

## **ESTABLISHMENT OF A NEW ONLINE PROGRAM IN MASTER OF ARTS IN ENVIRONMENTAL SCIENCE**

### **Recommendation**

It is recommended that the Board of Governors establish a new online degree program, the Master of Arts in Environmental Science, in the College of Liberal Arts and Sciences, effective Fall 2021.

### **Background**

The human impact on Earth's environment over the past two centuries (Anthropocene) is unprecedented. The population growth accompanied by high energy demand to power the human development has impacted the Earth system in many ways, including global change, ocean acidification, biodiversity loss, changes in weather patterns, degradation of water quality, increases in novel diseases and the spread of tropical diseases such as malaria in a warmer planet, among others. The proposed program is built upon a set of rigorous science courses that directly address identification and quantification of environmental changes that have taken place during the Anthropocene. This will be one of the first online, graduate level, science degrees at Wayne State, which allows the Department of Environmental Sciences and Geology in CLAS to recruit a diverse pool of students, including students outside of Michigan.

### **Program Description**

The online master's program consists of coursework that addresses many of the anthropogenic environmental changes listed above, including courses on coastal and environmental geology, low-temperature aqueous geochemistry, environmental isotope geochemistry, biogeochemistry, remote sensing, BIG DATA analytics, climate science, ecology, toxicology, water quality, etc. Curriculum requirements are relevant and useful for those who work in Federal, State, and local regulatory agencies, environmental consulting companies, and other sectors of the economy (including energy (mining, pollution), public policy, finance (actuary science related to flooding/drought caused by human-induced climate change)) and others. Online courses can prepare students to transition or advance their careers in environmentally related fields and can also allow students the opportunity to later pursue a Ph.D. in related fields. Furthermore, online courses enable people to continue their studies while working and contribute to the growth of their workplace.

### **Admission Requirements**

Admission to the program is contingent upon admission to the Graduate School and 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.

### **Program Requirements**

There are two curricular pathways for the students accepted to this program:

- (1) Pathway #1 is for those students who are interested in the *changes in the geological systems* such as identifying and quantifying sources, fate and transport of contaminants using isotopes as tracers and chronometers. On this track the core course is ESG 6400 *Isotopes: Applications in Geological and Environmental Sciences*.
- (2) Pathway #2 is for those students who are interested in the *changes in biological systems* such as changes in biodiversity, environmental microbiology and environmental DNA. In this track, students can take either of the ESG 6190 *Environmental Microbiology* or ESG 6180 *Environmental DNA for Ecosystem Monitoring and Conservation* as the core course.

Students will complete a total of 30 credits comprised of 3 core courses (9 credits) and 6-7 elective courses (21 credits). Core courses include one pathway-based core course (4 credits), one Environmental Law course (3 credits) and a Capstone course (2 credits). 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. This curriculum structure gives students the flexibility to pursue learning in their area of interest.

### **Graduation Requirements**

This is a “Plan C” Master’s program that includes coursework only (no thesis or essay required). Instead, all students will require a course-based capstone project on a topic related to their interests. Students will complete all required coursework with a ‘B’ grade or better, and maintain a minimum GPA of 3.0 or better.

### **Program Administration**

In the first two years, the present chair of the Department of Environmental Sciences and Geology will serve as the Director of the new Master’s program. 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. There will be a curriculum committee for the online Master’s program, chaired either by Director of the ES program or Graduate Director. The Chair and Graduate Director will advise students in the program, with help from departmental faculty.

### **Budget and Resource Requirements**

The proposed program will operate using existing resources in the Department of Environmental Science and Geology. Additional part-time faculty may be hired to teach specific courses in the curriculum in the initial phase, however most courses can be offered by departmental faculty within existing teaching loads. There will be small costs in promoting and recruiting to the new program, but no additional resources or costs are associated with the implementation of this new graduate program.

Submitted by: Laurie Lauzon Clabo, Interim Provost and Senior Vice President for Academic Affairs

**Approvals**

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