

Faculty Senate: April 16, 2020  
Colonnade/General Education Report (April 2020, Partial)

*Julio Shadoan, Chair*

Senate Recommendation 2020-04-02 Colonnade General Education  
Committee\_Partial\_ 4.7.2020

**Colonnade General Education Committee Report (Partial)**  
**University Senate**  
**Apr. 7, 2020**  
**via Zoom**

**Action Items**

***Course Proposal and syllabus of GEOL 250 attached***

Approval of:

1. ART 395 to be equivalent to HIST 395 Cultural History of Alcohol (Connections: Social & Cultural) Implementation ASAP. *HIST 341 has changed its course number to HIST 395. However, both HIST 341 and HIST 395 appear on the Colonnade list of approved courses. Therefore, remove HIST 341 from the approved courses.*
2. GEOL 250, Environmental Geology (Explorations: Natural & Physical Sciences with applied/lab component [NS & SL]) Implementation: Fall 2020

**Please complete the following and return electronically to the current chair of the Colonnade Committee, as listed on the Faculty Senate website.**

### **Colonnade Explorations Course Proposal**

Proposal Contact Name, E-mail, and Phone: Nahid Gani, [nahid.gani@wku.edu](mailto:nahid.gani@wku.edu), 270-745-2813

College and Department: Ogden College, Department of Geography and Geology.

Proposal Date: 2/17/2020

#### **1. Course Details:**

- 1.1** Course prefix (subject area), number and title: **GEOL 250, Environmental Geology**
- 1.2** Explorations sub-category (Arts & Humanities, Social & Behavioral Sciences; Natural & Physical Sciences): **Natural & Physical Sciences with applied/lab component (NS & SL)**
- 1.3** Credit hours: **3**
- 1.4** Prerequisites<sup>1</sup>: **None**
- 1.5** Equivalent courses (prefix and number): **None**
- 1.6** Expected number of sections offered each semester/year: **1 to 2 per semester, depending on student demand**
- 1.7** Is this an existing course or a new course? **New course, which has been already approved for fall 2020**
- 1.8** Proposed implementation term? **Fall 2020**
- 1.9** Where will this course be offered? (Bowling Green main campus, regional campuses, online? List all.) **Bowling Green main campus, and online**

#### **2. Provide a brief course description (100-200 words).**

This course is designed as a combined lecture and applied/lab course to investigate the important interplay between geologic principles, environments, humans and the Earth. This course addresses the most pressing environmental concerns encountered by humanity on the Earth's systems, which are not only controlled by internal and external surficial Earth's processes but also by the huge footprint of the world's growing population and their increasingly affluent lifestyle.

---

<sup>1</sup> Courses may require prerequisites only when those prerequisites are within the Colonnade Foundations and/or Explorations listing of courses.

In this course, the use of fundamental geologic knowledge is investigated in the remediation of these challenges and better management of the Earth as a sustainable planet. Students will gain an in-depth understanding of the Earth's various systems and its natural and anthropogenic processes that control environmental changes and increase societal risk and vulnerability. Examples include current global warming, anthropogenic and natural pollution, loss of habitat and wetland, increased geologic hazards, extreme climate and erratic hydrologic cycle, environmental effect on human health, and environmental disasters due to the exploitation of geologic resource (i.e., water, soil, energy).

**3. How will this course meet the specific learning objectives of the appropriate subcategory? Please address all of the learning outcomes listed for the appropriate subcategory.**

The course objectives are designed to meet the four specific learning objectives in the Natural and Physical Sciences subcategory as stated below. Hands-on exercises constitute an essential applied learning component in this course.

**Colonnade Learning Objective 1:**

**Demonstrate an understanding of the methods of science inquiry.**

Upon successfully completing this course, students will be able to:

- Demonstrate an understanding of the methods of science inquiry by learning data collection, interpretation, and drawing conclusions specific to natural and anthropogenic processes that are relevant to humans and the environment. A number of lab assignments (35% of the overall course grade) constitute a key part of this scientific inquiry.

**Colonnade Learning Objective 2:**

**Explain basic concepts and principles in one or more of the sciences.**

Students will be able to explain:

- Basic physical, chemical and biological processes occurring at or near the Earth surface.
- Nitrogen and carbon cycle, trophic levels and food chains, changes in biodiversity, habitat destruction, population and ecosystem relevant.
- Pedosphere such as weathering, assessing soil-erosion hazard, desertification, degradation and conservation.
- Earthquake hazards and how to take necessary steps to minimize property damage and loss of life.
- Groundwater pollution/contamination and its migration, cleanup, restoration.

- Role of human-induced air pollution in environmental change and management.
- Human impact in changing land cover and atmospheric composition.

### **Colonnade Learning Objective 3:**

**Apply scientific principles to interpret and make predictions in one or more of the sciences.**

This objective will be achieved primarily through lab assignments, where students will be able to:

- Analyze the dynamic behavior of the Earth-like plate tectonics that contributes to our changing environments. For example, they will analyze the relationship between continental and oceanic plate motion and predict increased risk of earthquake and volcanic hazards relevant to environmental and ecosystem health problems.
- Evaluate the human effect on geological environments by understanding and comparing how the atmospheric CO<sub>2</sub> concentration changes at different time scales of the century, several hundred years and millions of years.
- Explain flood frequency analysis, and assess flood hazard and mitigation, channel instability, watershed management and drought impact.

### **Colonnade Learning Objective 4:**

**Explain how scientific principles relate to issues of personal and/or public importance.**

The issue of personal and public importance is the central objective of this course. Students will be able to:

- Analyze geological data necessary to improve our living environments. Explore environmental issues related to the mining of economic resources, such as emission of sulfur dioxide into the atmosphere from the smelting of sulfur ores or metal-rich toxic water drainage incorporated into the food chains.
- Explain MARPOL Convention, coastal erosion and restoration, ocean acidification, waste disposal, and coastal hazards for those living by the sea.
- Learn how to trace the flow of energy through the earth's systems. Explain warming, waste disposal and other environmental impacts associated with the use of energy.
- Scrutinize how the earth system process is instrumental in formulating public policy or law to deal with a variety of environmental problems.

**4. Syllabus statement of learning outcomes for course. NOTE: In multi-section courses, the same statement of learning outcomes must appear on every section's syllabus.**

### **Colonnade learning outcomes:**

Students will:

1. Demonstrate an understanding of the methods of science inquiry.
2. Explain basic concepts and principles in one or more of the sciences.
3. Apply scientific principles to interpret and make predictions in one or more of the sciences.
4. Explain how scientific principles relate to issues of personal and/or public importance.

### **GEOL 250 learning outcomes:**

Upon completion of this course, students will be able to:

- Demonstrate an understanding of data collection, interpretation, and drawing conclusions specific to natural and anthropogenic processes that are relevant to humans and the environment.
- Explain physical, chemical and biological processes occurring at or near the earth's surface, including natural hazards, nitrogen and carbon cycles, trophic levels and food chains, and water cycles and budgets.
- Apply plate tectonic principles to analyze the relationship between continental and oceanic plate motion and predict increased risk of earthquake and volcanic hazards relevant to environmental and ecosystem health problems.
- Scrutinize how the earth system process is instrumental in formulating public policy or law to deal with a variety of environmental problems.

### **5. Brief description of how the department will assess the course for these learning objectives.**

The department will use a number of assessment instruments to measure student learning in this course that will fulfill the four colonnade learning objectives:

#### **Assessment tool for Objective 1: Demonstrate and understand the methods of science inquiry**

**Lab #1** (EDDIE Environmental data-driven inquiry and exploration) will be used for this purpose. In this lab, students will collect, analyze and interpret environmental data. This lab-related assessment will allow students to understand the methods of science inquiry.

#### **Assessment tool for Objective 2: Explain basic concepts and principles in one or more of the sciences**

Students will be provided **case study #1** article on the current global warming issues related to the ice mass and sea-level change. They will particularly study Greenland, which is one of the two largest ice sheets in the world today. They will participate in a group discussion in the class and then write a short essay on its

implication to our civilization. This case study assessment will be used to measure students' understanding of scientific principles relating to global issues.

**Assessment tool for Objective 3: Apply scientific principles to interpret and make predictions in one or more of the sciences**

Students will be provided **case study #2** article on monitoring volcanoes and communicating risks. They will study different volcanoes (e.g., Mt. St. Helen, Hawaii, and Yellowstone) to understand eruption and assess societal risk. They will participate in a discussion in the class and then take a quiz on predicting risks for the local communities and providing alert levels. This case study assessment will be used to measure students' ability to apply scientific principles to interpret and make predictions.

**Assessment tool for Objective 4: Explain how scientific principles relate to issues of personal and/or public importance**

Students will be provided **case study #3** on the MARPOL (Marine Pollution) Convention. They will participate in a group discussion in the class and then write a short essay on the significance and implementation of the MARPOL Convention in preventing coastal pollutions that can affect marine ecosystems and humans living in coastal areas. This case study assessment will be used to measure students' ability to relate scientific principles to issues of public importance like marine pollution.

**6. Please attach sample syllabus for the course. PLEASE BE SURE THE PROPOSAL FORM AND THE SYLLABUS ARE IN THE SAME DOCUMENT.**

**Please see the sample syllabus in next page.**

## **GEOL 250: ENVIRONMENTAL GEOLOGY (3 credit)**

**Instructor:** Dr. Nahid Gani

### **Course Description:**

This course is designed as a combined lecture and applied/lab course to investigate the important interplay between geologic principles, environments, humans and the Earth. This course addresses the most pressing environmental concerns encountered by humanity on the Earth's systems, which are not only controlled by internal and external surficial Earth's processes but also by the huge footprint of world's growing population. Students will gain an in-depth understanding of the Earth's various systems and its natural and anthropogenic processes that controls environmental changes and increases societal risk and vulnerability.

### **Colonnade Explorations Learning Outcomes:**

This course fulfills Colonnade Explorations Category's four learning objectives. Students will:

1. Demonstrate an understanding of the methods of scientific inquiry.
2. Explain basic concepts and principles in one or more of the sciences.
3. Apply scientific principles to interpret and make predictions in one or more of the sciences.
4. Explain how scientific principles relate to issues of personal and/or public importance.

### **GEOL 250 learning outcomes:**

Upon completion of this course, students will be able to:

- Demonstrate an understanding of data collection, interpretation, and drawing conclusions specific to natural and anthropogenic processes that are relevant to human and environment.
- Explain physical, chemical and biological processes occurring at or near the Earth surface, including natural hazards, nitrogen and carbon cycles, tropic levels and food chains, and water cycles and budgets.
- Apply plate tectonic principles to analyze the relation between continental and oceanic plate motion and predict increased risk of earthquake and volcanic hazards relevant to environmental and ecosystem health problems.
- Scrutinize how earth system process is instrumental in formulating public policy or law to deal with a variety of environmental problems.



**Required Text:**

*Environmental Geology: An Earth Systems Approach*, 2nd edition (2014), by Dorothy Merritts, Kirsten Menking, Andrew De Wit, ISBN 978-1429237437, W.H Freeman and Company.

**Evaluation and Grading:**

Your final grade will be evaluated in the following categories (in percentage):

Categories	(%)
3 Exams (3 X 15%)	45
Laboratory Exercises	35
Current Environmental Case Studies	15
Attendance and participation	5
<b>Total</b>	<b>100</b>

*Final letter grades for this course are:*

A = 90% and above; B = (80-89) %; C = (70-79) %; D = (60-69) %; F = 59% and below.

Grades are based on straight percentages as noted above (there will be NO curving of the grades). Scores in all the above categories will be posted on the blackboard regularly. I encourage you to keep track of your percentage grades in an excel spreadsheet to understand how you are progressing in the class. Late work or make-up exams are not accepted for a grade unless a VALID university excuse is presented to me at least one week before, or as soon as possible for unforeseen cases.

Exams: There will be 3 exams. The exams will cover materials mostly from class lectures, reading assignments, critical thinking of your textbook chapters, and class discussion. You will need to understand each concept covered in each lecture class (by reading the textbook, class lectures, video clips, recent news, supplemental materials that may be provided in the class as needed). Exams include a combination of questions styles including critical thinking, multiple choice, conceptual diagrams identification, matching, fill-in-the-blank, and short answers.

Lab Assignments: Five assignments will be given in class to analyze, synthesize and interpret the data to assess their technical and applied knowledge.

Current Environmental Case Studies: There will be three environmental case studies from journal articles. For each case study, you will participate in a group discussion in the class and then write a short essay and/or take a quiz, which will measure your understanding of the topic.

Attendance Policy: This course obligates you to be regular and punctual in class attendance. Regular attendance is essential for succeeding the class. Attendance will be taken in each class and will be recorded on Blackboard. Your attendance and class participation constitute 5% of the final grade.

### **Class Policies:**

**Academic Assistance through the Learning Center (TLC):** Should you require academic assistance with your WKU courses, The Learning Center (located in the Downing Student Union, 2141) provides free supplemental education programs for all currently enrolled WKU students. The Learning Center at Downing Student Union offers certified, one-on-one tutoring in over 200 subjects and eight academic skill areas by appointment or walk in. Online tutoring is offered to distance learners. TLC is also a quiet study area (with side rooms designated for peer-to-peer tutoring) and a computer lab to complete academic coursework. Please call TLC in the Downing Student Union at (270) 745-5065 for more information or to schedule a tutoring appointment. [www.wku.edu/tlc](http://www.wku.edu/tlc)

**Academic integrity:** Students are expected to conduct themselves according to the principles defined in the WKU Student Code of Conduct at <https://www.wku.edu/studentconduct/student-code-of-conduct.php>. Any student or group found to have committed an act of academic dishonesty shall have their case turned over to the Office of Student Conduct for disciplinary action. Academic dishonesty includes, but is not

limited to: cheating, plagiarism, fabrication, or misrepresentation, and being an accessory to an act of academic dishonesty. For more, see <https://www.wku.edu/handbook/academic-dishonesty.php/>

**Students with disability:** In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at [sarc.connect@wku.edu](mailto:sarc.connect@wku.edu). Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center. For more visit <http://www.wku.edu/sarc/>

**Title IX/ discrimination & harassment:** Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at <https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf> and Discrimination and Harassment Policy (#0.2040) at <https://www.wku.edu/policies/docs/251.pdf>. Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

## Semester Schedule

Week	Content	Chapter
1	<p><i>Dynamic Earth Systems</i></p> <p>Earths environmental system; earth's energy systems; human population &amp; earth-system boundaries</p>	1
2	<p><i>Plate Tectonics: Solid Earth in Motion</i></p> <p>Plate properties &amp; motion; plate tectonics &amp; biosphere evolution; recycling at subduction zones</p> <p><b>Current environmental case study #1</b></p>	2
3	<p><i>Earthquakes, their causes, hazards and risks</i></p> <p>Seismic energy, assessing earthquake hazards; minimizing the risk from earthquakes</p> <p><b>Lab 1: EDDIE Environmental data-driven inquiry and exploration</b></p>	3
4	<p><i>Earth Materials</i></p> <p>Elements, minerals &amp; rocks; Recycling of mineral resources; Environmental impacts of mining</p> <p><b>Exam 1</b></p>	4
5	<p><i>Volcanoes</i></p> <p>Hazard and minimizing the risk of volcanic eruptions; prediction challenges</p> <p><b>Current environmental case study #2</b></p>	5
6	<p><i>Geologic Time</i></p> <p>Time and earth system cycles; global change over different scales of time</p> <p><b>Lab 2: Climate change</b></p>	6
7	<p><i>The Biosphere</i></p> <p>Biosphere structure and functioning, ecosystem services, human impact of the biosphere</p>	7
8	<p><i>Soil and Weathering</i></p> <p>Pedosphere Resources: Soils, Clays, and Mineral Ores, Soil Erosion Hazards, Soil Conservation.</p> <p><b>Lab 3: Soil respiration</b></p>	8
9	<p><i>Earth's Surface Water</i></p> <p>The Hydrologic Cycle, Streams, Floods, Managing and Restoring Streams and Wetlands</p>	9

	<b>Exam 2</b>	
10	<b><i>The Groundwater System</i></b> Groundwater as a Resource, Groundwater Hazards, Groundwater Pollution and its Cleanup	10
11	<b><i>The Atmospheric System</i></b>	11
12	<b><i>The Ocean and Coastal System</i></b> Seawater Chemistry, Coastal Processes & Hazards, Ocean Acidification, Human Impacts on Seas	12
13	<b><i>Energy</i></b> Petroleum, Coal, Carbon capture & storage, Geothermal & Nuclear energy, Renewable energy <b>Current environmental case study #3</b>	13
14	<b><i>Understanding Climatic and Environmental Change</i></b> Climate on Terrestrial Planets, Causes of Climatic Change, Indicators of Environmental Change <b>Lab 5: Lake modeling/Eyes on the hydrosphere</b>	14
15	<b><i>Humans and the Whole Earth System</i></b> Living in the Anthropocene, Anthropogenic Climate Change, Impacts of Rising Greenhouse Gas Concentrations, Coming to Grips with the Anthropocene	15
16	<b>Exam 3</b>	