

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN SENATE  
COMMITTEE ON EDUCATIONAL POLICY  
(Final; Information)

EP.22.148 Report of Administrative Approvals through April 25, 2022

Senate committees are authorized to act for and in the name of the Senate on minor matters. Below is a listing of the administrative approvals the Senate Committee on Educational Policy approved at its meeting on April 25, 2022. Additional information for each approval is attached.

**A. Undergraduate Programs**

- 1) **Physical Geography concentration in the BSLAS in Geography & Geographic Information Science** (key 847) – revises the list of courses from which students are to select 25-27 concentration hours. There is no change to the total hours required.
- 2) **BSAG in Agricultural & Biological Engineering** (key 72) – moves footnote content into program table and revises the list of Additional Biological Sciences Coursework from which students select 4 hours. There is no change to the total hours required.



# Program Change Request

Date Submitted: 04/18/22 1:11 pm

Viewing: **3885 : Geography & Geographic Information Science: Physical Geography, Geography, BSLAS**

Last approved: 04/05/22 3:55 pm

Last edit: 04/22/22 10:21 am

Changes proposed by: Andrea Ray

Catalog Pages [Geography & Geographic Information Science: Physical Geography, BSLAS](#)  
Using this Program

## In Workflow

1. U Program Review
2. 1872 Head
3. SESE Head
4. KV Dean
5. University Librarian
6. Provost
7. Senate EPC
8. Senate
9. U Senate Conf
10. Board of Trustees
11. IBHE
12. HLC
13. DMI

Proposal Type:

## Approval Path

1. 04/19/22 9:48 am  
Deb Forgacs (dforgacs):  
Approved for U Program Review
2. 04/19/22 5:40 pm  
Shaowen Wang (shaowen):  
Approved for 1872 Head
3. 04/19/22 6:09 pm  
Jonathan Tomkin (tomkin):  
Approved for SESE Head
4. 04/20/22 3:01 pm  
Andrea Ray (aray): Approved for KV Dean
5. 04/20/22 3:30 pm  
John Wilkin (jpwilkin):  
Approved for University Librarian

6. 04/22/22 8:06 am  
Kathy Martensen  
(kmartens):  
Approved for  
Provost

## History

1. Aug 2, 2019 by  
Deb Forgacs  
(dforgacs)
2. Aug 6, 2019 by  
Deb Forgacs  
(dforgacs)
3. Apr 5, 2022 by  
Andrea Ray (aray)

Concentration (ex. Dietetics)

This proposal is  
for a:  
Revision

## Administration Details

Official Program Name	Geography & Geographic Information Science: Physical <u>Geography</u> , <del>Geography</del> , BSLAS	
Sponsor College	Liberal Arts & Sciences	
Sponsor Department	Geography & Geographic Information Science	
Sponsor Name	Shaowen Wang, Professor and Head	
Sponsor Email	shaowen@illinois.edu	
College Contact	Stephen R. Downie <del>-BEM</del>	College Contact Email
	sdownie@illinois.edu	
College Budget Officer		
College Budget Officer Email		

List the role for rollbacks (which role will edit the proposal on questions from EPC, e.g., Dept Head or Initiator) and/or any additional stakeholders. *Purpose: List here who will do the editing work if proposal needs rolled back. And any other stakeholders.*

Bruce Rhoads, Professor, brhoads@illinois.edu, Matthew Cohn cohn@illinois.edu

Does this program have inter-departmental administration?

No

## Proposal Title

Effective Catalog Term      Fall 2022

Provide a brief, concise description (not justification) of your proposal.

Administrative approval to revise the Physical Geography Concentration in the Geography and Geographic Information Science Major

List here any related proposals/revisions and their keys. *Example: This BS proposal (key 567) is related to the Concentration A proposal (key 145) and the Concentration B proposal (key 203).*

## Program Justification

## Why are these changes necessary?

The purpose of this proposal is to revise the requirements for the concentration in physical geography in the undergraduate major in Geography and Geographic Information Science to better reflect contemporary skills required for physical geographers. Changes include eliminating physics, chemistry, and calculus as requirements and replacing these requirements with options to take alternative courses focusing on spatial analysis and geographic information science (GIS) skills. This revision also includes recently developed courses in physical geography as part of the new curriculum.

Changes in the field of physical geography have led to the need for quantitative analytical skills in spatial analysis and GIS, rather than physics, chemistry, and calculus. Such changes are reflected in the recent elimination of calculus, physics, and chemistry as prerequisites for the GGIS graduate-program concentration in River, Watershed and Landscape Dynamics (the concentration corresponding to physical geography). Contemporary students of physical geographers are best served by training in spatial analysis and GIS. The field is changing, and these skills are the most important ones for employment or for pursuit of graduate studies. GGIS 371: Spatial Analysis or GGIS 379: Introduction to GIS are part of the core curriculum in the Physical Geography concentration, but the revision of this concentration now includes in the course list many advanced offerings in GIS/spatial analysis including: GGIS 224 Environmental Data Science, GGIS 280 Intro to Social Statistics, GGIS 380: GIS II Spatial Problem Solving, GGIS 403: Geographic Information Systems and Science, GGIS 407: Foundations of CyberGIS and Geospatial Data Science. The Quant I requirement for all undergraduate majors can be met by selecting GGIS 280: Intro to Social Statistics from the list of courses in the total concentration requirements or by selecting another Quant I course to fulfill the LAS general education requirement. The Quant II requirement can be met by selecting GGIS 371 or GGIS 380. Advisors in our program will ensure that students in the major fulfill these requirements.

Two optional course offerings in the physical geography concentration GGIS (GGIS 401 Watershed Hydrology and GGIS 406: Fluvial Geomorphology) list PHYS 101 (GGIS 406) and CHEM 102 (GGIS 401) as prerequisites. Undergraduates in GGIS who wish to take GGIS 401, which is administered by NRES, will have to take CHEM 102 as an elective, meet the Quant I requirement, and the statistics requirement of the NRES major, or see if the instructor will allow them to take the course without the prerequisite. The latter two requirements (Quant I and the NRES statistics requirement) already apply to this course so the only change from the standpoint of Geography majors will be meeting the CHEM 102 requirement. GGIS 406 is administered by GGIS and allows students who have not taken PHYS 101 to take the course with the consent of the instructor. Thus, GGIS majors who want to take GGIS 406 will either have to take PHYS 101 as an elective or seek the consent of the instructor. Given the large number of alternative courses from which to select and the small number of undergraduate majors in the physical geography concentration, the number of majors interested in enrolling in GGIS 401 or GGIS 406 will be small.

## Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

No

## Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

This curriculum change will not cause any change in the existing assessment plan for our undergraduate programs. This plan includes the following numbered objectives and assessment strategies.

### 1. SLO 1: Geographic Understanding

Definition: GIS students will understand the interconnectedness of places and scales in human-environmental systems, including the sustainability of those systems.

- a. Focus group with graduating seniors (yearly)
- b. Survey of recent GIS graduates (annually or bi-annually)

### 2. SLO 2: Spatial Patterns and Processes

Definition: GIS students will be able to analyze spatial patterns, distributions, processes, and connections within and among different human-environmental systems, using qualitative, quantitative, computational, and/or spatial methods of research appropriate to their level of training and their field of geographic inquiry.

- a. Focus group with graduating seniors (yearly)
- b. Survey of recent GIS graduates (annually or bi-annually)

### 3. SLO 3: Problem-Solving and Communication

Definition: GIS students will be able to formulate and conduct geographic analyses and communicate the results in verbal, written, and visual form.

- a. Focus group with graduating seniors (yearly)
- b. Survey of recent GIS graduates (annually or bi-annually)
- c. Evaluation of GIS course projects for a random sample of graduating GIS majors (every 5 years) N/A

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

## Program of Study

*"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: <https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf>). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.*

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs [Comparative Table GGIS Physical Geology Concentration.docx](#)  
[Degree Requirements Tab Physical Geology Concentration.docx](#)  
[physical geography curriculum proposal\\_032922.doc](#)

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text - Overview Tab

Text for Overview tab on the Catalog Page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

Statement for Programs of Study Catalog

		Course List	
Code	Title		Hours
<del>Physical Geography Concentration Requirements</del>			
<del>200- to 400-level Geography courses (at least 6 hours of which must be at the 300- or 400- level)</del>			
<del>selected from the following:</del>			
<del>GGIS-210</del>	<del>Social &amp; Environmental Issues</del>		
<u>Total Concentration Hours</u>			<u>25-27</u>
<u>200- to 400-level Geography and Geographic Information Science courses (at least 6 hours of which must be at the 300- or 400- level) selected from the following:</u>			
<u>GGIS 220</u>	<u>Landscapes, Ecosystems and Environmental Change: Science and Management</u>		
<u>GGIS 222</u>	Big Rivers of the World		
<del>GGIS/NRES 287</del>	<del>Environment and Society</del>		
<u>GGIS 224</u>	<u>Environmental Data Science</u>		
<u>GGIS 280</u>	<u>Intro to Social Statistics</u>		
<del>GGIS 370/ESE 320</del>	Water Planet, Water Crisis		
<u>GGIS 371</u>	Spatial Analysis		
<u>GGIS 379</u>	Introduction to Geographic Information Systems		
<u>GGIS 380</u>	<u>Spatial Problem Solving</u>		
<u>GGIS 390</u>	Independent Study		
<u>GGIS 391</u>	Honors Independent Study		
<del>GGIS/NRES 401</del>	Watershed Hydrology		
<u>GGIS 403</u>	<u>Geographic Information Science and Systems</u>		
<u>GGIS 405</u>	Geography Field Course		
<u>GGIS 406</u>	Fluvial Geomorphology		
<u>GGIS 407</u>	<u>Foundations of CyberGIS &amp; Geospatial Data Science</u>		
<u>GGIS 408</u>	Humans and River Systems		
<del>GGIS 412</del>	<del>Geospatial Technology &amp; Society</del>		
<u>GGIS/ATMS 421</u>	Earth Systems Modeling		



Code	Title	Hours
<a href="#">GGIS 436/IB 439</a>	Biogeography	
<a href="#">GGIS 459</a>	<a href="#">Ecohydraulics</a>	
<a href="#">GGIS 460</a>	Aerial Photo Analysis	
<a href="#">GGIS 468</a>	Biological Modeling	
<del>GGIS 471</del>	<del>Modern Geographic Thought</del>	
<a href="#">GGIS 473</a>	Digital Cartography & Map Design	
<a href="#">GGIS 476</a>	Applied GIS to Environ Studies	
<a href="#">GGIS 477</a>	Introduction to Remote Sensing	
<a href="#">GGIS 478</a>	Techniques of Remote Sensing	
MATH 220	Calculus	4-5
or MATH 221	Calculus I	
PHYS 101	College Physics: Mech & Heat	4-5
or PHYS 211	University Physics: Mechanics	
Select one of the following:		4
CHEM 102	General Chemistry I	
& CHEM 103	and General Chemistry Lab I	
CHEM 104	General Chemistry II	
& CHEM 105	and General Chemistry Lab II	
Total Hours required for graduation		120

## Program Relationships

Corresponding

Program(s):

Corresponding Program(s)

Geography & Geographic Information Science, BSLAS

## Program Features

Academic Level Undergraduate

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Additional concentration notes (e.g., estimated enrollment, advising plans, etc.)

[Change in concentration requirements will have no impact on admissions and advising management.](#)

## Delivery Method

This program is available:

On Campus - Students are required to be on campus, they may take some online courses.

## Enrollment

Describe how this revision will impact enrollment and degrees awarded.

The change should not impact enrollment and degrees awarded since we already have a physical geography concentration in the department and are merely revising the requirements for the concentration.

## Budget

Are there budgetary implications for this revision? No

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available? No

Additional Budget Information

Attach File(s)

## Financial Resources

How does the unit intend to financially support this proposal?

No impact to unit.

Will the unit need to seek campus or other external resources? No

Attach letters of support

## Resource Implications

### Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities? No

### Technology

Will the program need additional technology beyond what is currently available for the unit? No

## Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

## Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.

Attach File(s)

## Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

No impact to unit.

## Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

Current collections and services are adequate for the proposed program.

## EP Documentation

EP Control Number          EP.22.148

Attach  
Rollback/Approval  
Notices

This proposal          No  
requires HLC  
inquiry

## DMI Documentation

Attach Final  
Approval Notices

Banner/Codebook Name          Physical Geography

Program Code:          3885

Minor Code 5694	Conc Code	3885	Degree Code	BSLAS	Major Code
--------------------	-----------	------	-------------	-------	------------

Senate Approval

Date

Senate

Conference

Approval Date

BOT Approval

Date

IBHE Approval

Date

HLC Approval

Date

Effective Date:

Attached

Document

Justification for  
this request

Program Reviewer **Kathy Martensen (kmartens) (04/22/22 8:02 am):** Administrative approval: No  
Comments change to total hours; doesn't restrict student choice.

## Comparative Table

### Geography & Geographic Information Science: Physical Geography, BSLAS

- 1) Include a comparative table of the current and proposed requirements (courses added marked in blue, courses deleted marked in orange).

Physical Geography Concentration Requirements					
Revised Course List			Existing Course List		
Code	Title	Hours	Code	Title	Hours
Total Concentration Required Hours		25-27	Total Concentration Required Hours		25-27
200- to 400-level Geography and Geographic Information Science courses (of which at least 6 hours must be at the 300 or 400 level) selected from the following:			200- to 400-level Geography and Geographic Information Science courses (of which at least 6 hours must be at the 300 or 400 level) selected from the following:		
			GGIS 210	Social & Environmental Issues	
GGIS 220	Landscapes, Ecosystems, and Environmental Change				
GGIS 222	Big Rivers of the World		GGIS 222	Big Rivers of the World	
GGIS 224	Environmental Data Science				
GGIS 280	Intro to Social Statistics				
			GGIS/NRES 287	Environment and Society	
GGIS 370/ESE 320	Water Planet, Water Crisis		GGIS 370/ESE 320	Water Planet, Water Crisis	
GGIS 371	Spatial Analysis		GGIS 371	Spatial Analysis	
GGIS 379	Introduction to GIS				
GGIS 380	GIS II Spatial Problem Solving				
GGIS 390	Individual Study		GGIS 390	Individual Study	
GGIS 391	Honors Individual Study		GGIS 391	Honors Individual Study	
GGIS/NRES 401	Watershed Hydrology		GGIS/NRES 401	Watershed Hydrology	
GGIS 403	Geographic Information Science and Systems				
GGIS 405	Geography Field Course		GGIS 405	Geography Field Course	
GGIS 406	Fluvial Geomorphology		GGIS 406	Fluvial Geomorphology	
GGIS 407	Foundations of CyberGIS & Geospatial Data Science				
GGIS 408	Humans and River Systems		GGIS 408	Humans and River Systems	
			GGIS 412	Geospatial Tech & Society	
GGIS/ATMS 421	Earth Systems Modeling		GGIS/ATMS 421	Earth Systems Modeling	
GGIS 436/IB 439	Biogeography		GGIS 436/IB 439	Biogeography	
GGIS 459	Ecohydraulics				
GGIS 460	Aerial Photo Analysis		GGIS 460	Aerial Photo Analysis	
GGIS 468	Biological Modeling		GGIS 468	Biological Modeling	
			GGIS 471	Recent Trends in Geog Thought	
GGIS 473	Digital Cartography & Map Design		GGIS 473	Digital Cartography & Map Design	
GGIS 476	Applied GIS to Environ Studies		GGIS 476	Applied GIS to Environ Studies	

GGIS 477	Introduction to Remote Sensing		GGIS 477	Introduction to Remote Sensing	
GGIS 478	Techniques of Remote Sensing		GGIS 478	Techniques of Remote Sensing	
			MATH 220	Calculus	4-5
			or MATH 221	Calculus I	
			PHYS 101 or or PHYS 211	College Physics: Mech and Heat University Physics: Mechanics	4-5
			Select one of the following:		4
			CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	
			CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	
Total Hours required for graduation		120	Total Hours required for graduation		120

## Degree Requirements Tab

### Geography & Geographic Information Science: Physical Geography, BSLAS

#### 1.A) DEGREE REQUIREMENTS-

*for the degree of Bachelor of Science in Liberal Arts & Sciences: Major in Geography & Geographic Information Science, Physical Geography Concentration*

A Major Plan of Study Form must be completed and submitted to the LAS Student Affairs Office by the beginning of the fifth semester (60-75 hours).

**Departmental distinction:** Students majoring in Geography and Geographic Information Science can earn distinction, high distinction, and highest distinction upon graduation. The requirements for these awards are:

- For distinction: 3.3 GPA overall; 3.3 GPA in GGIS courses.
- For high distinction: 3.3 GPA overall; 3.75 GPA in GGIS courses.
- For highest distinction: 3.3 GPA overall; 3.75 GPA in GGIS courses; satisfactorily complete an independent study project (GGIS 391).

Students should consult their advisors regarding distinction requirements as soon as they enter the major (no later than the end of their junior year).

**General education:** Students must complete the [Campus General Education](#) requirements including the campus general education language requirement.

**Minimum required major and supporting course work:** a minimum of 40 upper-division hours. Twelve (12) hours of 300- and 400-level courses in the major must be taken on this campus.







---

## Proposal for revised curricula (degree, major, concentration, minor)

Submit completed proposals via email to Associate Dean Stephen R. Downie ([sdownie@illinois.edu](mailto:sdownie@illinois.edu)). Please obtain Executive Officer and School Director (if applicable) approval via email and forward with the proposal to LAS.

**Proposal Title:** *(Please provide a brief and concise title for your proposal e.g. Establish A New Master of Science in Xxxx Studies (M.S. in X.S.), in the Department of Yyyy, College of Zzzz.)*

*Revision of the Physical Geography Concentration in the Geography and Geographic Information Science Major*

**Sponsor(s):** *(Please include name, title, and email address of a faculty member knowledgeable about the proposal who will serve as the primary contact for the proposal. This person must be authorized to make changes in the proposal on behalf of the department. In case of multiple units, give information for each unit.)*

*Bruce Rhoads, Professor, [brhoads@illinois.edu](mailto:brhoads@illinois.edu)*

**College contact:** Stephen R. Downie, Interim Associate Dean for Curricula and Academic Policy, College of Liberal Arts and Sciences, [sdownie@illinois.edu](mailto:sdownie@illinois.edu)

In addition to the unit sponsor(s), who in the unit should be contacted if the College or campus has questions on the proposal?

*Shaowen Wang, Professor and Head, [shaowen@illinois.edu](mailto:shaowen@illinois.edu)*

**Does this program have inter-departmental administration?** Yes / No If yes, list department. Please describe the oversight/governance for this program, e.g., traditional departmental/college governance. Inclusion of/roles of elected faculty committees? Inclusion of/roles of any advisory committees.

*No*

---

## PROGRAM DESCRIPTION and JUSTIFICATION

**Proposed effective catalog term:** Fall 2022 *(Proposals may not be implemented until they go through all necessary levels of approval. Proposed changes may not be publicized as final on any web sites, printed documents, etc. until written confirmation of final approval is issued. For LAS units, a fall semester effective term for all curricula will be requested, please indicate the proposed year).*

- 1) **Provide a brief, concise description of your proposal.** For example, if proposing revisions to a curriculum, state specifically what is changing. Where applicable, note whether stated program changes include additional requirements in the form of prerequisite courses. Requests for curriculum revisions must be accompanied by a table which clearly outlines the current requirements and the proposed revisions. This information may be submitted as an appendix. See Appendix A for an example. Please provide pertinent information only.

*The purpose of this proposal is to revise the requirements for the concentration in physical geography in the undergraduate major in Geography and Geographic Information Science to better reflect contemporary skills required for physical geographers. Changes include eliminating physics, chemistry, and calculus as requirements and replacing these requirements with options to take alternative courses focusing on spatial analysis and geographic information science (GIS) skills. This revision also includes recently developed courses in physical geography as part of the new curriculum.*

- 2) **Why are these changes necessary?** Please include how your unit decided to revise this program and highlight of the program objectives when applicable.

*Changes in the field of physical geography have led to the need for quantitative analytical skills in spatial analysis and GIS, rather than physics, chemistry, and calculus. Such changes are reflected in the recent elimination of calculus, physics, and chemistry as prerequisites for the GGIS graduate-program concentration in River, Watershed and Landscape Dynamics (the concentration corresponding to physical geography). Contemporary students of physical geographers are best served by training in spatial analysis and GIS. The field is changing, and these skills are the most important ones for employment or for pursuit of graduate studies. GGIS 371: Spatial Analysis or GGIS 379: Introduction to GIS are part of the core curriculum in the Physical Geography concentration, but the revision of this concentration now includes in the course list many advanced offerings in GIS/spatial analysis including: GGIS 224 Environmental Data Science, GGIS 280 Intro to Social Statistics, GGIS 380: GIS II Spatial Problem Solving, GGIS 403: Geographic Information Systems and Science, GGIS 407: Foundations of CyberGIS and Geospatial Data Science. The Quant I requirement for all undergraduate majors can be met by selecting GGIS 280: Intro to Social Statistics from the list of courses in the total concentration requirements or by selecting another Quant I course to fulfill the LAS general education requirement. The Quant II requirement can be met by selecting GGIS 371 or GGIS 380. Advisors in our program will ensure that students in the major fulfill these requirements.*

*Two optional course offerings in the physical geography concentration GGIS (GGIS 401 Watershed Hydrology and GGIS 406: Fluvial Geomorphology) list PHYS 101 (GGIS 406) and CHEM 102 (GGIS 401) as prerequisites. Undergraduates in GGIS who wish to take GGIS 401, which is administered by NRES, will have to take CHEM 102 as an elective, meet the Quant I requirement, and the statistics requirement of the NRES major, or see if the instructor will allow them to take the course without the prerequisite. The latter two requirements (Quant I and the NRES statistics requirement) already apply to this course so the only change from the standpoint of Geography majors will be meeting the CHEM 102 requirement. GGIS 406 is administered by GGIS and allows students who have not taken PHYS 101 to take the course with the consent of the instructor. Thus, GGIS majors who want to take GGIS 406 will either have to take PHYS 101 as an elective or seek the consent of the instructor. Given the large number of alternative courses from which to select*

*and the small number of undergraduate majors in the physical geography concentration, the number of majors interested in enrolling in GGIS 401 or GGIS 406 will be small.*

- 3) In addition, please provide an answer as to how your undergraduate degree (120 hours of coursework) will satisfy this requirement: IBHE requires that all degree programs contain at least 40 credit hours in upper division courses. Upper division courses have been described as 300- and 400- level coursework and some 200-level courses in which multiple prerequisites are required.

*Students in the physical geography concentration can select up to 25-27 hours of upper division courses to meet the requirements of the concentration and the remaining credit hours in upper division courses can be selected as electives.*

---

## **INSTRUCTIONAL RESOURCES**

- 1) **Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?** If yes, please describe.

*No*

- 2) **Does the program include any required or recommended subjects that are offered by other departments?** If yes, please list the courses. Explain how these additional courses will be used by the program and provide letters of support from the departments.

*No*

---

## **PROGRAM REGULATION & ASSESSMENT**

- 1) **Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning.** Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable.

*This curriculum change will not cause any change in the existing assessment plan for our undergraduate programs. This plan includes the following numbered objectives and assessment strategies.*

1. SLO 1: Geographic Understanding

Definition: GGIS students will understand the interconnectedness of places and scales in human-environmental systems, including the sustainability of those systems.

- a. Focus group with graduating seniors (yearly)
- b. Survey of recent GGIS graduates (annually or bi-annually)

2. SLO 2: Spatial Patterns and Processes

Definition: GGIS students will be able to analyze spatial patterns, distributions, processes, and connections within and among different human-environmental systems, using qualitative, quantitative,

computational, and/or spatial methods of research appropriate to their level of training and their field of geographic inquiry.

- a. Focus group with graduating seniors (yearly)
- b. Survey of recent GIS graduates (annually or bi-annually)

3. SLO 3: Problem-Solving and Communication

Definition: GIS students will be able to formulate and conduct geographic analyses and communicate the results in verbal, written, and visual form.

- a. Focus group with graduating seniors (yearly)
- b. Survey of recent GIS graduates (annually or bi-annually)
- c. Evaluation of GIS course projects for a random sample of graduating GIS majors (every 5 years)

**2) Is the career/profession for graduates of this program regulated by the State of Illinois?** If yes, please describe.

*No*

---

## PROGRAM FEATURES

**1) Will specialized accreditation be sought for this program?** Yes / No If yes, describe plans for seeking accreditation.

*No*

**2) If a proposal for a concentration-**

**will you admit to the concentration directly?** *No*

**is a concentration required for graduation?** *Yes*

**3) If a proposal for a Minor-**

**Is this minor:**

- A comprehensive study in a single discipline
- An interdisciplinary study focusing on a single theme
- Exception

**Other than certification via the students' degree audits, is there any additional planned mechanism to award/honor successful completion of the minor?**

**4) What is the typical time to completion of this program? (majors and grad programs only)**

*4 years*

**5) What are the minimum Total Credit Hours required for this program? (majors and grad programs only)**

*120 hrs*

**6) For Grad Programs only: What is the required GPA?**

---

## DELIVERY METHOD

What is the program's primary delivery method, choose from following?

- On campus – Students are required to be on campus, they may take some online courses;
- \*Online & On campus – 2 program types. Students can receive the entire program either on campus or online. Students can choose to take courses in either modality;
- \*Online Only – The entire program is delivered online; students are not required to come to campus;
- \*Blended – A single program in which students are required to take part of the curriculum on campus and another part in a different location or online.

\*Describe the use of this delivery method:

*On campus*

---

## ADMISSION REQUIREMENTS (grad programs and undergraduate majors)

1) Desired admissions term: *Fall 2022*

Is this revision a change to the admission status of the program? *No*

2) Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students. (degrees, majors, concentrations ONLY)

*Admission requirements are those for GIS major*

3) Describe how critical academic functions such as admissions and student advising are managed.

*Change in concentration requirements will have no impact on admissions and advising management*

---

## ENROLLMENT (grad programs and undergraduate majors)

1) Describe how this revision will impact enrollment and degrees awarded.

2) Estimated Annual Number of Degrees Awarded

Year 1: 5

Year 5 (or when fully implemented): 20

3) What is the matriculation term for this program? Fall OR Spring/summer/other

## ENROLLMENT (minors only)

Will the department limit enrollment to the minor Y/N? if yes, please explain

Describe how the department will monitor the admission to/enrollment in the minor.

Are there any prerequisites for the minor?

Describe how this revision will impact enrollment and degrees awarded.

---

## BUDGET

- 1) Please describe any budgetary implications for this revision- addressing applicable personnel, facilities, technology and supply costs.

*No budget implications*

- 2) Will the revision require staffing (faculty, advisors, etc.) beyond what is currently available? If yes, please describe.

*No*

- 3) Please provide any additional budget information needed to effectively evaluate the proposal.
- 

## FINANCIAL RESOURCES

- 1) How does the unit intend to financially support this proposal?

*No budget implications*

- 2) Will the unit need to seek campus or other external resources? If yes, please provide a summary of the sources and an indication of the approved support.

*N/A*

- 3) What tuition rate do you expect to charge for this program? e.g, Undergraduate Base Tuition, or Engineering Differential, or Social Work Online (no dollar amounts necessary) (degrees, majors, concentrations ONLY) *If this program requires a tuition or differential change, initiate a discussion with the LAS curricula contact, LAS budget officer, and LAS Associate Dean.*

*N/A*

- 4) Are you seeking a change in the tuition rate or differential for this program Y/N? If yes, please explain.

*N/A*

---

## RESOURCE IMPLICATIONS

- 1) Facilities - Will the program require new or additional facilities or significant improvements to already existing facilities? If yes, please outline the specific need and Year 1 and Year 5 cost.

*No*

- 2) Technology - Will the program need additional technology beyond what is currently available for the unit? If yes, please outline the specific need and Year 1 and Year 5 cost.

*No*

- 3) Non-Technical Resources - Will the program require additional supplies, services or equipment (non-technical)? If yes, please outline the specific need and Year 1 and Year 5 cost.

*No*

---

## RESOURCES

*For each of these items, be sure to include in the response if the change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and*

*instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.*

**1) Faculty Resources:** Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

*No impact on faculty resources or advising resources*

**2) Library Resources:** Describe your proposal's impact on the University Library's resources, collections, and services. If necessary, please consult with the appropriate disciplinary specialist within the University Library.

*Current collections and services are adequate for the proposed program.*

---

## **ACADEMIC CATALOG ENTRY**

1) All academic catalog entries contain 2 tabs: *Overview* and *Degree Requirements*. All proposal revisions will include updates to the *Degree Requirements* tab- which notes the major requirements (courses, hours) for the proposed curricula. Please see the University of Illinois Academic Catalog- <http://catalog.illinois.edu/> for your unit for an example of the entry. Below, provide the updated degree requirements, using the current entry as a model.

### **1.A) DEGREE REQUIREMENTS-**

*for the degree of Bachelor of Science in Liberal Arts & Sciences: Major in Geography & Geographic Information Science, Physical Geography Concentration*

A Major Plan of Study Form must be completed and submitted to the LAS Student Affairs Office by the beginning of the fifth semester (60-75 hours).

**Departmental distinction:** Students majoring in Geography and Geographic Information Science can earn distinction, high distinction, and highest distinction upon graduation. The requirements for these awards are:

- For distinction: 3.3 GPA overall; 3.3 GPA in GIS courses.
- For high distinction: 3.3 GPA overall; 3.75 GPA in GIS courses.
- For highest distinction: 3.3 GPA overall; 3.75 GPA in GIS courses; satisfactorily complete an independent study project (GIS 391).

Students should consult their advisors regarding distinction requirements as soon as they enter the major (no later than the end of their junior year).

**General education:** Students must complete the [Campus General Education](#) requirements including the campus general education language requirement.

**Minimum required major and supporting course work:** a minimum of 40 upper-division hours. Twelve (12) hours of 300- and 400-level courses in the major must be taken on this

campus.

<b>Geography and Geographic Information Science Core Requirements</b>		
<b>Revised Course List</b>		
<b>Code</b>	<b>Title</b>	<b>Hours</b>
Total Core Hours		10-12
Select One of the Following 3 Courses		3-4
GGIS 100	Intro to Meteorology	
GGIS 103	Earth's Physical Systems	
GGIS 222	Big Rivers of the World	
Select one of the following six (6) courses		3-4
GGIS 101	Global Development and Environment	
GGIS 104	Social and Cultural Geography	
GGIS 105	The Digital Earth	
GGIS 106	Geographies of Globalization	
GGIS 210	Social and Environmental Issues	
GGIS 221	Geographies of Global Conflict	
Select one of the following two (2) courses		4
GGIS 371	Spatial Analysis	
GGIS 379	Introduction to GIS	
<b>Revised Course List</b>		
<b>Code</b>	<b>Title</b>	<b>Hours</b>
Total Concentration Required Hours		25-27
200- to 400-level Geography and Geographic Information Science courses (of which at least 6 hours must be at the 300 or 400 level) selected from the following:		
GGIS 220	Landscapes, Ecosystems, and Environmental Change	
GGIS 222	Big Rivers of the World	
GGIS 224	Environmental Data Science	
GGIS 280	Intro to Social Statistics	
GGIS 370/ESE 320	Water Planet, Water Crisis	
GGIS 371	Spatial Analysis	
GGIS 379	Introduction to GIS	
GGIS 380	GIS II Spatial Problem Solving	
GGIS 390	Individual Study	
GGIS 391	Honors Individual Study	
GGIS/NRES 401	Watershed Hydrology	
GGIS 403	Geographic Information Science and Systems	
GGIS 405	Geography Field Course	
GGIS 406	Fluvial Geomorphology	
GGIS 407	Foundations of CyberGIS & Geospatial Data Science	
GGIS 408	Humans and River Systems	
GGIS/ATMS 421	Earth Systems Modeling	
GGIS	Biogeography	



436/IB 439		
GGIS 459	Ecohydraulics	
GGIS 460	Aerial Photo Analysis	
GGIS 468	Biological Modeling	
GGIS 473	Digital Cartography & Map Design	
GGIS 476	Applied GIS to Environ Studies	
GGIS 477	Introduction to Remote Sensing	
GGIS 478	Techniques of Remote Sensing	
Total Hours required for graduation		120

**1.B) If updates are needed for the Overview tab, please include those here-**

*None needed*

**3) Include a comparative table of the current and proposed requirements (courses added marked in blue, courses deleted marked in orange).**

Physical Geography Concentration Requirements					
Revised Course List			Existing Course List		
Code	Title	Hours	Code	Title	Hours
Total Concentration Required Hours		25-27	Total Concentration Required Hours		25-27
200- to 400-level Geography and Geographic Information Science courses (of which at least 6 hours must be at the 300 or 400 level) selected from the following:			200- to 400-level Geography and Geographic Information Science courses (of which at least 6 hours must be at the 300 or 400 level) selected from the following:		
			GGIS 210	Social & Environmental Issues	
GGIS 220	Landscapes, Ecosystems, and Environmental Change				
GGIS 222	Big Rivers of the World		GGIS 222	Big Rivers of the World	
GGIS 224	Environmental Data Science				
GGIS 280	Intro to Social Statistics				
			GGIS/NRES 287	Environment and Society	
GGIS 370/ESE 320	Water Planet, Water Crisis		GGIS 370/ESE 320	Water Planet, Water Crisis	
GGIS 371	Spatial Analysis		GGIS 371	Spatial Analysis	
GGIS 379	Introduction to GIS				
GGIS 380	GIS II Spatial Problem Solving				
GGIS 390	Individual Study		GGIS 390	Individual Study	
GGIS 391	Honors Individual Study		GGIS 391	Honors Individual Study	
GGIS/NRES 401	Watershed Hydrology		GGIS/NRES 401	Watershed Hydrology	
GGIS 403	Geographic Information Science and Systems				
GGIS 405	Geography Field Course		GGIS 405	Geography Field Course	
GGIS 406	Fluvial Geomorphology		GGIS 406	Fluvial Geomorphology	
GGIS 407	Foundations of CyberGIS & Geospatial Data Science				
GGIS 408	Humans and River Systems		GGIS 408	Humans and River Systems	
			GGIS 412	Geospatial Tech & Society	
GGIS/ATMS 421	Earth Systems Modeling		GGIS/ATMS 421	Earth Systems Modeling	

GGIS 436/IB 439	Biogeography		GGIS 436/IB 439	Biogeography	
GGIS 459	Ecohydraulics				
GGIS 460	Aerial Photo Analysis		GGIS 460	Aerial Photo Analysis	
GGIS 468	Biological Modeling		GGIS 468	Biological Modeling	
			GGIS 471	Recent Trends in Geog Thought	
GGIS 473	Digital Cartography & Map Design		GGIS 473	Digital Cartography & Map Design	
GGIS 476	Applied GIS to Environ Studies		GGIS 476	Applied GIS to Environ Studies	
GGIS 477	Introduction to Remote Sensing		GGIS 477	Introduction to Remote Sensing	
GGIS 478	Techniques of Remote Sensing		GGIS 478	Techniques of Remote Sensing	
			MATH 220	Calculus	4-5
			or MATH 221	Calculus I	
			PHYS 101 or or PHYS 211	College Physics: Mech and Heat University Physics: Mechanics	4-5
			Select one of the following:		4
			CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	
			CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	
Total Hours required for graduation		120	Total Hours required for graduation		120

# Program Change Request

Date Submitted: 04/08/22 2:03 pm

Viewing: **10KL5163BSAG : Agricultural & Biological Engineering, BSAG**

Last approved: 02/26/20 6:01 pm

Last edit: 04/22/22 4:51 pm

Changes proposed by: Brianna Gregg

Catalog Pages  
Using this  
Program

[Agricultural & Biological Engineering, BS and Agricultural & Biological Engineering, BSAG](#)

Proposal Type:

## In Workflow

1. U Program Review
2. 1741 Committee Chair
3. 1741 Head
4. KL Committee Chair
5. KL Dean
6. University Librarian
7. Provost
8. Senate EPC
9. Senate
10. U Senate Conf
11. Board of Trustees
12. IBHE
13. HLC
14. DMI

## Approval Path

1. 04/08/22 2:13 pm  
Emily Stuby  
(eastuby):  
Approved for U  
Program Review
2. 04/08/22 4:15 pm  
Kent Rausch  
(krausch):  
Approved for 1741  
Committee Chair
3. 04/08/22 5:10 pm  
Ronaldo  
Maghirang  
(ronaldom):  
Approved for 1741  
Head
4. 04/22/22 3:01 pm  
Brianna Gregg  
(bjgray2):  
Approved for KL  
Committee Chair
5. 04/22/22 4:02 pm

Anna Ball (aball):  
Approved for KL  
Dean

6. 04/22/22 4:23 pm  
John Wilkin  
(jpwilkin):  
Approved for  
University  
Librarian

7. 04/22/22 4:53 pm  
Kathy Martensen  
(kmartens):  
Approved for  
Provost

## History

1. Jul 15, 2019 by  
Deb Forgacs  
(dforgacs)
2. Jul 24, 2019 by  
Brooke Newell  
(bsnewell)
3. Jul 25, 2019 by  
Deb Forgacs  
(dforgacs)
4. Feb 26, 2020 by  
Brooke Newell  
(bsnewell)

Major (ex. Special Education)

This proposal is  
for a:  
Revision

## Administration Details

Official Program Name      Agricultural & Biological Engineering, BSAG

Sponsor College      Agr, Consumer, & Env Sciences

Sponsor Department      Agricultural & Biological Engr

Sponsor Name      [Ronaldo Maghirang, Kent Rausch](#)

Sponsor Email      [ronaldom@illinois.edu](mailto:ronaldom@illinois.edu), [krausch@illinois.edu](mailto:krausch@illinois.edu)

College Contact      [Anna Ball](#)

College Contact

Email [aball@illinois.edu](mailto:aball@illinois.edu)

College Budget Officer [Tessa Hile](#)

College Budget Officer Email [tmhile@illinois.edu](mailto:tmhile@illinois.edu)

List the role for rollbacks (which role will edit the proposal on questions from EPC, e.g., Dept Head or Initiator) and/or any additional stakeholders. *Purpose: List here who will do the editing work if proposal needs rolled back. And any other stakeholders.*

[Ronaldo Maghirang, ronaldom@illinois.edu \(ABE head\); Kent Rausch, krausch@illinois.edu \(ABE CnC editing\)](#)

Does this program have inter-departmental administration?

No

## Proposal Title

Effective Catalog Term Fall 2022

Provide a brief, concise description (not justification) of your proposal.

Administrative approval to revise the BSAG in Agricultural & Biological Engineering

The BSAG program is a dual degree program that builds from the ABE:BS, requiring an additional 30 hours. For the BSAG program, the revision removes footnotes. Total requirements of 158 hours are unchanged. Minor clarifications to Program of Study Tables were made. The revisions coincide with revisions of the ABE:BS and ABE:Ag Eng and ABE:Bio Eng concentrations which were more extensive.

List here any related proposals/revisions and their keys. *Example: This BS proposal (key 567) is related to the Concentration A proposal (key 145) and the Concentration B proposal (key 203).*

This BSAG program (10KL5163BSAG) is related to: ABE-BS (10KP5163BS), Agricultural Engineering Concentration (5270) and ABE-Biological Engineering (5271) Concentration

## Program Justification

Why are these changes necessary?

Many courses were no longer offered and needed removal from elective lists (e.g., PLPA and FSHN). Headings and course listings were updated. Footnotes were incorporated into the POS tables to improve accessibility.

## Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

Yes

Required courses

Explain how the inclusion or removal of the courses/subjects listed above impacts the offering departments.

The list of electives was updated to include FSHN 481, 482, 483, 484. FSHN 461 is no longer being offered, and these new courses will work well.

Attach letters of support or acknowledgement from other departments.

## Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

The department of Agricultural and Biological Engineering has undergraduate curriculum program education objectives (PEOs) that prepare our graduates to succeed in their career activities relating to the ABE discipline. These PEOs are:

Objective 1: Enter the agricultural and biological engineering profession as practicing engineers and consultants with prominent companies and organizations in diverse areas that include agricultural and off-road equipment manufacturing and automation, food and fiber processing, renewable energy production, environmental conservation and water quality engineering, indoor environmental control, systems informatics and analysis, or other related fields.

Objective 2: Pursue graduate education and research at major research universities in agricultural and biological engineering and related fields.

Objective 3: Advance in their chosen fields to supervisory and management positions.

Objective 4: Engage in continued learning through professional development.

Objective 5: Participate in and contribute to professional societies and community services.

These PEOs were developed and are regularly reviewed by our constituent groups to evaluate, revise and refocus issues relating to the ABE BS program. These constituent groups are:

Students – The purpose of the PEOs is to prepare undergraduate students for employment in agricultural and biological engineering and related fields. Students are served by all five PEOs.

Alumni - ABE alumni are considered a valuable asset to the development and evaluation of the ABE Program Educational Objectives. They are served directly by PEOs 2, 3, 4 and 5 as they continue their professional careers.

Employers – The overall expected student outcome of ABE PEOs is to prepare qualified professional engineers for agricultural and biological engineering fields. Employers are served directly by objectives 1, 3, 4 and 5.

This process allows for continued assessment and improvement to our curricula and to maintain quality and vitality of ABE programs. The ABE Courses and Curriculum Committee and the ABE Faculty Advisory Committee work with department administration to maintain and revise PEOs. The ABE Outcomes and Assessment Committee manages the processes of the development, collection and summarization of PEO review data collection.

## Student Outcomes:

The seven student outcomes for the agricultural and biological engineering program are:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Process for Review of the Program Educational Objectives:

The process of periodical reviews is an ongoing continuous improvement process. The ABE Course and Curriculum Committee and the ABE Faculty Advisory Committee work with the department administration to maintain and revise the program educational objectives. The ABE Outcomes and Assessment Committee manages the processes of the development, collection and summarization of the program education objectives review data collection.

Student senior exit interviews are conducted by the Head. A written senior exit survey questionnaire is provided to each graduating senior at the end of the last semester of enrollment. All graduating seniors are asked to participate in a focus group to discuss the nature of their undergraduate experience. Participation in the senior exit interviews and the completion of the written senior exit questionnaire are voluntary. The information provided by the senior exit interview and questionnaires are compiled by the ABE Undergraduate Program Coordinator. The summary information is provided to the ABE Administration, the ABE Faculty Advisory Committee and the ABE Course and Curriculum Committee. The information is used to review the program educational objectives.

Alumni surveys also are used. ABE alumni are surveyed after graduation at 2, 5 and 10



year intervals post-graduation. A survey form is sent to each available alumnus via electronic media. Completed forms are compiled in a summary format. The information is available to the ABE faculty, administration and Courses and Curriculum Committee for reviewing the objectives.

Feedback from employers is provided by the ABE External Advisory Committee and companies representatives that work with the senior design team projects. The ABE External Advisory Committee meets on an annual basis with ABE administration, students, faculty and staff. The Committee provides feedback relative to PEOs as part of a committee report. This report is provided to faculty, administration and staff as a written report and a discussion presentation. Companies sponsor the ABE senior industry linked design projects, and representatives from these companies provide feedback to students and faculty about students' preparedness upon completion of the projects. This information is considered very useful in assessing and reviewing the program educational objectives.

Alumni surveys also are used to assess involvement of ABE graduates in the ABE profession. Participation in professional meetings and conferences is not formally assessed, but efforts are made on behalf of the ABE department to connect with graduates in professional activities through departmental sponsored receptions at annual ASBAE International Meetings, local ASABE section meetings, the Grainger College of Engineering annual open house, College of ACES annual ExplorACES open house, an annual ABE@Illinois on-campus event for all alumni and annual homecoming activities in conjunction with university events. These activities are not formally assessed, but they are discussed by the ABE department relative to our program quality and program educational objectives.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

## Program of Study

*"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: <https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf>). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.*

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs [ABE BSAG sidebyside 20220408.xlsx](#)

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text - Overview Tab

Text for Overview tab on the Catalog Page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

## Statement for Programs of Study Catalog

### Agricultural & Biological Engineering, BSAG Requirements in addition to completion of Agricultural & Biological Engineering, B.S.

#### Course List

Code	Title	Hours
<u>Required coursework:</u>		
Communication		3
<u>CMN 101</u>	Public Speaking	
<del>Biological Sciences Coursework; choose 4 hours from: 1</del>		
<u>Additional Biological Sciences Coursework. Choose an additional 4 hours from the list below (sum total will be 10 hours with the 6 hours of Biological Sciences coursework from the ABE BS requirements):</u>		
<u>ANSC 100</u>	Intro to Animal Sciences	
<u>ANSC 221</u>	Cells, Metabolism and Genetics	
<u>ANSC 350</u>	Cellular Metabolism in Animals	
<u>ANSC 363</u>	Behavior of Domestic Animals	
<u>ANSC 400</u>	Dairy Herd Management	
<u>ANSC 401</u>	Beef Production	
<u>ANSC 402</u>	Sheep and Goat Production	
<u>ANSC 403</u>	Pork Production	
<u>ANSC 404</u>	Poultry Science	
<u>ANSC 406</u>	Zoo Animal Conservation Sci	
<u>ANSC 450</u>	Comparative Immunobiology	
<u>ATMS 201</u>	General Physical Meteorology	
<u>ATMS 307</u>	Climate Processes	
<u>CHEM 232</u>	Elementary Organic Chemistry I ( <u>CHEM 232</u> and <u>MCB 150</u> are required for the BIO concentration)	
<u>CHEM 233</u>	<u>Elementary Organic Chem Lab I</u>	
<u>CHEM 312</u>	Inorganic Chemistry	
<u>CHEM 332</u>	Elementary Organic Chem II	
<u>CHEM 360</u>	Chemistry of the Environment	
<u>CHEM 460</u>	Green Chemistry	
<u>CPSC 112</u>	Introduction to Crop Sciences	
<u>CPSC 261</u>	Biotechnology in Agriculture	
<u>CPSC 265</u>	Genetic Engineering Lab	
<u>CPSC 270</u>	Applied Entomology	
<u>CPSC 352</u>	Plant Genetics	
<u>CPSC 414</u>	Forage Crops & Pasture Ecology	
<u>CPSC 415</u>	Bioenergy Crops	
<u>CPSC 418</u>	Crop Growth and Management	
<u>CPSC 431</u>	Plants and Global Change	

Code	Title	Hours
<a href="#">CPSC 437</a>	Principles of Agroecology	
<a href="#">CPSC 473</a>	Mgmt of Field Crop Insects	
<a href="#">FSHN 101</a>	The Science of Food and How it Relates to You	
<a href="#">FSHN 414</a>	Food Chemistry	
<a href="#">FSHN 416</a>	Food Chemistry Laboratory	
<a href="#">FSHN 461</a>	<del>Course FSHN 461 Not Found</del>	
<a href="#">FSHN 471</a>	Food & Industrial Microbiology	
<a href="#">FSHN 481</a>	<a href="#">Food Processing Unit Operations I</a>	
<a href="#">FSHN 482</a>	<a href="#">Food Processing Unit Operations I Lab</a>	
<a href="#">FSHN 483</a>	<a href="#">Food Processing Unit Operations II</a>	
<a href="#">FSHN 484</a>	<a href="#">Food Processing Unit Operations II Lab</a>	
<a href="#">GEOL 107</a>	Physical Geology	
<a href="#">GEOL 380</a>	Environmental Geology	
<a href="#">HORT 100</a>	Introduction to Horticulture	
<a href="#">HORT 341</a>	Greenhouse Mgmt and Production	
<a href="#">HORT 344</a>	Planting for Biodiversity and Aesthetics	
<a href="#">HORT 360</a>	Vegetable Crop Production	
<a href="#">HORT 361</a>	Small Fruit Production	
<a href="#">HORT 362</a>	Tree Fruit Production	
<a href="#">HORT 363</a>	Postharvest Handling Hort Crop	
<a href="#">HORT 421</a>	Horticultural Physiology	
<a href="#">HORT 435</a>	Urban Food Production	
<a href="#">IB 103</a>	Introduction to Plant Biology	
<a href="#">IB 150</a> & <a href="#">IB 151</a>	Organismal & Evolutionary Biol and Organismal & Evol Biol Lab	
<a href="#">IB 203</a>	Ecology	
<a href="#">IB 329</a>	Animal Behavior	
<a href="#">IB 335</a>	Plant Systematics	
<a href="#">IB 411</a>	Bioinspiration	
<a href="#">IB 420</a>	Plant Physiology	
<a href="#">IB 439</a>	Biogeography	
<a href="#">IB 444</a>	Insect Ecology	
<a href="#">IB 452</a>	Ecosystem Ecology	
<a href="#">IB 482</a>	Insect Pest Management	
<a href="#">IB 485</a>	Environ Toxicology & Health	
<a href="#">IB 486</a>	Pesticide Toxicology	
<a href="#">MCB 100</a> & <a href="#">MCB 101</a>	Introductory Microbiology and Intro Microbiology Laboratory	
<a href="#">MCB 150</a> & <a href="#">MCB 151</a>	Molec & Cellular Basis of Life and Molec & Cellular Laboratory ( <a href="#">CHEM 232</a> and <a href="#">MCB 150</a> are required for the BIO concentration)	
<a href="#">MCB 244</a> & <a href="#">MCB 245</a>	Human Anatomy & Physiology I and Human Anat & Physiol Lab I	
<a href="#">MCB 250</a> & <a href="#">MCB 251</a>	Molecular Genetics and Exp Techniqs in Molecular Biol	
<a href="#">MCB 252</a> & <a href="#">MCB 253</a>	Cells, Tissues & Development and Exp Techniqs in Cellular Biol	

Code	Title	Hours
<a href="#">MCB 300</a>	Microbiology	
& <a href="#">MCB 301</a>	and Experimental Microbiology	
<a href="#">MCB 314</a>	Introduction to Neurobiology	
<a href="#">MCB 316</a>	Genetics and Disease	
<a href="#">MCB 450</a>	Introductory Biochemistry	
<a href="#">NRES 201</a>	Introductory Soils	
<a href="#">NRES 219</a>	Applied Ecology	
<a href="#">NRES 348</a>	Fish and Wildlife Ecology	
<a href="#">NRES 351</a>	Introduction to Environmental Chemistry	
<a href="#">NRES 419</a>	Env and Plant Ecosystems	
<a href="#">NRES 420</a>	Restoration Ecology	
<a href="#">NRES 429</a>	Aquatic Ecosystem Conservation	
<a href="#">NRES 439</a>	Env and Sustainable Dev	
<a href="#">NRES 471</a>	Pedology	
<a href="#">NRES 475</a>	Environmental Microbiology	
<a href="#">NRES 487</a>	Soil Chemistry	
<a href="#">NRES 488</a>	Soil Fertility and Fertilizers	
<a href="#">PLPA 204</a>	<del>Course PLPA 204 Not Found</del>	
<a href="#">PLPA 405</a>	Plant Disease Diagnosis & Mgmt	
<a href="#">PLPA 407</a>	<del>Course PLPA 407 Not Found</del>	

Agricultural Sciences Coursework (15 hours of agricultural sciences with courses from at least two subject areas other than ABE and ETMAS, and approval of advisers are required) 3 15

#### Free Electives-4

Free Electives (sufficient free electives selected to total minimum curriculum requirement of 158 hours. All requirements of the combined curriculum must be completed to satisfy the requirements for both degrees)

Total hours required to receive an Agricultural and Biological Engineering, BS and an Agricultural Science, BSAG 158

#### 1

~~In addition to the Biological and Natural Sciences Elective hours required for Agricultural and Biological Engineering (6 hours), a further 4 hours of biological sciences must be completed to make up a total of 10 hours.~~

~~2CHEM 232 and MCB 150 are required for the BIO concentration.3~~

~~Fifteen hours of agricultural sciences with courses from at least two subject areas other than Agricultural and Biological Engineering and Technical Systems Management, and approval of advisers are required.~~

#### 4

~~Sufficient free electives selected to total minimum curriculum requirement of 158 hours. All requirements of the combined curriculum must be completed to satisfy the requirements for both degrees.~~

Corresponding Degree [BSAG Bachelor of Science in Agriculture](#)

## Program Features

Academic Level Undergraduate

Does this major [No](#)

have transcribed concentrations?

What is the typical time to completion of this program?

5 years

What are the minimum Total Credit Hours required for this program?

158

CIP Code                    140301 - Agricultural Engineering.

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

## Delivery Method

This program is available:

On Campus - Students are required to be on campus, they may take some online courses.

## Admission Requirements

Desired Effective        Fall 2022

Admissions Term

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.

Describe how critical academic functions such as admissions and student advising are managed.

## Enrollment

Describe how this revision will impact enrollment and degrees awarded.

This revision will have no impact on enrollment.

Estimated Annual Number of Degrees Awarded

Year One Estimate

5th Year Estimate (or when fully implemented)

What is the matriculation term for this program?

## Budget

Are there budgetary implications for this revision? No

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?

No

Additional Budget Information

Attach File(s)

## Financial Resources

How does the unit intend to financially support this proposal?

[There is no impact on financial resources.](#)

Will the unit need to seek campus or other external resources?

No

Attach letters of support

What tuition rate do you expect to charge for this program? e.g, Undergraduate Base Tuition, or Engineering Differential, or Social Work Online (no dollar amounts necessary)

Are you seeking a change in the tuition rate or differential for this program?

No

## Resource Implications

### Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?

No

### Technology

Will the program need additional technology beyond what is currently available for the unit?

No

### Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

## Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/acknowledgement from faculty, students, and/or other impacted units as appropriate.

Attach File(s)

## Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

These changes will not impact our faculty resources.

## Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

There is no impact on Library resources

## EP Documentation

EP Control Number            EP.22.148

Attach  
Rollback/Approval  
Notices

This proposal            No  
requires HLC  
inquiry

## DMI Documentation

Attach Final  
Approval Notices

Banner/Codebook Name    BS AG:Agr Engr & Agr Sc -UIUC

Program Code:            10KL5163BSAG

Minor Code	5163	Conc Code	Degree Code	BSAG	Major Code
------------	------	-----------	-------------	------	------------

Senate Approval

Date

Senate

Conference

Approval Date

BOT Approval

Date

IBHE Approval

Date

HLC Approval

Date

Effective Date:

Attached

Document

Justification for

this request

Program Reviewer

**Kathy Martensen (kmartens) (04/22/22 4:49 pm):** Administrative approval:

Comments

Doesn't change total hours, doesn't restrict student choice.



**Agricultural & Biological Engineering, BSAG Requirements in addition to completion of Agricultural & Biological Engineering, B.S.**

Course List

Course List

Code	Title	Hours
<b>Communication</b>		<b>3</b>
<a href="#">CMN 101</a>	Public Speaking	
<b>Biological Sciences Coursework; choose 4 hours from:</b> <sup>1</sup>		<b>4</b>
<a href="#">ANSC 100</a>	Intro to Animal Sciences	
<a href="#">ANSC 221</a>	Cells, Metabolism and Genetics	
<a href="#">ANSC 350</a>	Cellular Metabolism in Animals	
<a href="#">ANSC 363</a>	Behavior of Domestic Animals	
<a href="#">ANSC 400</a>	Dairy Herd Management	
<a href="#">ANSC 401</a>	Beef Production	
<a href="#">ANSC 402</a>	Sheep and Goat Production	
<a href="#">ANSC 403</a>	Pork Production	
<a href="#">ANSC 404</a>	Poultry Science	
<a href="#">ANSC 406</a>	Zoo Animal Conservation Sci	
<a href="#">ANSC 450</a>	Comparative Immunobiology	
<a href="#">ATMS 201</a>	General Physical Meteorology	
<a href="#">ATMS 307</a>	Climate Processes	
<a href="#">CHEM 232</a>	Elementary Organic Chemistry I	
<a href="#">&amp; CHEM 233</a>	and Elementary Organic Chem Lab I <sup>2</sup>	
<a href="#">CHEM 312</a>	Inorganic Chemistry	
<a href="#">CHEM 332</a>	Elementary Organic Chem II	
<a href="#">CHEM 360</a>	Chemistry of the Environment	
<a href="#">CHEM 460</a>	Green Chemistry	
<a href="#">CPSC 112</a>	Introduction to Crop Sciences	
<a href="#">CPSC 261</a>	Biotechnology in Agriculture	
<a href="#">CPSC 265</a>	Genetic Engineering Lab	
<a href="#">CPSC 270</a>	Applied Entomology	
<a href="#">CPSC 352</a>	Plant Genetics	
<a href="#">CPSC 414</a>	Forage Crops & Pasture Ecology	
<a href="#">CPSC 415</a>	Bioenergy Crops	
<a href="#">CPSC 418</a>	Crop Growth and Management	
<a href="#">CPSC 431</a>	Plants and Global Change	
<a href="#">CPSC 437</a>	Principles of Agroecology	
<a href="#">CPSC 473</a>	Mgmt of Field Crop Insects	
<a href="#">FSHN 101</a>	The Science of Food and How it Relates to You	
<a href="#">FSHN 414</a>	Food Chemistry	
<a href="#">FSHN 416</a>	Food Chemistry Laboratory	
<a href="#">FSHN 463</a>	course not found	
<a href="#">FSHN 471</a>	Food & Industrial Microbiology	
<a href="#">GEOL 107</a>	Physical Geology	
<a href="#">GEOL 380</a>	Environmental Geology	
<a href="#">HORT 100</a>	Introduction to Horticulture	
<a href="#">HORT 341</a>	Greenhouse Mgmt and Production	

**Agricultural & Biological Engineering, BSAG Requirements in addition to completion of Agricultural & Biological Engineering, B.S.**

Course List

Course List

Code	Title	Hours
<b>Required coursework:</b>		<b>3</b>
<b>Communication</b>		<b>3</b>
<a href="#">CMN 101</a>	Public Speaking	
<b>Biological Sciences Coursework; choose 4 hours from (In addition to the Biological and Natural Sciences Elective hours required for Agricultural and Biological Engineering (6 hours), an additional 4 hours of biological sciences must be completed for a total of 10 hours.):</b>		<b>4</b>
<a href="#">ANSC 100</a>	Intro to Animal Sciences	
<a href="#">ANSC 221</a>	Cells, Metabolism and Genetics	
<a href="#">ANSC 350</a>	Cellular Metabolism in Animals	
<a href="#">ANSC 363</a>	Behavior of Domestic Animals	
<a href="#">ANSC 400</a>	Dairy Herd Management	
<a href="#">ANSC 401</a>	Beef Production	
<a href="#">ANSC 402</a>	Sheep and Goat Production	
<a href="#">ANSC 403</a>	Pork Production	
<a href="#">ANSC 404</a>	Poultry Science	
<a href="#">ANSC 406</a>	Zoo Animal Conservation Sci	
<a href="#">ANSC 450</a>	Comparative Immunobiology	
<a href="#">ATMS 201</a>	General Physical Meteorology	
<a href="#">ATMS 307</a>	Climate Processes	
<a href="#">CHEM 232</a>	Elementary Organic Chemistry I	
<a href="#">&amp; CHEM 233</a>	and Elementary Organic Chem Lab I (CHEM 232 and MCB 150 are required for the BIO concentration)	
<a href="#">CHEM 312</a>	Inorganic Chemistry	
<a href="#">CHEM 332</a>	Elementary Organic Chem II	
<a href="#">CHEM 360</a>	Chemistry of the Environment	
<a href="#">CHEM 460</a>	Green Chemistry	
<a href="#">CPSC 112</a>	Introduction to Crop Sciences	
<a href="#">CPSC 261</a>	Biotechnology in Agriculture	
<a href="#">CPSC 265</a>	Genetic Engineering Lab	
<a href="#">CPSC 270</a>	Applied Entomology	
<a href="#">CPSC 352</a>	Plant Genetics	
<a href="#">CPSC 414</a>	Forage Crops & Pasture Ecology	
<a href="#">CPSC 415</a>	Bioenergy Crops	
<a href="#">CPSC 418</a>	Crop Growth and Management	
<a href="#">CPSC 431</a>	Plants and Global Change	
<a href="#">CPSC 437</a>	Principles of Agroecology	
<a href="#">CPSC 473</a>	Mgmt of Field Crop Insects	
<a href="#">FSHN 101</a>	The Science of Food and How it Relates to You	
<a href="#">FSHN 414</a>	Food Chemistry	
<a href="#">FSHN 416</a>	Food Chemistry Laboratory	
<a href="#">FSHN 471</a>	Food & Industrial Microbiology	
<a href="#">FSHN 481</a>	Food Processing Unit Operations I	
<a href="#">FSHN 482</a>	Food Processing Unit Operations I Lab	
<a href="#">FSHN 483</a>	Food Processing Unit Operations II	
<a href="#">FSHN 484</a>	Food Processing Unit Operations II Lab	
<a href="#">GEOL 107</a>	Physical Geology	
<a href="#">GEOL 380</a>	Environmental Geology	
<a href="#">HORT 100</a>	Introduction to Horticulture	
<a href="#">HORT 341</a>	Greenhouse Mgmt and Production	

<a href="#">HORT 344</a>	Planting for Biodiversity and Aesthetics	
<a href="#">HORT 360</a>	Vegetable Crop Production	
<a href="#">HORT 361</a>	Small Fruit Production	
<a href="#">HORT 362</a>	Tree Fruit Production	
<a href="#">HORT 363</a>	Postharvest Handling Hort Crop	
<a href="#">HORT 421</a>	Horticultural Physiology	
<a href="#">HORT 435</a>	Urban Food Production	
<a href="#">IB 103</a>	Introduction to Plant Biology	
<a href="#">IB 150</a>	Organismal & Evolutionary Biol	
<a href="#">&amp; IB 151</a>	and Organismal & Evol Biol Lab	
<a href="#">IB 203</a>	Ecology	
<a href="#">IB 329</a>	Animal Behavior	
<a href="#">IB 335</a>	Plant Systematics	
<a href="#">IB 411</a>	Bioinspiration	
<a href="#">IB 420</a>	Plant Physiology	
<a href="#">IB 439</a>	Biogeography	
<a href="#">IB 444</a>	Insect Ecology	
<a href="#">IB 452</a>	Ecosystem Ecology	
<a href="#">IB 482</a>	Insect Pest Management	
<a href="#">IB 485</a>	Environ Toxicology & Health	
<a href="#">IB 486</a>	Pesticide Toxicology	
<a href="#">MCB 100</a>	Introductory Microbiology	
<a href="#">&amp; MCB 101</a>	and Intro Microbiology Laboratory	
<a href="#">MCB 150</a>	Molec & Cellular Basis of Life	
<a href="#">&amp; MCB 151</a>	and Molec & Cellular Laboratory <sup>2</sup>	
<a href="#">MCB 244</a>	Human Anatomy & Physiology I	
<a href="#">&amp; MCB 245</a>	and Human Anat & Physiol Lab I	
<a href="#">MCB 250</a>	Molecular Genetics	
<a href="#">&amp; MCB 251</a>	and Exp Techniqs in Molecular Biol	
<a href="#">MCB 252</a>	Cells, Tissues & Development	
<a href="#">&amp; MCB 253</a>	and Exp Techniqs in Cellular Biol	
<a href="#">MCB 300</a>	Microbiology	
<a href="#">&amp; MCB 301</a>	and Experimental Microbiology	
<a href="#">MCB 314</a>	Introduction to Neurobiology	
<a href="#">MCB 316</a>	Genetics and Disease	
<a href="#">MCB 450</a>	Introductory Biochemistry	
<a href="#">NRES 201</a>	Introductory Soils	
<a href="#">NRES 219</a>	Applied Ecology	
<a href="#">NRES 348</a>	Fish and Wildlife Ecology	
<a href="#">NRES 351</a>	Introduction to Environmental Chemistry	
<a href="#">NRES 419</a>	Env and Plant Ecosystems	
<a href="#">NRES 420</a>	Restoration Ecology	
<a href="#">NRES 429</a>	Aquatic Ecosystem Conservation	
<a href="#">NRES 439</a>	Env and Sustainable Dev	
<a href="#">NRES 471</a>	Pedology	
<a href="#">NRES 475</a>	Environmental Microbiology	
<a href="#">NRES 487</a>	Soil Chemistry	
<a href="#">NRES 488</a>	Soil Fertility and Fertilizers	
<a href="#">PLPA 204</a>	course not found	
<a href="#">PLPA 405</a>	Plant Disease Diagnosis & Mgmt	
<a href="#">PLPA 401</a>	course not found	
<b>Agricultural Sciences Coursework<sup>3</sup></b>		<b>15</b>
<b>Free Electives<sup>4</sup></b>		
<b>Total hours required to receive an Agricultural and Biological Engineering, BS and an Agricultural and Biological Engineering, BSAG</b>		<b>158</b>

<a href="#">HORT 344</a>	Planting for Biodiversity and Aesthetics	
<a href="#">HORT 360</a>	Vegetable Crop Production	
<a href="#">HORT 361</a>	Small Fruit Production	
<a href="#">HORT 362</a>	Tree Fruit Production	
<a href="#">HORT 363</a>	Postharvest Handling Hort Crop	
<a href="#">HORT 421</a>	Horticultural Physiology	
<a href="#">HORT 435</a>	Urban Food Production	
<a href="#">IB 103</a>	Introduction to Plant Biology	
<a href="#">IB 150</a>	Organismal & Evolutionary Biol	
<a href="#">&amp; IB 151</a>	and Organismal & Evol Biol Lab	
<a href="#">IB 203</a>	Ecology	
<a href="#">IB 329</a>	Animal Behavior	
<a href="#">IB 335</a>	Plant Systematics	
<a href="#">IB 411</a>	Bioinspiration	
<a href="#">IB 420</a>	Plant Physiology	
<a href="#">IB 439</a>	Biogeography	
<a href="#">IB 444</a>	Insect Ecology	
<a href="#">IB 452</a>	Ecosystem Ecology	
<a href="#">IB 482</a>	Insect Pest Management	
<a href="#">IB 485</a>	Environ Toxicology & Health	
<a href="#">IB 486</a>	Pesticide Toxicology	
<a href="#">MCB 100</a>	Introductory Microbiology	
<a href="#">&amp; MCB 101</a>	and Intro Microbiology Laboratory	
<a href="#">MCB 150</a>	Molec & Cellular Basis of Life	
<a href="#">&amp; MCB 151</a>	and Molec & Cellular Laboratory (CHEM 232 and MCB 150 are required for the BIO concentration)	
<a href="#">MCB 244</a>	Human Anatomy & Physiology I	
<a href="#">&amp; MCB 245</a>	and Human Anat & Physiol Lab I	
<a href="#">MCB 250</a>	Molecular Genetics	
<a href="#">&amp; MCB 251</a>	and Exp Techniqs in Molecular Biol	
<a href="#">MCB 252</a>	Cells, Tissues & Development	
<a href="#">&amp; MCB 253</a>	and Exp Techniqs in Cellular Biol	
<a href="#">MCB 300</a>	Microbiology	
<a href="#">&amp; MCB 301</a>	and Experimental Microbiology	
<a href="#">MCB 314</a>	Introduction to Neurobiology	
<a href="#">MCB 316</a>	Genetics and Disease	
<a href="#">MCB 450</a>	Introductory Biochemistry	
<a href="#">NRES 201</a>	Introductory Soils	
<a href="#">NRES 219</a>	Applied Ecology	
<a href="#">NRES 348</a>	Fish and Wildlife Ecology	
<a href="#">NRES 351</a>	Introduction to Environmental Chemistry	
<a href="#">NRES 419</a>	Env and Plant Ecosystems	
<a href="#">NRES 420</a>	Restoration Ecology	
<a href="#">NRES 429</a>	Aquatic Ecosystem Conservation	
<a href="#">NRES 439</a>	Env and Sustainable Dev	
<a href="#">NRES 471</a>	Pedology	
<a href="#">NRES 475</a>	Environmental Microbiology	
<a href="#">NRES 487</a>	Soil Chemistry	
<a href="#">NRES 488</a>	Soil Fertility and Fertilizers	
<a href="#">PLPA 405</a>	Plant Disease Diagnosis & Mgmt	
<b>Agricultural Sciences Coursework 15 hours of agricultural sciences with courses from at least two subject areas other than ABE and ETMAS, and approval of advisers are required)</b>		<b>15</b>
<b>Free Electives (sufficient free electives selected to total minimum curriculum requirement of 158 hours. All requirements of the combined curriculum must be completed to satisfy the requirements for both degrees)</b>		
<b>Total hours required to receive an Agricultural and Biological Engineering, BS and an Agricultural Science, BSAG</b>		<b>158</b>

#### Footnotes

- <sup>1</sup> In addition to the Biological and Natural Sciences Elective hours required for Agricultural and Biological Engineering (6 hours), a further 4 hours of biological sciences must be
- <sup>2</sup> *CHEM 232 and MCB 150 are required for the BIO concentration.*
- <sup>3</sup> Fifteen hours of agricultural sciences with courses from at least two subject areas other than Agricultural and Biological Engineering and Technical Systems Management, and approval of advisers are required.
- <sup>4</sup> Sufficient free electives selected to total minimum curriculum requirement of 158 hours. All requirements of the combined curriculum must be completed to satisfy the requirements for both degrees.

