

**University of Nevada, Las Vegas**  
**Executive Master of Science in Crisis and Emergency Management**  
**ECEM 712 - Science of Catastrophes**  
**Summer/Fall 2016**  
**Syllabus**

### **Course Description**

This course provides a comprehensive examination of the fundamental scientific principles and concepts which underpin preparations for, mitigation of, and responses to disasters relative to “All-Hazards” (i.e., those caused by the processes of the earth (natural hazards), those caused by processes of modern society (technological hazards), and those associated with intentional events such as acts of terrorism). Also included will be consideration of the scientific principles related to risk factors and effects on human populations including toxicology, environmental protection, and engineering of the built environment. Although the course will be presented at the managerial level and will not require solving mathematical or chemical equations, units of measure, mathematical relationships, and chemical formulas will be examined where appropriate in order to impart an understanding and appreciation of how scientific principles related to disasters are defined, measured, and communicated. Examples include for natural disasters the Fugita scale for tornados, Saffir-Simpson scale for hurricanes, and the Mercalli and Richter scales for earthquakes. The basic principles and nomenclature of chemistry, biology, and radioactivity will be examined as they relate to understanding the basis of technological hazards and those related to terrorism and weapons of mass destruction. Disaster case studies and/or after action reports will also be utilized to highlight the fundamental principles examined. Course participants are not expected to have specific backgrounds in science or mathematics.

### **Course Objectives**

- Develop an understanding of the scientific principles related to the explanation and measurement of natural hazards including earthquake, tsunami, volcanos, severe storms, climate change, and their effect upon human populations;
- Investigate and develop an understanding of the fundamental principles of chemistry, biology, and radioactivity necessary to define and explain the underlying causes and effects of technological hazards and those related to weapons of mass destruction (i.e., chemical, biological, radiological, nuclear, and explosive - CBRNE);
- Recognize and apply important aspects of major Federal regulations which apply to the manufacture, transportation, use and disposal of hazardous materials including those of the Department of Transportation (DOT), Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and others.
- Gain working knowledge of the types and classes of hazardous materials commonly used throughout modern society and elements of basic firefighting and emergency response actions.
  
- Analyze case studies and/or after-action reports of catastrophes such as floods, fires, hurricanes, tsunami, earthquakes, tornadoes, epidemics, chemical releases etc., and determine and describe the scientific and engineering issues associated with such events;

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- Become better prepared to find, understand, relate, and report complex scientific and regulatory information associated with the four phases of emergency management (mitigation, preparedness, response, and recovery)

**Textbooks**

*Natural Disasters, 10<sup>th</sup> Edition* by Patrick L. Abbott, McGraw-Hill, 2015

*Chemistry of Hazardous Materials, 6<sup>th</sup> Edition* by Eugene Meyer, Pearson 2014

**Other required course materials available free online**

FEMA Daily Operations Briefing (sign up to receive daily by email)

[https://public.govdelivery.com/accounts/USDHSFEMA/subscriber/new?topic\\_id=USDHSFEMA\\_432](https://public.govdelivery.com/accounts/USDHSFEMA/subscriber/new?topic_id=USDHSFEMA_432)

U.S. DOT Emergency Response Guidebook

[http://phmsa.dot.gov/pv\\_obj\\_cache/pv\\_obj\\_id\\_7410989F4294AE44A2EBF6A80ADB640BCA8E4200/filename/ERG2012.pdf](http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_7410989F4294AE44A2EBF6A80ADB640BCA8E4200/filename/ERG2012.pdf)

National Institute of Occupational Health and Safety (NIOSH) Pocket Guide

<http://www.cdc.gov/niosh/npg/>

Students are also expected to stay informed of current disaster and emergency events by continuously monitoring the FEMA Daily Operations Briefing and pertinent broadcasts of the major national networks (CNN, ABC, PBS, etc.), the Weather Channel, and the History Channel.

**Objectives Measurements and Grading Structure**

Reading and discussion assignments:	100 points
Midterm exam:	100
Final exam:	100
Research paper:	100
Class presentation:	<u>100</u>
Total:	500 points

**Grading Distribution**

95-100%	A
90-94%	A-

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85-89%      B+

80-84%      B

75-79%      B-

74 and below not passing

All assignments must be submitted through WebCampus assignment submission tool by the due date and time. Late assignments will not be accepted after the due date without permission of the instructor.

### **Biweekly Discussion Topics**

There are a total of ten Discussion Topic reading and writing assignments for this course. The purpose of the Discussion Topics is to foster collegial discussions amongst all course participants concerning the subject matter presented. Each Discussion Topic will be drawn from the textbook, case studies, or other materials and will be assigned at the beginning of each two-week period. A total of ten points will be available for each Discussion Topic assignment.

Students must submit an original post in answer to the initial assignment question which will be worth a total of four points. Please read all your classmates' initial and subsequent posts. Please post to reply to no less than three other students' initial posts or replies within the Discussion Board. Each of the three required replies beyond the initial four-point post will be worth two points each for a total of six points. Please don't hesitate to ask questions or make statements to each other to forward the discussion and exchange of ideas.

In summation, to receive full credit of ten (10) points per Discussion Topic, you must post at least one original response worth four points and at least three replies worth two points each to other students. Your replies to the work of another must capitalize upon the original thoughts and express agreement, polite disagreement, or other views, and must otherwise add to the stream of ideas. Simply stating "yes, I agree" will not constitute an effective reply for full credit.

### **Midterm and Final Exams**

The midterm exam will focus on material from the Abbott text, *Natural Disasters*, and/or related discussion assignments. The final exam will focus on material from the Meyer text, *Chemistry of Hazardous Materials*, and/or related discussion assignments.

### **Research Paper**

Select a narrow topic relevant to a specific natural, technological, or intentional disaster and perform an examination of research materials available. Your topic may be about any issue

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covered in this course to include earthquakes, hurricanes, chemical plant explosion, terrorist attack, and etc. Write a research paper which identifies the name, location, and dates of the event, and includes a fairly comprehensive description of what happened, why, and what were its effects on human populations and the environment. If the focus of your investigation and research involves natural hazards, include in your discussion any specific measures of magnitude, duration, underlying causes, warning signs, and effects. If the focus of your research involves chemical, biological, radiological, nuclear or explosive materials, whether industrial products or WMD, include description of the materials physical, chemical, biological, or radiological properties and explain its effects. Your paper need not exceed 10-15 typed pages plus bibliography. The research paper will be due no later than the end of Week 20.

**Stylist factors to remember in writing these research papers**

- (1) Papers must be typed, double-spaced, with 1 inch margins and 12 point fonts.
- (2) The American Psychological Association (APA) style manual must be used. Endnotes will be acceptable as footnotes. The bibliography does not count as a typewritten page.
- 3) A cover page is to include the title of the paper, your name, the name of the class, and the date you are submitting the assignment. The cover page does not count as a typewritten page.
- 4) Be sure to include page numbers and/or web pages when citing source material.
- 5) Quotes, statistics, and paraphrased material should have notes.
- 6) Academic journal articles are a very good source of information.
- 7) The use of the Internet is acceptable, but all information cited must be from sound academic or other reliable sources. Wikipedia is not a credible source and must not be cited.
- 8) Papers should be sent to the instructor using the WebCampus assignment tool as attachments in .doc or .rtf format.
- 9) Articles, working papers, or books may be identified through the Natural Hazards Center at the University of Colorado at Boulder ([www.colorado.edu/hazards](http://www.colorado.edu/hazards)), through the Learning Resource Center (FEMA's library) at ([www.lrc.fema.gov](http://www.lrc.fema.gov)), and through the University of Delaware's Disaster Research Center ([www.udel.edu/DRC/](http://www.udel.edu/DRC/))
- 10) Research Paper Grading Criteria will be based on the information found at [www.ResearchPaperGuidanceChecklist.com](http://www.ResearchPaperGuidanceChecklist.com)

**Class Presentation**

Create a PowerPoint presentation based on your research paper for delivery during the second on-campus session. Your presentation should be 10 minutes in duration. As an Emergency Management professional, you may need to present information to politicians, government officials, the media, and the public. The class presentation gives you the opportunity practice that skill through sharing the knowledge gained from your research.

**WRITING CENTER**

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One-on-one or small group assistance with writing is available free of charge to students at the Writing Center, located in CDC-301. Although some walk-in appointments are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 895-3908. When you go to your appointment, please take a copy of your assignment and any writing that you may have completed on the assignment.

### **DISABILITY RESOURCE CENTER (DRC)**

The DRC is the official office to provide Disability Services. If you have a documented disability that may require assistance, you will need to contact DRC for coordination in your academic accommodations. DRC is located in the Reynolds Student Services Complex, suite 137. The phone number is 702-895-0866, or TTD 702-895-0652. You may also visit the website at [www.unlv.edu/studentinf/les](http://www.unlv.edu/studentinf/les)

### **COURSE POLICIES**

Make-ups for the mid-term and final exams will be limited to very special circumstances only and will require prior notification and approval. Completion of all assigned reading and writing assignments is expected. Students can turn in assignments early. The American Psychological Association (APA) style manual will be used and all written assignments must conform to the APA standards. All written assignment submissions must be in Times-Roman type and 12-point font. There will be no extra credit or make up work.

UNLV policy governs Incompletes.

### ***Institutional Policy on Academic Honesty, Student Integrity and Plagiarism***

Students are expected to contribute actively to the development of an atmosphere of academic integrity. UNLV assumes, therefore, that students will not resort to plagiarism or any other form of academic dishonesty. Students found guilty of willful academic dishonesty may be subject to a broad range of sanctions. At the discretion of their instructor, or UNLV, they may be required to redo the plagiarized assignment, or they may receive an automatic F for the exam/assignment and/or course. Suspension from the ECEM program is also possible. Students found to be in collaboration with other students involved in willful academic dishonesty are also subject to disciplinary action. Cheating in any form will not be tolerated.

**Grading, Incomplete Grades**—The grade of I (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving I grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of

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F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

**Grading, Recording Date of Last Attendance for Incomplete and F Grades**—Under NSHE and UNLV policy, faculty are “not required to take attendance” as defined under federal financial aid guidelines. However, both federal financial aid and NSHE policy require faculty to record, when assigning an Incomplete or F grade, the student’s “date of last attendance” to determine if the student has completed more than 60% of the instruction of a course. Individual faculty may, at their discretion, record an “FN” grade (F for non-attendance) in the case of a student who has not completed greater than 60% of instruction but has not withdrawn from the course.

In all of these instances, the percent of instruction achieved is based upon the student’s date of last attendance, which in turn, based upon Federal financial aid guidelines, is defined as the “last date of attendance at an academically related activity” associated with the course. This could be later than the last date of physical classroom attendance.

Academically related activity is defined at UNLV as any of the following, all of which are drawn from Title VI federal financial aid guidelines:

- a. physically attending a class where there is an opportunity for direct interaction between the instructor and students;
- b. submitting an academic assignment;
- c. taking an exam, an interactive tutorial or computer-assisted instruction;
- d. attending a study group that is assigned by the school;
- e. participating in an online discussion about academic matters;
- f. Initiating contact with a faculty member to ask a question about the academic subject studied in the course.

Academically related activities do not include activities where a student may be present, but not academically engaged, such as:

- a. living in institutional housing;
- b. participating in the school’s meal plan;
- c. logging into an online class without active participation; or
- d. participating in academic counseling or advisement.

Note (c) above—logging into an online course without active participation—is specified as not the acceptable standard; instead the standard is that an institution can demonstrate “that a student participated in class or was otherwise engaged in an academically related activity, such as by contributing to an online discussion or initiating contact with a faculty member to ask a course-related question.”

*This syllabus is a guide, not a contract. It may be revised if it seems in the best interest of the class to do so. Students will be notified promptly of any revisions.*

**Recommended Websites:**

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- [www.fema.gov](http://www.fema.gov) - for information on the Federal Emergency Management Agency including statutes, Incident Command System and related training and planning, status reports on current disasters, as well as links to state and local emergency management agencies
- [www.dhs.gov](http://www.dhs.gov) - for basic information on the Department of Homeland Security, including FEMA, and its constituent agencies and directorates
- [www.csb.gov](http://www.csb.gov) – for reports of investigations by the Chemical Safety Board of chemical accidents at fixed industrial facilities including root causes such as deficiencies in safety management systems, equipment failures, human errors, unforeseen chemical reactions or other hazards
- [www.osha.gov](http://www.osha.gov) – for information on the Occupational Safety and Health Administration including OSHA standards, enforcement, training, outreach, education and assistance
- [www.cdc.gov](http://www.cdc.gov) – for information on a wide variety of topics including diseases, environmental safety and health, and emergency preparedness and response
- [www.iaem.com](http://www.iaem.com) - for information on the International Association of Emergency Managers, job listings, commentary on current policy issues
- [www.colorado.edu/hazards](http://www.colorado.edu/hazards) - for information regarding specific hazards, full texts of some of the Natural Hazards Center’s series of working papers and quick response reports for recent disasters, and other information resources
- [www.drc.udel.edu](http://www.drc.udel.edu) - for applied social science research related to disasters, full texts of some of the Disaster Research Center’s publications, including reports to FEMA and other government agencies
- [www.emforum.org](http://www.emforum.org) - Emergency Information Infrastructure Partnership (EIIP) forum. Holds Internet workshops on a broad range of emergency management issues and maintains an archive of transcripts. Tune in online for Wednesday noon programs
- Students may subscribe to discussion lists for a variety of disaster organizations and related professions and receive email notification of major earthquakes and other disasters, federal disaster relief announcements, job announcements, research opportunities, and other relevant professional news from the field.
- Additional websites will be suggested in the class discussions and readings

**Recommended Journals:**

- *The ASPEP Journal* (American Society of Professional Emergency Planners)
- *The Australian Journal of Emergency Management*
- *Disaster Prevention and Management: An International Journal* (UK)
- *Disaster Recovery Journal* (for Business Continuity Planners)
- *Disasters: The Journal of Disaster Studies, Policy and Management*
- *Environmental Hazards: Human and Policy Dimensions*
- *Homeland Protection Professional*
- *International Journal of Mass Emergencies and Disasters* (International Research Committee on Disasters, American Sociological Association)
- *Journal of Contingencies and Crisis Management* (The Netherlands)

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- *Journal of Emergency Management*
- *Journal of Homeland Security and Emergency Management* (electronic)
- *The Liaison (for Civil-Military Humanitarian Relief Collaboration)* (Center of Excellence in Disaster Management and Humanitarian Assistance, Hawaii)
- *Natural Hazards: An International Journal of Hazards Research & Prevention*
- *Natural Hazards Review* (Natural Hazards Center, University of Colorado)

***UNLV Policies:***

**Academic Misconduct**—Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution.

An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at: <https://www.unlv.edu/studentconduct/student-conduct>.

**Copyright**—The University requires all members of the University Community to familiarize themselves **with** and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://www.unlv.edu/provost/copyright>.

**Disability Resource Center (DRC)**—The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

**Religious Holidays Policy**—Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make

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up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor **within** the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or **within** the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit:

<http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

**Transparency in Learning and Teaching**—The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:

<https://www.unlv.edu/provost/teachingandlearning>

<https://www.unlv.edu/provost/transparency>

**Incomplete Grades**—The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

**Library**— Students may consult with a librarian on research needs. For this class, the subject librarian is [https://www.library.unlv.edu/contact/librarians\\_by\\_subject](https://www.library.unlv.edu/contact/librarians_by_subject). UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at <https://www.library.unlv.edu/>.

**Tutoring and Coaching**—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

**UNLV Writing Center**—One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two

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copies of any writing to be reviewed are requested for the consultation. More information can be found at:  
<http://writingcenter.unlv.edu/>

**Rebelmail**—By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always [@unlv.nevada.edu](mailto:@unlv.nevada.edu). **Emailing within WebCampus is acceptable.**

**Final Examinations**—The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.

**Any other class specific information**—(e.g., absences, make-up exams, status reporting, extra credit policies, plagiarism/cheating consequences, policy on electronic devices, specialized department or college tutoring programs, bringing children to class, policy on recording classroom lectures, etc.)