



Department of Architecture

**Course:** ARC324, Disaster Resilient Buildings

**Instructors:** Dr. Nagaraju Kaja

**Class:** III Yr B.Arch VI Sem AY2022-23

**Internal Assessment:** 50

**External Theory Exam:** 50

**Total Marks:** 100

**Credits:** 3

**Contact Periods/ week:** 03 periods

**Time Table:** Wednesday (Section-A)

**Attendance:** Min 75%     **Min. Passing Marks:** 40% each in Internal & External Assessment, 40% in Aggregate

**Objective:**

To equip learners with skills and improve their understanding of Disaster Risk Reduction and Climate Change Adaptation concepts and ultimately lead to increased communities' resilience to common hazards such as earthquake, floods etc.

**Outcome of the Course:**

Students completing this course will be able to:

1. Utilize the knowledge of built resilience and traditional systems gained through study of various case studies while designing the varied scale projects in academics and Profession.
2. Apply the knowledge about varied Climate responsive approaches.

**LECTURE PLAN**

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	Remarks
1	04.01.2024	Introduction to the course - Disaster Resilient Buildings. Discussion on the objectives, scope etc. Unit I: General Introduction of disaster and resilient	Lecture and Discussion
2	11.01.2024	<b>Unit I: General Introduction of disaster and resilience</b> Brief introduction to different types of natural disaster, Occurrence of disaster in different climatic and geographical regions, hazard (earthquake and cyclone) map of the world and India.	Lecture and Discussion - Introduction of Assignment I & III
3	18.01.2024	<b>Unit II Floods</b> Problem of Floods in India; Causes of Floods; Elements at Risk of Flood Damage; Categories of Damage; Flood Mitigation Measures; Flood Zoning;	Lecture and Discussion
4	25.01.2024	<b>Unit II Floods</b> Problem of Floods in India; Causes of Floods; Elements at Risk of Flood Damage; Categories of Damage; Flood Mitigation Measures; Flood Zoning; General and Specific Protection of Habitat/Buildings from Flood Damage. Case studies	Lecture and Discussion
5	01.02.2024	<b>Unit III Earthquake</b> Causes of earthquake, Earthquake effects – On ground, soil rupture, liquefaction, landslides. Behaviour of various types of buildings, structures, collapse patterns, non-structural elements like services, fixtures, mountings.	Lecture and Discussion & Assignment Discussion
6	08.02.2024	<b>Unit III Earthquake</b> Seismic retrofitting- Weakness in existing buildings, aging, concepts in repair, restoration and seismic strengthening.	Lecture and Discussion
7	15.02.2024	<i>Field Work</i>	Lecture and Discussion
8	22.02.2024	<b>Unit III Earthquake</b> Traditional regional responses; Computational investigation techniques.	Lecture and Discussion
9	29.02.2024	<b>MID Semester Assessment</b>	MCQ - Test

10	07.03.2024	<b>Unit IV Cyclone</b> Climate change and its impact on tropical cyclone, Nature of cyclonic wind, velocities and pressure, Cyclone effects and Storm surge.	Lecture and Discussion - Climatology Lab Visit - Instruments for measuring Climate Data Demonstration
11	14.03.2024	<b>Unit IV Cyclone</b> General planning/design considerations under wind storms & cyclones Cyclonic retrofitting, strengthening of structures and adaptive sustainable reconstruction and temporary cyclone shelter.	Lecture and Discussion - Climatology Lab Visit - Instruments for measuring Climate Data Demonstration
12	21.03.2024	<b>Unit V Traditional and Indigenous building system</b> Climate Responsive approaches, Introduction to varied traditional and Indigenous building system and technology to mitigate the varied natural hazards by reviewing examples of different regions.	Lecture and Discussion & Assignment Discussion
13	28.03.2024	<b>Unit V Traditional and Indigenous building system</b> Case studies.	Lecture and Discussion & Assignment Discussion
14	04.04.2024	Students Presentation (Assessment Presentation)	Students Presentation
15	11.04.2024	Students Presentation (Assessment Presentation)	Students Presentation
16	18.04.2024	Students Presentation (Assessment Presentation)	Students Presentation

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination - MCQ	20
3	Third stage: Assessment –3	15
	Total	50

**References:**

1. Vulnerability Atlas of India, 2006, Building Materials & Technology Promotion Council (BMTPC),
2. Ministry of Housing & Urban Poverty Alleviation, Government of India.
3. Judy, L. B. (2012). Climate change, Disaster Risk and the urban poor – cities building resilience for a changing World. Washington DC : The World Bank.
4. Lee, B. Ed. (2008). Hazards and the Built Environment: Attaining Built-In Resilience. Oxon : Taylor and Francis
5. Natural Disaster Management Guidelines – Requirement of Flood, National Disaster
6. Management Authority (NDMA), 2008
7. Singh, P. P. and Sharma, S. (2006). Modern dictionary of natural disaster. Deep & Deep Publications.
8. Taranath, B. S. (2004). Wind and Earthquake Resistant Buildings: Structural Analysis and Design. CRC Press.
9. Thomas, F. (2013). Designing to avoid disaster: The Nature of Fracture-Critical Design. London : Routledge.
10. Pelling, M. (2003). The Vulnerability of Cities: Social Resilience & Natural Disaster. London : Earthscan.
11. U.N.D.P. (2004). Reducing Disaster Risk: A Challenge for Development. New York : UNDP.
12. World Bank. (2009). Handbook for Reconstructing after Natural Disasters.

**Course Instructors:**

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**Head of Department:**

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