

	School of Planning and Architecture: Vijayawada	
	(An institution of National Importance under the Ministry of Education, Govt. of India)	
	Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India	
	Department of Architecture	
Course:	ARC 324 - Disaster Resilient Buildings	Class: B. Arch 3th Year VI - Semester 2024-25
Instructors:	Dr. Khuplianlam Tunngung	Internal Assessment: 50
		External Theory Exam: 50
Contact Periods/ week: 03 periods. (55 min each)		Total Marks: 100
Time Table:	Wednesday (03 periods)	Credits: 3 (2+1)

Objective: The course is designed to provide an overview of all kinds of natural disaster and related resilient buildings. 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 droughts, floods etc. Emphasis is given on contemporary as well as traditional knowledge system with respect to varied disaster typologies.

Week	Lecture Plan	Remarks/Topic of Assignment
Week 1	General introduction to Disasters and Resiliency Unit I: General Introduction of disaster and resilience:	Lecture + Tutorial/Practical
Week 2	Unit I: General Introduction of disaster and resilience: 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 + Tutorial/Practical

Week 3	Unit II - Floods: Problem of Floods in India; Causes of Floods; Elements at Risk of Flood Damage; Categories of Damage; Flood Mitigation Measures;	Lecture + Tutorial/Practical
Week 4	Unit II - Floods: Flood Zoning; General and Specific Protection of Habitat/Buildings from Flood Damage. Case studies	Lecture + Tutorial/Practical
Week 5	Unit III: Earthquake: Causes of earthquake, Earthquake effects – On ground, soil rupture, liquefaction, landslides.	Lecture + Tutorial/Practical
Week 6	Unit III: Earthquake: Behaviour of various types of buildings, structures, collapse patterns, non-structural elements like services, fixtures, mountings. Seismic retrofitting- Weakness in existing buildings, aging, concepts in repair, restoration and seismic strengthening.	Lecture + Tutorial/Practical
Week 7	Assessments	Seminar/ Presentations/ Test
Week 8	Unit III: Earthquake: Seismic retrofitting- Weakness in existing buildings, aging, concepts in repair, restoration and seismic strengthening.	Lecture + Tutorial/Practical
Week 9	Unit IV Cyclone: Climate change and its impact on tropical cyclone, Nature of cyclonic wind, velocities and pressure, Cyclone effects and Storm surge.	Lecture + Tutorial/Practical
Week 10	Unit IV Cyclone: General planning/design considerations under wind storms & cyclones. Cyclonic retrofitting, strengthening of structures and adaptive sustainable reconstruction and temporary cyclone shelter.	Lecture + Tutorial/Practical
Week 11	Unit IV Cyclone: Basic wind engineering, aerodynamics of bluff bodies, vortex shedding and associated unsteadiness along and across wind forces. Lab: Wind tunnel testing, its salient features. Introduction to Computational fluid dynamics.	Lecture + Tutorial/Practical
Week 12	Unit IV Cyclone: Wind effects on buildings, towers, glass panels etc, & wind resistant features in design. Codal Provisions, design wind speed, pressure coefficients.	Lecture + Tutorial/Practical

Week 13	Unit IV Cyclone: Coastal zoning regulation for construction & reconstruction phase in the coastal areas, innovative construction material & techniques, traditional construction techniques in coastal areas. Learning from case studies.	Lecture + Tutorial/Practical
Week 14	Unit V: Traditional and Indigenous building system: 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 + Tutorial/Practical
Week 15	Unit V: Traditional and Indigenous building system: 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 + Tutorial/Practical
Week 16	Unit I to V - Assessments Make-up classes, if any, may be arranged or accommodated in these weeks.	Seminar/ Presentations/ Test

S. No.	Stages of Evaluation	Weightage
1	Assessment (5 Marks/Unit)	10
2	Mid Semester Examination	20
3	Assessment (5 Marks/Unit)	15
4	Overall class performance	5
5	External Assessment	50
	Total	100

Outcomes: Students completing this course will be equipped with:

1. Understanding and awareness of natural disaster and related resilient buildings.
2. Improve understanding of disaster risk reduction and climate change adaptation concepts.
3. Appreciation of communities' resilience to common hazards such as droughts, floods etc.
4. Knowledge on contemporary as well as traditional knowledge system with respect to varied disaster typologies.

Course Instructor(s):
sd/-
(Dr. Khuplianlam Tungnung)

Head of Department:
sd/-
(Dr. Srinivas Daketi)

NOTES:

1. In cases where specified units or chapters are not completed within the stipulated time, it will carry forward to the next classes and adjustments will be made accordingly, as required.
2. Make-up classes, if any, may be arranged or accommodated in existing scheduled classes or other appropriate time.