

UNIVERSITY OF MASSACHUSETTS
(DEPARTMENT OF GEOGRAPHY AND GEOLOGY)

NATURAL DISASTERS GEOGRAPHY 250

Course designation:	3 credits, General Education Interdisciplinary category
Lectures:	MWF 9:05-9:55, Thompson 102
Schedule number:	329917
Instructor:	David Alexander, Morrill IV, Room 267 (tel: 545-2095)
Office hours:	MWF 10:05-11:05, or by appointment
Teaching assistants:	(1) Laura Fragiacomio (Office: Morrill IV, 168) (2) Dagmar Gnieser (Office: Morrill II, 228) The TAs' office hours will be announced at the start of the course.
Required texts:	<i>Natural Disaster</i> , by David Alexander (1993, Chapman & Hall, New York) and <i>Natural Disasters Study Guide</i> (1994, Kendall-Hunt, Dubuque, Iowa), available from the UMass Textbook Annex.
Examinations:	There will be multiple-choice exams, each consisting of 50 questions. Each exam will refer to the preceding one third of the course (12-13 classes) <i>only</i> . None of these exams is optional.
Make-up exam:	There will be one make-up exam for all students who have a legitimate reason, which can be properly substantiated, for missing one of the first two exams. It will be held one evening at the end of the teaching semester and will cover the entire course, but will be of the same format and length as the regular exams (50 multiple-choice questions). Students wishing to improve their grade can also take the makeup exam, and if appropriate it will be substituted for one of the first two grades. Doing badly in the make-up exam will not harm a student's grade. However, it is not a casual alternative to the regular exams.
Term paper:	Students will be expected to write a term paper. Guidelines and a list of topics will be distributed on Monday 26 September. Reading lists are included in the course texts and some reading material will be put on reserve in the Natural Science Library in Morrill Science Center. Note that the TAs are available to help you with your writing: you may also turn in a draft of your paper before December so that the instructor or a TA can review it for accuracy and consistency before you write the final version. <i>As this course must comply with the General Education requirements for the development of critical thinking, the term paper is not optional.</i>
Grading policy	The final grade will consist of the average of the best three exam grades (one of which must be the final exam grade) and the grade for the term paper. Thus each constituent grade is worth 25%

SYLLABUS

			Textbook Chapter
1.	Wed 14	Sep The global problem.....	1
2.	Fri 16	Sep Definitions, basic concepts, misconceptions	1
3.	Mon 19	Sep Time, space and intensity measures	1
4.	Wed 21	Sep The physical nature of earthquakes	2
5.	Fri 23	Sep Predicting earthquakes	2
6.	Mon 26	Sep Tsunamis	2
7.	Wed 28	Sep Volcanic eruptions	2
8.	Fri 30	Sep Case histories of eruptions	2
9.	Mon 3	Oct Floods.....	3
10.	Wed 5	Oct Hurricanes	3
11.	Fri 7	Oct Tornadoes	3
12.	Tue 11	Oct Avalanches	3
13.	Wed 12	Oct Snow, hail and frost hazards	3
	Fri 14	Oct FIRST EXAMINATION	
14.	Mon 17	Oct Soil erosion.....	4
15.	Wed 19	Oct Drought and desertification.....	4
16.	Fri 21	Oct Landslides.....	4
17.	Mon 24	Oct Subsidence.....	4
18.	Wed 26	Oct Coastal erosion.....	4
19.	Fri 28	Oct Forest and range fires	4
20.	Mon 31	Oct Damage and structural safety in disasters	5
21.	Wed 2	Nov High rise buildings in disaster.....	5
22.	Fri 4	Nov Dam disasters	5
23.	Mon 7	Nov Mapping and remote sensing of disasters	6
24.	Wed 9	Nov Disaster warning systems	6
	Mon 14	Nov SECOND EXAMINATION [covers second third of course only]	
25.	Wed 16	Nov Planning for disasters	6
26.	Fri 18	Nov Emergency management	6
27.	Mon 21	Nov Emergency shelter	6
28.	Wed 23	Nov Recovery and reconstruction.....	6
29.	Mon 28	Nov Death and injury.....	7
30.	Wed 30	Nov Disease rates.....	7
31.	Fri 2	Dec Disasters in developing countries	8
		<i>Term paper to be handed in.</i>	
32.	Mon 5	Dec Famine and starvation.....	8
33.	Wed 7	Dec Refugees	8
34.	Fri 9	Dec The case of Bangladesh.....	8
35.	Mon 12	Dec Sociology, psychology, and perception.....	9
36.	Wed 14	Dec Risk management and economics of disaster.....	9
37.	Fri 16	Dec A historical perspective	9
		Final exam period (Mon 19 Dec-Fri 23 Dec):	
		THIRD EXAMINATION [covers last third of course only]	

Time: MWF 11:15-12:05
Venue: Morrill IV Room 258
Credits: 3
Instructor: David Alexander
Office and phone: Morrill IV 267, 545-2095
Office hours: MWF 10:05-11:05, or by appointment
Schedule no.: 331710
Required text: *Natural Disasters*, by David Alexander (1993, Chapman & Hall, New York), available from the UMass Textbook Annex

Synopsis:

In many parts of the world the toll of death, injury, damage and deprivation caused by natural disasters is becoming increasingly serious. Major earthquakes, volcanic eruptions, droughts, floods or other similar catastrophes are often followed by large relief operations characterized by substantial involvement of the international community. The years 1990-2000 have therefore been designated by the United Nations as the International Decade for Natural Disaster Reduction.

This course provides a comprehensive overview of the physical, technological and social components of natural disaster. The main disaster-producing agents will be reviewed systematically in terms of geophysical processes and effects, monitoring, mitigation and warning. The relationship between hazards and society will be examined with respect to a wide variety of themes, including damage assessment and prevention, hazard mapping, emergency preparedness, the provision of shelter and the nature of reconstruction. Medical emergencies and the epidemiology of disasters will be discussed, and refugee management and aid to the Third World debated. Natural science and technological perspectives will be complemented by classes on the history, sociology and psychology of hazards.

The course will be run as a mixture of lessons and seminars, and will be based on the instructor's own text, entitled *Natural Disasters* which will form the bulk of the reading matter. Assessment will be based on three papers written during the semester, for which guided reading will be required.

SYLLABUS

			Textbook Chapter
1. Wed	14 Sep	The global problem.....	1
2. Fri	16 Sep	Definitions, basic concepts, misconceptions	1
<i>FIRST PAPER ASSIGNED</i>			
3. Mon	19 Sep	Time, space and intensity measures	1
4. Wed	21 Sep	The physical nature of earthquakes	2
5. Fri	23 Sep	Earthquake prediction.....	2
6. Mon	26 Sep	Tsunamis	2
7. Wed	28 Sep	Volcanic eruptions	2
8. Fri	30 Sep	Volcanic hazard management	2
9. Mon	3 Oct	Floods.....	3
10. Wed	5 Oct	Drought.....	3
11. Fri	7 Oct	Hurricanes	3
12. Tue	11 Oct	Tornadoes.....	3
13. Wed	12 Oct	Avalanches	3
14. Fri	14 Oct	Snow and frost hazards	3
15. Mon	17 Oct	Soil erosion.....	4
<i>FIRST PAPER TO BE HANDED IN: SECOND ASSIGNMENT</i>			
16. Wed	19 Oct	Desertification.....	4
17. Fri	21 Oct	Landslides.....	4
18. Mon	24 Oct	Subsidence.....	4
19. Wed	26 Oct	Coastal erosion.....	4
20. Fri	28 Oct	Forest and range fires	4
21. Mon	31 Oct	The nature and costs of damage	5
22. Wed	2 Nov	Buildings, structures and public safety	5
23. Fri	4 Nov	High rise buildings in disaster.....	5
24. Mon	7 Nov	Dam disasters	6
25. Wed	9 Nov	Mapping and remote sensing of disasters	6
26. Mon	14 Nov	Disaster warning.....	6
27. Wed	16 Nov	Planning for disasters	6
<i>SECOND PAPER TO BE HANDED IN: THIRD ASSIGNMENT</i>			
28. Fri	18 Nov	Emergency management	6
29. Mon	21 Nov	Emergency shelter	6
30. Wed	23 Nov	Recovery and reconstruction after disaster	6
31. Mon	28 Nov	Death, injury and disease rates.....	7
32. Wed	30 Nov	Disasters in developing countries	8
33. Fri	2 Dec	Famine and starvation.....	8
34. Mon	5 Dec	Refugees	8
35. Wed	7 Dec	The case of Bangladesh.....	8
36. Fri	9 Dec	The sociology of disasters	9
37. Mon	12 Dec	Psychology and perception.....	9
38. Wed	14 Dec	Risk management and economics of disaster.....	9
39. Fri	16 Dec	A historical perspective	9
<i>FINAL PAPER TO BE HANDED IN</i>			

GEO 491H/692D
Honors and Graduate Course on Disaster Planning and Emergency Management

SYLLABUS—FALL 2000

1. ***Introduction to emergencies*** Monday 11 September
 - What is in the course
 - What are disasters?
 - The disaster cycle
 - Mitigation, preparedness, emergency management, recovery, reconstruction
 - Six approaches to disaster and what they offer (medicine, engineering and architecture, geography, sociology and psychology, development studies, anthropology)
 - Federal, State and local emergency planning and management structures
 - Practical: class discussion of emergency management goals

2. ***Scenario modeling for disaster planning*** Monday 18 September
 - Hazard, vulnerability, risk, and emergency scenarios
 - Large group roundtable scenario exploration
 - Practical: small group and individual scenario preparation and exploration

3. ***Risk analysis and cartography*** Monday 25 September
 - Risk estimation, analysis, perception, communication, and management
 - Preparation and interpretation of risk maps
 - Practical: class exercise on risk mapping

4. ***Information technology resources*** Monday 2 October
 - Role of Geographic Information Systems in disaster planning and management
 - Computer-assisted decisionmaking
 - Emergency management software demonstration
 - Practical: Internet resource exercise and student experiment

5. ***How to write a general emergency plan*** Wednesday 11 October
(Monday schedule)
 - Elements of the plan
 - Structure of the plan
 - Practical: assignment of project work; small group projects to formulate a draft emergency plan for the UMass-Amherst campus

6. ***Specialized emergency planning*** Monday 16 October
 - Planning for hospitals and emergency medical services (EMS)
 - Veterinary services
 - Emergency planning for schools
 - Special groups (patients, senior citizens, prisoners, etc.)
 - Industrial emergency planning
 - Practical: brief workshop on plan preparation

7. ***Practical principles of management*** Monday 23 October
 - How to manage personnel effectively during emergencies
 - Characteristics of a good emergency manager
 - Problems and dilemmas of emergency management
 - Emergency communication
 - Computer-assisted decisionmaking
 - Practical: management process simulations

8. ***Managing an emergency***..... Monday 30 October
 - Alert procedures
 - The emergency operations center (EOC) and its functions
 - Search and rescue
 - Public order and security
 - Logistics and engineering
 - Shelter and food programs
 - Special care procedures
 - Practical: emergency operations center message simulation

9. ***Working with the mass media***Monday 6 November
 - How the media operate in disasters
 - What the media say about disasters
 - A guide for spokespersons
 - Warning the population through media broadcasts
 - News and information management
 - Practical: simulated media briefing

10. ***Medical emergencies***Monday 13 November
 - An epidemiology of disasters
 - Elements of medical response
 - Practical: scenario simulation of EMS operation

11. ***Visit to headquarters of the Massachusetts Emergency Management Agency (MEMA), Framingham, Mass.***Monday 20 November

12. ***Planning and managing recovery and reconstruction after disaster***
Monday 27 November
 - Models and processes of post-disaster recovery
 - Choices and dilemmas in recovery and reconstruction management
 - Practical: workshop and discussions on recovery scenarios

13. ***Disaster simulation game***..... Monday 4 December
 - Assignment of roles, briefing, progress of scenario, conclusion and debriefing

14. ***Project clinic and concluding lecture*** Monday 11 December

Course rationale and description

Designation:	3 credit honors course
Meetings:	Mondays, 2:30-5:00 p.m., Morrill IV, Room 258
Schedule number:	896759
Instructor:	Dr. David Alexander, Morrill IV Room 267 (tel. 545-2095)
Office hours:	Mon & Weds 11:20-12:15, Weds. 1:30-3:00, or by appointment.
Textbook:	Principles of Emergency Planning and Management. As this book is as yet unpublished, draft copies will be distributed by the instructor.

The United States and the rest of the world are experiencing a dramatic rise in the size and consequences of disasters. Natural catastrophes such as hurricanes, floods and earthquakes, technological disasters such as radiation emissions, chemical explosions, and transportation crashes, and social disasters such as terrorist outrages and crowd incidents are all increasing in magnitude, frequency and impact.

The Federal Emergency Management Agency (FEMA) has taken the lead in encouraging U.S. states and communities to improve their preparedness for disaster. Though the losses continue to mount, the accent has been placed squarely on prevention and mitigation. The inevitability of catastrophe means that planning and management are essential processes. More emergency managers and disaster planners will be needed in the future and there will be more jobs for them. However, as the complexity of society increases, their task will become harder and more and better training will be needed.

Already, more than 60 U.S. colleges, universities and training institutes offer courses, degrees, diplomas, certificates or graduate qualifications in disaster management. FEMA's own dedicated campus at Emmitsburg, Maryland. FEMA has also placed copious amounts of pedagogical material on the Internet and has set up an office to encourage educational institutions to offer vocational courses on emergencies. The aim is to ensure that every state has at least one college or university that offers counter-disaster training. Massachusetts is deficient in this respect, though it does have one of the better state emergency management agencies.

Emergency management training demands a high degree of commitment and mental elasticity on the part of students. It is valuable training, not only for people who eventually seek a career in civil protection, but also for those who go into other fields. For instance, tourism is the world's largest industry and FEMA has been working hard to increase emergency preparedness training among executives and operatives in the field, which is one that involves tourists in some very particular risks (hurricanes in Florida and Hawaii, earthquakes in California, flash floods in Colorado, etc.).

The course text for Geosciences 491H has been written in draft form by the instructor and is entitled *Principles of Emergency Planning and Management*. The course will also make use, in appropriately modified form, of many practical exercises developed by the instructor in order to train professional emergency managers.

The weekly three-hour classes will each consist of 0-2 hours of lectures and 1-3 hours of practical exercises. These include perceptual mapping, guided Internet navigation, use of dedicated software, scenario formulation and discussion, and a disaster management simulation

game that involves students in directing emergency operations during the evolution of a hypothetical disaster. A visit will be organized to the emergency operations center of the Massachusetts Emergency Management Agency at Framingham. The object of practical exercises is to show how emergency planning and management involve a very different way of thinking to that which is used in academic work. Lectures will both explain essential basic information and supply the theory and techniques that are needed to understand the imperatives of emergency management.

Assessment will involve grading project work. There will be some minor assignments during the course associated with locating, using and interpreting information, but the main graded exercise will be a joint project, in which students will work in groups of two or three (individually if preferred) on aspects of the same problem. This will be to draft an emergency plan for some of the operations of the UMass-Amherst campus, for example, the library system.

CHAPMAN & HALL, INC.
 ONE PENN PLAZA, 41st FL ▼ NEW YORK, NY 10119
 TEL(212) 564-1060 ▼ FAX(212) 564-1505 ▼ e-mail 71201.1651@compuserve.com

“This book sets the standard and will be the classic work against which newcomers will be judged...the best single available text for courses in disaster studies in disciplines from anthropology and sociology to geology, geography, and the atmospheric sciences.”

—Ian Burton, *Environment Canada*

Natural Disasters

By **David Alexander**,
 Department of Geology and Geography,
 University of Massachusetts, Amherst

Here is a comprehensive overview of the geophysical, technological and social aspects of natural disasters. This book systematically reviews the agents of natural catastrophes—earthquakes, volcanoes, floods, drought, hurricanes, erosion fires, etc.—in terms of their geophysical processes and effects. The human impact and response is examined from various perspectives including damage and the urban environment, the logistics of planning emergency action, medical emergencies and the epidemiology of disasters, the Third World, and socio-economic consequences. The author’s unique interdisciplinary perspective helps the reader achieve a clear perspective on natural disasters and possible strategies against them.

Contents: List of illustrations; List of tables; Acknowledgements; Preface; Introduction; The geophysical agents: Earthquakes and volcanoes; Atmospheric and hydrological hazards; Disasters and the land surface; The human impact and response: Damage and the built environment; The logistics of planning and emergency action; Medical emergencies; The Third World; Disasters and socio-economic systems; Conclusion: Towards an international strategy against disasters; References; Select bibliography; Index.

September 1993: 6 x 9: 640 pp, 155 illus.
 Cloth: 0 412 04741 1: #B2613: \$89.95
 Paper: 0 412 04751 9: #B2623: \$39.95
 [Can. cl \$112.50; pb \$49.50]

ORDER FORM Marketing Department • Chapman & Hall, Inc. • One Penn Plaza, 41st Fl.
 • New York, NY 10119 • Phone: 212-564-1060 • Fax: 212-564-1505

Residents in the following states please add local sales tax: AK, CA, CT, HI, MA, ME, NH, NJ, NY, OR, RI, VT, WA. Canadian customers: please pay in Canadian dollars and add 7% GST. Canadian dollar price is shown in brackets at the end of each title entry. Titles for which we have no Canadian rights are designated “NCR.”

I enclose a check or money order made out to Chapman & Hall, Inc. for the amount below.

Please charge my credit card:

American Express MasterCard VISA

Account Number: _____ Expiration Date: _____

Signature: _____ US or CAN

Name _____

Dept _____

Institution _____

Address _____

Qty.	Title	cl/pb	Stock #	price
	Natural Disasters	cl	B2613	
	Natural Disasters	pb	B2623	

Telephone _____

SHIPPING CHARGES for personal orders only

	1 st book	Ea. Add'l
USA	\$2.50	\$1.00
CAN	\$3.50	\$1.50

Subtotal	_____
Sales Tax/GST	_____
Shipping/Handling	_____
TOTAL	_____

Printed in USA 2/83

Prices are subject to change without notice.

