

## **ESTABLISHMENT OF THE MASTERS OF SCIENCE IN ENVIRONMENTAL SCIENCE**

### **Recommendation**

It is recommended that the Board of Governors establish a new degree program, Masters of Science in Environmental Science, in the College of Liberal Arts and Sciences, effective Fall 2022.

### **Background**

The human impact on Earth's environment over the past two centuries (anthropocene) is unprecedented. Population growth, accompanied by high energy demands to power societal development, has impacted the Earth system in many ways. Therefore, supporting education and training on the *science of the changing environment* must be at the forefront of human endeavor. A significant fraction of the global GDP is currently being spent on addressing this science (e.g., understanding and addressing the increasing spatial extent of harmful algal blooms, ocean acidification, ever increasing amount of micro-plastics in fresh and salt water systems, effects of global climate change including flooding/drought and other weather-related catastrophic events, increases in novel diseases and the spread of tropical diseases such as malaria in a warmer planet, etc.). The Department of Environmental Science and Geology established an online Masters of Arts program, Environmental Science in Fall 2021; this online program is geared towards working professionals who need additional certification in their fields. The newly proposed Masters of Science program adds a thesis option (Track A) and will enable department faculty to mentor and train students who are interested in research careers.

### **Program Description**

The proposed Masters of Science program addresses many of the anthropogenic environmental changes listed above and includes rigorous courses from several branches of science, including coastal and environmental geology, environmental biology, low-temperature aqueous geochemistry, environmental isotope geochemistry, biogeochemistry, remote sensing, big data analytics, climate science, toxicology, water quality, and environmental law and policy. Through interdisciplinary course work and the completion of a master's thesis, students will be prepared to transition or advance their careers in environmentally-relevant research fields and can also allow students the opportunity to later pursue a Ph.D. in related fields. The proposed program is expected to attract students with undergraduate degrees in Physics, Chemistry, Biology, Geology, Public Health and other science and engineering disciplines.

### **Admission Requirements:**

Admission to this graduate program is based on the following criteria: i) Evidence of a completed baccalaureate degree from an accredited college or university; ii) College-level coursework in Geology, Biology, Math, Physics and Chemistry; iii) Two letters of recommendation; and iv) One-page Statement of Purpose. The minimum GPA required for regular admission to the program is 2.75. Applicants with an undergraduate GPA between 2.50 and 2.75 may be considered on a case by case basis and, in these latter cases, work experience will be taken into consideration. Applicants with GPAs lower than 2.75 may also be required to take the General Graduate Record Examination (GRE).

### **Curriculum Requirements**

Program requirements (30-32 credits) include a Master's thesis project (8 credits), a Research Seminar in Environmental Science and Geology (1 credit), and 6-7 elective courses to be tailored to students' career aspirations and approved by the Graduate Director and student's faculty research mentor. The list of rotating elective topics will include, but is not limited to: Applied Remote Sensing, Biodiversity Changes in the Anthropocene, Isotopes: Applications in Geological and Environmental Sciences, Mathematical Methods in Earth Science, Spatial Statistics and Analyses for Environmental Applications, Environmental Microbiology, Environmental DNA for Ecosystem Monitoring and Conservation, Coastal Geology and Processes in the Great Lakes, Environmental and Applied Geophysics, and Emerging Organic Contaminants in Global Environment. Elective course options give flexibility to students with a variety of research career aspirations. Students will work under the mentorship of a full-time faculty member in the Department of Environmental Science and Geology for their 8 credit hours of thesis. As the hands-on research component of this program, thesis work is expected to be supported by faculty members' external grants/contracts or by students who join our university with their own funding.

### **Graduation Requirements**

Students will complete all required coursework (30-32 credits) with a 'B' grade or better, and maintain a minimum GPA of 3.0 or better. Students must also complete a Master's thesis that is approved by Departmental faculty and the Graduate School. Up to two elective courses may be transferred in from other accredited colleges and universities. Transfer courses must be completed at the graduate level with a grade of 'B' or better, and approved by the Graduate Director.

### **Program Administration**

The Chair of the Department of Environmental Science and Geology will oversee the proposed MS program. Course scheduling will be completed by the Chair and an Academic Services Officer in the Department. Admissions decisions will be made by the Chair, the Director of the Environmental Science program, the Graduate Director, and a committee comprised of department faculty. Graduate advising will be carried out by the Chair and Graduate Director. All full-time research faculty in the Department can serve as Master's thesis advisors (research mentors). All departmental faculty will be involved in advertising and recruitment efforts as well.

### **Budget and Resource Requirements:**

This program is created with existing courses and departmental resources. No additional resources are needed.

### **Accreditation**

No specialized accreditation is required.

### **Approvals**

The proposal was approved by the faculty of the Department of Environmental Science and Geology, the CLAS Faculty Council, CLAS Faculty Assembly, the Dean of CLAS, the Graduate Council, the Dean of the Graduate School, and the Provost.