

IBHE REPORT
Master of Science in Sustainability
Center for Clean Energy Research and Education

- 1. Reporting Institution:** Eastern Illinois University
- 2. Reporting Program:** Master of Science in Sustainability
- 3. Date:** January 15, 2021
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5. Overview:

On December 4, 2012, the Illinois Board of Higher Education (IBHE) officially approved the new Master of Science in Sustainable Energy program to be delivered by Eastern Illinois University. Due to the need to broaden the scope of sustainability issues beyond energy, the program was revised to become an M.S. in Sustainability with options in 1) Energy Management, 2) Natural Resources, and 3) Social Practices and Community Engagement. A RME (reasonable and moderate extension) was approved by IBHE on December 12, 2019. The revised program was offered for the Spring 2020 semester.

The Master of Science in Sustainability focuses on providing students with interdisciplinary and applied knowledge of the field of sustainability and the environment. In addition to a required core set of courses, the program provides four elective routes that allow students to cater their program toward their professional interest in sustainability, including option in Energy Management, Natural Resources, Social Practices and Community Engagement, and an option that permits curriculum flexibility, such that students could prepare for work in the public or private sector. This degree program is aimed primarily at preparing practitioners and professionals in the fields of Sustainability.

The M.S. in Sustainability program has been active in working on initiatives through the Illinois Innovation Network (IIN). IIN is a group of public universities and community colleges that work together to improve the state's economy through innovation, research, and education. EIU offered the first IIN research conference and the first course to have students from other universities take a class online with EIU students.

6. Major Findings and Recommendations:

- a. The M.S. in Sustainability is an interdisciplinary program which continues to focus on understanding the importance of the study of science and technology within the field of sustainability, but has broadened to include more of the economic and political science components as crucial aspects to a holistic approach of to this area. For Fall 2019, the M.S. in Sustainable Energy had 11 applicants approved for the program, but only one student enrolled in courses that semester. Applications have increased in the following semesters with the revision of the program increasing exposure to areas of student that are of interest to students, but due to COVID and issues with international students receiving a visa to study in the US only three international students have been able to come to campus. It is the goal of the program

to focus recruitment efforts on domestic students by transitioning more classes online so working professionals are able to take classes around their work schedule.

As sustainability impacts a wide variety of fields, the program was expanded from sustainable energy to include the study of related areas of sustainability. The courses offered in the M.S. in Sustainable Energy were:

Science Cluster	
1. BIO 5333 Bioenergy and Bioresources or BIO 5970A Bioenergy and Bioresources	3 hours
2. CHM 5007 Energy Chemistry	3 hours
3. PHY 5233 Energy and the Environment	3 hours
4. TEC 5533 Biomass Gasification and Renewable Energy	3 hours
Technology Management Cluster	
5. TEC 5103 Science and Technology of Leadership or MBA 5680 Organizational Behavior and Group Dynamics	3 hours
6. TEC 5133 Total Quality Systems or MBA 5660 Operations Management	3 hours
7. MBA 5001 Business Operations in Sustainability Facilities or OSC 4810 Supply Chain and Logistics Management	3 hours
Policy and Economics	
8. PLS 5843 Seminar in Public Policy or PLS 4763 Environmental Politics & Policy (Approved, starting Fall 2018) or ECN 5411 Seminar in Natural Resources and Environmental Economics or ECN 4751 Managerial Economics (Approved, starting Spring 2017)	3 hours
Research Methods	
9. TEC 5143 Research in Technology	3 hours
Communication	
10. CMN/ENG 5260 Communication in Science and Technical Organizations	3 hours
Research and Experience	
11. CERE 5983 Sustainability Practicum	3 hours
12. CERE 5953 Sustainability Research	3 hours
Total	36 hours

The courses for the revised M.S. in Sustainability program are:

Required Core Courses (18 credits)	
1. CERE 5100 - Introduction to Sustainability	3 hours
2. GEO 5200 - Human Impact and the Environment	3 hours
3. CMN/ENG 5260 - Science and Technical Communication	3 hours
4. PLS 4763 - Environmental Politics and Policy	3 hours
5. PLS 4793 - Civic and Non-Profit Leadership or TEC 5103 Leadership in Technology	3 hours
6. TEC 5143 - Research in Technology or PLS 5054 - Applied Research Methods in Public Policy or CMN 5040 - Communication Research Methods	3 hours
Energy Management Option- Electives (15 credits)	
TEC 5533 - Biomass Gasification and Renewable Energy	3 hours

PHY 5233 - Energy and the Environment	3 hours
BIO 5333 - Bioenergy and Bioresources	3 hours
CHM 5007 - Energy Chemistry	3 hours
TEC 5133 - Total Quality Systems	3 hours
GEO 4850 - Environmental Geology	3 hours
TEC 5173 - Global Technology	3 hours
ECN 5410 - Introduction to the Economics of Sustainability	3 hours
CERE 5983 - Practicum	3 hours
CERE 5953 - Sustainability Research (online and F2F)	3 hours
TEC 5533 - Biomass Gasification and Renewable Energy	3 hours
Natural Resources Options- Electives (15 credits)	
FMD 4772 - Sustainability and Social Change	3 hours
BIO 4812 - Fish Ecology Management	3 hours
BIO 4816 - Conservation Biology	3 hours
BIO 5200 - Study of Biotic Communities	3 hours
BIO 5200 - Stream Ecology	3 hours
BIO 5204 - Ecotoxicology and Bio. Monitoring of Pollution	3 hours
BIO 5209 - Community Ecology	3 hours
BIO 5333 - Bioenergy and Bioresources	3 hours
GEO 5810 - Introduction to Geographic Information Sciences	3 hours
CERE 5983 - Practicum	3 hours
Social Practices and Community Engagement- Electives (15 Credits)	
FMD 4772 - Sustainability and Social Change	3 hours
CMN 4820 - Political Communication	3 hours
GEO 4850 - Environmental Geology	3 hours
PLS 4873 - Budgeting in Governments and Nonprofits	3 hours
PLS 5153 - State Government and Policy	3 hours
GEO 5810 - Introduction to Geographic Information Sciences	3 hours
ECN 5410 - Introduction to the Economics of Sustainability	3 hours
CERE 5983 - Practicum	3 hours
Total	33 hours

To strengthen the program offerings and to make EIU more attractive to graduate students, three sets of dual degree programs continue to be offered.

MS in Sustainability and MS in Technology

MS in Sustainability and Professional Science Master's in Geographic Information Sciences (GIS)

MS in Sustainability and MS in Biological Sciences

There are a total of 12 credit hours overlapped between each set of dual degree programs. As a result of those dual degree programs, students are able to receive two master's degrees from EIU in a reasonable time frame. The dual degree programs provide students with both the depth and breadth of knowledge and skills in the field, and thus make them more marketable.

- b. Student evaluations through exit interviews, conference presentations, journal publication and grant recipients are provided from the start of the new program revision (Spring 2020).

- Exit Interview Spring 2020- 2/2 students met expectations of a score of 80/100 or higher (100, 100)
 - Exit Interview Summer 2020- 2/2 students met expectations of a score of 80/100 or higher (95, 95)
 - Spring 2020 Publications- 1 student: REV2020 Conference- full paper publication
 - Spring 2020 Conference Presentations
 - 4 students: Presentation at the EIU Research and Creative Activity Day
 - 1 student- Accepted to Sustainability as a Solution to Global Business Challenges Conference (postponed one year due to COVID)
 - 1 student- Accepted to the American Planning Association Conference (Cancelled due to COVID)
 - 1 student- Presentation at the REV2020 Conference
 - Fall 2020 Conference Presentations
 - 2 students: Presentation and the EIU Illinois Innovation Network Sustainability Research Conference
 - 1 student: Presentation at ATMAE (The Association of Technology, Management, and Applied Engineering)
 - Spring 2020 Grant recipients- 2 students received the Plummer Award for research funding of \$1,200 each
 - Fall 2020 Grant funded research project- 1 student and 1 sustainability faculty member have partnered with California Polytechnic- San Luis Obispo on a \$60,000 to develop and disseminate solar powered electric cookers in developing countries.
- c. Actions taken since the last review include the revision of the program (detailed in 6a) and the creation of CERE 5100: Introduction to Sustainability.

The creation of a new required course – CERE 5100: Introduction to Sustainability- not only helped to give students at EIU the opportunity to learn the fundamentals of sustainability, but the course was offered through IIN (Illinois Innovation Network) and students from ISU and NIU took the course with EIU students. This not only offered students from other programs the option to learn more about this field, but the varying perspectives from diverse program areas added depth to the online discussions. When it was first offered in Spring 2020, 17 students completed the course from varying fields including Sustainability, Political Science, Technology and Social Work.

- d. Since major changes have been made to the program since the last review, a focus is now on marketing the program. With the issues with international students trying to acquire a visa and travel due to COVID, a focus is on marketing to domestic students. The new program is focusing on converting many of its face to face classes online, so students can have the option to complete the program remotely or while working full-time.

7. Responses to Institution-Assigned Issues:

As courses have been organized and are being assessed, a focus has turned toward increasing enrollment. This has been difficult as a majority of applications are from international students that are not able to travel due to COVID or are having issues with acquiring a visa. However, the M.S. in Sustainability is still competitive in attracting Fulbright scholars. Our most recent Fulbright graduate returned to Tunisia after graduating August 2020, and two Fulbright students are currently enrolled in the M.S. in Sustainability program

8. Assessment of Unit Outcomes:

Program assessment has been an ongoing effort for the MS in Sustainable Energy program. Based upon the learning goals for graduate education at EIU, an assessment plan has been developed and data have been

collected for the program every semester by faculty members in charge of course instruction. A combination of direct and indirect assessment measures serve to provide the necessary data to enhance our academic programs.

Direct data on program assessment were collected by faculty members responsible for the instruction for each course. For example, out of 4 students enrolled in CERE 5100 in Spring 2020 semester, 4 students (100 %) met expectations of 80% or higher on the Final Research Paper. Out of 4 students enrolled in PLS 4763 in Spring 2020 semester, 4 students (100 %) met expectations of 80% or higher on the Graduate Student Research Proposal and Annotated Bibliography (88, 89, 92, 92%).

Students have also been active with gaining certification outside of the university. The Graduate Coordinator worked with students to prepare them for the LEED (Leadership in Energy and Environmental Design) Green Associate Exam, in which two student took and successfully received their accreditation in Spring 2020. One of those students went on to achieve his LEED AP BD+C (Accredited Professional in Building Design and Construction). In Fall 2020, the Graduate Coordinator worked with four more students to prepare them for the LEED Green Associate Exam. Those students are scheduled to take the exam in Spring 2021.

The M.S. in Sustainability has provided opportunities for students to complete and present research, allowing them to be more competitive in the job market when they graduate. The ability for strong faculty interaction with students in hands on projects allows students to learn in and out of the classroom. Students are actively engaged in the high quality learning process through course work, and have multiple opportunities to pursue research or internships with assistance of the program. As a foundation for the program has recently been implemented and stabilized the next step is to focus on marketing, particularly to domestic students.

8.1 Decision

- Program in Good Standing
- Program in Flagged for Priority Review
- Program Enrollment Suspended

8.2 Explanation

The summary above clearly and concisely describes the scale and scope of the significant change that has occurred over the past 18-months in the program. The change was driven by a broadened interest in the evolving field of sustainability across campus, faculty, and multiple units. While the FY20 total degrees awarded (n=5) met the IBHE benchmark, the Office of Academic Affairs is appreciative of the faculty's desire to innovate via a new more inclusive interdisciplinary framework and name as the program will no doubt outpace prior performance.

Given the new structure of the program and that the new assessment plan is only in Year 1 of implementation, the feedback for this cycle is inherently limited. As such, the next report will be required to demonstrate that the total program enrollments and degrees awarded meet or exceed IBHE APEER standards—and provide a broad (not detailed) summary of the assessment of student learning. Given the quality of the students, broadened curriculum, and emphasis on more flexible delivery, I am confident the revised program will be a success. For that reason, all of the contributing faculty, collaborating units, and the leadership of the program director are to be applauded.

Jay Gatrell
Provost & VPAA