CEE 5325/7325  DISASTER MANAGEMENT

Credits: 3 TCH (45 contact hours)

Instructor: Dr. Jonathan Dehn   203 Embrey Engineering Building
Office Hours: MTWT 14:00-16:00 or by appointment
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Catalog Course Description
This course introduces the student to basic concepts in disaster management. Drawing on a range of sources from the textbook to the U.S. National Response plan to research papers the course covers the fundamentals of preparedness, mitigation, response, and recovery. An all-hazards approach is taken, providing analysis of natural, technological, and man-made disasters. In addition to discussing basic theories of disaster management, the course introduces students to key methods in the field, including simulation modeling, consequence analysis tools, design criteria, statistical and case study methods ("lessons learned"), and risk analysis.

Prerequisites or Co-Requisites None

Textbook and Other Related Material
3. Readings from a variety of journal articles and other sources
4. Software exercises using, VENSIM for simulation, ArcMap and Google® Earth for GIS, and ALOHA and Puff (www.puff.images.alaska.edu) for modeling chemical plumes

Course Objectives
To provide an understanding of the basic concepts, processes, and methods employed in disaster management; equip the student to undertake various types of disaster management analyses; familiarize the student with sources of information regarding disaster management; and promote improved skills in communication and information synthesis.

Course Requirements
Grading will be based on a single mid-course exam (20%), a final exam (30%), participation in three disaster exercises (10% each), class participation (20%). Graduate students in CEE 7325 will be expected to complete the above and a class project about a disaster with a 20 minute presentation (20%), as well as lead a disaster exercise team (10%).

Class / Laboratory Schedule
4 hour sessions weekdays, May 17 to June 1, excluding Memorial Day.

Curriculum Professional Component Allocation
Engineering Science and Design: 3 Term Credit Hours or 100 percent of the course content

Relevant Program Outcomes
This course includes, but is not limited to, content supporting the educational objectives and outcomes of the environmental and civil engineering programs. Students develop proficiency in advanced principles and practice in disaster management as it relates to all major focus areas of environmental and civil engineering. Specific emphasis is placed on students attaining and demonstrating:

- An understanding of professional and ethical responsibility (ABET AEC Outcome F)
- An ability to communicate effectively in interdisciplinary environments ((ABET AEC Outcomes D and G)
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context ((ABET AEC Outcome H)
- A recognition of the need for, and an ability to engage in life-long learning ((ABET AEC Outcome I)
- A knowledge of contemporary issues ((ABET AEC Outcome J)

Topics Covered (Syllabus)

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<tr>
<th>Day</th>
<th>Topic (hours spent)</th>
<th>44 Hours</th>
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<tbody>
<tr>
<td>May 17</td>
<td>Disaster types – natural disasters, technological disasters, terrorism</td>
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<td></td>
<td>1. Introduction, types and durations</td>
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<td>2. Stages of disaster management</td>
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<td>The Preparedness, Mitigation, Response, and Recovery Paradigm</td>
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### May 18
**Disaster Response in the U.S.**
1. US National Response Plan & National Incident Management System
2. State and Local Activities & Tools and Methods for Disaster Response
3. Disaster Response Globally, European and Far East Asia Response Plans

### May 21
**Disaster Preparedness**
1. Measures and stages of preparedness
   - Public Outreach, FEMA Courses
   - Consequences of Disasters
   - Loss of life, Infrastructure, Economic effects
   - Environmental effects, Sociologic effects
   - Disaster Mitigation, Design standards, Regulatory issues

### May 22
**Disaster Response and Disaster Recovery**
1. What is recovery?, Recovery Patterns
2. Resilient communities and ecosystems
3. Risk-based disaster management practice, Avoidance vs. Mitigation
4. Mid-term (take home) -

### May 23
**Major Disasters, disaster rates, historic disasters**
1. Earthquakes: Great Mediterranean 1201, Shaanxi 1556, Lisbon 1755
2. Volcanic: Tambora 1815, Plague: Black Death 1346-1353
3. Major Disasters recent

### May 24
**Major Disasters recent**
3. Tsunami: Indian Ocean 2004
5. Landslide: Vargas Tragedy 1999, Sierra Leone 2017
7. Manmade: Exxon Valdez 1989, Deepwater Horizon 2010

### May 25
**Disaster Exercises, Hurricane (1.5 hours), Earthquake (1.5 hours) one hour total setup time for explaining roles**

### May 30
**Disaster Exercises, Forest Fire (1.5 hours), Terror attack (1.5 hours) one hour total setup to distribute roles**

### June 1
**Final Exam (in class)**

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**Class Participation:** Since a lot of our work is in-class activity, your attendance and participation will be factors in your final grade—just as they are factors in your success in industry. Please observe the following policies for this class: 1) attend all classes and participate in class discussion and group work; 2) if you cannot attend a class, notify the instructor as far in advance as possible—preferably 24 hours before the class—to discuss your reason (NOTE: An excused absence is one for which you and the instructor agreed in advance that you had good reason for missing class. Unexcused absences and tardies will adversely affect your grade); arrive to class on time; be prepared to discuss the reading assignments; help maintain a professional environment in the classroom, e.g., cell phones off, laptop/tablet use is only for course-related activities, etc.

**Plagiarism:** If it is determined that any student has not presented their own work for any graded exercise, the penalty will be dismissal from the class and a failing grade. Further penalty may result from the standing review procedures in the School of Engineering.

**Late Submittals** will be penalized—up to 10 percentage points are automatically subtracted for each day or part of a day that an assignment is late, including weekends.

**Disability Accommodations:** Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit http://www.smu.edu/Provost/ALEC/DASS to begin the process. Once registered, students should then schedule an appointment with the professor as early in the semester as possible, present a DASS Accommodation Letter, and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

**Religious Observance:** Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See Univ. Policy No. 1.9.)

**Excused Absences for University Extracurricular Activities:** Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

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**Prepared by:** Dr. Jonathan Dehn

**Date:** 12/20/2017

**Date:** 12/20/2017

**After work by Laura J. Steinberg (8/22/07)**