

New Core Component Proposal

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Viewing: **GEOL 208-GE : Life on a Dynamic Planet**

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Changes proposed by: david-w-sparks

Contact(s)

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Course Prefix GEOL Course Number 208

Academic Level UG

Complete Course Title Life on a Dynamic Planet

Abbreviated Course Title LIFE ON A DYNAMIC PLANET

Crosslisted With

Semester Credit Hour (s) 3

Proposal for:
Core CurriculumHow frequently will the class be offered?
yearly

Number of class sections per semester 1

Number of students per semester 60

Historic annual enrollment for the last three years

Last year: 9 Previous year: Year before:

Core curriculum

Foundational Component Area Core Life/Physical Sci (KLPS)

TCCN prefix/number

Foundational Component Area: Life/Physical Sci

How does the proposed course specifically address the Foundational Component Area definition above?

GEOLOGY 208 focus on the interaction between the evolutionary history of life and changes in the Earth environment over the last ~2 billion years. The course is centered on the application of the scientific method in observational sciences, especially the practice of evaluating multiple working hypotheses given evidence. Students must critically analyze evidence from the primary literature and learn to accommodate newly discovered information in their hypothesis tests. Investigated topics include: the rise of oxygen in Earth's atmosphere, global climate events from Snowball Earth to glacial-interglacial cycles, the origin of life and major animal groups, the causes of mass extinction events, the drivers of taxonomic diversity, the impacts of the evolution and extinction of organismal groups (including humans) on the Earth system, and the nature of the geological record human society will leave behind. Laboratory exercises focus on interpretation of the geological record and paleontological record using primary observation of samples, computer simulations, and quantitative analyses of existing data. Students work collaboratively during lab to draw on each other's unique backgrounds and gain appreciation for different perspectives in problem solving.

Core Objectives:

In Workflow

1. **GEPL Department Head**
2. **GE College Dean UG**
3. **CCC Preparer**
4. **CCC Chair**
5. Faculty Senate Preparer
6. Faculty Senate
7. Provost II
8. President
9. Curricular Services

Approval Path

1. 02/28/19 11:17 am
Michael Pope
(mcpope): Approved for GEPL Department Head
2. 03/07/19 5:09 pm
Christian Brannstrom
(cbrannst): Approved for GE College Dean UG
3. 03/11/19 12:39 pm
Barbara West
(barbwest): Approved for CCC Preparer

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

During the first classroom session of each week, students are introduced to a topic and guided through the foundational knowledge necessary for evaluating related hypotheses. Students are then asked to synthesize the new information with what they have learned previously (either from the class or their outside experiences) and with assigned journal articles (primary and review sources) by completing an at-home “thought experiment.” These thought experiments form the basis of discussion in the second classroom session of the week. Here, students compare the results of their thought experiments in small groups and then as a whole class discussion guided by the instructor. Students are encouraged to extend the “experiment” into related paths of inquiry and propose methods for testing their alternative hypotheses. In lab, students make and record observations from specimens of rocks and fossils and actively explore hypotheses using online computer simulations and quantitative datasets from online databases and the literature. Laboratory topics parallel and reinforce the classroom topics. Exams are structured to mimic the process of hypothesis testing and re-evaluation of hypotheses given new information. Exams are given in two parts in two sequential classroom sessions. In the first session, students answer questions and design tests of hypotheses using their current knowledge. Then students are given a related paper to read before the second session where they must evaluate how that paper supports or refutes the hypotheses from the first part of the exam citing evidence. They must also consider how the new knowledge altered their uncertainties regarding the topic.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

All thought experiments are written and students are evaluated on their ability to support their conclusions. Students must also verbally express their ideas to each other during small group discussions. The exams are essay format and directly evaluate their ability to develop and express ideas as well as interpret the written work of others. Laboratory assignments also require short essays where students present the results of their work, create visualizations of their data with appropriate captions, and interpret their findings, often in collaboration with others working with related, but not identical datasets.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

In lab, students work with numerical data sets provided to them and must use spreadsheet software to complete calculations and visualizations. Examples of data sets include pollen abundances to observe changes in Late Pleistocene landscapes and fossil occurrences through the Phanerozoic to calculate changes in diversity and recognize extinction and diversification events. Students must also evaluate published figures from different sources to test hypotheses about the drivers of changes in estuaries over the last few hundred years.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

In the classroom, students work together to further develop their “thought experiments” and for some experiments must co-author a statement that synthesizes their independent ideas. In the lab, students work in teams to test different aspects of the data sets and then compare their conclusions with other groups. The students must determine what aspects of their conclusions agree and propose explanations for aspects of their conclusions that disagree.

Additional Comments

Approved for core?

Please ensure that the attached course syllabus sufficiently and specifically details the appropriate core objectives.

Attach Course Syllabus [GEOL 208 Life Dynamic Planet.pdf](#)

Reviewer Comments

Key: 992