**Virginia Tech – Natural Disaster Mitigation and Geotechnical Aspects of Earthquake Engineering Courses**

Virginia Tech Department of Civil and Environmental Engineering is offering Natural Disaster Mitigation and Geotechnical Aspects of Earthquake Engineering. Both courses deal in depth with natural disaster, causes, mechanics, strategies of mitigation and causative mechanism of earthquakes and other natural disasters. The department is accredited by the Accreditation Board for Engineering and Technology, Inc. (ABET).

**CEE4554 – Natural Disaster Mitigation (3 credits)**

Course Prerequisite: Senior Standing or Approval of the Instructor

Specific Course Objectives:
Upon completion of this course, students should be able to:

- Demonstrate an understanding of the magnitudes and consequences of extreme events such as hurricanes, floods, earthquakes and landslides.
- Assess frequency and probability of occurrence of natural hazards; determine recurrence intervals and event magnitudes for use in engineering design.
- Evaluate vulnerability/resistance of natural and engineered ground and constructed facilities to threats from natural hazards.
- Assess risks from natural disasters in terms of fatalities, injuries, property and infrastructure damage, as well as social, economic and environmental costs
- Identify and evaluate via cost-benefit analysis acceptable risk mitigation, emergency response, and disaster recovery alternatives.
- Explain roles of engineers and other risk professionals, government agencies, community-based organizations and other key stakeholders and decision makers in the management of natural hazards and associated risks.

Program Area: Geotechnical Engineering

**CEE 5584 – Geotechnical Aspects of Earthquake Engineering**

Course Prerequisite: CEE 3514
Specific Course Objectives:
Upon completion of this course, students should be able to:

- Identify and describe basic earthquake concepts, terms, and definitions: A review of the causative mechanisms of earthquakes, wave propagation, earthquake magnitudes, and intensity.
- Describe the main areas of seismicity within the United States.
- Develop earthquake ground motions to be used in simplified and time history (advanced) analyses.
- Understand how to develop and use response spectra.
- Recognize and predict the effects of local soil conditions on site response and ground motions.
• Apply seismic design procedures in current U.S. earthquake codes.
• Understand dynamic soil behavior and period matching.
• Perform computer-based site response analysis.
• Perform analyses to predict liquefaction and related effects.
• Apply seismic design procedures for earth slopes and dams.
• Develop design ground motions and apply design procedures design for the seismic analysis earth retaining systems and pile foundations.

Program Area: Geotechnical Engineering

Virginia Tech is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools.

For more information:

Russell A. Green, Ph.D., P.E.
Professor
120-B Patton Hall
Department of Civil and Environmental Engineering
Virginia Tech
Blacksburg, VA 24061
Phone: (540) 231-9826
Fax: (540) 231-7532
Email: rugreen@vt.edu

Additional information: http://www.cee.vt.edu

Updated: 8/11/2017

“Please note: Some of the Web sites linked to in this document are not federal government Web sites, and may not necessarily operate under the same laws, regulations, and policies as federal Web sites.”