ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Revision of the Bachelor of Science in Crop Sciences in the Department of Crop Sciences in the College of Agricultural, Consumer and Environmental Sciences.

SPONSOR: Frederic L. Kolb, Cavanah Professor of Plant Breeding and Genetics, Crop Sciences Teaching Coordinator, 333-9485, f-kolb@illinois.edu

COLLEGE CONTACT: Soo-Yeun Lee, Assistant Dean, Academic Programs, 333-3380, soolee@illinois.edu

BRIEF DESCRIPTION: The Department of Crop Sciences proposes the following changes to the curriculum.

- Establishing a new concentration in Horticultural Food Systems to replace the major in Horticulture (eliminated in related proposal)
- Updating the current concentrations
    - Agroecology
        - Addition of 2 newer CPSC courses to list of course choices
        - Addition of 1 PLPA course to list of course choices
        - Changing ACES prescribed and elective hours from 40 to 35 hours to standardize hours across all concentrations in Crop Sciences
    - Biological Sciences
        - Addition of 1 HORT physiology course as an option to be taken instead of a CPSC physiology course
        - Addition of 1 PLPA course to list of course choices
    - Crop Agribusiness
        - Addition of 2 newer CPSC courses to list of course choices
        - Addition of 6 HORT courses to the list of course choices to allow for students interested in horticulture crops to specialize in that area
        - Removal of 1 NRES course that has not been offered since 2004
        - Removal of 1 BADM course-please see attached letter
    - Crops
        - Addition of 2 newer CPSC courses to list of course choices
        - Addition of 1 HORT physiology course as an option to be taken instead of a CPSC physiology course
        - Addition of 1 PLPA course to list of course choices
        - Removal of 3 NRES courses
            - NRES 473 last taught 2004
            - NRES 487 last taught 2009

        - NRES 489 last taught 2005
    - Plant Biotechnology and Molecular Biology
        - Removal of 2 MCB courses from a choice of three, due to long lists of prerequisites, thus making the last choice, MCB 450, required – see attached letter of support
        - Addition of 4 HORT courses to allow for students that are interested in the biotechnology aspect of horticulture to take these options
        - Changing ACES prescribed and elective hours from 30 to 35 hours to standardize hours across all concentrations in Crop Sciences
    - Horticultural Food Systems
        - Addition of an entirely new concentration

JUSTIFICATION: The Department of Crop Sciences proposes to incorporate the horticulture students into the Crop Sciences major. Several years ago the horticulture program merged into the Department of Crop Sciences. We are now proposing to consolidate the two majors into one to further integrate the two programs into one. In response to student demand the new concentration will be named "Horticultural Food Systems".

In addition to adding the Horticultural Food Systems concentration we are also proposing changes to two of the existing Crop Sciences concentrations, Crop Agribusiness and Plant Biotechnology and Molecular Biology, to allow students with interests in horticultural species to obtain a strong education in those concentrations. This will be done with the addition of horticulture classes to the Crop Agribusiness, and Plant Biotechnology and Molecular Biology concentrations. Students will be able to select hours in advanced crop sciences classes or advanced horticulture classes as part of these two concentrations. Two other revisions to two of the concentrations, Agroecology and Plant Biotechnology and Molecular Biology, are proposed to make all concentrations in the department require the same total number of hours in the college, 35. And finally, minor updates to course offerings in five of the concentrations are also included; this includes the addition of newer courses and removal of courses that are not being offered or taken by our students. The three rubrics- CPSC, HORT, and PLPA are all controlled by the Crop Sciences Department, and are the majority of these course revisions.

The proposed changes are supported by the faculty in the department, including most of the faculty in the horticulture area. In the faculty vote, 88% (28/32) voted in favor of establishing the new concentration. These changes will position the department to attract students interested in current areas of faculty strength in horticulture and consolidate our students into one major.

BUDGETARY AND STAFF IMPLICATIONS: *(Please respond to each of the following questions. Place your response right after each item.* ***See Appendix A for questions required of new degree program proposals as well additional notes regarding budgetary and staff implications.)***

Additional staff and dollars needed

The proposed revisions do not create a need for additional resources; however, in order for the department to maintain this program into the future there is a need to commit to current staffing levels. It is understood within the department that funds will be required to continue to pay existing Academic Professionals who are involved in providing instruction in several courses both new and already established. As senior faculty members who are heavily involved in teaching classes in this curriculum retire over the next few years, strategic decisions will need to be made about hiring new faculty members or Academic Professionals to assume these teaching responsibilities.

Internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.)

Our intent is that the revision of these concentrations will enhance and update the program and that enrollment in the horticulture courses will increase across all concentrations. Currently, a number of the horticulture classes have small enrollments so additional students populating these classes will be beneficial. There is capacity available, and the faculty members in the horticulture area are willing to develop revised classes and teach classes with larger enrollments. It is not anticipated that an additional 5-15 students per year in this concentration will exceed the course enrollment capacity of classes within the Crop Sciences Department.

Effect on course enrollment in other units and explanations of discussions with representatives of those departments

While we hope to attract more students to the horticulture concentration than were enrolled in the horticulture major, a realistic increase is probably 50 % or 10 students. It is not anticipated that an additional 5-15 students per year in any of the concentrations will impact course enrollments in classes outside of the Crop Sciences Department. No changes in class enrollments outside of ACES are anticipated as a result of the creation of a new concentration.

Please see letters from the School of Molecular and Cellular Biology and the Department of Business Administration.

Impact on the University Library

No impact is expected. Please see letter from the ACES library.

Impact on computer use, laboratory use, equipment, etc.

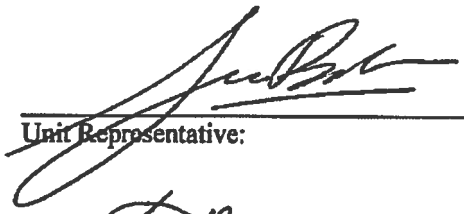
No impact is expected on computer labs. Some labs within horticulture may have larger enrollments, but as indicated there is capacity available at this time. If necessary, additional lab sections will be added to courses as required to meet demand.

DESIRED EFFECTIVE DATE: We would like to implement these revisions as soon as possible, but we understand that they must be approved at a number of levels. Ideally, we would like to have the effective date be Fall semester of 2015. Ideally, approvals will be completed in time to admit students into the revised concentrations in Fall 2015.

STATEMENT FOR PROGRAMS OF STUDY CATALOG: See attached appendix.

CLEARANCES: *(Clearances should include signatures and dates of approval.* ***These signatures must appear on a separate sheet.*** *If multiple departments or colleges are sponsoring the proposal, please add the appropriate signature lines below.)*

Signatures:



Unit Representative: _____ Date: 2/10/2015

College Representative: _____ Date: 2/10/15

Graduate College Representative: _____ Date: _____

Council on Teacher Education Representative: _____ Date: _____

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Senate Educational Policy Committee
Proposal Check Sheet

PROPOSAL TITLE: Revision of the Bachelor of Science in Crop Sciences in the Department of Crop Sciences in the College of Agricultural, Consumer and Environmental Sciences.

PROPOSAL TYPE (Please select all that apply below)**:**

A. ☒ **Program and degree proposals**

1. This proposal is for a graduate program or degree

☐ Yes ☒ No

Degree proposal (e.g. B.S., M.A. or Ph.D.)

☐ New degree — please name the new degree: _____

☐ Revision of an existing degree — please name the existing degree to be revised: _____

Major proposal (disciplinary focus, e.g., Mathematics)

☐ New major — please name the new major: _____

☐ Revision of an existing major — please name the existing major to be revised: _____

Concentration proposal (e.g. Financial Planning)

☒ New concentration — please name the new concentration: Horticultural Food Systems

☒ Revision of an existing concentration — please name the existing concentration to be revised: Agroecology, Biological Sciences, Crops, Crop Agribusiness, and Plant Biotechnology and Molecular Biology

Minor proposal (e.g. Cinema Studies)

☐ New minor — please name the new minor: _____

☐ Revision of an existing minor — please name the existing minor to be revised:

☐ Proposal for renaming an existing degree, major, concentration, or minor

☐ degree ☐ major ☐ concentration ☐ minor

Please provide the current name: _____

Please provide the proposed new name: _____

☐ Proposal for terminating an existing degree, major, concentration, or minor

Please name the existing degree, major, concentration, or minor: _____

☐ Proposal for a multi-institutional degree between Illinois (UIUC) and a foreign institution

Please name the existing Illinois degree or program: _____

Please name the partnering institution: _____

☐ **Proposal for renaming existing academic units** (college, school, department, or program)

Please provide the unit's current name: _____

Please provide the unit's proposed new name: _____

☐ **Proposal for reorganizing existing units** (colleges, schools, departments, or programs)

☐ Change in status of an existing and approved unit (e.g. change from a program to department) — please indicate current unit name including status: _____

☐ Transfer an existing unit

Please provide the current unit's name and home: _____

Please provide the new home for the unit: _____

☐ Merge two or more existing units (e.g., merge department A with department B)

Please provide the name and college of unit one to be merged: _____

Please provide the name and college of unit two to be merged: _____

☐ Terminate an existing unit — please provide the current unit's name and status: _____

☐ **Other educational policy proposals** (e.g., academic calendar, grading policies, etc.)

Please indicate the nature of the proposal: _____

Appendix A:
(Budgetary and Staff Implications)
Appendix B:

From: Rindfleisch, Aric P
Sent: Friday, February 06, 2015 7:57 AM
To: Kolb, Frederic L
Cc: Ward, Megan Marie
Subject: RE: Approval of Revision to Crop Sciences Curriculum

Hi Fred,

This is your program and if you would like to remove BADM 320 from your Agribuisness concentration, that is fine with me.

Best,

Aric

Aric Rindfleisch
John M. Jones Professor of Marketing
Executive Director, Illinois MakerLab
Head, Department of Business Administration
University of Illinois
383 Wohlers Hall
Champaign, IL 61820
Phone: (217) 265-0438 Email: aric@illinois.edu

Dear Professor Rindfleisch,

The Department of Crop Sciences is in the process of revising the curriculum. As part of this process we are removing BADM 320 from a list of classes in our Crop Agribusiness concentration. Please see the change below. The current requirement is for one class selected from ACE 222, ACE 428, BADM 320, ACE 231, ACE 232 or ACE 345. In the past very few students in this concentration have taken BADM 320 either because they did not have the prerequisite (ECON 202) or they were unable to get into the class. Therefore, we do not expect that this change will have any impact on enrollment in BADM 320. There are 53 students in this concentration currently.

If you approve, we simply need an e-mail from you, as Department Head, stating that this change is ok with the Department of Business Administration.
Thank you for your help.

Sincerely,
Fred Kolb

From: Steve Sligar <s-sligar@illinois.edu>
Date: February 7, 2015 at 12:23:25 PM CST
To: "Kolb, Frederic L" <f-kolb@illinois.edu>
Cc: melissa <mmichae@life.uiuc.edu>, Brenda Anne Wilson <bawilson@life.illinois.edu>, sligar <s-sligar@uiuc.edu>
Subject: Re: Approval of Revision to Crop Sciences Curriculum

Fred:
We have reviewed this proposal with the Assistant and Associate Directors of Undergraduate Education in MCB.
We fully support the change you suggest. Most of these students are already in MCB450, so there should not be a load problem.
Steve

On 2/5/15, 4:50 PM, Kolb, Frederic L wrote:
Hello Steve,

The Department of Crop Sciences is in the process of revising our curriculum. As part of this process we are removing several MCB classes from a list of classes in our Plant Biotechnology and Molecular Biology concentration. Please see the change below. In short, the current requirement is for one class selected from MCB 421, MCB 430 or MCB 450. The requirement will be changed to MCB 450. So we are still requiring a 400 level MCB class but the students will now be required to take MCB 450. In the past essentially all of the students in this concentration have taken MCB 450 because there are a number of prerequisites for the other classes that our students typically have not had. Therefore, we do not expect that this change will have any impact on enrollments in MCB classes. There are 58 students in this concentration currently.

We simply need an e-mail from you, as Director of MCB, stating that this change is ok with the School of Molecular and Cellular Biology.
Thank you for your help.

Sincerely,
Fred

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

University Library
Office of Dean of Libraries
and University Librarian
230 Main Library, MC-522
1408 West Gregory Drive
Urbana, IL 61801

December 19, 2014

Frederic L. Kolb
Cavanah Professor of Plant Breeding and Genetics
Crop Sciences Teaching Coordinator
AE-120 Turner Hall
1102 S Goodwin
M/C 046

Dear Dr. Kolb:

Thank you for giving the University Library the opportunity to review the Department of Crop Science's proposal to the Senate Committee on Educational Policy. Per the proposal sent to the University Library, the department is recommending the elimination of the Horticulture major and the establishment of a concentration in Horticultural Food Systems leading to the Bachelor of Science. Additionally, the proposal recommends the revision of two concentrations (Crop Agribusiness and Plant Biotechnology and Molecular Biology) and the revision of the Horticulture minor in the Department of Crop Sciences in the College of Agricultural, Consumer and Environmental Sciences.

Based upon a review of the draft proposal that we received from you on December 18, 2014, it is our belief that there will be no significant impact on our operations or collections.

If additional services or materials are required as the program develops, we will be happy to discuss those needs as they emerge.

Sincerely,

John P. Wilkin
Juanita J. and Robert E. Simpson
Dean of Libraries and University Librarian

c: Thomas Teper
Robert "Pat" Allen

telephone 217-333-0790 • *fax* 217-244-4358

From: Allen, Robert Stanton
Sent: Tuesday, December 16, 2014 4:27 PM
To: Kolb, Frederic L; Teper, Thomas H
Cc: Ward, Megan Marie
Subject: RE: Crop Sciences curriculum changes

Hi Fred.

I have looked over the proposed changes and no impact on the ACES Library is anticipated as a result of the proposed changes to the curriculum in the Department of Crop Sciences.

I am also copying our Associate Dean of Libraries & Associate University Librarian for Collections and Technical Services, Tom Teper, as he typically deals with these changes eventually.

Robert S. (Pat) Allen
Associate Professor of Library Administration Agricultural, Consumer, and Environmental Sciences (ACES) Librarian

_____

Crop Sciences- Current

For the Degree of Bachelor of Science in Crop Sciences

Agroecology Concentration

The Agroecology Concentration addresses ecologically based management of cropping systems, stewardship of the environment, and sustainable food production systems. The intersection between crop plants and their environment is emphasized in this concentration. Graduates of the Agroecology concentration are prepared for careers in integrated plant health management, government regulatory and environmental agencies or for entrance into graduate or professional school.

Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232 or CPSC 382	Elementary Organic Chemistry I Organic Chem of Biol Processes	3 or 4
IB 103	Introduction to Plant Biology	4
IB 150	Organismal & Evolutionary Biol	4
MCB 150	Molec & Cellular Basis of Life	4
IB 203	Ecology	4

Crop Sciences- Proposed

For the Degree of Bachelor of Science in Crop Sciences

Agroecology Concentration

The Agroecology Concentration addresses ecologically based management of cropping systems, stewardship of the environment, and sustainable food production systems. The intersection between crop plants and their environment is emphasized in this concentration. Graduates of the Agroecology concentration are prepared for careers in integrated plant health management, government regulatory and environmental agencies or for entrance into graduate or professional school.

Natural Sciences and Technology Required		**31-33**
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232 or CPSC 382	Elementary Organic Chemistry I Organic Chem of Biol Processes	3 or 4
IB 103	Introduction to Plant Biology	4
IB 150	Organismal & Evolutionary Biol	4
MCB 150	Molec & Cellular Basis of Life	4
IB 203	Ecology	4

Select one of the following:		4-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Lab	
IB 104	Animal Biology	
Agroecology Concentration Required		
CPSC 112	Introduction to Crop Sciences	4
CPSC 226	Introduction to Weed Science	3
CPSC 270	Applied Entomology	3
CPSC 336	Tomorrow's Environment	3
CPSC 431	Plants and Global Change	3
CPSC 437	Principles of Agroecology	3
PLPA 204	Introductory Plant Pathology	3
CPSC 498	Crop Sci Professional Develpmt	1
NRES 201	Introductory Soils	4
NRES 474 or NRES 488	Soil and Water Conservation Soil Fertility and Fertilizers	3
Select three of the following:		9-12
ACE 210	Environmental Economics	
ACE 310	Natural Resource Economics	
CPSC 414 or CPSC 418	Forage Crops and Pasture Eco Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 473	Mgmt of Field Crop Insects	
NRES 401	Watershed Hydrology	
NRES 419 or NRES 439	Env and Plant Ecosystems Env and Sustainable Dev	

Select one of the following:		4-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Lab	
IB 104	Animal Biology	
Agroecology Concentration Required		**42-46**
CPSC 112	Introduction to Crop Sciences	4
CPSC 226	Introduction to Weed Science	3
CPSC 270	Applied Entomology	3
CPSC 336	Tomorrow's Environment	3
CPSC 431	Plants and Global Change	3
CPSC 437	Principles of Agroecology	3
PLPA 204	Introductory Plant Pathology	3
CPSC 498	Crop Sci Professional Develpmt	1
NRES 201	Introductory Soils	4
NRES 474 or NRES 488	Soil and Water Conservation Soil Fertility and Fertilizers	3
Select three of the following:		9-12
ACE 210	Environmental Economics	
ACE 310	Natural Resource Economics	
CPSC 412 Or CPSC 414 Or CPSC 415 or CPSC 418	Principles of Crop Advising Forage Crops and Pasture Eco Bioenergy Crops Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 473	Mgmt of Field Crop Insects	
NRES 401	Watershed Hydrology	
NRES 419 or NRES 439	Env and Plant Ecosystems Env and Sustainable Dev	

NRES 488	Soil Fertility and Fertilizers	
One of: PLPA 401, PLPA 402, PLPA 404, PLPA 405, or PLPA 407		
Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Total ACES prescribed and elective courses must total 40 hours, of which 20 hours must be completed in residence.		40

NRES 488	Soil Fertility and Fertilizers	
One of: PLPA 401, PLPA 402, PLPA 404, PLPA 405, PLPA 406 or PLPA 407		
Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Total ACES prescribed and elective courses must total 35 hours, of which 20 hours must be completed in residence.		

TOTALS	
Prescribed Courses Including Campus General Education	37-41
Total Required Concentration Hours	73-79
Open Electives	6-16
Total Hours	126

Biological Sciences Concentration

The biological sciences concentration is designed for students who plan to enter a graduate study program or who want professional positions that require more science than in included in the other concentrations. Students follow a first-year program of General Education courses similar to students in other Crop Sciences concentrations. Programs for the second, third, and fourth years are planned in consultation with the student's faculty advisor, in the area of biological sciences. Students and advisors are encouraged to consult individual graduate schools for the specific entrance requirements. Although flexibility in individual course selection is a characteristic of this concentration, graduation requirements are established by selection of elective courses.

Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232	Elementary Organic Chemistry I	3 or 4
IB 103	Introduction to Plant Biology	4
IB 150	Organismal & Evolutionary Biol	4
MCB 150	Molec & Cellular Basis of Life	4
PHYS 101	College Physics: Mech & Heat	5
Biological Sciences Concentration Required		
CPSC 112	Introduction to Crop Sciences	4
CPSC 352	Plant Genetics	4
CPSC 498	Crop Sci Professional Develpmt	1

Biological Sciences Concentration

The biological sciences concentration is designed for students who plan to enter a graduate study program or who want professional positions that require more science than is included in the other concentrations. Students follow a first-year program of General Education courses similar to students in other Crop Sciences concentrations. Programs for the second, third, and fourth years are planned in consultation with the student's faculty advisor, in the area of biological sciences. Students and advisors are encouraged to consult individual graduate schools for the specific entrance requirements. Although flexibility in individual course selection is a characteristic of this concentration, graduation requirements are established by selection of elective courses.

Natural Sciences and Technology Required		**28-29**
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232	Elementary Organic Chemistry I	3 or 4
IB 103	Introduction to Plant Biology	4
IB 150	Organismal & Evolutionary Biol	4
MCB 150	Molec & Cellular Basis of Life	4
PHYS 101	College Physics: Mech & Heat	5
Biological Sciences Concentration Required		**36-42**
CPSC 112	Introduction to Crop Sciences	4
CPSC 352	Plant Genetics	4
CPSC 498	Crop Sci Professional Develpmt	1

Select one of the following:		3
CPSC 226	Introduction to Weed Science	
CPSC 270	Applied Entomology	
PLPA 204	Introductory Plant Pathology	
CPSC 261 or CPSC 265	Biotechnology in Agriculture Genetic Engineering Lab	3
Select three of the following:		9
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 431	Plants and Global Change	
CPSC 452	Evol Genetics and Genomics	
CPSC 453	Principles of Plant Breeding	
CPSC 466	Genomics for Plant Improvement	
CPSC 473	Mgmt of Field Crop Insects	
CPSC 484	Plant Physiology	
PLPA 401	Plant Pathogenic Fungi	
PLPA 402	Phytoparasitic Nematodes	
PLPA 404	Plant Virology	
PLPA 405	Plant Disease Diagnosis & Mgmt	
PLPA 407	Diseases of Field Crops	

Select one of the following:		3
CPSC 226	Introduction to Weed Science	
CPSC 270	Applied Entomology	
PLPA 204	Introductory Plant Pathology	
CPSC 261 or CPSC 265	Biotechnology in Agriculture Genetic Engineering Lab	3
Select three of the following:		9
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 431	Plants and Global Change	
CPSC 452	Evol Genetics and Genomics	
CPSC 453	Principles of Plant Breeding	
CPSC 466	Genomics for Plant Improvement	
CPSC 473	Mgmt of Field Crop Insects	
CPSC 484 Or HORT 421	Plant Physiology Horticultural Physiology	
PLPA 401	Plant Pathogenic Fungi	
PLPA 402	Phytoparasitic Nematodes	
PLPA 404	Plant Virology	
PLPA 405	Plant Disease Diagnosis & Mgmt	
PLPA 406	Phytobacteriology	
PLPA 407	Diseases of Field Crops	

Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
NRES 201	Introductory Soils	
TSM 100	Technical Systems in Agr	
Select one of the following:		3-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	
MCB 450	Introductory Biochemistry	
Natural Science Electives		6-9
Total ACES prescribed and elective courses must total 35 hours, of which 20 hours must be completed in residence.		35

Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
NRES 201	Introductory Soils	
TSM 100	Technical Systems in Agr	
Select one of the following:		3-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	
MCB 450	Introductory Biochemistry	
Natural Science Electives		6-9
Total ACES prescribed and elective courses must total 35 hours, of which 20 hours must be completed in residence.		

TOTALS

Prescribed Courses Including Campus General Education	37-41
Total Required Concentration Hours	64-71
Open Electives	14-25
Total Hours	126

Crop Agribusiness Concentration

The concentration in crop agribusiness is designed for students wanting to combine agronomic production and business management. This concentration prepares students for careers in production and marketing, cropping systems management, and a broad range of multi-functional agricultural enterprises, or for entrance into graduate school.

Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
IB 103	Introduction to Plant Biology	4
Select one of the following:		3-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	
IB 104	Animal Biology	
Crop Agribusiness Concentration Required		
ACCY 200 or ACCY 201	Fundamentals of Accounting Accounting and Accountancy I	3
CPSC 112	Introduction to Crop Sciences	4
CPSC 226	Introduction to Weed Science	3
CPSC 270	Applied Entomology	3
CPSC 498	Crop Sci Professional Develpmt	1
NRES 201	Introductory Soils	4
PLPA 204	Introductory Plant Pathology	3

Crop Agribusiness Concentration

The concentration in crop agribusiness is designed for students wanting to combine agronomic production and business management. This concentration prepares students for careers in production and marketing, cropping systems management, and a broad range of multi-functional agricultural enterprises, or for entrance into graduate school.

Natural Sciences and Technology Required		**15-17**
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
IB 103	Introduction to Plant Biology	4
Select one of the following:		3-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	
IB 104	Animal Biology	
Crop Agribusiness Concentration Required		**47-49**
ACCY 200 or ACCY 201	Fundamentals of Accounting Accounting and Accountancy I	3
CPSC 112	Introduction to Crop Sciences	4
CPSC 226	Introduction to Weed Science	3
CPSC 270	Applied Entomology	3
CPSC 498	Crop Sci Professional Develpmt	1
NRES 201	Introductory Soils	4
PLPA 204	Introductory Plant Pathology	3

Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Select 12 hours from the following:		12
CPSC 352	Plant Genetics	
CPSC 414	Forage Crops and Pasture Eco	
CPSC 418	Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 431	Plants and Global Change	
CPSC 437	Principles of Agroecology	
CPSC 453	Principles of Plant Breeding	
CPSC 473	Mgmt of Field Crop Insects	
PLPA 405	Plant Disease Diagnosis & Mgmt	
PLPA 407	Diseases of Field Crops	

Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Select 12 hours from the following:		12
CPSC 352	Plant Genetics	
CPSC 412	Principles of Crop Advising	
CPSC 414	Forage Crops and Pasture Eco	
CPSC 415	Bioenergy Crops	
CPSC 418	Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 431	Plants and Global Change	
CPSC 437	Principles of Agroecology	
CPSC 453	Principles of Plant Breeding	
CPSC 473	Mgmt of Field Crop Insects	
HORT 341	Greenhouse Mgmt and Production	
HORT 360	Vegetable Crop Production (New Course)	
HORT 361	Small Fruits and Viticulture	
HORT 362	Tree Fruit Production	
HORT 466	Growth and Development of Hort Crops	
HORT 482	Plant Tissue Culture	
PLPA 405	Plant Disease Diagnosis & Mgmt	
PLPA 407	Diseases of Field Crops	

Select one of the following:		2-3
ACE 448	Rural Real Estate Appraisal	
NRES 473	Soil Testing Practicum	
NRES 474	Soil and Water Conservation	
NRES 488	Soil Fertility and Fertilizers	
Select one of the following:		3
ACE 222	Agricultural Marketing	
ACE 428	Commodity Futures and Options	
BADM 320	Principles of Marketing	
ACE 231 or ACE 232	Food and Agribusiness Mgt Management of Farm Enterprises	3
ACE 345	Finan Decision Indiv Sm Bus	3
Total ACES prescribed and elective courses must total 35 hours, of which 20 must be completed in residence.		35

Select one of the following:		2-3
ACE 448	Rural Real Estate Appraisal	
NRES 474	Soil and Water Conservation	
NRES 488	Soil Fertility and Fertilizers	
Select one of the following:		3
ACE 222	Agricultural Marketing	
ACE 428	Commodity Futures and Options	
ACE 231 or ACE 232	Food and Agribusiness Mgt Management of Farm Enterprises	3
ACE 345	Finan Decision Indiv Sm Bus	3
Total ACES prescribed and elective courses must total 35 hours, of which 20 must be completed in residence.		

TOTALS

Prescribed Courses Including Campus General Education	37-41
Total Required Concentration Hours	62-66
Open Electives	19-27
Total Hours	126

Crops Concentration

The crops concentration is designed for students with an interest in agronomic crop plants. Students study the diversity of crop plants-how they grow and how they are grown This concentration prepares students for careers in crop production and marketing, cropping systems management, plant breeding, and seed merchandising, or for entrance into graduate school.

Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232 or CPSC 382	Elementary Organic Chemistry I Organic Chem of Biol Processes	3 OR 4
IB 103	Introduction to Plant Biology	4
Crops Concentration Required		
CPSC 112	Introduction to Crop Sciences	4
CPSC 226	Introduction to Weed Science	3
CPSC 270	Applied Entomology	3
CPSC 498	Crop Sci Prfessional Develpmt	1
Select one of the following:		4-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Lab	
IB 104	Animal Biology	
NRES 201	Introductory Soils	4
PLPA 204	Introductory Plant Pathology	3
Select one of the following:		3-4

Crops Concentration

The crops concentration is designed for students with an interest in agronomic crop plants. Students study the diversity of crop plants-how they grow and how they are grown This concentration prepares students for careers in crop production and marketing, cropping systems management, plant breeding, and seed merchandising, or for entrance into graduate school.

Natural Sciences and Technology Required		**15-16**
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232 or CPSC 382	Elementary Organic Chemistry I Organic Chem of Biol Processes	3 OR 4
IB 103	Introduction to Plant Biology	4
Crops Concentration Required		**43-45**
CPSC 112	Introduction to Crop Sciences	4
CPSC 226	Introduction to Weed Science	3
CPSC 270	Applied Entomology	3
CPSC 498	Crop Sci Prfessional Develpmt	1
Select one of the following:		4-5
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Lab	
IB 104	Animal Biology	
NRES 201	Introductory Soils	4
PLPA 204	Introductory Plant Pathology	3
Select one of the following:		3-4

ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Select 12 hours from the following:		12
CPSC 261	Biotechnology in Agriculture	
CPSC 265	Genetic Engineering Lab	
CPSC 352	Plant Genetics	
CPSC 414	Forage Crops and Pasture Eco	
CPSC 418	Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 431	Plants and Global Change	
CPSC 437	Principles of Agroecology	
CPSC 452	Evol Genetics and Genomics	
CPSC 453	Principles of Plant Breeding	
CPSC 454	Plant Breeding Methods	
CPSC 484	Plant Physiology	
NRES 419	Env and Plant Ecosystems	
PLPA 401	Plant Pathogenic Fungi	
PLPA 402	Phytoparasitic Nematodes	
PLPA 404	Plant Virology	
PLPA 405	Plant Disease Diagnosis & Mgmt	

ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Select 12 hours from the following:		12
CPSC 261	Biotechnology in Agriculture	
CPSC 265	Genetic Engineering Lab	
CPSC 352	Plant Genetics	
CPSC 412	Principles of Crop Advising	
CPSC 414	Forage Crops and Pasture Eco	
CPSC 415	Bioenergy Crops	
CPSC 418	Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 431	Plants and Global Change	
CPSC 437	Principles of Agroecology	
CPSC 452	Evol Genetics and Genomics	
CPSC 453	Principles of Plant Breeding	
CPSC 454	Plant Breeding Methods	
CPSC 484 Or HORT 421	Plant Physiology Horticultural Physiology	
NRES 419	Env and Plant Ecosystems	
PLPA 401	Plant Pathogenic Fungi	
PLPA 402	Phytoparasitic Nematodes	
PLPA 404	Plant Virology	
PLPA 405	Plant Disease Diagnosis & Mgmt	

PLPA 407	Diseases of Field Crops	
Select six hours from the following:		6
NRES 471	Pedology	
NRES 473	Soil Testing Practicum	
NRES 474	Soil and Water Conservation	
NRES 475	Environmental Microbiology	
NRES 487	Soil Chemistry	
NRES 488	Soil Fertility and Fertilizers	
NRES 489	Physics of Plant Environments	
Total ACES prescribed and elective courses must total 35 hours, of which 20 hours must be completed in residence.		35

PLPA 406	Phytobacteriology	
PLPA 407	Diseases of Field Crops	
Select six hours from the following:		6
NRES 471	Pedology	
NRES 474	Soil and Water Conservation	
NRES 475	Environmental Microbiology	
NRES 488	Soil Fertility and Fertilizers	
Total ACES prescribed and elective courses must total 35 hours, of which 20 hours must be completed in residence.		

TOTALS	
Prescribed Courses Including Campus General Education	37-41
Total Required Concentration Hours	58-61
Open Electives	24-31
Total Hours	126

Plant Biotechnology and Molecular Biology Concentration

The plant biotechnology and molecular biology concentration provides a curriculum that prepares students for careers in biotechnology or for entrance into graduate or professional school. The basic sciences are emphasized, including a strong foundation in biology and genetics. Students are encouraged to participate in undergraduate independent study in a molecular biology laboratory. For those who wish to pursue graduate work later, adequate preparation may be obtained by suitable choices of electives within the framework of this concentration.

Natural Sciences and Technology		
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
IB 150	Organismal & Evolutionary Biol	4
Plant Biotechnology and Molecular Biology Concentration Required		
CHEM 232	Elementary Organic Chemistry I	3 OR 4
CHEM 233	Elementary Organic Chem Lab I	2
CPSC 112	Introduction to Crop Sciences	4
CPSC 261	Biotechnology in Agriculture	3
CPSC 265	Genetic Engineering Lab	3
CPSC 352	Plant Genetics	4
CPSC 484	Plant Physiology	3
CPSC 498	Crop Sci Professional Develpmt	1

Plant Biotechnology and Molecular Biology Concentration

The plant biotechnology and molecular biology concentration provides a curriculum that prepares students for careers in biotechnology or for entrance into graduate or professional school. The basic sciences are emphasized, including a strong foundation in biology and genetics. Students are encouraged to participate in undergraduate independent study in a molecular biology laboratory. For those who wish to pursue graduate work later, adequate preparation may be obtained by suitable choices of electives within the framework of this concentration.

Natural Sciences and Technology Required		**12**
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
IB 150	Organismal & Evolutionary Biol	4
Plant Biotechnology and Molecular Biology Concentration Required		**51-62**
CHEM 232	Elementary Organic Chemistry I	3 OR 4
CHEM 233	Elementary Organic Chem Lab I	2
CPSC 112	Introduction to Crop Sciences	4
CPSC 261	Biotechnology in Agriculture	3
CPSC 265	Genetic Engineering Lab	3
CPSC 352	Plant Genetics	4
CPSC 484	Plant Physiology	3
CPSC 498	Crop Sci Professional Develpmt	1
MCB 450	Introductory Biochemistry	3

Select two of the following:		6-8
CPSC 226	Introduction to Weed Science	
CPSC 270	Applied Entomology	
PLPA 204	Introductory Plant Pathology	
Select two of the following:		6-8
CPSC 418	Crop Growth and Management	
CPSC 452	Evol Genetics and Genomics	
CPSC 453	Principles of Plant Breeding	
CPSC 466	Genomics for Plant Improvement	
Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	
Select one of the following:		3-4
MCB 450	Introductory Biochemistry	
MCB 421	Microbial Genetics	
MCB 430	Molecular Microbiology	

Select two of the following:		6-8
CPSC 226	Introduction to Weed Science	
CPSC 270	Applied Entomology	
PLPA 204	Introductory Plant Pathology	
Select two of the following:		6-8
CPSC 418	Crop Growth and Management	
CPSC 452	Evol Genetics and Genomics	
CPSC 453	Principles of Plant Breeding	
CPSC 466	Genomics for Plant Improvement	
HORT 421	Horticultural Physiology	
HORT 442	Plant Nutrition	
HORT 466	Growth and Dev of HORT Crops	
HORT 482	Plant Tissue Culture	
Select one of the following:		3-4
ANSC 100	Intro to Animal Sciences	
FSHN 101	Intro Food Science & Nutrition	
HORT 100	Introduction to Horticulture	
NRES 102	Introduction to NRES	
TSM 100	Technical Systems in Agr	

Three courses/groups selected from:		10-15
IB 103	Introduction to Plant Biology	
IB 104	Animal Biology	
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	
MCB 150 & MCB 151	Molec & Cellular Basis of Life and Molec & Cellular Laboratory	
MCB 300 & MCB 301	Microbiology and Experimental Microbiology	
Total ACES prescribed and elective courses must total 30 hours, of which 15 must be completed in residence.		30

Three courses/groups selected from:		10-15
IB 103	Introduction to Plant Biology	
IB 104	Animal Biology	
MCB 100 & MCB 101	Introductory Microbiology and Intro Microbiology Laboratory	
MCB 150 & MCB 151	Molec & Cellular Basis of Life and Molec & Cellular Laboratory	
MCB 300 & MCB 301	Microbiology and Experimental Microbiology	
Total ACES prescribed and elective courses must total 35 hours, of which 20 must be completed in residence.		

TOTALS

Prescribed Courses Including Campus General Education	37-41
Total Required Concentration Hours	63-74
Open Electives	11-26
Total Hours	126

Does not currently exist

For the Degree of Bachelor of Science in Crop Science with a concentration in

Horticultural Food Systems

This concentration provides students with a strong foundation in plant sciences along with specialized knowledge in horticultural fruit and vegetable crop systems at urban, local, and commercial scales. Graduates from this program are prepared for careers as crop consultants, crop protection and production specialists; entrepreneurs in urban and local food systems; greenhouse or farm managers; and as community gardening and horticultural educators. This concentration will also prepare students for graduate studies leading to careers in research, extension, and education.

Natural Sciences and Technology Required		**15-16**
CHEM 102 & CHEM 103	General Chemistry I and General Chemistry Lab I	4
CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	4
CHEM 232	Elementary Organic Chemistry I	3or 4
or CPSC 382	Organic Chem of Biol Processes	
IB 103	Introduction to Plant Biology	4
Horticultural Food Systems Concentration Required		**63**
ACE 231	Food and Agribusiness Mg	3
CPSC 226	Introduction to Weed Science	3
CPSC 261	Biotechnology in Agriculture	3
CPSC 270	Applied Entomology	3
CPSC 352	Plant Genetics	4
CPSC 498	Crop Sci Professional Develpmt	1
HORT 100	Introduction to Horticulture	3
HORT 240	Plant Propagation	3
HORT 341	Greenhouse Mgmt and Production	4
HORT 360	Vegetable Crop Production	3
HORT 361	Small Fruits and Viticulture	2

HORT 362	Tree Fruit Production	2
HORT 421	Horticultural Physiology	4
NRES 201	Introductory Soils	4
NRES 438 Or NRES 474	Soil Nutrient Recycling Soil and Water Conservation	
Or NRES 488	Soil Fertility and Fertilizers	
PLPA 204	Introductory Plant Pathology	3
Select 15 hours from the following:		15
CPSC 431	Plants and Global Change	
CPSC 437	Principles of Agroecology	
HORT 180	Medicinal Plants and Herbology	
HORT 205	Local Food Networks	
HORT 298	Travel Abroad	
HORT 301	Woody Landscape Plants	
HORT 343	Local Herb & Cut Flowers	
HORT 344	Planting Biodiversity & Esthetics	
HORT 363	Postharvest Handling Hort Crops	
HORT 434	Designing Urban Agriculture	
HORT 435	Urban Food Production	
HORT 442	Plant Nutrition	
HORT 447	Horticultural Plant Breeding	
HORT 464	International Hort Products	
HORT 475	Permaculture & Agroforestry	
HORT 482	Plant Tissue Culture	

Total ACES prescribed and elective courses must total 35 hours, of which 20 must be completed in residence.	
TOTALS	
Prescribed Courses Including Campus General Education	37-41
Total Required Concentration Hours	63-74
Open Electives	11-26
Total Hours	126

Crop Sciences

For the Degree of Bachelor of Science in Crop Sciences

Prescribed Courses including Campus General Education

Composition I and Speech		
RHET 105 & CMN 101	Writing and Research and Public Speaking (or equivalent - see College Composition I requirement)	6-7
Advanced Composition		
Select from campus approved list.		3-4
Cultural Studies		
Select one course from Western culture and one from non-Western/U.S. minority culture from campus approved list.		6
Foreign Language		
Coursework at or above the third level is required for graduation.		
Quantitative Reasoning I		
Select one of the following:		4-5
MATH 220	Calculus	
MATH 221	Calculus I	
MATH 234	Calculus for Business I	
Quantitative Reasoning II		
CPSC 241	Intro to Applied Statistics	3
Natural Sciences and Technology		
See Specific Concentration Requirements		
Humanities and the Arts		
Select from campus approved list		6
Social and Behavioral Sciences		
ACE 100	Agr Cons and Resource Econ (not required in Biological Sciences Concentration)	4
Select from campus approved list.		3-4
ACES required		
ACES 101	Contemporary Issues in ACES	2
Required Concentration		**58-79**
Concentration prescribed courses. See specific requirements for each concentration listed below.		
Total Hours		**126**