Colonnade General Education Committee Report
University Senate
Mar. 3, 2020

Action Items

Course Proposals and syllabi attached

Approval of:

1. FLK 276. Revise title from “Introduction to Folk Studies” to “Introduction to Folklore” (Explorations: Arts & Humanities)
2. GEOL 301: Geology and Climate: Past and Future (Connections: Systems) Implementation: Fall 2020

Information

On the Colonnade website, under the tab “Colonnade Requirements,” the sub-tabs “Language Requirement” and “STAMP Assessment Overview” have been revised to reflect the current Language Requirement.

Colonnade Connections Course Proposal

Systems Subcategory

Proposal Contact Name, E-mail, and Phone: M. Royhan Gani, royhan.gani@wku.edu, 270-745-5977

College and Department: Ogden, Geography & Geology Proposal Date: 2/20/20

1. Course Details:

- **1.1** Course prefix (subject area), number and title: GEOL 301: Geology and Climate: Past and Future
- **1.2** Credit hours: 03
- **1.3** Prerequisites[1]: GEOG/GEOL 103 OR GEOL 111 OR GEOL 112
- **1.4** Cross listed and/or equivalent courses (prefix and number): None
- **1.5** Expected number of sections offered each semester/year: 1/year (more if sufficient demand)
- **1.6** Is this an existing course or a new course? New course (already approved for fall 2020)
- **1.7** Proposed implementation term: Fall 2020
- **1.8** Where will this course be offered? Bowling Green main campus (and online if sufficient demand)

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

This course is a survey of Earth's past climate changes, the present state, and what these mean for the future of our planet – our only home. Climate change is reshaping our daily conversation in every sector of society. Why and how the Earth's climate has changed through time and what to expect in the near future is an important part of that conversation. Understanding climate change relies on integrated knowledge of the earth's system components (e.g., hydrosphere, atmosphere, and biosphere). Natural and/or anthropogenic alterations of these various subsystems are responsible for noticeable changes in Earth's climate. This course provides an in-depth understanding of geological factors and processes that influence Earth's climate over a variety of timescales. Students will gain the ability to assess climate risks from the local to the global scale and from the short to the long term.

3. Explain how this course provides a *capstone* learning experience for students in Colonnade (compared to an introductory learning experience).

Climate change is one of the principal challenges facing humanity today with grave global implications: environmental, economic, social, political, and national security. Thus, climate change is reshaping our

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

daily conversation in every sector of the society (including at WKU!). By assessing past climate changes as well as future climate risks from the local to the global scale, this course prepares students to become mindful and responsible global citizens.

Earth's climate is a complex system. To understand how this system has changed in the past over geologic time, it is important for students to gain some introductory knowledge first. For example, Earth Systems concepts are introduced in foundational and exploratory Colonnade courses. This course (Geol 301) also builds on multi-disciplinary knowledge to investigate Earth's climate. For example, the notable Berkeley Earth Project (http://berkeleyearth.org/) assessing the nature of global climate change, involves a multi-disciplinary team of scientists including Nobel laureates, as the complexity of Earth's climate cuts across disciplinary boundaries.

Any changes in Earth System components – the land (lithosphere), air (atmosphere), water (hydrosphere), and life (biosphere) – play a critical role in altering Earth's climate. Thus, students in this course will apply knowledge from multiple disciplines including geology, physics, meteorology, chemistry, and biology to understand the interconnectedness of various Earth System components, and particularly how this interconnectedness has a major impact on climate change throughout the earth history. For example, snowball earth in the Precambrian (~650 million years ago), greenhouse earth in the Mesozoic (~200 million years ago), icehouse earth in the Oligocene (~30 million years ago), and global warming in the Anthropocene (past ~100 years) are all discussed through the common thread of changing earth system components.

4. List the *course goals* (see Glossary of Terms), and explain how are they aligned with the Connections student learning outcomes.

Connections Student Learning Outcomes	**How does the course meet these learning outcomes? (Align course goals to Connections SLOs)**
1. Analyze how systems evolve.	Students analyze how various components of the earth's systems evolved over geologic time. For example, long-term variations of past CO_2 concentration in the atmosphere, reorganization of plates and ocean circulations through geologic time, past hydrologic budgets, and changes of the biosphere because of biological evolution.
2. Compare the study of individual components to the analysis of entire systems.	Students learn how the interconnectedness of and the balance between various earth system components control Earth's climate. For example, students examine how i) plate reorganization both created and then ended the snowball-earth climate during Precambrian, ii) rapid evolution and subsequent fossilization of large land-plants prompted draw-down of atmospheric CO_2

	creating global cooling around 300 million years ago, and iii) rapid burning of fossil fuels increased atmospheric CO_2 level over the past 200 years, prompting global warming.
3. Evaluate how system-level thinking informs decision-making, public policy, and/or the sustainability of the system itself.	Students evaluate how Earth's climate system has changed over the past billion years. They also evaluate the drivers of these changes. This makes them aware of the vulnerability of Earth's climate to natural versus anthropogenic processes. For example, students are able to scrutinize whether Earth's temperature is currently rising, and if yes, whether this global warming is natural or anthropogenic. Students also evaluate risks of future climate change, mitigation strategies, and management of Earth's resources in a sustainable way. For example, students are able to appreciate how responsibilities at the personal, city, state, and international levels can minimize climate change risks.

5. List additional student learning outcomes, beyond the three Connections SLOs, that will guide student learning in this course (if any).

In addition, upon successful completion of this course, students should be able to:

- Analyze paleoclimate archives and data.
- Examine long-term versus short-term paleoclimate changes.
- Evaluate the magnitude of Earth's past CO_2 fluctuations and compare that with the Anthropocene's.

6a. Explain how the department plans to assess each of the Connections of student learning outcomes *beyond course grades*. Note: SACSCOC requires the assessment of SLOs to compare Bowling Green campus, online, and regional campus learning experiences; some consideration of such a distinction must be included in the right-hand column, when applicable.

Connections Student Learning Outcomes	**Identify the "artifact(s)" (assignments, papers, activities, etc) that will be used for assessing each learning outcome *beyond course grades*. Applicants must be**	**Describe in detail the assessment methods the department will employ for this Connections course. Assessment plans must produce a *separate evaluative rating* for each Connections SLO.**

	explicit in describing how the artifact(s) provides evidence of student learning for each Connections SLO.	
1. Analyze how systems evolve.	As part of the final exam, students will answer several questions on long-term variations in atmospheric CO_2 concentration, plate reorganization, ocean circulation patterns, hydrologic cycles, and ecosystem changes.	Based on the course offering frequency and enrollment, the department will use a sample size for assessment of this Connections SLO using the rubric provided in section 6b. The initial goal will be for the sample size to be rated at a 2 or greater. Results obtained from this assessment will be used to strengthen subsequent course offerings.
2. Compare the study of individual components to the analysis of entire systems.	Students will complete an exercise to compare how a change in one component (e.g., biosphere) can influence another component (e.g. atmosphere) of the earth system, ultimately altering Earth's climate. Students will also assess the mode and tempo of earth system perturbations.	Based on the course offering frequency and enrollment, the department will use a sample size for assessment of this Connections SLO using the rubric provided in section 6b. The initial goal will be for the sample size to be rated at a 2 or greater. Results obtained from this assessment will be used to strengthen subsequent course offerings.
3. Evaluate how system-level thinking informs decision-making, public policy, and/or the sustainability of the system itself.	Students will complete a group project on evaluating a current news event on climate change. Students will use evidence to make compelling arguments for the larger implication of the event: environmental, economic, social, political, and/or national security. The project will include a group presentation and discussion prompt for the class. Each student will write a short essay on the topic.	Based on the course offering frequency and enrollment, the department will use a sample size for assessment of this Connections SLO using the rubric provided in section 6b. The initial goal will be for the sample size to be rated at a 2 or greater. Results obtained from this assessment will be used to strengthen subsequent course offerings.

6b. Include the rubric that will be used for Connections assessment (either in the space below or as an attachment). Also, for each of the SLOs briefly note what benchmarks you will use to determine whether the course successfully met its goals for each of the rubrics.

Connections SLO	4. Distinguished	3. Proficient	2. Developing	1. Not Evident
1. Analyze how systems evolve	Provides clear examples of how earth system components vary over geologic time and at what time-scale.	Provides specific examples of how earth system components vary over geologic time but does not clarify at what time-scale they vary.	Recognizes that earth system components vary over geologic time but does not specify how.	Little to no identification of how earth system components vary over geologic time.
2. Compare the study of individual components to the analysis of entire systems.	Clearly identifies how earth system components can influence one another, recognizes their nature of perturbations, and demonstrates how these mechanisms can cause climate change.	Identifies how earth system components can influence one another, and recognizes their perturbations. However, fails to demonstrate how these mechanisms can cause climate change.	Identifies how earth system components can influence one another but fails to identify their perturbations.	Little to no identification of how earth system components are interconnected.
3. Evaluate how system-level thinking informs decision-making, public policy, and/or the sustainability of the system itself	Clearly distinguishes between natural and anthropogenic climate changes, assesses the risks of future climate change and their local to global implications, and addresses mitigation strategies.	Distinguishes between natural and anthropogenic climate changes, and assesses the risks of future climate change. However, fails to address mitigation strategies.	Specifies how both natural and anthropogenic processes can cause climate change but fails to distinguish between natural and anthropogenic climate changes.	Little to no demonstration of how natural and anthropogenic processes can cause climate change.

7. Evidence & Argument Artifact. As the capstone experience for the Colonnade Program, Connections courses are expected to include activities, assignments, or other learning experiences that will produce at least one "artifact" (research paper, presentation, major project, etc.) that can be used to evaluate students' ability to identify, synthesize, and make use of evidence in support of cogent and persuasive arguments.

What “artifact” in the proposed course could be used for this purpose? (Note: This could be but is not required to be, the same “artifact” identified in 6a above.)

Students will complete a group project on evaluating a current news event on climate change (point #3 in table 6a). Students will use evidence to make compelling arguments for the larger implication of the event: environmental, economic, social, political, and/or national security. The project will include a group presentation and discussion prompt for the class. Each student will also write a short essay on the topic. This essay constitutes the assessment artifact.

8. Attach a sample course syllabus. The course syllabus must contain the three Connections student learning outcomes for the subcategory as well as any additional student learning outcomes listed in this application, and those learning outcomes must appear in every section's syllabus.

Syllabus

GEOL 301: Geology and Climate: Past and Future (3 credit hours)

Instructor: Dr. M. Royhan Gani

Office: Environmental Sciences & Tech building, Room# EST 317

Email: royhan.gani@wku.edu

Phone: 270-745-5977 (office)

Helpful information for students enrolled in WKU Classes: http://www.wku.edu/syllabusinfo/

Course Overview: This course is a study of Earth's past climate changes, the present state, and what these mean for the future of our planet – our only home. Climate change is reshaping our daily conversation in every sector of society. Why and how the earth's climate has changed through time and what to expect in the near future is an important part of that conversation. Natural and/or anthropogenic alterations of the various earth system components (e.g., air, water, and biological community) are responsible for noticeable changes in Earth's climate. This course provides an in-depth understanding of geological factors and processes that influence Earth's climate over a variety of timescales. Emerging climate disruptions across the globe are also assessed.

Textbook (required): *Earth's Climate: Past and Future*, 3rd edition (2014), 464 pages, by William F. Ruddiman. W.H. Freeman & Company Limited. ISBN-10: 1429255250; ISBN-13: 978-1429255257.

Additional readings are made available on Blackboard in PDF format.

Student learning outcomes: Upon successful completion of this course, students will be able to:

- Analyze paleoclimate archives and data.
- Examine long-term versus short-term paleoclimate changes.
- Evaluate the magnitude of Earth's past CO_2 fluctuations and compare that with the Anthropocene's.
- Scrutinize factors that influence paleoclimate systems.
- Assess the type of future climate disruptions and their mitigation strategies.

Colonnade Systems Learning Outcomes:

1. Analyze how systems evolve.
2. Compare the study of individual components to the analysis of entire systems.
3. Evaluate how system-level thinking informs decision-making, public policy, and/or the sustainability of the system itself.

Assessment: Your grade will be based on exams (Mid-term and Final), in-class exercises, and a group project. The two exams will cover the material from lectures, exercises, and any class activities. Exam questions will be a combination of long-answer, short-answer, and multiple-choice questions. In-class exercises will require you to analyze, produce, and/or interpret a combination of hand samples, data, graphs, and models. **Group projects**: students will be divided into a number of teams based on the class size. Each team will select a current news topic on a climate event (topic must be selected *by Week 10 with instructor's approval*), analyze and evaluate the news, and use evidence to make compelling arguments for the larger implication of the climate event such as environmental, economic, social, political and/or national security. All teams will formally present their findings in the class during Week 14 using PowerPoint and/or Poster.

Grading:

Mid-term:	20%
Exercises:	25%
Project:	25%
Final exam:	30%
Total =	100%

Grades based on straight percentages:

90% - 100% of total points possible = A

80% - 89% of total points possible = B

70% - 79% of total points possible = C

60% - 69% of total points possible = D

Below 60% is not passing = F

Schedule of the semester:

Week	**Topics**	**Readings (Ruddiman)**
Week 1	Introduction: Science, Geology, Climate, and Society	Chapter 1
Week 2	Earth's Climate System Today	Chapter 2
Week 3	Climate Archives, Data, and Models *Exercise 1: Climate Archives*	Chapter 3
Week 4	CO_2 and Long-Term Climate	Chapter 4
Week 5	Plate Tectonics, Ocean circulation, and Long-Term Climate *Exercise 2: Ocean circulation and Climate change*	Chapter 5
Week 6	Greenhouse versus Icehouse Climate **Midterm Exam**	Chapter 6-7
Week 7	Astronomical Control of Solar Radiation *Exercise 3: Earth's radiation budget*	Chapter 8
Week 8	Insolation Control of Monsoons and Ice sheets	Chapter 9-10
Week 9	Orbital-Scale Changes	Chapter 11-12
Week 10	Glacial/Deglacial Climate Change of the Quaternary *Exercise 4: Growth and Decay of Ice Sheets*	Chapter 13-14
Week 11	Humans and Preindustrial Climate	Chapter 16, 17
Week 12	Climate Changes Since 1850	Chapter 18, 19
Week 13	Future Climate Changes: risks and mitigations *Exercise 5: Risks of sea-level rise*	Chapter 20
Week 14	**Formal Group Presentations**	
Week 15	**Final Exam** (cumulative)	

Classroom Policies:

Class attendance: You must attend class regularly. If you know you will be missing a class because of a valid reason, email me ahead of time (or, as soon as possible for unforeseen ones). Each week contains important material that we build upon throughout the class. You will enjoy the course more (and likely get a much better grade) if you attend regularly and participate in discussions with a positive attitude.

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, room 1074 of the Student Success Center. The phone number is 270-745-5004, or email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a letter of accommodation 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 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 your confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.