University of Arkansas – Fort Smith
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General Syllabus

GEOS 31133 Volcanology

Credit Hours: 3 Lecture Hours: 3 Laboratory Hours: 0

Prerequisite: GEOS 23143/23131 Minerals and Rocks/Laboratory

Effective Catalog: 2018~2019

I. Course Information

A. Catalog Description

Examines volcanism in various tectonic settings and its impact on climate and the biosphere. Topics include analysis and mitigation of volcanic hazards, and monitoring techniques for active volcanoes.

B. Additional Information

This course is an elective for the B.S. degree in Geoscience.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Reflect upon the history of human interaction with volcanism.
2. Analyze the mechanisms of magma generation in a variety of tectonic environments.
3. Analyze the chemical and physical properties of magma.
4. Analyze volcanic landforms and describe the mechanisms by which they formed.
5. Evaluate important case studies of past volcanic eruptions: explosivity, nature of deposits, extent and severity of impact on climate and biosphere, etc.
6. Analyze existing volcanic landforms and deposits in order to a) determine the dominant styles of past eruptions and b) identify the hazards we should expect during future eruptions.
7. Assess modern techniques used to monitor active volcanoes and to mitigate.

B. University Learning Outcomes

This course will enhance student abilities in the following areas:

Analytical Skills
Critical Thinking Skills: Students will identify a problem or issue and will research, evaluate, and compare information from varying sources in order to evaluate authority, accuracy, recency, and bias relevant to the problems/issues. Students will generate solutions/analysis of problems/issues evaluated and will assess and justify the solutions and/or analysis.

Communication Skills (written and oral)
Students will communicate proficiently. Students will compose coherent documents appropriate to the intended audience and effectively communicate orally in a public setting.

Ethical Decision Making
Students will model ethical decision-making processes. Students will identify ethical dilemmas and affected parties and will apply ethical frameworks to resolve a variety of ethical dilemmas.

Global & Cultural Perspectives
Students will reflect upon cultural differences and their implications for interacting with people from cultures other than their own. Students will demonstrate understanding or application of their discipline in a global environment and will demonstrate how their discipline impacts or is impacted by different cultures.

III. Major Course Topics

A. Origin, chemistry, and physical properties of magma
B. Plate tectonic settings of volcanism
C. Volcanic landforms
D. Volcanic eruption styles and materials produced
E. Volcanoes in human history
F. Volcanic hazards – monitoring and mitigation