Date Submitted: 06/21/18 4:09 pm

Viewing: ESWSBS : Environmental Soil and Water Science, Bachelor of Science in Agri Food & Life Sciences

Last approved: 06/07/17 5:05 pm

Last edit: 06/22/18 8:40 am

Changes proposed by: msavin

Catalog Pages Using this Program

Environmental, Soil and Water Science B.S.A.

Environmental, Soil, and Water Science (ESWS)

Submitter: User ID: crsleaf1 Phone: 575-6731

Program Status Active

Academic Level Undergraduate

Type of proposal Major/Field of Study

Select a reason for this modification

Making Minor Changes to an Existing Degree (e.g. changing 15 or fewer hours, changing admission/graduation requirements, adding Focused Study)

Are you adding a concentration?

No

Are you adding a track?

No

Are you adding a focused study?

No

Effective Catalog Year Fall 2019

College/School Code

Bumpers College of Agricultural, Food, and Life Sciences(AFLS)

In Workflow

1. **AFLS Dean Initial**
2. **Director of Program Assessment and Review**
3. **Registrar Initial**
4. **Institutional Research**
5. **CSES Chair**
6. **CSES Curriculum Committee**
7. **AFLS Faculty**
8. **AFLS Dean**
9. **Global Campus**
10. **Provost Review**
11. **University Course and Program Committee**
12. Faculty Senate
13. Provost Final
14. Provost's Office--Notification of Approval
15. Registrar Final
16. Catalog Editor Final

Approval Path

1. 04/13/18 7:47 am Lona Robertson (ljrobert): Approved for AFLS Dean Initial
2. 06/21/18 3:34 pm Alice Griffin (agriffin): Rollback to Initiator
3. 06/25/18 4:47 pm Lona Robertson

Department Code

Department of Crop, Soil and Environmental Sciences(CSES)

Program Code ESWSBS

Degree Bachelor of Science in Agricultural, Food & Life Sciences

CIP Code

(ljrobert): Approved for AFLS Dean Initial

4. 06/26/18 11:25 am Alice Griffin (agriffin): Approved for Director of Program Assessment and Review
5. 06/26/18 3:01 pm Karen Turner (kjvestal): Approved for Registrar Initial
6. 06/26/18 3:06 pm Gary Gunderman (ggunderm): Approved for Institutional Research
7. 06/26/18 4:35 pm Robert Bacon (rbacon): Approved for CSES Chair
8. 06/27/18 1:04 pm Jefferson Miller (jdmiller): Approved for CSES Curriculum Committee
9. 09/24/18 11:49 am Douglas Karcher (karcher): Approved for AFLS Faculty
10. 09/24/18 1:17 pm Lona Robertson (ljrobert): Approved for AFLS Dean
11. 09/24/18 4:55 pm Miran Kang (kang): Approved for Global Campus

12. 10/08/18 8:06 am Terry Martin (tmartin): Approved for Provost Review

History

1. Aug 15, 2014 by Leepfrog Administrator (clhelp)
2. Jan 23, 2015 by Mary Savin (msavin)
3. Mar 31, 2015 by Charlie Alison (calison)
4. Mar 31, 2015 by Charlie Alison (calison)
5. Jun 10, 2015 by Charlie Alison (calison)
6. Jun 15, 2015 by Lisa Kulczak (lkulcza)
7. Jun 1, 2017 by Lisa Kulczak (lkulcza)
8. Jun 7, 2017 by Lisa Kulczak (lkulcza)

03.0104 - Environmental Science.

Program Title

Environmental Soil and Water Science, Bachelor of Science in Agri Food & Life Sciences

Program Delivery Method

On Campus

Is this program interdisciplinary?

No

Does this proposal impact any courses from another College/School?

No

What are the total hours needed to complete the program?	**120**

Program Requirements and Description

Requirements

Requirements for a Major in Environmental, Soil, and Water Science (ESWS)

State minimum core and discipline specific general education requirements:
(Course work that meets state minimum core requirements is in bold.)

University Requirements		**1**
UNIV 1001	University Perspectives (Counts as General Elective)	
Communication		12
Choose from English Core course (6 hours)		
COMM 1313	Public Speaking (ACTS Equivalency = SPCH 1003)	
CSES 3023	Crop, Soil, and Environmental Sciences Colloquium	
or AGED 3143	Communicating Agriculture to the Public	
U.S. History and Government		3
~~One U.S. History Core Courses~~		~~3~~
Choose 3 hours U.S. History/Government from University Core		
Mathematics		6
MATH 1203	College Algebra (ACTS Equivalency = MATH 1103)	
MATH 1213	Plane Trigonometry (ACTS Equivalency = MATH 1203) (Higher level MATH is encouraged for students with an ACT of 26 or higher and considering graduate school.)	
~~Select one of the following:~~		~~3~~
~~AGST 4023~~	~~Principles of Experimentation~~	
~~STAT 2023~~	~~Biostatistics~~	
Sciences		35
BIOL 1543	Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture)	
& BIOL 1541L	and Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab)	
BIOL 2013	General Microbiology (ACTS Equivalency = BIOL 2004 Lecture)	
& BIOL 2011L	and General Microbiology Laboratory (ACTS Equivalency = BIOL 2004 Lab)	
BIOL 3863	General Ecology	
& BIOL 3861L	and General Ecology Laboratory	

or ENSC 3223	Ecosystems Assessment	
& ENSC 3221L	and Ecosystems Assessment Laboratory	
CSES 1203	Introduction to Plant Sciences	
CHEM 1103	University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)	
& CHEM 1101L	and University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab)	
CHEM 1123	University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)	
& CHEM 1121L	and University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)	
CHEM 2613	Organic Physiological Chemistry (ACTS Equivalency = CHEM 1224 Lecture)	
& CHEM 2611L	and Organic Physiological Chemistry Laboratory (ACTS Equivalency = CHEM 1224 Lab)	
or CHEM 3603	Organic Chemistry I	
& CHEM 3601L	and Organic Chemistry I Laboratory	
GEOS 1113	General Geology (ACTS Equivalency = GEOL 1114 Lecture)	
& GEOS 1111L	and General Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)	
PHYS 2013	College Physics I (ACTS Equivalency = PHYS 2014 Lecture)	
& PHYS 2011L	and College Physics I Laboratory (ACTS Equivalency = PHYS 2014 Lab)	
Fine Arts and Humanities		6
Select 3 hours Fine Arts from University Core		
Select 3 hours Humanities from University Core		
~~ESWS Requirements~~		
Social Sciences		9
Select 9 hours Social Sciences from University Core		
ESWS Requirements*		
Environmental Science Core		17
CSES 2203	Soil Science	
CSES 2201L	Soil Science Laboratory	
ENSC 1003	Environmental Science	
ENSC 1001L	Environmental Science Laboratory	
AGME 2903	**Agricultural and Human Environmental Sciences Applications of Microcomputers**	
ENSC 3003	Introduction to Water Science	
STAT 2303	Principles of Statistics (ACTS Equivalency = MATH 2103)	
or AGST 4023	Principles of Experimentation	
Soil Science Core		
Select one of the following:		3-4
CSES 3214	Soil Resources and Nutrient Cycles (with Lab Component)	
CSES 4224	Soil Fertility (with Lab Component)	
CSES 4253	Soil Classification and Genesis (with Lab Component)	
CSES 4553	**Wetland Soils**	
ENSC 3263	Soil and Water Conservation	
ENSC 4263	Environmental Soil Science (with Lab Component)	

Water Science Core		
Select one of the following:		3
ENSC 4023	Water Quality	
GEOS 3333	Oceanography	
GEOS 4033	Hydrogeology	
GEOS 4363	**Climatology**	
GEOS 4473	**Applied Climatology**	
Natural Resources Core		
~~Select 12 hours from the following two groups:~~		~~12~~
Select 9 hours from the following two groups:		**9**
Environmental Science**		
AGME 3153	Surveying in Agriculture and Forestry	
CSES 2013	Pest Management	
CSES 355V	Soil Profile Description (1 hour, may take twice)	
CSES 462V	Internship (1-6 credit hours)	
CSES 4553	Wetland Soils	
ENSC 3103	Plants and Environmental Restoration	
ENSC 3263	**Soil and Water Conservation**	
ENSC 3603	GIS for Environmental Science	
ENSC 4021L	Water Quality Laboratory	
ENSC 4034	Analysis of Environmental Contaminants	
ENSC 4401	Professional Certification Preparation	
GEOS 3043	Sustaining Earth	
GEOS 3543	Geospatial Applications and Information Science	
Environmental Studies (0-3 hours)		
AGEC 3413	Principles of Environmental Economics	
AGEC 3503	Agricultural Law I	
AGEC 3523	Environmental and Natural Resources Law	
ENSC 3933	Environmental Ethics	
SOCI 4603	Environmental Sociology	
General Electives		16-17
Total Hours		120

***Courses within major cannot be taken for duplicate credit.**

****One 3-hr study abroad course, either Experiential Learning in Indian Agriculture (Jan) or Sustainability in the Eurozone Agro-Food Chain (May), which are both taken under AFLS 401V/401VH, can be substituted for 3 hours of Natural Resources core.**

8-Semester Plan

Environmental, Soil, and Water Science B.S.A.

Eight-Semester Degree Program

Students wishing to follow the degree plan should see the Eight-Semester Degree Policy for university requirements of the program.

First Year	Units Fall	Spring
ENGL 1013 Composition I (ACTS Equivalency = ENGL 1013)	3	
ENSC 1003 Environmental Science	4	
& ENSC 1001L Environmental Science Laboratory		
BIOL 1543 Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture)	4	
& BIOL 1541L Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab)		
MATH 1203 College Algebra (ACTS Equivalency = MATH 1103)	3	
UNIV 1001 University Perspectives	1	
Fine Arts/Humanities University Core Elective		3
ENGL 1023 Composition II (ACTS Equivalency = ENGL 1023)		3
CSES 1203 Introduction to Plant Sciences		3
Social Sciences University Core Elective		3
CHEM 1103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)		4
& CHEM 1101L University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab)		
Year Total:	15	16

Second Year	Units Fall	Spring
General Elective as Broadening Elective (could apply toward a minor)	3	
GEOS 1113 General Geology (ACTS Equivalency = GEOL 1114 Lecture)	4	
& GEOS 1111L General Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)		
History University Core Elective	3	
COMM 1313 Public Speaking (ACTS Equivalency = SPCH 1003)	3	
MATH 1213 Plane Trigonometry (ACTS Equivalency = MATH 1203)	3	
CHEM 1123 University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)		4
& CHEM 1121L University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)		
Fine Arts/Humanities University Core Elective		3
Social Sciences University Core Elective		3
ENSC 3003 Introduction to Water Science		3
~~General Elective (Could apply elective toward a minor)~~	-	~~3~~
AGME 2903 Agricultural and Human Environmental Sciences Applications of Microcomputers		**3**
Year Total:	16	16

Third Year	Units Fall	Spring

CSES 2203 Soil Science	4	
& CSES 2201L Soil Science Laboratory		
PHYS 2013 College Physics I (ACTS Equivalency = PHYS 2014 Lecture)	4	
& PHYS 2011L College Physics I Laboratory (ACTS Equivalency = PHYS 2014 Lab)		
Water Science or Natural Resources Core	3	
Select one of the following:	3-4	
General Electives as AFLS Broadening Electives (Could apply toward a minor)		
CHEM 3603 Organic Chemistry I		
& CHEM 3601L Organic Chemistry I Laboratory		
BIOL 2013 General Microbiology (ACTS Equivalency = BIOL 2004 Lecture)		4
& BIOL 2011L General Microbiology Laboratory (ACTS Equivalency = BIOL 2004 Lab)		
CHEM 2613 Organic Physiological Chemistry (ACTS Equivalency = CHEM 1224 Lecture)		4
& CHEM 2611L Organic Physiological Chemistry Laboratory (ACTS Equivalency = CHEM 1224 Lab)		
Social Sciences Core Elective		3
Water Science or Soil Science Core (For Water Science: Recommended: ENSC 3003; Soil Science: Pre- at least CSES 2203)		3-4
Year Total:	14	14

Fourth Year	Units	
	Fall	Spring
Select one of the following:	3	
CSES 3023 Crop, Soil, and Environmental Sciences Colloquium		
AGED 3143 Communicating Agriculture to the Public		
Select one of the following:	4	
ENSC 3223 Ecosystems Assessment		
& ENSC 3221L Ecosystems Assessment Laboratory		
BIOL 3863 General Ecology		
& BIOL 3861L General Ecology Laboratory		
Statistics or Natural Resources Core	3	
Soil Science or Natural Resources Core	3-4	
Natural Resources Core or General Elective (Could apply elective toward a minor)	3	
Natural Resources Core or General Elective		3
Statistics or Natural Resources Core		3
General Elective		3
General Elective as Broadening Elective (Could apply toward a minor)		2-3
General Elective (May wish to take another elective. Could apply toward a minor)		2-3
Year Total:	16	13

Total Units in Sequence:	120

Are Similar Programs available in the area?

No

Estimated Student Demand for Program: 160

Scheduled Program Review Date: **2020** ~~2017~~

Program Goals and Objectives

Program Goals and Objectives
1. Graduates have the discipline-specific knowledge in soil, water, and environmental sciences required to perform successfully in private, government, or academic entry-level positions. **2. Graduates are able to critically analyze, synthesize, and evaluate new information to make informed decisions.** **3. Graduates have the ability to solve complex, multidisciplinary problems.** **4. Graduates are able to prepare and synthesize information to effectively communicate, both orally and in writing.** ~~The Environmental, Soil, and Water major educates students in water quality, proper use of soils, land application of wastes, proper use of fertilizers, fate of pesticides in soil and water, bioremediation of contaminated soils and waters, and wetlands.The major provides a strong science background and a practical education.~~

Learning Outcomes

Learning Outcomes
~~ESWS Student Learner Outcomes~~
~~1.Technical Skills~~
~~A.Demonstrate a high level of technical competency in soil, water, and environmental sciences to perform successfully in private, government, or academic entry-level positions~~
~~B.Understand fundamental properties and processes of soil, water, and environmental sciences for sustainability, assessment, management, and conservation.~~
~~C.Demonstrate basic computer skills, including Excel spreadsheet and GIS skills.~~
~~D.Understand variability and descriptive statistics, quality control, and how to practice the scientific method.~~

Learning Outcomes
1. Students will demonstrate the discipline specific knowledge required to function as environmental, soil, and/or water science professionals. **2. Students will demonstrate the ability to critically evaluate situations or scenarios to arrive at well thought out and supported decisions and outcomes.** **3. Students will demonstrate the ability to work through and solve complex, multidisciplinary problems.** **4. Communication skills** **a. Students will demonstrate the skills required to effectively communicate technical/scientific information in oral platforms.** **b. Students will demonstrate the ability to integrate, organize, and effectively present written reports of technical/scientific information.**
~~2.Communication Skills~~
~~A.Prepare, organize, and synthesize information to effectively communicate, both orally and in writing, with technical and non-technical audiences.~~
~~B.Prepare visual aids and use them effectively in oral communication~~
~~C.Clearly present written reports of technical information to general and professional audiences.~~
~~3.Ethics and Leadership~~
~~A.Discuss and apply the code of ethics the students will use in their work, including academic honesty and professional ethics~~
~~B.Discuss the social and multi-cultural aspects of the students' chosen careers~~
~~C.Demonstrate leadership skills in classroom projects and non-classroom activities~~
~~D.Successfully engage in active learning activities and develop life-long learner skills~~
~~E.Demonstrate their leadership skills, social awareness, and ethical responsibility by leading and participating in discussion sessions on the topics.~~
~~4.Problem Solving and Critical Thinking~~
~~A.Demonstrate the ability to solve complex, multi-disciplinary problems as a member of a team and as an individual~~
~~B.Collect, summarize, interpret, and communicate data generated by the student in laboratory and field exercises~~
~~C.Find, evaluate, and communicate current research information presented in scientific journal and popular press articles~~

Learning Outcomes
~~D.Conduct soil, water quality, and environmental quality assessment and make recommendations to solve problems~~

Description and justification of the request

Description of specific change	Justification for this change
A. Remove requirement for additional hours in ENGL, JOUR, COMM, or foreign language if EXEMPT from ENGL 1013 and ENGL 1023 B. Move STAT/AGST options to Environmental Science core and delete biostatistics (which has a Calculus pre-req); MATH section becomes 6 hours C. Add AGME 2903 (Ag and Human Environ Science Appl of Microcomputers to Environmental Science core for a total of 17 hours, remove 3 hours from Natural Resources core, and increase Departmental Requirements to 32-33 credits. D. Add CSES 4553 Wetland Soils and ENSC 3263 Soil and Water Conservation as options to 2nd Soil Science block E. Add GEOS 4363 Climatology and GEOS 4473 Applied Climatology as options to 2nd Water Science block F. Add AFLS 401V/401VH Experiential Learning in Indian Agriculture (Jan) or AFLS 401V/401VH Sustainability in the Euro Food System (May) to the Natural Resources core, Environmental Science block G. Add footnote that “courses taken in major cannot be taken for duplicate credit” H. Make sure that check sheet state 0-3 credits for Environmental Studies, which is the current program (not 3 hours).	Change in ENGL 1013 and ENGL 1023 exemption allows students to enroll in upper division hours in the major or provides more flexibility to pursue experiential learning or other opportunities. STAT 2023 requires MATH 2554, which is not required for the major. Students need to be proficient in computer skills to be successful in the sciences, and many students lack computer skills, especially those to analyze data. ESWS attracts many transfer students and students with diverse interests in environmental sciences and the flexibility to pursue different upper division water and soil science courses allows students some customization to shape degree experience to fit future career interests and pursuits. Inclusion of study abroad programs focused on the natural and agricultural sciences within the natural resources core provides global enrichment and experiential learning opportunities.

Upload attachments

19-20-eswsbs-8sdcp final.docx

ESWS checksheet 2019-2020 Apr 2018rev - final.docx

Reviewer Comments

Alice Griffin (agriffin) (05/07/18 2:47 pm): Changed effective catalog date from spring 2019 to fall 2019. UGRD programs can only be implemented with the publication of the fall catalog. Inserted AGME 2903 into Environmental Science Core requirements (as noted in description). Thus changed hours from 14 to 17 for the core requirements (with permission from college).

Alice Griffin (agriffin) (06/21/18 3:34 pm): Rollback: Rollback per request of department.

Key: 126