INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

COMPUTER SCIENCE ENGINEERING

COURSE DESCRIPTOR

Course Title	**DISASTER MANAGEMENT**				
Course Code	ACE551				
Programme	B.Tech				
Semester	VI	CSE / IT / ECE / EEE / ME			
Course Type	Open Elective-I				
Regulation	IARE - R16				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	-	3	-	-
Chief Coordinator	Mr. Gude Ramakrishna, AssociateProfessor				
Course Faculty	Mr. Gude Ramakrishna, Associate Professor, CE Mr. S.Siva Ramaskrishna, Assistant Professor, CE Mr. S.Selva Prakash, Assistant Professor, CE Mr. G.N.V.Sai Teja, Assistant Professor, CE Ms. N. Sri Ramya, Assistant Professor, CE Mr..J.Tirupathi, Assistant Professor, CSE				

I. COURSE OVERVIEW:

This course is intended to provide fundamental understanding of different aspects of disaster management. It will expose the students to the concept and functions of disaster management and to build competencies of disaster management professionals and development practitioners for effective supporting environment as put by the government in legislative manner. It would also provide basic knowledge, skills pertaining to planning, organizing and decision-making process for disaster risk reduction.

II. COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites	Credits
-	-	-	-	-

III. MARKSDISTRIBUTION:

Subject	SEE Examination	CIA Examination	Total Marks
Disaster Management	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✘	Chalk & Talk	✔	Quiz	✔	Assignments	✘	MOOCs
✔	LCD / PPT	✔	Seminars	✘	Mini Project	✔	Videos
✘	Open Ended Experiments						

V. EVALUATION METHODOLOGY:

The course will be evaluated for a total of 100 marks, with 30 marks for Continuous Internal Assessment (CIA) and 70 marks for Semester End Examination (SEE). Out of 30 marks allotted for CIA during the semester, marks are awarded by taking average of two CIA examinations or the marks scored in the make-up examination.

Semester End Examination (SEE): The SEE is conducted for 70 marks of 3 hours duration. The syllabus for the theory courses is divided into fiveUnits and each Unit carries equal weightage in terms of marks distribution. The question paper pattern is as follows. Two full questions with "either" or "choice" will be drawn from each Unit. Each question carries 14 marks. There could be a maximum of two sub divisions in a question.

The emphasis on the questions is broadly based on the following criteria:

50 %	To test the objectiveness of the concept.
50 %	To test the analytical skill of the concept OR to test the application skill of the concept.

Continuous Internal Examination (CIE):

CIA is conducted for a total of 30 marks (Table 1), with 25 marks for Continuous Internal Examination (CIE), 05 marks for Quiz / Alternative Assessment Tool (AAT).

Table 1: Assessment pattern for CIA

Component	Theory		Total Marks
Type of Assessment	CIE Exam	Quiz/AAT	
CIA Marks	25	05	30

Continuous Internal Examination (CIE):
Two CIE exams shall be conducted at the end of the 8th and 16th week of the semester respectively. The CIE exam is conducted for 25 marks of 2 hours duration consisting of two parts. Part–A shall have five compulsory questions of one mark each. In part–B, four out of five questions have to be answered where, each question carries 5 marks. Marks are awarded by taking average of marks scored in two CIE exams.

Quiz - Online Examination:
Two Quiz exams shall be online examination consisting of 25 multiple choice questions and are to be answered by choosing the correct answer from a given set of choices (commonly four). Such a question paper shall be useful in testing of knowledge, skills, application, analysis, evaluation and understanding of the students. Marks shall be awarded considering the average of two quiz examinations for every course.

Alternative Assessment Tool (AAT):
This AAT enables faculty to design own assessment patterns during the CIA. The AAT converts the classroom into an effective learning centre. The AAT may include tutorial hours/classes, seminars, assignments, term paper, open ended experiments, METE (Modeling and Experimental Tools in Engineering), five minutes video, MOOCs etc.

VI. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes (POs)		Strength	Proficiency assessed by
PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	3	Presentation on real world problem
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	3	Lectures
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	2	Discussion of real-time applications

3 = High; 2 = Medium; 1 = Low

VII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes (PSOs)		Strength	Proficiency assessed by
PSO 1	**Problem Solving**: Exploit the knowledge of high voltage engineering in collaboration with power systems in innovative, dynamic and challenging environment, for the research based team work.	-	-
PSO 2	**Professional Skills:** Identify the scientific theories, ideas, methodologies and the new cuttingedge technologies in renewable energy engineering, and use this erudition in their professional development and gain sufficient competence to solve the current and future energy problems universally.	2	Discussion of real-time applications

Program Specific Outcomes (PSOs)		Strength	Proficiency assessed by
PSO 3	**Modern Tools in Electrical Engineering:** Comprehend the technologies like PLC, PMC, process controllers, transducers and HMI and design, install, test, maintain power systems and industrial applications.	2	Group discussion

3 = High; 2 = Medium; 1 = Low

VIII. COURSE OBJECTIVES :

The course should enable the students to:	
I	Identify the major disaster types and develop an understanding of modern disaster management.
II	Recognize and develop awareness of the chronological phases of natural disaster response and refugee relief operations.
III	Understand the key concepts of disaster management related to development and the relationship of different disaster management activities.
IV	Categorize the organizations that are involved in natural disaster assistance and relief system.

IX. COURSE OUTCOMES (COs):

COs	Course Outcome	CLOs	Course Learning Outcome
CO 1	Identifyenvironmental hazards and disasters, meaning of environmental stress; concept of environmental hazards.	CLO 1	Integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels, even when limited information is available.
		CLO 2	Analyze and evaluate the environmental, social, cultural, economic, legal and organizational Aspects influencing vulnerabilities and capacities to face disasters. and to know about different types of environmental hazards
		CLO 3	Obtain knowledge on different types of natural and man- made disasters. Work theoretically and practically in the processes of disaster management (disaster risk reduction, response, and recovery)
		CLO 4	Describe endogenous and exogenous hazards their harmful effects to the environment. Case studies of India
CO 2	Describe types of environmental hazards and disasters: Natural hazards and disasters,	CLO 5	Analyze, and communicate information on risks, relief needs and order to formulate strategies for mitigation.
		CLO 6	Understand the Mitigation and control measures of exogenous hazards.
		CLO 7	Understand different approaches of different phases
CO 3	Describe endogenous hazards, volcanic eruption, earthquakes, landslides, volcanic hazards/ disasters, causes and distribution of volcanoes, Analyse the earthquake	CLO 8	Capacity to analyze and evaluate research work on the field of emergencies and disaster.
		CLO 9	Demonstrating insight into the potential and limitations of science, its role in society and people's responsibility for how it is used. And emerging approaches of disasters.

COs	Course Outcome	CLOs	Course Learning Outcome
	hazards, hazardous effects of, earthquakes, earthquake hazards in India, human adjustment, perception and mitigation of earthquake.	CLO 10	Analyze the future scenarios with the ability to clearly present and discuss their conclusions and the knowledge and arguments.
CO 4	Understand exogenous hazards/ disasters, infrequent events, cumulative atmospheric hazards/ disasters; Infrequent events: Cyclones , lightning , hailstorms; Cumulative atmospheric hazards/ disasters: Floods, droughts, cold waves, heat waves floods; Causes of floods, flood hazards India.	CLO 11	Understand integrated approach for disaster preparedness, mitigation & awareness; Mitigation.
		CLO 12	Understand different types of institution for disaster mitigation and management
		CLO 13	Design and perform research on the different aspects of the emergencies and disaster.
		CLO 14	Relate their interconnections, particularly in the field of the Public Health aspects of the disasters.
		CLO 15	Understand different approaches to prevent disasters.
CO 5	UnderstandEmerging approaches in disaster management i.e pre, disaster stage (preparedness), emergency stage and post disaster stage, rehabilitation.	CLO 16	Understanding the race process of dealing with work place hazards.
		CLO 17	Identification of natural calamities that tends to hazards and disasters.

X. COURSE LEARNING OUTCOMES (CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
ACE551.01	CLO 1	Integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels, even when limited information is available.	PO 1	3
ACE551.02	CLO 2	Analyze and evaluate the environmental, social, cultural, economic, legal and organizationalAspects influencing vulnerabilities and capacities to face disasters. and to know about different types of environmental hazards	PO 1	3
ACE551.03	CLO 3	Obtain knowledge on different types of natural and man- made disasters. Work theoretically and practically in the processes of disaster management (disaster risk reduction, response, and recovery)	PO 6	2
ACE551.04	CLO 4	Describe endogenous and exogenous hazards their harmful effects to the environment. Case studies of India	PO 6	2
ACE551.05	CLO 5	Analyze, and communicate information on risks, relief needs and order to formulate strategies for mitigation.	PO1, PO3	3
ACE551.06	CLO 6	Understand the Mitigation and control measures of exogenous hazards.	PO1, PO3	3
ACE551.07	CLO 7	Understand different approaches of different phases	PO 1	3

CLO Code	CLO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
ACE551.08	CLO 8	Capacity to analyze and evaluate research work on the field of emergencies and disaster.	PO 6	2
ACE551.09	CLO 9	Demonstrating insight into the potential and limitations of science, its role in society and people's responsibility for how it is used. And emerging approaches of disasters.	PO 6	2
ACE551.10	CLO 10	Analyze the future scenarios with the ability to clearly present and discuss their conclusionsand the knowledge and arguments.	PO 1	3
ACE551.11	CLO 11	Understand integrated approach for disaster preparedness, mitigation & awareness;Mitigation.	PO3, PO6	3
ACE551.12	CLO 12	Understand different types of institution for disaster mitigation and management	PO6	3
ACE551.13	CLO 13	Design and perform research on the different aspects of the emergencies and disaster.	PO1, PO3,PO6	3
ACE551.14	CLO 14	Relate their interconnections, particularly in the field of the Public Health aspects of the disasters.	PO1, PO3,PO6	3
ACE551.15	CLO 15	Understand different approaches to prevent disasters.	PO 3	2
ACE551.16	CLO 16	Understanding the race process of dealing with work place hazards.	PO 6	2
ACE551.17	CLO 17	Obtain knowledge on identification of natural calamities that tends to hazards and disasters.	PO1, PO 3	3

3= High; 2 = Medium; 1 = Low

XI. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES

Course Outcomes (COs)	Program Outcomes (POs)			Program Specific Outcomes (PSOs)	
	PO 1	PO 3	PO 6	PSO2	PSO3
CO 1	3	3	2		2
CO 2	3	3	2	2	
CO 3	2	2	3		2
CO 4	3	3	2	2	2
CO 5	2	3	2		

XII. MAPPING COURSE LEARNING OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

Course Learning Outcomes (CLOs)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO 1	3														2
CLO 2	3													2	

Course Learning Outcomes (CLOs)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO 3	2					3								2	
CLO 4	2		2			3									2
CLO 5	2		2											2	
CLO 6	2		2												2
CLO 7	2														
CLO 8	3		3			2									
CLO 9	2		2			2								2	
CLO 10	1														2
CLO 11			3			3								2	
CLO 12	3		3			3									
CLO 13	2					2									
CLO 14	2		2			2									2
CLO 15			2			2									
CLO 16			2												2
CLO 17	2		2												

XIII. ASSESSMENT METHODOLOGIES–DIRECT

CIE Exams	PO1, PO3, PO6, PSO2, PSO3	SEE Exams	PO1, PO3, PO6, PSO2, PSO3	Assignments	PO1, PO3, PO6, PSO2, PSO3	Seminars	-
Laboratory Practices	-	Student Viva	-	Mini Project	-	Certification	-
Term Paper	-						

XIV. ASSESSMENT METHODOLOGIES-INDIRECT

✔	Early Semester Feedback	✔	End Semester OBE Feedback
✘	Assessment of Mini Projects by Experts		

XV. SYLLABUS

Unit–I	ENVIRONMENTAL HAZARDS AND DISASTERS
Environmental hazards and disasters:Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept ofEnvironmental Hazards, Environmental stress &Environmental Disasters. Different approaches & relation with human Ecology.Landscape Approach - Ecosystem Approach-Perception approach- Human ecology & itsapplication in geographical researches.	
Unit–II	**TYPES OF ENVIRONMENTAL HAZARDS AND DISASTERS**
Types of environmental hazards and disasters: Natural hazards and disasters, man induced hazards anddisasters, natural hazards, planetary hazards/ disasters, extra planetary hazards/ disasters, planetary hazards, endogenous hazards, exogenous hazards.	
Unit – III	**ENDOGENOUS HAZARDS**
Endogenous Hazards - Volcanic Eruption Earthquakes - Landslides - Volcanic Hazards/ Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions. Earthquake Hazards/ disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - Earthquake Hazards in India - Human adjustment, perception & mitigation of earthquake.	
Unit – IV	**EXOGENOUS HAZARDS AND DISASTERS**
Exogenous hazards/ disasters, infrequent events, cumulative atmospheric hazards/ disasters; Infrequent events: Cyclones , lightning , hailstorms; Cyclones: Tropical cyclones and local storms, destruction by tropical cyclones and local storms (causes, distribution human adjustment, perception and mitigation); Cumulative atmospheric hazards/ disasters: Floods, droughts, cold waves, heat waves floods; Causes of floods, flood hazards India, flood control measures (human adjustment, perception and mitigation); Droughts: Impacts of droughts, drought hazards in India, drought control measures, extra planetary hazards/ disasters, man induced hazards /disasters, physical hazards/ disasters, soil erosion, Soil erosion: Mechanics and forms of soil erosion, factors and causes of soil erosion, conservation measures of soil erosion; Chemical hazards/ disasters: Release of toxic chemicals, nuclear explosion, sedimentation processes; Sedimentation processes: Global sedimentation problems regional sedimentation problems, sedimentation and environmental problems, corrective measures of erosion and sedimentation, biological hazards/ disasters, population explosion.	
Unit – V	**EMERGING APPROACHES IN DISASTER MANAGEMENT**
Emerging approaches in Disaster Management. Three Stages 1. Pre, disaster stage (preparedness) 2. Emergency Stage 3. Post Disaster stage, Rehabilitation.	
Text Books:	
1. Pardeep Sahni, “Disaster Mitigation: Experiences and Reflections”, PHI Learning Pvt. Ltd., 1st Edition, 2001. 2. J. Glynn, Gary W. Hein Ke, “Environmental Science and Engineering”, Prentice Hall Publishers, 2nd Edition, 1996.	
Reference Books:	
1. R.B.Singh (Ed), “Environmental Geography”, 2nd Edition, 1990. 2. R.B. Singh (Ed), “Disaster Management”, 2nd Edition, 2006.	

XVI. COURSE PLAN:

The course plan is meant as a guideline. Probably there may be changes.

Lecture No	Topics to be covered	Course Learning Outcomes (CLOs)	Reference
1	knowledge , analyze, and evaluate Environmental Hazards & Disasters	CLO 1	T1:22.5 R1:2.3
2	Understand the Meaning of Environmental Hazards	CLO 1	T1:22.5 R1:2.4
3	Understand Environmental Stress	CLO 2	T1:22.6 R1:2.6
4	Understand Environmental stress.	CLO 2	T1:22.7 R1:4.4
5-6	Obtain knowledge on Concept of Environmental Hazards	CLO 3	T1:22.7 R1:4.10
7	Capacity to analyze Environmental stress & Environmental Disasters	CLO 4	T1:22.8 R1:4.15
8	Capacity to analyze Ecology concept	CLO 4	T1:22.9 R1:5.4
9	Understand Different Approaches	CLO 5	T1:22.9 R1:5.8
10	Understand Landscape Approach -.	CLO 5	T1:23.10 R1:6.8
11	Analyze and evaluate Ecosystem approach -Perception approach.	CLO 6	T1:23.10 R1:6.13
12-13	Understand Human ecology & its application in geographical researches	CLO 7	T1:23.9 R1:7.5
14	Understand Types of Environmental hazards & Disasters	CLO 7	T1:23.10 R1:7.5
15-16	Capacity to analyze and evaluate Natural hazards and Disasters	CLO 9	T1:23.10 R1:8.1
17-18	Understand Man induced hazards & Disasters	CLO 9	T1:23.1 R1:9.2
19-20	Obtain knowledge on Natural Hazards- Planetary Hazards/ Disasters	CLO 10	T1:23.1 R1:9.4
21-22	Analyze the Planetary Hazards-Endogenous Hazards - Exogenous Hazards	CLO 10	T1:23.1 R1:9.9
23-24	Understand Volcanic Eruption – Earthquakes – Landslides	CLO 11	T1:23.1 R1:9.10
25-26	Volcanic Hazards/Disasters- Causes and distribution of Volcanoes	CLO 11	T2:27.5 R1:10.2
27-28	Analyze the Hazardous effects of volcanic eruptions	CLO 11	T2:27.7 R1:11.3
29-30	Understand Environmental impacts of volcanic eruptions - Earthquake Hazards/ disasters - Causes of Earthquakes	CLO 12	T2:27.8 R1:11.6
31	Distribution of earthquakes - Hazardous effects of - earthquakes - Earthquake Hazards in India	CLO 12	T2:27.12 R1:11.7
32-33	Analyze the Exogenous hazards/ disasters - Infrequent events- Cumulative atmospheric hazards/ disasters	CLO 12	T2:27.12 R1:11.8
34-35	Understand the Infrequent events: Cyclones, Lightning, Hailstorms, Cyclones: Earthquake Hazards in India	CLO 13	T2:27.12 R1:11.9
36-37	Analyze the Tropical cyclones and Local storms	CLO 13	T2:27.12 R1:11.10

Lecture No	Topics to be covered	Course Learning Outcomes (CLOs)	Reference
38	Understand the Destruction by tropical cyclones and local storms (causes, distribution human adjustment, perception and mitigation)	CLO 13	T2:27.14 R1:12.3
39-40	Analyze the Cumulative atmospheric hazards/ disasters : Floods, Droughts, Cold waves, Heat waves Floods	CLO 14	T2:27.1 R1:12.7
41-42	Identification of Flood control measures (Human adjustment, perception and mitigation),	CLO 14	T2:27.17 R1:12.15
43-44	Analyse the Droughts: Impacts of droughts, Drought hazards in India	CLO 17	T2:27.18 R1:12.19
45	Understand Extra Planetary Hazards/ Disasters- Man induced Hazards /Disasters	CLO 17	T2:27.19 R2:14.4

XVII. GAPS IN THE SYLLABUS-TO MEET INDUSTRY / PROFESSION REQUIREMENTS:

S No	Description	Proposed actions	Relevance with POs	Relevance with PSOs
1	Exogenous hazards/ disasters	Seminars	PO 1	PSO 3
2	Impacts of droughts, Drought hazards in India	Guest Lecture	PO 4	PSO 3

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