



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

Intent to Plan for a New Program

UNIVERSITY:	USD
DEGREE(S) AND TITLE OF PROGRAM:	M.S./Ph.D. in Sustainability
INTENDED DATE OF IMPLEMENTATION:	Fall 2018

University Approval

To the Board of Regents and the Executive Director: I certify that I have read this intent to plan, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.

Click here to enter a date.

President of the University

Date

1. What is the general nature/purpose of the proposed program?

The University of South Dakota requests permission to plan graduate programs in sustainability to include the following degrees:

- Master of Arts (M.A.) in Sustainability – thesis and non-thesis option: This degree will be available for students focusing on sustainability from a social science and humanities perspectives.
- Master of Science (M.S.) in Sustainability – thesis and non-thesis option: This degree will be available for students focusing on sustainability from a natural science perspective.
- Doctor of Philosophy (Ph.D.) in Sustainability – dissertation only: This degree will be available for students seeking a doctoral degree in sustainability.

Sustainability is an emerging field that seeks to address many of society’s complex and interdisciplinary issues. Sustainability is often described as moving towards systems that are environmentally beneficial, socially just, and economically profitable both now and into the future. The proposed graduate programs in sustainability would build upon USD’s existing academic and research leadership in sustainability in the state and region. USD is one of only sixteen schools with an undergraduate degree in Sustainability or Sustainability Studies,¹ and no South Dakota colleges or universities offer a sustainability undergraduate degree. USD has 25 faculty members who are affiliated with the Sustainability Program through teaching courses for the major and minor. Twelve faculty members serve on the Sustainability Advisory Committee. Ten faculty members are participating in the new National Science Foundation (NSF) Research Experience for Undergraduates (REU) program titled Sustainable RIVER (Remediating InVasives to Encourage Resilience). Twelve faculty members participated in a pedagogy training program that was a sub-

¹ Association for the Advancement of Sustainability in Higher Education (2016) Campus Sustainability Hub. Available at https://hub.aashe.org/browse/types/academicprogram/?search=&content_type=academic_program&discipline=7&organization_type=Doctorate&organization_type=Master&organization_type=System+Office&country=US&program_type=2#resources-panel.

award from a NSF-funded Science Technology, Engineering, and Mathematics Talent Expansion Program (STEP) Center at Carleton College. Finally, USD recently received a \$1.86 million NSF Experimental Program to Stimulate Competitive Research (EPSCoR) Research Infrastructure Improvement (RII) Track 2 grant focused on sustainability.

The mission of the EPSCoR program is to “advance excellence in science and engineering research and education in order to achieve sustainable increases in research, education, and training capacity and competitiveness that will enable EPSCoR jurisdictions to have increased engagement in areas supported by the NSF.”² Environmental and energy sustainability and climate change are major focal areas for the NSF and many other funding agencies including federal, state, and non-profit entities that provide funding in these disciplines. Through the NSF EPSCoR grant that USD received, we propose to enhance our sustainability research and educational capacity in three primary ways. First, we propose to start a Ph.D. program in sustainability to build on our existing expertise in sustainability research and pedagogy. Second, we will hire two new faculty member to enhance our research and pedagogy capacity focused on sustainability. One of the faculty members will have expertise in ecological modeling such as climate change modeling. The other faculty member will have expertise in ecosystem services valuation and ecological economics. For more information about the faculty hires, please see question #10. Third, the NSF EPSCoR grant will support three Ph.D. students on full research assistant (RA) positions for four years. It is anticipated that these three students will be the first three graduate students in the Sustainability Program.

Since USD began the undergraduate Sustainability Program in August 2012, we have continued to grow in terms of the number of students, the number of faculty members involved, and the research capacity associated with the program. There is great interest among the faculty, administrators, and students at USD to build on our academic and research leadership in this emerging field of study.

2. What is the need for the proposed program (e.g., Regental system need, institutional need, workforce need, etc.)? What is the expected demand for graduates nationally and in South Dakota (provide data and examples; data sources may include but are not limited to the South Dakota Department of Labor, the US Bureau of Labor Statistics, Regental system dashboards, etc.)?

The demand for sustainability-focused jobs is increasing and expected to increase in the future.³ For example, environmental science positions are expected to increase 11% faster than average nationally between 2014 and 2024.⁴ Within SD, adding a Master’s and Ph.D. program in sustainability would contribute to our workforce development in industries that the State has identified as crucial to our future. Innovation in Energy and Environment, including renewable energy, is one of the target sectors for the *2020 Vision: The South Dakota Science and Innovation Strategy*.⁵ From 2012-2013 professional, scientific, and technical services, which include many

² National Science Foundation (n.d.) Experimental Program to Stimulate Competitive Research (EPSCoR). Available at <https://www.nsf.gov/od/oia/programs/epscor/index.jsp>.

³ Hamilton J (2012) Is a sustainability career on your green horizon? U.S. Bureau of Labor Statistics. Available at <http://www.bls.gov/green/sustainability/sustainability.pdf>.

⁴ Bureau of Labor Statistics, U.S. Department of Labor (2015) *Occupational Outlook Handbook, 2016-2017 Edition*, Environmental Scientists and Specialists. Available at <http://www.bls.gov/ooh/life-physical-and-social-science/print/environmental-scientists-and-specialists.htm>.

⁵ SD EPSCoR REACH Committee (2013) *2020 Vision: The South Dakota Science and Innovation Strategy*. Available at <http://sdepscor.org/sdepscorHome/wp-content/uploads/2015/07/2020-Vision.pdf>.

sustainability professions, in South Dakota had an “extraordinarily low unemployment rate ... of just 1.4 percent”.⁶ The community and social services/life, physical, and social science occupational category, which include sustainability jobs focused on community development, increased in South Dakota by 41.8% between 2000 and 2011/2012.⁷

There is a large need for sustainability-trained professionals within academia. The Association for the Advancement of Sustainability in Higher Education (AASHE) lists more than 1,000 majors or minors at institutions of higher education focused on sustainability in the US.⁸ Because there are a limited number of graduate programs educating scholars in sustainability, there is demand for students with graduate training in sustainability. In the past year, Ecolog, which is a listserv through the Ecological Society of America, has posted more than twenty faculty positions specifically focused on sustainability, and this is in addition to environmental science/studies faculty positions. Beyond faculty positions, many institutions of higher education have at least one Office of Sustainability and multiple sustainability director and coordinator positions that implement sustainability on campus, including South Dakota State University that has a paid sustainability coordinator. For example, by July 2016, 296 institutions of higher education in the US completed the Sustainability Tracking, Assessment & Rating System (STARS), which is “a transparent, self-reporting framework for colleges and universities to measure their sustainability performance.”⁹ Paid staff at these institutions usually complete or coordinate the completion of STARS.

Beyond need for sustainability professionals in existing fields, the number of careers associated with sustainability is expanding. For example, the number of companies with full-time sustainability professionals increased 400% since 2000 in North America.¹⁰ In 2007, Forbes magazine highlighted sustainability coordinators outside of academia as one of a “constellation” of new green careers.¹¹ USD sustainability undergraduates, although they have only recently graduated, have careers in multiple areas including with environmental consulting companies, non-profit organizations, federal conservation organizations, and US congress members.

⁶ Fogg NP, Harrington PE (2014) Growth and Change in South Dakota Labor Markets: An Assessment of the State’s Labor Market Imbalances in Weak National Recovery. Available at http://southdakotawins.com/images/data/files/sd_labor_markets_may2014.pdf.

⁷ Ibid.

⁸ Association for the Advancement of Sustainability in Higher Education (2016) Campus Sustainability Hub. Available at

https://hub.aashe.org/browse/types/academicprogram/?search=&content_type=academicprogram&topics=curriculum&organization_type=Associate&organization_type=Baccalaureate&organization_type=Doctorate&organization_type=Master&organization_type=Business&organization_type=System+Office&country=US&state=AL&state=AK&state=AZ&state=AR&state=CA&state=CO&state=CT&state=DE&state=DC&state=FL&state=GA&state=HI&state=ID&state=IL&state=IN&state=IA&state=KS&state=KY&state=LA&state=ME&state=MD&state=MA&state=MI&state=MN&state=MS&state=MO&state=MT&state=NE&state=NV&state=NH&state=NJ&state=NM&state=NY&state=NC&state=ND&state=OH&state=OK&state=OR&state=PA&state=RI&state=SC&state=SD&state=TN&state=TX&state=UT&state=VT&state=VA&state=WA&state=WV&state=WI&state=WY&program_type=1&program_type=2&program_type=4&program_type=6&program_type=7&program_type=8#resources-panel.

⁹ Association for the Advancement of Sustainability in Higher Education (2016) Sustainable Campus Index: 2016 Top Performers & Highlights. Available at <http://www.aashe.org/files/sci-2016-final.pdf>.

¹⁰ Avlonas N (2016) The sustainability and corporate responsibility profession the job of the future? Centre for Sustainability and Excellence. Available at <http://www.csrwire.com/blog/posts/1706-is-the-sustainability-and-corporate-responsibility-profession-the-job-of-the-future>.

¹¹ Wingfield B (2007) For job market, green means growth. Forbs. Available at http://www.forbes.com/2007/07/02/environment-economy-jobs-biz_cx_bw_0703green_greenjobs.html.

USD alumni, who have received undergraduate and graduate degrees from USD before the Sustainability Program began, are involved in pioneering work in sustainability and will be sharing their expertise with the Sustainability Program. In September 2015, the Sustainability Program officially began the External Sustainability Advisory Committee although USD had informally been communicating with sustainability-focused alumni prior to the start of the committee. The purpose of this committee is develop a structure for the Sustainability Program to more actively and directly seek advice about the program from professionals who are working in a diversity of sustainability-related fields. The committee currently has fifteen members, nine of whom are USD alumni. The members who are USD alumni are Paul Ellingstad, Managing Partner of Public Technology Institute (PTI) Advisors and former Partner & Program Development Director of Sustainability & Social Innovation for Hewlett Packard (HP); Aimee House Ladonski, Food Systems Volunteer Management Field Specialist for the SDSU Extension; Jessica Lantgen, Sustainability Coordinator for the City of Sioux Falls; Craig Moody, Founder and Managing Principal of Verdis Group; Wayne Nelson-Stastny, Missouri River Natural Resources Coordinator for the US Fish and Wildlife Service; Mel Ustad, Director of Commercialization, Governor's Office of Economic Development (GOED) for the State of South Dakota; Lisa Yager, Biologist for the National Park Service; and Brian Yeoman, Director of Sustainable Leadership for the National Association of Educational Procurement and City Director of Houston C40 through the Clinton Foundation.

South Dakota's efforts to create economic opportunity in industries related to sustainability are growing, and the State will be well served by graduates who are prepared to contribute to this new and rapidly evolving field. National and international companies that are based in South Dakota such as POET, Raven Industries, and CITI (Citigroup Inc.) have a focus on sustainability, including sustainability professionals, within their organizations.

3. How would the proposed program benefit students?

Students are asking for graduate sustainability programs within USD and the State and beyond. Many Sustainability Program alumni have talked with Dr. Meghann Jarchow, Sustainability Program Coordinator, about their desire to pursue graduate studies in sustainability.¹² Because USD does not have a graduate program in sustainability, students have pursued graduate studies at other universities such as Presidio Graduate School and the University of Nebraska at Kearney, have pursued the Master of Arts in Interdisciplinary Studies at USD, or have delayed pursuing graduate education. Many Millennials, who are the generation of people most likely to enroll in graduate education in the near term, are seeking careers that address pressing challenges such as resource scarcity, climate change, and income inequality, which are the foci of sustainability.¹³ Yet, there are only two universities in the United States to offer a Ph.D. in sustainability: Arizona State University with a School of Sustainability and Rochester Institute of Technology.¹⁴

¹² Jarchow ME, personal communication.

¹³ Deloitte (2014) Big demands and high expectations: The Deloitte Millennial Survey. Available at <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-dttl-2014-millennial-survey-report.pdf>.

¹⁴ Association for the Advancement of Sustainability in Higher Education (2016) Campus Sustainability Hub. Available at https://hub.aashe.org/browse/types/academicprogram/?search=&content_type=academicprogram&discipline=7&organization_type=Doctorate&organization_type=System+Office&country=&program_type=4#resources-panel and <https://www.rit.edu/gis/academics/ph.d-sustainability/>. The University of Alaska Fairbanks offers a PhD in Natural Resources and Sustainability and Columbia University offers a PhD in Sustainable Development.

Therefore, USD is in a unique and advantageous position to build on our existing undergraduate program to train future sustainability leaders and become a regional leader.

4. How does the proposed program relate to the university's mission as provided in South Dakota Statute and Board of Regents Policy, and to the current Board of Regents Strategic Plan 2014-2020?

The statutory mission of the University of South Dakota is provided in SDCL 13-57-1:

Designated as South Dakota's liberal arts university, the University of South Dakota, established and located at Vermillion, in Clay County, shall be under the control of the Board of Regents and shall provide undergraduate and graduate programs of instruction in the liberal arts and sciences and professional education in business, education, fine arts, law and medicine, and other courses or programs as the Board of Regents may determine.

The mission is provided in BOR Policy 1:10:1, University of South Dakota Mission Statement:

The legislature established The University of South Dakota as the liberal arts university to meet the needs of the State and region by providing undergraduate and graduate programs in the liberal arts and sciences, and professional education in business, education, fine arts, law, and medicine, and other courses or programs as the Board of Regents may determine. (SDCL 13-57-1).

The Board implemented SDCL 13-57-1 by authorizing undergraduate and graduate programs in the liberal arts and sciences and in professional education and by requiring the University to promote excellence in teaching and learning, to support research, scholarly and creative activities, and to provide service to the State of South Dakota, the region, and beyond. The University of South Dakota is the comprehensive university with the South Dakota System of Higher Education.

Both the statutory mission and Board of Regents mission statement for the University of South Dakota designate the institution as the liberal arts university for the State of South Dakota. Sustainability education aligns closely with the goals of a liberal arts education to “nurture the growth of human talent in the service of human freedom... to explore and fulfill the promise of [the students’] own highest talents.”¹⁵ In fact, sustainability education has been called “the ultimate liberal art... The concept of sustainability could provide a new foundation for the liberal arts and sciences.”¹⁶ This includes fostering a love of learning in students while also teaching them how to be innovators and agents of change in their communities and world.¹⁷ The proposed Master’s and Ph.D. programs in sustainability would be an archetype of the tradition of teaching and learning in the liberal arts. Offering graduate degrees in sustainability thus strongly supports the statutory mission and Board of Regents-approved mission for the University of South Dakota.

¹⁵ Cronon W (1998) “Only Connect...” The goals of a liberal education. *The American Scholar* 67(4). Available at https://www.grinnell.edu/sites/default/files/documents/Cronon_Only_Connect.pdf.

¹⁶ Rhodes FHT (2006) Sustainability: The ultimate liberal art. *Chronicle of Higher Education*. Available at <http://www.chronicle.com/article/Sustainability-the-Ultimate/29514>.

¹⁷ Weissman NB (2012) Sustainability & liberal education: Partners by nature. *Liberal Education* 98(4). Available at <https://www.aacu.org/publications-research/periodicals/sustainability-liberal-education-partners-nature>.

Developing a Master's and Ph.D. program in sustainability would advance the Board of Regents Strategic Plan 2014-2020 in the following ways.

Goal 1: Student Success – Reflecting rates of growth in total graduates over the last five years, grow degree production to 7,450 per year by 2020.

One of the outcomes for this goal is to increase the number of graduate degrees awarded. By offering new graduate degrees at the Master's and Ph.D. levels that are in a field that is increasing in demand, we expect the graduate program in sustainability to contribute to achieving this goal.

A second outcome for this goal is to increase the number of degrees awarded to Native American students. A focus of the undergraduate program is practicing Inclusive Excellence including being welcoming to students of color. For the example, 24% of the current sustainability majors are students of color, which is higher than the University-wide demographics.¹⁸ The Sustainability Program has received programmatic grants that focus on Native American issues. The NSF Sustainable RIVER REU program is focused on recruiting Native American students, has topical foci on Native American issues, and collaborates with two tribal colleges. The NSF STEP Center subaward included a focus on the disproportionately negative impacts that the management of the Missouri River has had on Native American tribes. Research in the NSF EPSCoR grant will involve Native American tribes in the Upper Missouri River Basin. To help facilitate recruitment of Native American students, Dr. Jarchow and other members of the Sustainability Program faculty are and have been actively seeking collaborations with tribal colleges in the region.

Goal 2: Academic Quality and Performance – Document that academic programs are of the highest quality.

One of the outcomes for this goal is the addition of new graduate programs, such as the program this document is proposing.

A second outcome is to grow the number of students participating in experiential learning. “By its nature, sustainability also breaks down barriers between higher education and the wider world.”¹⁹ Sustainability studies are grounded in applied topics (i.e. “real-world issues”), and sustainability students should be trained in how to solve complex problems and be change agents.²⁰ We have quantified the number of experiential learning opportunities for eighteen students who recently completed the sustainability major. On average the undergraduate students participated in ten experiential learning opportunities focused on sustainability while studying at USD.²¹ We expect the graduate programs in sustainability to be even more experiential than the undergraduate program because most of the students will be conducting research and generating new knowledge and informing of their findings in open literature.

Goal 3: Research and Economic Development – Increase annual system research and contract expenditures to \$150M by 2020 to advance knowledge, enhance technology transfer, commercialization, and catalyze economic development.

¹⁸ Jarchow ME, unpublished data.

¹⁹ Weissman NB (2012) Sustainability & liberal education: Partners by nature. Liberal Education 98(4). Available at <https://www.aacu.org/publications-research/periodicals/sustainability-liberal-education-partners-nature>.

²⁰ Wiek A, Withycombe L, Redman CL (2011) Key competencies in sustainability: A reference framework for academic program development. Sustainability Science 6(2):203-218.

²¹ Jarchow ME, unpublished data.

One of the outcomes for this goal is to increase grant and contract expenditures. As described in question #1, grants focusing on the Sustainability Program have already received more than \$2.2 million in federal funds. The Sustainability Program has been a focus of two additional, unfunded NSF EPSCoR grants and one Board of Regents grant. The development of a graduate, especially Ph.D., program in sustainability is expected to increase USD's competitiveness for external grants.

A second outcome for this goal is to increase the number of graduates from STEM programs. Sustainability includes both natural and social sciences. Therefore, the program will increase the number of natural science (i.e. STEM) graduates in the state.

In summary, the proposed Master's and Ph.D. program in sustainability is well aligned with the USD and Board of Regents' goals.

5. Do any related programs exist at other public universities in South Dakota? If a related program already exists, explain the key differences between the existing programs and the proposed program, as well as the perceived need for adding the proposed new program. Would approval of the proposed new program create opportunities to collaborate with other South Dakota public universities?

The Master of Science in Sustainability at Black Hills State University is the most closely related program that exists within the Regental system. The Master of Science in Sustainability from BHSU is an online-only, non-thesis graduate program. Therefore, the proposed Master's and Ph.D. programs in sustainability at USD would be distinct from the BHSU program in the following ways.

- USD is proposing to offer M.A., M.S., and Ph.D. degrees.
- The USD program would be developed as a primarily in-person degree.
- The USD program would create synergies with the existing graduate, including Ph.D., programs at the University.
- The Master's and Ph.D. degrees would leverage the existing faculty and infrastructure from the undergraduate Sustainability Program that includes 25 faculty drawn from more than a dozen departments.

Sustainability is an interdisciplinary field of study, and the existing disciplines present at USD provide robust resources for sustainability pedagogy and research. Sustainability is often described as having three pillars: environmental sustainability, social sustainability, and economic sustainability. USD has tremendous existing faculty expertise in all three of these areas including environmental sustainability expertise through departments such as Biology, Chemistry, and Earth Science; social sustainability expertise through departments such as Political Science, Sociology, Anthropology, and Philosophy; and economic sustainability through the Beacom School of Business. Faculty from across USD are currently engaged with the undergraduate Sustainability Program, and we expect that engagement to increase with a graduate program in sustainability. Expanding the Sustainability Program to include graduate education aligns with USD's current strategic plan in multiple ways including our goal for expanding interdisciplinary research, scholarship, and creative work.

We anticipate that having a graduate program in sustainability would create new opportunities for USD to collaborate with other SD public universities. As USD expands its research capacity in

sustainability, we anticipate applying for more programmatic grants such as the EPSCoR RII Track 1 grants that usually involve intra-state collaborations. We anticipate that the graduate programs in sustainability would also offer opportunities for collaborations on course offerings across the state. For example, we would work with BHSU to see if there could be synergies between their online Master of Science in Sustainability degree and our graduate program in sustainability. We would also seek to incorporate the expertise available at other SD public universities into the program, such as the environmental engineering and life cycle assessment (LCA) expertise at SD School of Mines & Technology or the geospatial expertise at SDSU.

6. Do related programs exist at public colleges and universities in Minnesota, North Dakota, Montana, and/or Wyoming?

	Institution	Program Title
Minnesota	University of Minnesota Twin Cities	Science, Technology, and Environmental Policy (M.S.)
	University of Minnesota Duluth	Environmental Education (M.Ed.)
North Dakota	University of North Dakota	Environmental Management (M.S.)
Montana	University of Montana	Environmental Studies (M.A./M.S.)
Wyoming	None	

The Master’s and Ph.D. program at USD will be distinct from these programs because USD will be offering a degrees focused on sustainability rather than environmental conservation, education, or policy. Furthermore, USD will be offering a Ph.D., which is not currently offered in any of the states in the region.

7. Are students enrolling in this program expected to be new to the university or redirected from other existing programs at the university?

USD anticipates that most of the students enrolling in this program will be new to the University. For example, the NSF EPSCoR grant provides funding for research assistant positions for three Ph.D. students in sustainability who will be recruited to the University for the specific projects in the grant.

USD plans to evaluate the possibility of offering dual majors or joint degrees as are currently being offered through the School of Law at USD. If students were able to earn joint degrees, we anticipate that some of the students would be shared with other graduate programs (i.e. some students initially coming to USD for the sustainability program and adding another degree and vice versa).

8. What are the university’s expectations/estimates for enrollment in the program through the first five years? What are the university’s expectations/estimates for the annual number of graduates from the program after the first five years? Provide an explanation of the methodology the university used in developing these estimates.

We anticipate that four to ten students will enroll in the graduate program in sustainability annually through the first five years (see Table 1). Of these students, we anticipate that most (60-80%) of the students will be pursuing Master's degrees and the remaining students will be pursuing Ph.D. degrees. By the end of five years (2022), we expect to have graduated 17-24 Master's students and 5-7 Ph.D. students.

Table 1. Estimated graduate student enrollment in the graduate program in sustainability from 2017 to 2026.

<i>Year</i>	Ph.D. students admitted	M.A. + M.S. students admitted	Ph.D. graduates	M.A. + M.S. graduates
2017	3*	0	0	0
2018	1-2	3-5	0	0
2019	1-2	4-6	0	3-5
2020	1-3	5-6	3	4-6
2021	2-3	5-7	1-2	5-6
2022	2-3	5-7	1-2	5-7
2023	2-3	5-8	1-3	5-7
2024	2-4	5-10	2-3	5-8
2025	2-5	5-10	2-3	5-10
2026	2-6	5-10	2-3	5-10

*We anticipate officially starting the graduate program in sustainability in August 2018. The three Ph.D. students who will be hired for the NSF EPSCoR grant will be starting in August 2017 due to the requirements of the grant. It is expected that those students will change degrees to Ph.D. in sustainability once it is available.

These estimates were based on evaluating the Master's and Ph.D. program in the Departments of Biology, Political Science, and Psychology at USD. All three of these program have approximately equal numbers of Master's and Ph.D. students. During the first 5-10 years of the graduate program in sustainability, we expect to have more Master's students because our program will involve departments such as Earth Science and Anthropology that currently do not have graduate programs. We expect that faculty in these departments will primarily advise Master's students initially.

9. Complete the following charts to indicate if the university intends to seek authorization to deliver the entire program at any off-campus location (e.g., UC Sioux Falls, Capital University Center, Black Hills State University-Rapid City, etc.) or intends to seek authorization to deliver the entire program through distance technology (e.g., as an on-line program)?

	Yes/No	<i>If Yes, list location(s)</i>	<i>Intended Start Date</i>
Off-campus	No		

	Yes/No	<i>If Yes, identify delivery methods</i>	<i>Intended Start Date</i>

Distance Delivery	No		
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10. What are the university’s plans for obtaining the resources needed to implement the program?

	Development/ Start-up	Long-term Operation
Reallocate existing resources	Yes	Yes
Apply for external resources	Yes	Yes
Ask Board to seek new State resources	No	No
Ask Board to approve a new or increased student fee	No	No

The University does not request new State resources although starting a new graduate program does take additional resources. These additional resources, including the additional research and teaching expertise of two faculty members and paid stipends for three Ph.D. students, will be provided by the NSF EPSCoR grant.²² Faculty members associated with the Sustainability Program are actively seeking additional programmatic and individual research grants focused on sustainability. For example, faculty members of the Sustainability Program have submitted a full proposal to the National Science Foundation (NSF) Research Traineeship (NRT) grant program for a project titled “NRT-INFEWS: Graduate training to promote sustainable food, energy, and water systems (Sustainable FEWSion).” If funded, this \$3,000,000 grant would fully support 12 Ph.D. students²³ in graduate sustainability education. The grant would also provide resources for faculty training and the hiring of a project coordinator. In addition to the NRT, faculty members of the Sustainability Program are actively seeking grants to support sustainability-focused research.

All of the courses in the program will be taught by current USD faculty or the new faculty hired through the NSF EPSCoR grant. The coursework in the program will be supported by existing courses and by reassigning faculty to a small number of anticipated new courses. This will not significantly impact their teaching or research workloads.

11. Curriculum Example: Provide (as Appendix A) the curriculum of a similar program at another college or university. The Appendix should include required and elective courses in the program. Catalog pages or web materials are acceptable for inclusion. Identify the college or university and explain why the selected program is a model for the program under development.

The curricula for Arizona State University and Rochester Institute of Technology were not selected as examples because both universities are able to offer a curriculum based almost exclusively on sustainability-specific courses. The selected example is Iowa State University, which has Master of

²² Although the research and teaching expertise of the two new faculty hires will greatly enhance our capacity to offer a graduate program in sustainability, these two new faculty members will not only teach courses for the graduate program in sustainability. Their teaching will benefit the Sustainability Program in general, including teaching undergraduate and graduate sustainability courses and advising sustainability majors, and other departments on campus such as the Biology Department.

²³ Eight Ph.D. students would be funded at \$34,000 per year plus tuition and fees for four years, and four Ph.D. students would be funded at the same rate for three years.

Science and Doctor of Philosophy degrees in sustainable agriculture. Iowa State University offers “double degree programs,” which are similar to joint degrees. The Iowa State University curriculum utilizes primarily pre-existing courses, as USD intends to do. The Iowa State University curriculum is similar to the expected USD curriculum in that it has a set of core courses, most of which are specifically designed for the program, and also requires students to take coursework from at least two different topical/disciplinary areas. The content of courses required would differ between the Iowa State University sustainable agriculture program and USD’s graduate sustainability programs, but the structure would be similar.

Appendix A Curriculum Example

Iowa State University Graduate Program in Sustainable Agriculture
Available at: <https://susag.iastate.edu/academics/#curriculum-reqs>

Master of Science

Degree requirements: 35 credits

- Agroecosystem analysis (SUSAG 509) – 4 credits
- Foundations of sustainable agriculture (SUSAG 610) – 3 credits
- Sustainable agriculture colloquium (SUSAG 600) – 4 credits
- Statistical methods for research workers (STAT 401) – 3 credits
- Cross-disciplinary courses from *two* cross-disciplinary areas – 6 credits
- Electives – 9 credits
- Research/creative component (SUSAG 599/699) – 6 credits

Doctor of Philosophy

Degree requirements: 76 credits

- Agroecosystem analysis (SUSAG 509) – 4 credits
- Foundations of sustainable agriculture (SUSAG 610) – 3 credits
- Sustainable agriculture colloquium (SUSAG 600) – 6 credits
- Statistical methods for research workers (STAT 401) – 3 credits
- Cross-disciplinary courses from *two* cross-disciplinary areas – 12 credits
- Electives – 30 credits
- Research (SUSAG 699) – 18 credits