2023.
9. Francis D. K. Ching, Ian M. Shapiro ,”Green Building Illustrated” (PDF), 2013.
10. McDonough, W. and M. Braungart, “Cradle to Cradle: Remaking the Way We Make Things”, New York: Farrar, Straus and Giroux, 2002.
11. Kibert, C, “Sustainable Construction: Green Building Design and Delivery”, Hoboken, NJ: John Wiley & Sons, 2007.
12. Ken Yeang, “Building for Sustainability: A Guide to Green Design, Construction, and Operation”, 2009.
13. Linda Reeder, “Green Buildings and Sustainable Environments: Assessment, Strategies, and Examples” John Wiley & Sons, Inc , 2010.

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
<b>ECT402(4)</b>	<b>DISASTER MITIGATION, MANAGEMENT AND RECOVERY</b>	<b>3-0-0-0</b>	<b>3</b>	<b>2021</b>

### Course Objectives

- To make the students aware about various disasters and its impacts
- To understand the relevance of disaster preparedness and management
- To familiarize the strategies for recovery and rehabilitation

### Course Outcome

At the end of successful completion of the course students will be able

Course outcome	Description of course outcome	Prescribed learning level
CO1	To define terms associated with Disaster management	Understand
CO2	To identify various phases of disaster management and current practices in building construction	Understand and evaluate
CO3	To analyse disaster mitigation strategies and preventive measures	Understand and Analyse
CO4	To assess Disaster preparedness and understand tools for prediction	Understand, Analyse and Evaluate

### Mark Distribution

Total Marks	Continuous internal evaluation marks	End semester examination marks	End semester examination duration
100	40	60	3 hours

### Continuous internal evaluation pattern:

Attendance : 4 Marks

Continuous assessment tests (2 nos.) : 20 Marks

Assignment/Quiz/Course project : 16 Marks

**End semester examination pattern:**

There will be two parts; Part A and B. Part A contains 5 questions with 1 question from each module, having 4marks for each question. Students should answer all the questions (5x4=20marks). Part B contains 2 questions from each of the 5 modules, of which the student should answer any one. Each question carries 8marks (Total 5x8=40). Part B questions can have subdivisions.

**Syllabus**

Definition and typology of disasters, Behaviour of structures during disasters and measures, Disaster Mitigation and Management, Disaster Response & Recovery, Disaster Preparedness and Prediction

<b>Module</b>	<b>Contents</b>	<b>Course outcome</b>	<b>No. of Hours</b>
I	<b>Definition and typology of disasters</b> <i>Natural Disasters:</i> Earthquakes, Cyclones, Floods, Drought, Landslides, Land subsidence, Volcanoes, Tsunami, Storm, Hurricane, Avalanches, Global climate extremes. <i>Man made disasters:</i> Terrorism, Toxic waste disposal, Oil spills, nuclear explosion, Leakage of gas and radiations, Forest fires, Bio hazards, building structural collapse Cause-and- effect relationships between various human, natural and climatic factors that impinge upon ecological systems and their linkages. Understanding of global climate change and impacts with respect to rural/urban communities; increased risk/vulnerabilities.	CO1	5
II	<b>Behaviour of structures during disasters and measures</b> General planning/design considerations, Norms and Standards for wind storms & cyclones; Design wind speed; Coastal zoning regulation for construction & reconstruction phase in the coastal areas; innovative construction materials & techniques; traditional construction techniques in coastal	CO2, CO3	10

	<p>areas.</p> <p><i>Cyclonic retrofitting</i> - strengthening of structures and adaptive sustainable reconstruction; Life–line structures such as temporary cyclone shelter.</p> <p><i>Seismic retrofitting</i> - Weakness in existing buildings, concepts in repair, restoration and seismic strengthening.</p> <p>Various types and construction details - Foundations, retaining walls, plinth fill, flooring, walls, openings, roofs and boundary walls. Innovative construction materials and techniques, traditional regional practices</p>		
<b>FIRST INTERNAL TEST</b>			
III	<p><b>Disaster Mitigation and Management</b></p> <p>Basic principles of disaster management, Disaster management cycle, Disaster management Policy, Disaster Management Act 2005</p> <p>Role of International, national and state level bodies in disaster management, Role of NGOs in disaster management</p> <p>Disaster Mitigation measures- Structural and Nonstructural mitigation measures, Nature based solutions (NbS) for Disaster Risk Reduction</p>	CO3 CO4	10
IV	<p><b>Disaster Response &amp; Recovery</b></p> <p>Response and recovery for various typology of disasters, Search and Rescue operations, Evacuation and relief measures</p> <p>Restoration of critical infrastructure, Rehabilitation &amp; Reconstruction, Post Disaster Damage and Need Assessment, Post Disaster Recovery and rehabilitation of 2004 Indian Ocean Tsunami and 2018 Kerala Floods</p>	CO3 CO4	10
<b>SECOND INTERNAL TEST</b>			
	<p><b>Disaster Preparedness and Prediction</b></p> <p>Forecasting and Warning of disasters: Early Warning System (EWS) for earthquake, flood and tsunami.</p> <p>Usage of Remote sensing, GIS, Artificial Intelligence, drones, Mobile Apps in Disaster preparedness, prediction</p>		10

V	and monitoring. Mini Project on disaster risk assessment and preparedness for disaster with reference to Kerala state	CO4 CO5	
<b>END SEMESTER EXAMINATION</b>			

## References

1. Pradeep K. Goyal, Anil Kumar Gupta, "Disaster Management", All India Council for Technical Education (AICTE), 2023.
2. Rajib Shaw, R.R. Krishnamurthy, 'Disaster Management Global Challenges and Local Solutions', Universities Press (India) Private Limited, New Delhi, 2009.
3. Bruce C.Glavovic, Mick Kelly, Robert Kay, Ailbhe Travers, 'Climate Change and the Coast- Building Resilient Communities', CRC Press, Taylor & Francis Group, 2015.
4. Rajib Shaw, 'Community based Disaster Risk Reduction, Volume 10', Emerald Publishing, March 2012.
5. Damon Coppola, 'Introduction to International Disaster Management', Butterworth Heinemann, September 2020.
6. David A.McEntire, 'Disaster Response and Recovery- Strategies and tactics for Resilience', third edition, John Wiley & Sons, 2022.
7. Brenda D.Philips, David M.Neal, Gary R.Webb, 'Introduction to Emergency Management and Disaster Science', Taylor & Francis Group, December 2021.
8. Himanshu Grover, Tanveer Islam, Jean Slick, 'Case studies in Disaster Mitigation and Prevention', first edition, Elsevier, 2022.
9. State Action Plan on Climate Change (2023-2030), Directorate of Environment and Climate Change, Department of Environment, Government of India, 2022.
10. Agarwal, P. and Shrikhande, M. Earthquake Resistant Design of Structures. New Delhi: PHI Learning, 2009.
11. Singh, P. P. and Sharma, S. Modern dictionary of natural disaster. Deep & Deep Publications, 2006.
12. Simiu E. and Scanlan R. H. Wind Effects on Structures-Fundamentals and Applications to Design. 3rd Edn., John Wiley, 1996.
13. Sinha, P. C. Disaster Mitigation, preparedness, recovery and Response. New Delhi: SBS Publishers, 2006.
14. Talwar, A. K. and Juneja, S. Cyclone Disaster Management. Commonwealth Publishers, 2009.
15. Taranath, B. S. Wind and Earthquake Resistant Buildings: Structural Analysis and

Design. CRC Press, 2004.

16. U.N.D.P. Reducing Disaster Risk: A Challenge for Development. New York : UNDP, 2004.
17. World Bank. Handbook for Reconstructing after Natural Disasters,2009.
18. Disaster Management Act, 2005
19. National Policy on Disaster Management,2009
20. National Disaster Management Plan, 2019
21. Kerala State Disaster management policy,2010
22. Kerala State Disaster Management Plan,2016