

Contact: Rachel Boon

**REQUEST FOR NEW PROGRAM AT THE UNIVERSITY OF NORTHERN IOWA:
BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE**

Action Requested: Consider approval of the request by the University of Northern Iowa to establish a Bachelor of Science in Environmental Science (BS) in the College of Humanities, Arts and Sciences.

Executive Summary: Building on the strength of an existing Bachelor of Arts in Environmental Science, and UNI proposes creating a BS in Environmental Sciences to improve student preparation for graduate studies or industry employment. Based on expertise of existing faculty members and lab facilities, additional resources for this new program are limited to primarily to marketing and recruitment materials. The proposed program addresses the Board of Regents Strategic Plan objective 1.1; "The Regent institutions provide clear pathways for students to enter, move through and complete their education and career goals." The Council of Provosts and the Board office reviewed this proposal and recommend approval.

Background:

Description of proposed program. The Environmental Science BS program will include two curricular paths for students, one with a biological emphasis and the other with a geosciences emphasis. The program will prepare students for a graduate program in environmental sciences or to enter industry in the public or private sector. All students will have a common core of courses providing a foundation in biology and geosciences, and will be required to take part in a capstone research project.

Academic objectives. Upon completion of the Environmental Science BS program, students will be able to do the following:

1. Use the appropriate discipline specific tools to measure the level of environmental damage due to hazards in the air, water and/or land.
2. Effectively communicate environmental issues to the public and private sector in a concise manner.
3. Provide appropriate recommendations to the public and private sector to address environmental issues.
4. Conduct independent research in environmental issues resulting in a presentation of research results at a discipline specific venue.

Need for proposed program. The Department of Earth and Environmental Sciences currently offers an Environmental bachelor of arts (BA) degree, while the Department of Biology offers a Ecology, Evolution and Organismal Biology Emphasis BA degree. The Environmental Science BA degree has been available only since fall 2013, and by the end of spring 2016 had 48 continuing majors and 12 degrees awarded. The Biology BA degree in Ecology, Evolution and Organismal Biology has 34 continuing major (including those under the previous degree title of Biology: Ecology and Evolution) at the end of spring 2016.

Each of these degree programs appeals to students with similar interests in understanding environmental issues. Both degree programs are limited in preparing majors for careers in the broader environmental science disciplines, providing content that shows the interrelationship between the physical and biological environments. The rapid growth of the Environmental Science BA degree, and interest for a similar degree program in Biology, with a solid foundation in both

biology and geoscience would make this a unique degree program in the state of Iowa, and would appeal to talented students with interest in both life and physical science exploration of the environment.

Link to institutional strategic plan. The current institutional mission for UNI is “The University of Northern Iowa provides transformative learning experiences that inspire students to embrace challenge, engage in critical inquiry and creative thought, and contribute to society.”

The College of Humanities, Arts and Sciences’ Strategic Plan includes the following goals –

- Goal 1. Develop and maintain excellence in departments, programs and centers within the College of Humanities, Arts and Sciences.
- Goal 2. Provide the strong liberal arts foundation necessary to develop the knowledge and understanding needed by citizens of a free and just society.
- Goal 3. Continue to build upon our reputation as an academic community committed to student learning through teaching and scholarship.

The proposed degree program provides students with the opportunity to be challenged and engaged in a curriculum that will lead them to careers that will benefit society and the state of the world.

Relationship to existing programs at other colleges and universities. The proposed BS Environmental Science program is similar to that offered by SU1 in the College of Liberal Arts and Sciences, with the explicit tracks in biology and the geosciences. It also is similar to the current degree offered by ISU through the College of Agriculture and Life Sciences and the College of Liberal Arts and Sciences.

In addition to the degrees offered at the University of Iowa and Iowa State University, Environmental Science or Studies programs are offered by Ashford University, Buena Vista University, Briar Cliff College, Central College, Coe College, Cornell College, Dordt College, Drake University, Luther College, Simpson College, University of Dubuque, and Wartburg College. The vast majority of these programs are offered as biology-based majors, with a significant amount of coursework in biology and ecology courses. In addition, many of these are BA programs which may not have a required research component which is a critical component of UNI’s proposed BS in Environment Sciences.

Unique features. There is a significant history of interactions between the departments of Biology and Earth and Environmental Sciences at UNI, with students either double-majoring or combining majors and minors in both departments. Both departments have significant student-centered research programs that makes this an appropriate site for the proposed degree. In the past, undergraduate student research has also been funded, in part or in total, by the College of Humanities, Arts and Sciences; the Iowa Space Grant Consortium; the Roy J. Carver Charitable Trust; the National Science Foundation and a variety of individual and corporate donors to the departments.

Resources to establish a high-quality program. Each department has an array of laboratory resources, as well as on-site research areas in environmental science that will support this program. These include hydrologic well sites on campus, geological and atmospheric sample testing laboratories, biological preserves and ecology laboratories. There are also on-going research programs in both departments centered on environmentally related issues, along with courses geared toward environmental issues.

Current lab facilities include the Environmental Hydrology and Hydrogeology laboratory, STORM (Meteorology) facilities, and mineralogy laboratories in the department. Equipment includes x-ray fluorescent system, petrographic microscopes, SODAR, LIDAR, temperature profiler, weather station, well-sites on campus, continuous stream flow monitoring equipment (along Dry Run Creek), water quality field testing equipment, GPS systems, GIS software, and geological field equipment. A recent grant from the Roy J. Carver Charitable Trust will result in the purchase of \$490,000 of environmental analysis and monitoring equipment for geological and meteorological studies.

Each of the Biology faculty have their own research space with equipment appropriate to their research pursuits, which are related to both the field of Biology and to Environmental Science.

The Department of Biology has established the Cedar River Ecological Research Site (ERERS), a 40-acre research site located on abandoned farmland in Black Hawk County, IA. In 2009, this acreage was successfully seeded with four prairie biomass feedstocks with different diversity of plantings on the four separate sites. This site serves for the study of prairie ecology involving, animals, plants, and microbes.

The Department of Biology also maintains a Biological Preserves System close to the main UNI campus. This Preserves System is composed of a complex and diverse natural habitats (tallgrass prairie, upland forest, oak savanna, etc.) totaling 155 acres. These are used as a field laboratory for a variety of courses and research projects.

The Department of Biology further has associated with it the UNI Botanical Center. This facility offers students opportunities to learn about the relationships between plant species, climate and plant diversity, and plant adaptations to climate and ecosystems. The facility is maintained by two full time professional staff who assist faculty and students with research and course work that involve the Botanical Center.

Student demand. The rapid growth of the current Environmental Science BA program indicates that there is great interest in this area of study. In addition, many students in the departments of Biology and Earth and Environmental Sciences would benefit professionally from the high standards required in a BS degree program.

The demand for this area of study is also observed throughout the state, with the increase in the number of students in Environmental Science programs at the Regents institutions. In Fall 2005 there were a total of 118 undergraduates in Environmental Science at SUI and ISU, while the total in Fall 2015 for the three Regents institutions is 324, a growth of 175% in 10 years. Currently the number of students entering UNI with an interest in majoring in Environmental Science has resulted in record number of students into the department of Earth and Environmental Science, leading to an all-time high in the number of majors in the department.

Workforce need/demand. The Bureau of Labor Statistics Occupational Outlook Handbook (published December 2015) indicates that Environmental Scientists and Specialists should have an 11% growth in jobs from 2014-2024, or 10,200 more jobs during that time span. For those that go into academe, there is a 13% growth in jobs over the same time span, while those who become specialists in an area such as environmental microbiology, air quality, geology or hydrology there are a range of growth rates from 9% to 13%.

Data from the state of Iowa provided for the Occupational Employment Statistics reports shows a long-term growth (through 2022) of Environmental Scientists and Specialists in the state of 14.7%.

Cost. New costs for increased lab supplies, student research, and conference presentations will be split between the participating departments.

	TOTAL COSTS	TOTAL NEW COSTS
Year 1	\$1000	\$1000
Year 2	\$1500	\$500
Year 3	\$2000	\$500
Year 4	\$2500	\$500
Year 5	\$3000	\$500
Year 6	\$3000	None
Year 7	\$3000	None

Projected enrollment.

Undergraduate	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Majors	10	15	25	30	40	40	40
Non-Majors	0	2	4	6	8	10	10

Anticipated sources of students. The majority of students will initially come from the current BA programs in Environmental Science and Biology, with some students in Chemistry and Biochemistry, Geography or Physics also being potential majors. Incoming students from the state of Iowa are the main source for UNI students. In addition, Environmental Science Magnet high schools will be made aware of the program and provided with marketing materials.

Articulation agreement. None are currently planned.

Off-campus delivery. There is no plan to offer this program away from the UNI campus.

Accreditation. There is no programmatic accreditation applicable to this program. It will be covered under existing accreditation approval from the Higher Learning Commission.

Opportunities for internships. Internships are not required for this degree, but may be done as university electives. The program will contain a strong element of experiential learning through undergraduate research.

Date of implementation. Creation of the proposed program will become effective upon approval by the Board of Regents and will be included in the University's General Catalog. The anticipated implementation date is May 2018.

LETTERS OF SUPPORT



COLLEGE OF
LIBERAL ARTS & SCIENCES

Office of the Dean

240 Schaeffer Hall
Iowa City, Iowa 52242-1409
319-335-2611 Fax 319-335-3755
clas@uiowa.edu www.clas.uiowa.edu

September 2, 2016

Earth and Environmental Sciences
121 Latham Hall
Cedar Falls, Iowa 50614

Dear Professors Sanders and Morgan:

Thank you for sharing the plan for your proposed major with us. Your proposed degree was reviewed by the Environmental Sciences Advisory Board and by Professor Tom Foster, Chair of the Department of Earth and Environmental Sciences. Professor Foster noted that the discipline is important and broad enough so that the University of Iowa, Iowa State, and UNI all should be allowed to offer a major in this area.

The College of Liberal Arts and Sciences at the University of Iowa, therefore, is pleased to support UNI's proposed BS Environmental Sciences major.

A handwritten signature in purple ink that reads "Chaden Djalali".

Please don't hesitate to contact me if you need any additional information.

Sincerely,

Chaden Djalali, Dean
UI Alumni Association Dean's Chair
College of Liberal Arts & Sciences
University of Iowa
240 Schaeffer Hall Iowa City, IA 52242

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

March 15, 2017

David Saunders

Professor of Biology and Head, Department of Biology University of Northern Iowa
Cedar Falls, IA 50614-0335

Dear Professor Saunders,

Thank you for your note requesting our input on your proposed addition of the Bachelor of Science degree program in Environmental Science. The University of Northern Iowa currently offers the BA in Ecology and in Environmental Science. A key feature of the proposed curriculum is the admirable requirement for undergraduate research. This addition, as well as some of the other differences between the BA and proposed BS degree in Environmental Science at UNI, supports the BS designation.

Here at Iowa State the Environmental Science degree is jointly administered by the Liberal Arts and Sciences College and the College of Agriculture and Life Sciences. Both colleges and the Director of the Environmental Sciences program reviewed the proposed BS curriculum. As you noted, the proposed program does have similarities with Iowa State's BS in Environmental Sciences. There are also important differences—for example, the ISU program requires Physics and more focused coursework in Environmental Sciences whereas the proposed program's "life sciences" track relies heavily on Biology coursework with only two required courses in Earth Sciences. The "environmental earth science" track has more in common with the ISU degree.

Given UNI's recent name change from the "Department of Earth Sciences" to the "Department of Earth and Environmental Sciences" and its addition of the BA degree in Environmental Science, the step to add a BS degree in the department seems a natural evolution. We have no objection to the department moving forward with this request.

Thank you for sharing this request. It is always good to keep open the lines of communication across the Regents Institutions. If I can be of further assistance, please let me know.

Sincerely,



Amy R. Slagell

College of Liberal Arts and Sciences Office of the Dean
202 Catt Hall
Ames, Iowa 50011-1301
515 294-3220
FAX 515 294-1303