



University Council

February 9, 2024

UNIVERSITY CURRICULUM COMMITTEE – 2023-2024

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Dear Colleagues:

The attached proposal from the Franklin College of Arts and Sciences to create minors in Conservation Paleobiology, Environmental Geology, Geoenergy and Mineral Resources, and Solid Earth Dynamics will be an agenda item for the February 16, 2024, Full University Curriculum Committee meeting.

Sincerely,

Susan Sanchez, Chair

cc: Provost S. Jack Hu

Dr. Marisa Pagnattaro

PROPOSAL FOR MINOR PROGRAM OF STUDY

1. **School/College:** Franklin College of Arts and Sciences
2. **Department/Division:** Geology
3. **Minor Name:** Conservation Paleobiology
4. **CIP:** 30.4301
5. **Proposed Effective Date:** Fall 2024
6. **Which campus(es) will offer this program?** Athens

7. **Provide a brief summary of the objective of the program**

Conservation paleobiology is an Earth system science, uniting the Geosphere with the Biosphere, Atmosphere, and Hydro-Cryosphere disciplines. Fossils archive the record of life on Earth, their environments and climate, dating back 3.8 billion years. This extensive geohistorical archive is unique for understanding extinction dynamics, species origination and diversification, and most especially, biotic resilience to environmental and climatic change prior to human modification which are used to solve pressing issues for the Anthropocene. A conservation paleobiology minor provides the principal skill sets for interpreting the past record for conservation services and also provides experiential learning in applied environmental problems. Conservation paleobiology is complementary for undergraduate majors in Ecology, Biology, Anthropology, Marine Science, Geography, Wildlife Science, Natural Resource Management and Sustainability, Sustainability, Water Resources, and Parks, Recreation, and Tourism Management. The department consulted the Alumni Board, the internal Student Advisory Committee, and alumni in various industry sectors regarding the proposed minor; members of all groups indicated that having more focused minors will aid in credentialization and better prepare students for the changing landscape in the field.

8. **Program of Study/Requirements**

All students will complete a minimum of 15 credit hours, including:

Required Courses (6-7 hours)

Choose two of the following:

ECOL 3530, Conservation Biology (3 hours)

GEOL 1260-1260L, Historical Geology (4 hours)

or GEOL 1122, Earth's History of Global Change (3 hours)

GEOL 4010-4010L, Life and Ecologies of the Past (3 hours)

Elective Courses

Choose two of the following (6 hours):

FANR(WILD) 4820/6820, Human Dimensions of Natural Resources and Wildlife Conservation (3 hours)

GEOG 4040/6040, Global Environmental Change Past and Present (3 hours)

GEOL 4040/6040, Conservation Paleobiology (3 hours) - **NEW**

GEOL 4520/6520, Paleocology (3 hours)

Select at least 3 hours from the following general conservation courses or from the electives listed above:

ECOL 4010/6010, Ecosystem Ecology (3 hours)

ECOL 4080/6080, Principles of Integrative Conservation and Sustainability (4 hours)

ECOL 4160-4160L, Ecology of North America (4 hours)

ECOL(FANR) 4220/6220, Foundations of Restoration Ecology (3 hours)

ECOL(FISH)(WASR) 4310/6310, Freshwater Ecosystems (3 hours)
FISH(WILD) 4520-4520L, Conservation Decision-Making (3 hours)
GENE(ECOL) 4020W/6020W, Biotic Responses to Climate Change in the Ocean (3 hours)
GEOG(ATSC) 3180, Global Climate Change: Causes and Consequences (3 hours)
GEOL 3350, Dinosaurs - Lifestyles of the Big and Famous in the Mesozoic (3 hours)
GEOL 4030/6030, Agrogeology (3 hours)
GEOL 4220/6220, Hydrogeology (3 hours)
GEOL 4460/6460, Introduction to Research in Paleontology (1-3 hours)
GEOL 4960R, Faculty-Mentored Undergraduate Research I (1-6 hours)
GEOL 4970R, Faculty-Mentored Undergraduate Research II (1-6 hours)
GEOL 4980R, Faculty-Mentored Undergraduate Research III (1-6 hours)
GEOL 4990R, Undergraduate Research Thesis (or Final Project) (3 hours)
SUST 4200/6200, Interdisciplinary Sustainability Seminar (1 hour, repeatable up to 2 hours)
WILD 4100-4100L, Principles of Wildlife Habitat and Management (3 hours)
WILD 4500/6500, Nongame and Endangered Species Management (3 hours)

PROPOSAL FOR MINOR PROGRAM OF STUDY

1. **School/College:** Franklin College of Arts and Sciences
2. **Department/Division:** Geology
3. **Minor Name:** Environmental Geology
4. **CIP:** 30.4101
5. **Proposed Effective Date:** Fall 2024
6. **Which campus(es) will offer this program?** Athens

7. **Program Description:**

Environmental Geology is an interdisciplinary field that explores the interactions between Earth's processes, landscape, and human activities, with a primary focus on addressing environmental geology challenges and promoting sustainability. This proposed minor would provide students with valuable skills and knowledge to engage with the pressing environmental issues of our time. Environmental challenges such as natural resource management, water remediation, alternative energy storage, natural hazard mitigation, and environmental management and stewardship require a strong foundation in geology and its applications. The minor would encourage students to integrate geological principles with other disciplines, fostering a holistic understanding of environmental issues. It would also serve to meet student demand and prepare future leaders in environmental consultancy, regulatory agencies, research institutions, and non-profit organizations. The department consulted the Alumni Board, the internal Student Advisory Committee, and alumni in various industry sectors regarding the proposed minor; members of all groups indicated that having more focused minors will aid in credentialization and better prepare students for the changing landscape in the field.

8. **Program of Study/Requirements:**

All students will complete a minimum of 15 credit hours, including:

Required Courses (6-8 hours)

Choose two of the following:

GEOL 1121, Earth Processes and Environments (3 hours)

 Optional: GEOL 1121L, Earth Processes and Environments Laboratory (1 hour)

GEOL 1122, Earth's History of Global Change (3 hours)

 Optional: GEOL 1122L, Earth's History of Global Change Lab (1 hour)

GEOL 1250-1250L, Physical Geology (4 hours)

GEOL 1260-1260L, Historical Geology (4 hours)

Elective Courses (9 hours)

Choose six hours from the following:

CRSS(GEOL) 4540/6540-4540L/6540L, Pedology (3 hours)

GEOL 4030/6030, Agrogeology (3 hours)

GEOL 4110/6110, Principles of Geochemistry (3 hours)

GEOL 4130/6130, Aqueous Environmental Geochemistry (3 hours)

GEOL 4220/6220, Hydrogeology (3 hours)
GEOL 4530/6530-4530L/6530L, Principles and Environmental Application of GIS (3 hours)
GEOL 4550/6550, Clay Mineralogy and Geochemistry (3 hours)
GEOL 4620/6620, Exploration Geophysics (3 hours)
GEOL 4670/6670, Environmental Instrumental Analysis (3 hours)

Select at least 3 hours of elective courses from the following Environmental Geology courses or from the electives listed above:

CRSS(WASR) 4660/6660, Hydrogeochemical Characterization of Environmental Field Sites (3 hours)
ENVE 4435/6435, Natural Resources Engineering (3 hours)
ENVE 4530/6530, Energy and Environmental Policy Analysis (3 hours)
ENVM 3060, Principles of Resource Economics (3 hours)
ENVM 4800/6800, Water Resource Economics and Management (3 hours)
GEOL 4420/6420, Introduction to Research in Geochemistry (1-3 hours)
GEOL 4440/6440, Introduction to Research in Hydrogeology (1-3 hours)
GEOL 4960R, Faculty-Mentored Undergraduate Research I (1-6 hours)
GEOL 4970R, Faculty-Mentored Undergraduate Research II (1-6 hours)
GEOL 4980R, Faculty-Mentored Undergraduate Research III (1-6 hours)
GEOL 4990R, Undergraduate Research Thesis (or Final Project) (3 hours)
WASR(CRSS)(ECOL)(ENGR)(GEOG)GEOL 4700L/6700L, Hydrology, Geology, and Soils of Georgia (3 hours)

PROPOSAL FOR MINOR PROGRAM OF STUDY

1. **School/College:** Franklin College of Arts and Sciences
2. **Department/Division:** Geology
3. **Minor Name:** Geoenergy and Mineral Resources
4. **CIP:** 40.0606
5. **Proposed Effective Date:** Fall 2024
6. **Which campus(es) will offer this program?** Athens

7. **Program Description:**

Energy and mineral resources are critical for global society. Demand continues to grow in both the energy and mineral sectors, and the switch to green resources will place emphasis on new resources in addition to traditional and current resources. This new minor will help prepare graduates for work in this rapidly changing and growing field. The Department of Geology currently teaches a broad spectrum of classes that will constitute this minor, and existing faculty can readily cover these classes. The mineral exploration sector is a significant employer of UGA's undergraduate and graduate students, and this minor will enhance the qualifications of those students seeking entry into this discipline. The department consulted the Alumni Board, the internal Student Advisory Committee, and alumni in various industry sectors regarding the proposed minor; members of all groups indicated that having more focused minors will aid in credentialization and better prepare students for the changing landscape in the field.

8. **Program of Study/Requirements:**

All students will complete a minimum of 15 credit hours, including:

Required Courses (6-8 hours)

Choose at least two of the following:

GEOL 1121, Earth Processes and Environments (3 hours) **or** GEOL 1250-1250L, Physical Geology (4 hours)

Optional: GEOL 1121L, Earth Processes and Environments Laboratory (1 hour)

GEOL 1122, Earth's History of Global Change (3 hours) **or** GEOL 1260-1260L, Historical Geology (4 hours)

Optional: GEOL 1122L, Earth's History of Global Change Lab (1 hour)

Elective Courses (9 hours)

Choose three of the following:*

CRSS(GEOL) 4540/6540-4540L/6540L, Pedology (3 hours)

ENVM(AAEC) 4150 Energy Economics (3 hours)

GEOL 4110/6110, Principles of Geochemistry (3 hours)

GEOL 4310/6310, Economic Geology (3 hours)

GEOL 4320/6320, Petroleum Geology (3 hours)

GEOL 4330/6330-4330L/6330L, Geology of North America (4 hours)

GEOL 4550/6550, Clay Mineralogy and Geochemistry (3 hours)

GEOL 4620/6620, Exploration Geophysics (3 hours)
GEOL 4640/6640, Geochemical and Geophysical Surveys (3 hours)

**One of the following courses can be selected in addition to the list above:*

GEOL 4400, Introduction to Research in Planetary Geology (1-3 hours)
GEOL 4430/6430, Introduction to Research in Geophysics (1-3 hours)
GEOL 4470/6470, Introduction to Research in Petrology (1-3 hours)
GEOL 4960R, Faculty-Mentored Undergraduate Research I (1-6 hours)
GEOL 4970R, Faculty-Mentored Undergraduate Research II (1-6 hours)
GEOL 4980R, Faculty-Mentored Undergraduate Research III (1-6 hours)
GEOL 4990R, Undergraduate Research Thesis (or Final Project) (3 hours)

PROPOSAL FOR MINOR PROGRAM OF STUDY

1. **School/College:** Franklin College of Arts & Sciences
2. **Department/Division:** Geology
3. **Minor Name:** Solid Earth Dynamics
4. **CIP:** 40.0603
5. **Proposed Effective Date:** Fall 2024
6. **Which campus(es) will offer this program:** Athens
7. **Program Description:**

This minor will explore the tectonic systems of Earth and other terrestrial planets in our solar system, with the goal of providing students with a better understanding of interior structure and the physical and chemical processes involved in the deformation of rock and other materials. Topics will include rock mechanics, the generation of earthquakes and volcanic eruptions, the use of seismic waves to image planetary interiors, mantle convection and the nature of forces driving tectonic plate motion on Earth, mountain building, and the formation of continents and ocean basins on Earth and analogous features on other planets. Course material will cover the results of major new initiatives such as NSF's EarthScope program and recent planetary missions and will draw on the research experiences of faculty members in the UGA Department of Geology. The department consulted the Alumni Board, the internal Student Advisory Committee, and alumni in various industry sectors regarding the proposed minor; members of all groups indicated that having more focused minors will aid in credentialization and better prepare students for the changing landscape in the field.

8. **Program of Study/Requirements:**

Students will complete a minimum of 15 credit hours, including:

Required Courses (6-8 hours)

Choose two of the following:

GEOL 1121, Earth Processes and Environments, 3 hours

Optional: GEOL 1121L, Earth Processes and Environments Laboratory, 1 hour

GEOL 1122, Earth's History of Global Change, 3 hours

Optional: GEOL 1122L, Earth's History of Global Change Laboratory, 1 hour

GEOL1250-1250L, Physical Geology, 4 hours

GEOL1260-1260L, Historical Geology, 4 hours

Elective Courses (9 hours)

Choose three courses from the following list:

GEOL 4330/6330-4330L/6330L, Geology of North America, 4 hours

GEOL 4350/6350, Planetary Dynamics, 3 hours

GEOL 4360/6360, Introduction to Rock Mechanics, 3 hours

GEOL 4600/6600, Solid Earth Geophysics, 3 hours

GEOL 4620/6620, Exploration Geophysics, 3 hours

GEOL 4940L/6940L, Volcanology and Volcano Petrology: Field, Experiments, and Modelling, 3 hours

Optional Research/Thesis Course

One elective can be replaced with a 3-hour research or thesis course (listed below).

GEO 4400, Introduction to Research in Planetary Geology, 1-3 hours

GEO 4430/6430, Introduction to Research in Geophysics, 1-3 hours

GEO 4470/6470, Introduction to Research in Petrology, 1-3 hours

GEO 4490/6490, Introduction to Research in Structure/Tectonics, 1-3 hours

GEO 4960R, Faculty-Mentored Undergraduate Research I, 1-6 hours

GEO 4970R, Faculty-Mentored Undergraduate Research II, 1-6 hours

GEO 4980R, Faculty-Mentored Undergraduate Research III, 1-6 hours

GEO 4990R, Undergraduate Research Thesis (or Final Project), 3 hours

Documentation of Approval and Notification

Proposal: Minor in Conservation Paleobiology; Minor in Environmental Geology; Minor in Geoenergy and Mineral Resources; Minor in Solid Earth Dynamics

College: Franklin College of Arts and Sciences

Department: Geology

Proposed Effective Term: Fall 2024

School/College:

- Geology department head, Dr. Adam Milewski, 11/6/23
- Franklin College of Arts and Sciences Associate Dean, Dr. Jean Martin-Williams, 1/29/24