

**University of Arkansas – Fort Smith**  
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**Fort Smith, AR 72913–3649**  
**479–788–7000**

## **General Syllabus**

### **GEOL 3303 Global Tectonics**

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisite: GEOL 2263/2261 Historical Geology/Laboratory

Effective Catalog: 2018~2019

#### **I. Course Information**

##### **A. Catalog Description**

Development and current state of plate tectonic theory. Topics include measurements of current plate motions and reconstructions of past plate motions and supercontinents.

##### **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. Identify, sketch and describe currently accepted interpretations of earth's interior structure and composition, and summarize the geological and geophysical evidence on which those interpretations are based.
2. Evaluate the historical development of plate tectonic theory: key researchers, technological advancements, data, hypotheses, and interpretations.
3. Analyze and model the mechanics of plate motion, using principles from kinetics, seismology, heat flow, and mantle convection.
4. Assess plate tectonic theory as an explanation for the observed structure, petrology, and age patterns of mid-ocean ridges.
5. Assess plate tectonic theory as an explanation for the observed features of continental rifts and rifted margins.
6. Evaluate seismicity, gravity anomalies, and thermal tomography of subduction zones, and compare these observations with predictions of plate tectonic theory.
7. Evaluate the overall structure of major collisional orogenies, including the Alps, Himalaya, the Andes, Japan, and the Philippines.

8. Analyze the changing nature of plate tectonics through geologic time, including widely accepted evidence of past supercontinents.

## **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. Structure and composition of Earth's interior
- B. Ocean ridges and sea floor spreading
- C. Transform faults
- D. Continental rifts and rifted margins
- E. Subduction zones
- F. Orogenic belts
- G. Plate tectonic reconstructions and the supercontinent cycle
- H. Mechanics of plate motions