Natural Hazards and Disasters
EAS 185- Section: 001

Credit Hours: 3.00    Lecture Hours: 3.00
IAI Core: P1 908    IAI Majors:

Semester: Fall    Course Begins: 8/19/2013    Course Ends: 12/11/2013
Days: MW
Times: MW 1:00PM-2:20PM
Room: A223

Instructor: Paul Hamill
E-mail: phamill@mchenry.edu
Phone: 815-455-8698
Office Hours: http://www.mchenry.edu/faculty/phamill/EAS185/courseschedule.pdf
Office Location: B252
Website: http://www.mchenry.edu/faculty/phamill/EAS185/eas185.html

Required Course:

Supplies: Various models, charts and DVD videos are used for demonstrations and laboratory exercises. PowerPoint slideshows are used in lecture.

Course Description:
Natural Hazards and Disasters examines the causes and impacts of earthquakes, volcanoes, tornadoes, hurricanes, tsunamis, floods and wildfires. Students look at patterns of occurrence, research, prediction, and our adaptation to geophysical and atmospheric threats. Students also analyze past and present extremes of nature from human and environmental perspectives.

Course Notes: This course requires intermediate reading, intermediate writing and basic math.

Course Objectives:
Cognitive:
1. Define the fundamental vocabulary used in the discussion and analysis of natural hazards and disasters.
2. Explain how natural hazards can become disasters, and even catastrophes, by recognizing an event’s unique geophysical, atmospheric and human variables.
3. Discuss how the theory of, and properties inherent to, plate tectonics, contributes to earthquake occurrence, magnitude and threats.
4. Compare and contrast the numerous techniques used to predict earthquake frequency, magnitude, threat and post-event impact.
5. Differentiate amongst the numerous types of volcanic risks, and how earth scientists are working to identify and mitigate these risks.
6. Detail the geophysical variables precipitating landslides, sinkholes and avalanches.
7. Argue how stream flooding processes are well-documented and how such processes contribute to flood prediction and risk assessment.
8. Indicate how shoreline waves and currents naturally influence sand flow and coastal erosion patterns.
9. Evaluate the short and long-term effectiveness of shoreline hardening, beach replenishment and other coastal-erosion protection measures.
10. Appraise the strength of past hurricanes and Nor’easters, and describe the unique characteristics of each kind of storm, as well as the threat each poses to human activity.
11. Review the variables contributing to the formation of thunderstorms and tornadoes, while assessing the risks inherent to these kinds of storms.
12. Analyze the conditions necessary for wildfires, and contribute to the debate about fire suppression and zoning restrictions.

13. Compare the chances of a large asteroid impact on Earth, and likely consequences, with Earth-based geophysical and atmospheric natural hazards and disasters.

Affective:

1. Appreciate the geophysical and atmospheric forces that may materialize into natural hazards and disasters.
2. Develop an understanding and appreciation of qualitative and quantitative scientific inquiry to investigate natural hazards and disasters.
3. Accept an element of human responsibility in both precipitating and mitigating some natural hazards and disasters.
4. Share your knowledge of natural hazards and disasters, and encourage others to enhance their own awareness and understanding thereof.

Manipulative:

1. Demonstrate proficiency in using geographic tools such as maps, graphs, tables, and models to analyze natural hazards and disasters around the world.
2. Use reference materials such as atlases, public and private studies, the Internet, and library resources to investigate natural hazards and disasters around the world.
3. Calculate variables used in natural hazards and risk assessment. These include: the magnitude of a disaster, the risk of a natural hazard, the Richter magnitude of earthquakes, the velocity of tsunami waves, the force parallel to a slope, the distance traveled by avalanche debris, stream power, flood recurrence intervals, wave velocity in shallow and deep water, hurricane storm surge height and hurricane exceedence probability.

Course Outline:

I. Plate Tectonics and Physical Hazards
   A. Earth’s Structure

II. Earthquakes and Damage
    A. Seismic waves
    B. Damage Control and Building Structure

III. Tsunamis: The Great Waves
    A. Generation of Waves
    B. Coastal Effects and Hazard Mitigation

IV. Volcanoes
    A. Forcing Mechanisms
    B. Volcanic Structures

V. Landslides and Avalanches
    A. Slope Materials
    B. Types of Down Slope Movement

VI. Sinkholes and Land Subsidence
    A. Formation and Topography

VII. Floods
    A. Stream Types
    B. Destructive Energy and Recurrence Intervals

VIII. Coastal Erosion
    A. Beach Erosion and Hardening

IX. Hurricanes and Nor’ Easters
A. Formation and Damage
B. Predictions and Warnings

X. Thunderstorms, Hail, Lightning
   A. Formation and Hazards

XI. Tornadoes
   A. Safety and Warning Systems
   B. Formation and Scaled Damage

XII. Wildfires
   A. Fire Suppression and Prevention

XIII. Asteroids and Comets
   A. The Ultimate Catastrophe
   B. Human Intervention

The instructional format for the lecture section of the course will include formal lectures, group discussion, review sessions, cooperative learning groups, and occasional demonstrations.

**Assignments and Grading Criteria**

A) **Exams and Tests:** 7 Exams are given.

B) **Primary Grading Basis:**
   - Lecture Exams 70%
   - CLG’s 30%

C) **Grading Scale:** The components of the primary grading basis will be totaled to determine your cumulative grade. The grades awarded will be determined on the following scale:
   - A – 90%
   - B – 80%
   - C – 70%
   - D – 60%
   - F – below 60%

**Policies**

**Late work/make-up policy:** Deadlines for all course material is due by the dates specified by the instructor. Materials turned in late will have grades lowered accordingly.
## Weekly Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8/19/13</td>
<td>Introduction to course</td>
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<tr>
<td></td>
<td>Go over syllabus</td>
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<tr>
<td></td>
<td>Chapter 1 “Natural Hazards and Disasters”</td>
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<tr>
<td>8/21/13</td>
<td>Chapter 2 “Plate Tectonics and Physical Hazards”</td>
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<tr>
<td>8/26/13</td>
<td>Chapter 2 continued</td>
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<tr>
<td>8/28/13</td>
<td><strong>Exam 1 (Chapters 1-2)</strong></td>
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<tr>
<td>9/02/13</td>
<td><strong>No Class. Labor Day Holiday Observed. College Closed.</strong></td>
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<tr>
<td>9/04/13</td>
<td>Chapter 3 “Earthquakes and Their Causes”</td>
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<tr>
<td>9/09/13</td>
<td>Chapter 3 continued</td>
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<td></td>
<td>Chapter 4 “Earthquake Predictions, Forecasts and Mitigation”</td>
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<tr>
<td>9/11/13</td>
<td>Chapter 4 continued</td>
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<td>Chapter 5 “Tsunami”</td>
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<td>9/16/13</td>
<td>Chapter 5 continued</td>
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<td>9/18/13</td>
<td><strong>Exam 2 (Chapters 3-5)</strong></td>
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<tr>
<td>9/23/13</td>
<td>Chapter 6 “Volcanoes: Tectonic Environments and Eruptions”</td>
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<td>9/25/13</td>
<td>Chapter 6 continued</td>
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<td>Chapter 7 “Volcanoes: Hazards and Mitigation”</td>
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<tr>
<td>9/30/13</td>
<td>Chapter 7 continued</td>
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<tr>
<td>10/02/13</td>
<td><strong>Exam 3 (Chapters 6-7)</strong></td>
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<tr>
<td>10/07/13</td>
<td>Chapter 8 “Landslides and Other Downslope Movements”</td>
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<tr>
<td>10/09/13</td>
<td>Chapter 8 continued</td>
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<td></td>
<td>Chapter 9 “Sinkholes, Land Subsidence, and Swelling Soils”</td>
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<td>10/14/13</td>
<td><strong>Exam 4 (Chapters 8-9)</strong></td>
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<td>10/16/13</td>
<td>Chapter 12 “Streams and Flood Processes”</td>
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<td>10/21/13</td>
<td>Chapter 12 continued</td>
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<td>Chapter 13 “Floods and Human Interactions”</td>
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<td>10/23/13</td>
<td>Chapter 13 continued</td>
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<tr>
<td>10/28/13</td>
<td>Chapter 16 “Wildfires”</td>
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<td>10/30/13</td>
<td><strong>Exam 5 (Chapters 12, 13 and 16)</strong></td>
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<tr>
<td>11/04/13</td>
<td>Chapter 10 “Weather, Thunderstorms and Tornadoes”</td>
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<td>11/06/13</td>
<td>Chapter 10 continued</td>
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<td>11/11/13</td>
<td>Chapter 11 &quot;Climate Change&quot;</td>
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<td>11/13/13</td>
<td>Chapter 15 &quot;Hurricanes and Nor'easters&quot;</td>
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<td>11/18/13</td>
<td>Chapter 15 continued</td>
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<td>11/20/13</td>
<td><strong>Exam 6 (Chapters 10, 11, and 15)</strong></td>
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<tr>
<td>11/25/13</td>
<td>Chapter 17 “Impact of Asteroids and Comets”</td>
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<td>11/27/13</td>
<td>Chapter 17 continued</td>
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<tr>
<td>12/02/13</td>
<td>Lecture and Videos: Other Hazards from Space</td>
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<tr>
<td>12/04/13</td>
<td><strong>Exam 7 (Chapter 17)</strong></td>
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Withdrawals: The last day to drop this course is 11/13/13. Failure to attend class does not constitute official withdrawal. If students are considering a withdrawal, they should consult directly with the instructor and an academic advisor. Students may withdraw from a class through the Registration Office, either in person or by fax: (815) 455-3766. In their request, students should include their name, student ID number, course prefix, number and section, course title, instructor, reason for withdrawing, and their signature. Withdrawal from a course will not be accepted over the telephone.

Please refer to the following link for other important college dates: www.mchenry.edu/academiccalendar.asp

General Education Goals:
1. Critical Thinking: To identify, define, analyze, synthesize, interpret, and evaluate ideas.
2. Information Literacy: To locate, evaluate, and use resources effectively.
3. Effective Communication: To develop, articulate, and convey meaning.
4. Ethical Awareness: To identify and make responsible choices in a diverse world.
5. Technological Literacy: To use tools skillfully.

Assessment:
Some student work may be collected for the purpose of assessment, including student competency in the general education goals, the program, or the course.

Effective Fall 2014: Student E-Portfolio:
The instructor of the course will designate at least one graded assignment for possible inclusion in the student E-portfolio. Students applying for an AA, AS, AFA, AES, or AGE degree must document their learning outcomes with a graded assignment for each of the five general education goals by the time of graduation. These five assignments and a cover letter will be in the student E-portfolio in Canvas.

Special Needs Statement
McHenry County College offers support services for students with special needs. It is your responsibility to meet with the Special Needs Coordinator and provide current documentation regarding a disability. Please call or stop by the Special Needs Department, (815) 455-8676, Room A260, as soon as possible if you would like more information about the accommodations that are available. In addition, it is important for you to discuss those accommodations with your instructor so you are fully able to participate in this course.

Academic Integrity
As an educational community, McHenry County College values the pursuit of academic excellence and integrity. In accordance with this philosophy and Chapter 10, Act 5 of the 1994 Illinois Community College Act, academic dishonesty in any form, including cheating, plagiarism, and all other acts of academic theft, is considered intolerable. Appropriate sanctions, up to and including suspension from the College will be imposed by authorized College personnel.

Copyright Policy
MCC will maintain current procedures and guidelines to ensure that all staff and students comply with applicable copyright laws and other intellectual property protection laws. The College will encourage staff and students to engage in the development of intellectual property and facilitate ownership protections with respect to such development of intellectual property.

The College expects that staff and students will act responsibly and ethically in a manner consistent with all copyright laws and College copyright procedures and guidelines. This policy authorizes the College to adopt and maintain such procedures and guidelines necessary to ensure compliance with copyright laws and to facilitate ownership protection with respect to the development of intellectual property.
**Student Code of Conduct and the Judicial Process**
Consistent with the MCC mission is an expectation that students will govern themselves in terms of appropriate behavior with emphasis on self-respect and respect for others. It is the practice of the College to respect the properly exercised rights of its students. The College recognizes a student’s rights within the institution to freedom of speech, inquiry and assembly; to the peaceful pursuit of education; and to the reasonable use of services and facilities at MCC.

MCC has adopted a Student Code of Conduct and judicial process to maintain a learning environment of respect, civility, safety, and integrity for all members of the MCC community.

Whenever possible, sanctions for violations of the Student Code of Conduct may be educational in nature. However, violations affecting the health and safety of members of the MCC community are deemed to be the most serious. Therefore, acts of violence, threats or dangerous behavior are most likely to result in a suspension from the College. Violations of the academic dishonesty policy may also result in suspension or expulsion from the institution and/or reduced or failing grade.

**Children on Campus**
For the safety of children on campus, children (i.e., less than 16 years of age) are not permitted on campus unattended by a parent/guardian, except when they are attending classes offered by MCC for children. The College requires that no children be allowed into a classroom/laboratory environment, including the Testing Center, Learning Center and computer labs, solely for the purpose of a parent/guardian to provide direct supervision of his/her child.

**Teaching Schedule**
The scheduling of the activities and teaching strategies on this syllabus, but not the objectives or content, may be altered at any time at the discretion of the instructor.

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**Resources**
The following are useful resources available to you as a student at McHenry County College:

- **Advising and Transfer Center:**
  Phone (815) 479-7565; Office A257
  www.mchenry.edu/ATC/Index.asp

- **Counseling:**
  Phone (815) 455-8765; Office A257
  www.mchenry.edu/counseling

- **Financial Aid:**
  Phone (815) 455-8761; Office A262
  www.mchenry.edu/financialaid

- **Library:**
  Phone (815) 455-8533; Office A212
  www.mchenry.edu/library

- **Special Needs:**
  Phone (815) 455-8676; Office A260
  www.mchenry.edu/specialneeds

- **Tutoring and Study Skills (Sage Learning Center):**
  Phone (815) 455-8579; Office A247
  www.mchenry.edu/sage