

Cover Sheet: Request 13722

Plant Biotechnology and Improvement

Info

Process	Specialization New/Modify/Close Ugrad
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Gerardo Nunez Villegas g.nunez@ufl.edu
Created	3/5/2019 12:52:06 PM
Updated	10/9/2019 6:11:03 PM
Description of request	We request to: 1) modify the 8-semester plan of our existing specialization Plant Molecular and Cellular Biology, 2) change specialization name to "Plant Biotechnology and Improvement", and 3) catalog copy included with universal tracking for semesters 5-8 (original submission 12590)

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Horticultural Sciences 514923000	Christine Chase		3/5/2019
HOS curriculum revision support letter.pdf					3/5/2019
College	Approved	CALS - College of Agricultural and Life Sciences	Joel H Brendemuhl	Corrections requested by the CALS CC on 3/15/19 have been addressed.	4/19/2019
Plant Biotechnology and Improvement - For UCC upload.docx					4/18/2019
Associate Provost for Undergraduate Affairs	Approved	PV - Associate Provost for Undergraduate Affairs	Casey Griffith		9/11/2019
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			9/11/2019
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Specialization|Modify for request 13722

Info

Request: Plant Biotechnology and Improvement

Description of request: We request to: 1) modify the 8-semester plan of our existing specialization Plant Molecular and Cellular Biology, 2) change specialization name to "Plant Biotechnology and Improvement", and 3) catalog copy included with universal tracking for semesters 5-8 (original submission 12590)

Submitter: Gerardo Nunez Villegas g.nunez@ufl.edu

Created: 4/18/2019 7:40:33 PM

Form version: 2

Responses

Specialization Name Plant Molecular and Cell Biology

Specialization Code PMB

Effective Term Earliest Available

Effective Year Earliest Available

Is this an Undergraduate Innovation Academy Program No

Current Curriculum for Specialization SEMESTER 1

BSC 2010

& 2010L Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1
(Critical Tracking; State Core Gen Ed Biological and Physical Sciences) 4

IDS 1161 What is the Good Life (Gen Ed Humanities) 3

MAC 1147 Precalculus Algebra and Trigonometry (State Core Gen Ed Mathematics)

4

State Core Gen Ed Composition; Writing Requirement 3

Credits 14

SEMESTER 2

BSC 2011

& 2011L Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2
(Critical Tracking; Gen Ed Biological Sciences and Physical Sciences) 4

Select one: 4-5

PHY 2053

& 2053L Physics 1 and Laboratory for Physics 1 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)

PHY 2048

& 2048L Physics with Calculus 1 and Laboratory for Physics with Calculus 1 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)

State Core Gen Ed Social and Behavioral Sciences 3

Elective3

Credits 14-15

SEMESTER 3

AEC 3033C Research and Business Writing in Agricultural and Life Sciences (Writing Requirement) 3

CHM 2045

& 2045L General Chemistry 1

and General Chemistry 1 Laboratory (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences) 4

MAC 2311 Analytic Geometry and Calculus 1 (Critical Tracking; Gen Ed Mathematics)

4

State Core Gen Ed Humanities 3

Elective2

Credits 16

SEMESTER 4

Select one: 3-4

AEB 2014 Economic Issues, Food and You (Gen Ed Social and Behavioral Sciences)

ECO 2013 Principles of Macroeconomics (Gen Ed Social and Behavioral Sciences)

ECO 2023 Principles of Microeconomics (Gen Ed Social and Behavioral Sciences)

AEC 3030C Effective Oral Communication 3

CHM 2046

& 2046L General Chemistry 2

and General Chemistry 2 Laboratory (Critical Tracking) 4

Gen Ed Composition; Writing Requirement 3

Elective3

Credits 16-17

SEMESTER 5

HOS 3020C Principles of Horticultural Crop Production 4

CHM 2210 Organic Chemistry 1 3

HOS 3305

Intro. to Plant Molecular Biology3

HOS4313C

Lab Methods in Plant Mol. Biology 2

AGR 3303 Genetics 3

Total

15

SEMESTER 6

CHM 2211 Organic Chemistry 2 3

CHM 2211L Organic Chemistry Lab 2

HOS 4933 Professional Development in Horticulture 1

Approved electives

9

Total 15

SEMESTER 7

HOS 4304 Horticultural Physiology 3

PLP 3002C

Fundamentals of Plant Pathology 4

BCH 3025

Fundamentals of Biochemistry (or BCH 4024) 4

Approved electives

3

Total 14

SEMESTER 8

MCB 3020

Basic Biology of Microorganisms 3

MCB 3002L

Basic Biology of Microorganisms Lab 1

AGR 4320

Genetic Improvement of Plants 3

Approved electives

9

Total 16

Proposed Changes No changes in semesters 1-4.

SEMESTER 5

HOS 3020C	TC Principles of Horticultural Crop Production	4
CHM 2210	Organic Chemistry 1	3
STA 2023	Introduction to Statistics I	3
AGR3303	Genetics	3
	Approved electives	2
	Total	15

SEMESTER 6

STA 3024	Introduction to Statistics II	3
AGR 4320		

Genetic Improvement of Plants 3

HOS 4933	TC Professional Development in Horticulture	1
CHM 2211	Organic Chemistry 2	3
CHM 2211L	Organic Chemistry Lab	2
	Approved electives	3
	Total	15

SEMESTER 7

HOS 4304	Horticultural Physiology	3
HOS 3305	Intro. to Plant Molecular Biology	3
HOS 4313C	Lab Methods in Plant Mol. Biology	2
HOS 4918	TC Capstone Planning	1
BCH 4024	Biochemistry	4
	Approved electives	2
	Total	15

SEMESTER 8

HOS 4241C	Genetics & Breeding of Vegetable Crops	3
HOS 4921	TC Horticultural Sciences Capstone	2 - 4
	Approved electives	10
	Total	15

Pedagogical Rationale/Justification We propose renaming our Plant Molecular and Cell Biology specialization "Plant Biotechnology and Improvement". We also propose updating the required courses for this specialization. Changes reflect overall hiring and admission trends in the plant science disciplines where graduates require more quantitative skills (STA2023 and STA 3024 were added) and plant breeding courses (HOS4241C was added). Additionally, changes include the addition of courses in our capstone sequence, which are focused on providing meaningful horticulture experience to our graduates.

Impact on Other Programs No impacts on other programs are foreseen, as the majority of these courses are taught in-house.

Assessment Data Review Proposed changes do not affect Student Learning Outcomes.

Academic Learning Compact and Academic Assessment Plan Proposed changes do not affect the Academic Learning Compact or Academic Assessment Plan.

Horticultural Science

Horticultural Science graduates have a foundation of knowledge in the science behind fruit and vegetable production, including commodity production, cropping systems, basic plant science, and molecular biology. Horticultural Science students study genetics, crop nutrition, plant physiology, chemistry, physics, entomology and nematology, and soil and water sciences.

College: [Agricultural and Life Sciences](#)

Degree: Bachelor in Science

Credits for Degree: 120

Specializations:

Science and Technology of Horticultural Crops [Organic Horticultural Systems](#) ; [Plant Biotechnology and Improvement](#)

[Academic Learning Compact](#)

[Additional Information](#)

[Related Horticultural Science Programs](#)

To graduate with this major, students must complete all university, college, and major requirements.

Overview

The department offers three specializations: science and technology of horticultural crops, organic horticultural systems and plant biotechnology and improvement. These options provide a strong science background and flexibility when choosing elective courses. Details of the specializations are outlined below. An academic advisor will help develop the curriculum that best suits your career and educational goals.

Plant Biotechnology and Improvement

[Critical Tracking](#) [Model Semester Plan](#)

This is a comprehensive program focusing on the molecular aspects of crops, including crop growth, development and cultivar improvement. This specialization is geared toward preparing students for careers in laboratory research and is also an excellent preparation for students planning to pursue graduate studies.

Critical Tracking

Note that critical tracking is the same for all specializations of this major except Plant Molecular and Cellular Biology

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida [Common Course Prerequisites](#) may be used for transfer students.

Semester 1

Complete 1 of 6 critical-tracking courses, excluding labs: BSC 2010/2010L, BSC 2011/2011L, CHM 2045/2045L, CHM 2046/2046L, MAC 2311, PHY 2048/2048L or PHY 2053/2053L

2.0 GPA required for all critical-tracking courses

2.0 UF GPA required

Semester 2

Complete 1 additional critical-tracking course, excluding labs

2.0 GPA required for all critical-tracking courses

2.0 UF GPA required

Semester 3

Complete 2 additional critical-tracking courses, excluding labs

2.0 GPA required for all critical-tracking courses

2.0 UF GPA required

Semester 4

Complete 2 additional critical-tracking courses, excluding labs

2.0 GPA required for all critical-tracking courses

2.0 UF GPA required

Semester 5

Complete all critical-tracking courses, including labs

2.0 GPA required for all critical-tracking courses

Complete 1 of 4 upper division critical tracking courses: HOS 3020C, HOS 4933, HOS 4304, HOS 4921

2.0 UF GPA required

2.0 Upper Division GPA required

Semester 6

Complete 1 additional upper division tracking course

2.0 UF GPA required

2.0 Upper Division GPA required

Semester 7

Complete 1 additional upper division tracking course

2.0 UF GPA required

2.0 Upper Division GPA required

Semester 8

Complete all upper division tracking courses

2.0 UF GPA required

2.0 Upper Division GPA required

Model Semester Plan

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

BSC 2010 Integrated Principles of Biology 1 , 3 credits, and **4**

† **BSC 2010L Integrated Principles of Biology Laboratory 1** , 1 credit

† *State Core GE-B/P*

IDS 1161 1000 What is the Good Life **3**

† *GE-H*

MAC 1147 Precalculus: Algebra and Trigonometry **4**

† *State Core GE-M*

Composition **3**

† *State Core GE-C* ; WR

Total **14**

BSC 2011 Integrated Principles of Biology 2 , 3 credits, and **4**

† **BSC 2011L Integrated Principles of Biology Laboratory 2** , 1 credit

† *GE-B/P*

PHY 2053 Physics 1 , four credits, and **4-5**

† **PHY 2053L Laboratory for Physics 1** , 1 credit

□ OR

† **PHY 2048 Physics 1 with Calculus** , 3 credits, and

† **PHY 2048L Laboratory for Physics 1 with Calculus** , 1 credit

† *GE-B/P*

electives **3**

Social and Behavioral Sciences **3**

† *State Core GE-C*

Total 14-15

AEC 3033C Research and Business Writing in Agricultural and Life Sciences 3

↑WR

CHM 2045 General Chemistry 1 , 3 credits, and 4

↑**CHM 2045L General Chemistry 1 Laboratory** , 1 credit

↑GE-B/P

MAC 2311 Analytic Geometry and Calculus 1 4

↑GE-M

elective 2

Humanities 3

↑ [State Core GE-H](#)

Total 16

AEB 2014 Economic Issues, Food and You , 3 credits, or 3-4

↑ECO 2013 Principles of Macroeconomics , 4 credits, or

↑ECO 2023 Principles of Microeconomics , 4 credits

↑GE-S

AEC 3030C Effective Oral Communication 3

CHM 2046 General Chemistry 2 , 3 credits, and 4

↑**CHM 2046L General Chemistry 2 Laboratory** , 1 credit

Composition 3

† [GE-C](#) ; WR

elective 3

Total 16-17

AGR 3303 Genetics 3

CHM 2210 Organic Chemistry 1 3

HOS 3020C Principles of Horticulture Crop Production 4

STA 2023 Introduction to Statistics I 3

Approved Electives* 2

Total 15

CHM 2211 Organic Chemistry 2 , 3 credits, and 5

†CHM 2211L Organic Chemistry Laboratory , 2 credits 3

STA 3024 Introduction to Statistics II 3

AGR 4320 Genetic Improvement of Plants

HOS 4933 Professional Development in Horticulture 1

Approved electives 3



Total 15

Semester 7	Credits
BCH 3025 Fundamentals of Biochemistry <i>or</i>	4
†BCH 4024 Introduction to Biochemistry and Molecular Biology	
HOS 4304 Horticultural Physiology	3
HOS 3305 Introduction to Plant Molecular Biology	3
HOS 4313C Laboratory Methods In Plant Molecular Biology	2
HOS 4918 Capstone Planning	1
Approved electives ♦	2
Total	15

Semester 8	Credit
HOS 4241C Genetics and Breeding of Vegetable Crops	3
HOS 4921 Horticultural Sciences Capstone	2-4
Approved electives ♦	10
Total	15-17

♦
For approved electives, see advisor

Bachelor of Science in Horticultural Sciences

Specialization in Plant Molecular and Cell Biology (Current)

Semester 1	
BSC 2010 ¶& 2010L	Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory (Critical Tracking; State Core Gen Ed Biological and Physical Sciences)
IDS 1161	What is the Good Life (Gen Ed Humanities)
MAC 1147	Precalculus Algebra and Trigonometry (State Core Gen Ed Mathematics)
	State Core Gen Ed Composition; Writing Requirement
Semester 2	
BSC 2011 ¶& 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)
	Select one:
PHY 2053 ¶& 2053L	Physics 1 and Laboratory for Physics 1 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)
PHY 2048 ¶& 2048L	Physics with Calculus 1 and Laboratory for Physics with Calculus 1 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)
	State Core Gen Ed Social and Behavioral Sciences
	Elective
Semester 3	
AEC 3033C	Research and Business Writing in Agricultural and Life Sciences (Writing Requirement)
CHM 2045 ¶& 2045L	General Chemistry 1 ¶and General Chemistry 1 Laboratory (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)
MAC 2311	Analytic Geometry and Calculus 1 (Critical Tracking; Gen Ed Mathematics)
	State Core Gen Ed Humanities
	Elective
Semester 4	
	Select one:
AEB 2014	Economic Issues, Food and You (Gen Ed Social and Behavioral Sciences)
ECO 2013	Principles of Macroeconomics (Gen Ed Social and Behavioral Sciences)
ECO 2023	Principles of Microeconomics (Gen Ed Social and Behavioral Sciences)
AEC 3030C	Effective Oral Communication
CHM 2046 ¶& 2046L	General Chemistry 2 ¶and General Chemistry 2 Laboratory (Critical Tracking)
	Gen Ed Composition; Writing Requirement
	Elective
Semester 5	
HOS 3020C	Principles of Horticultural Crop Production
CHM 2210	Organic Chemistry 1
HOS 3305	Intro. to Plant Molecular Biology
HOS4313C	Lab Methods in Plant Mol. Biology
AGR 3303	Genetics
Semester 6	
CHM 2211	Organic Chemistry 2
CHM 2211L	Organic Chemistry Lab
HOS 4933	Professional Development in Horticulture
	Approved electives
Semester 7	
HOS 4304	Horticultural Physiology
PLP 3002C	Fundamentals of Plant Pathology
BCH 3025	Fundamentals of Biochemistry (or BCH 4024)

	Approved electives
Semester 8	
MCB 3020	Basic Biology of Microorganisms
MCB 3002L	Basic Biology of Microorganisms Lab
AGR 4320	Genetic Improvement of Plants
	Approved electives

Bachelor of Science in Horticultural Sciences

Specialization in Plant Biotechnology and Improvement (Proposed)

No changes in semesters 1-4.

Semester 5	
HOS 3020C	Principles of Horticultural Crop Production
CHM 2210	Organic Chemistry 1
STA 2023	Introduction to Statistics I
AGR3303	Genetics
	Approved electives
Semester 6	
STA 3024	Introduction to Statistics II
AGR 4320	Genetic Improvement of Plants
HOS 4933	Professional Development in Horticulture
CHM 2211	Organic Chemistry 2
CHM 2211L	Organic Chemistry Lab
	Approved electives
Semester 7	
HOS 4304	Horticultural Physiology
HOS 3305	Intro. to Plant Molecular Biology
HOS 4313C	Lab Methods in Plant Mol. Biology
HOS 4918	Capstone Planning
BCH 4024	Biochemistry
	Approved electives
Semester 8	
HOS 4241C	Genetics & Breeding of Vegetable Crops
HOS 4921	Horticultural Sciences Capstone
	Approved electives

TC

Semester tracking course



Institute of Food and Agricultural Sciences
Horticultural Sciences Department

1253 Fifield Hall
PO Box 110690
Gainesville, FL 32611-0690
352-392-1928

February 11, 2019

To: Plant Science Department Chairs

From: Chris Chase, Interim Chair, Horticultural Sciences (HOS) Department

Re: HOS undergraduate curriculum revision

The HOS faculty has voted to sunset our undergraduate curriculum when and if a new Plant Science Undergraduate Curriculum is developed by a joint committee of HOS and Plant Science faculty and approved by a majority vote of faculty members in the participating departments. Due to the relatively long time-frame for this joint venture we would, at this point, like to implement proposed revisions to our departmental undergraduate curriculum. We have spent the last 18 months developing these revisions, and we anticipate that many of these revisions will find their way into the new Plant Science curriculum.

The proposed HOS undergraduate curriculum revision is presented in detail below. It includes ten new courses, several revised courses, and a requirement for an e-portfolio. Our aim is to become the national standard for quality education in horticultural sciences while addressing current and future needs of students and industry. We developed new courses and revised existing courses to incorporate experiential and evidence-based learning, aligning our course offerings with recommendations for undergraduate science education from AAAS and NSF [<http://visionandchange.org/reports/>]. Our semester 5-8 tracking courses position us as a model for the adoption of UF-QUEST curricula in the future. Our capstone sequence was designed with the Model for the Integration of Experiential Learning into Capstone Courses framework [Andreasen NACTA Journal 48:52] in mind. Additionally, by connecting our unique network of academic and industry horticulturists, we have designed a capstone experience that will promote critical thinking and problem solving, increase educational quality, and enhance student career-readiness.

Implementation of the revised HOS curriculum would be advantageous for the proposed new joint Plant Science degree since it would give us the opportunity to pilot the newly developed courses, the revised courses, and the e-portfolio. All of the required new and revised courses for the proposed curriculum have been approved by the CALS and University Curriculum Committees and the revised curriculum was approved by unanimous vote of Horticultural Sciences Department Faculty. Our next step will be submitting our proposed curriculum revision to the CALS Curriculum Committee. We ask that you sign below to indicate your support for our curriculum revision as we work toward development of a new joint Plant Sciences curriculum proposal that leverages and combines the strengths of our respective academic programs. Thanks in advance for your support.

APPROVALS

<u>Department</u>	<u>Chair</u>	<u>Signature</u>	<u>Date</u>
Environmental Horticulture	Dean Kopsell	<u>Dean D. Kopsell</u>	_____
Plant Pathology	Rose Loria	<u>Rosemary Loria</u>	_____
Agronomy	Diane Rowland	<u>Diane Rowland</u>	_____
Entomology/Nematology	Blair Siegfried	<u>Blair Siegfried</u>	_____
Soil & Water Sciences	Matthew Whiles	<u>Matthew Whiles</u>	_____

Bachelor of Science in Horticultural Sciences

Specialization in Horticultural Science (Current)

	Courses	Credit
Fifth semester (Fall)		
HOS 3020	Principles of Horticultural Crop Production	3
ORH 3513C	Environmental Plant ID	3
	Pest management course	3-4
	Approved electives	6
	Total	15
Sixth semester (Spring)		
HOS 4933	Professional Development in Horticulture	1
HOS 3430C	Nutrition of Horticultural Crops	3
	Pest management course	3-4
	Approved electives	8
	Total	15
Seventh semester (Fall)		
HOS 4304	Horticultural Physiology	3
PLS 3223	Plant Propagation	2
PLS 3223L	Plant Propagation Lab	1
AGR 3303	Genetics	3
	Approved electives	6
	Total	15
Eighth semester (Spring)		
HOS 4341	Advanced Horticultural Physiology	3
SWS 3022	Intro to Soils in the Environment	3
SWS 3022L	Intro to Soils Lab	1
	Approved electives	8
	Total	15

Commented [NG1]: New specialization name: Science and Technology of Horticultural Crops

Commented [NG2]: Replaced by HOS3020C – Principles of Horticultural Crop Production (4 credits)

Commented [NG3]: Replaced by PLP3002C – Fundamental of Plant Pathology (4 credits)

Commented [NG4]: Replaced by STA2023 - Introduction to Statistics I (3 credits)

Commented [NG5]: Replaced by ENY3005 + L – Principles of Entomology and Lab (3 credits)

Commented [NG6]: 2-3 credits must be practical experience electives

Commented [NG7]: Moved to sixth semester

Commented [NG8]: Moved to sixth semester

Commented [NG9]: New courses added: PLS4601C – Principles of Weed Science (3 credits) HOS 4XXX – Capstone Planning (1 credit)

Commented [NG10]: Replaced by HOS3222C – Greenhouse and Protected Agriculture (3 credits)

Commented [NG11]: Moved to fifth semester

Commented [NG12]: Moved to fifth semester

Commented [NG13]: New courses added: HOS4XXX – Principles of Postharvest Horticulture (3 credits) HOS4XXX – Horticultural Sciences Capstone (2-4 credits) Technology electives (3 credits)

Bachelor of Science in Horticultural Sciences**Specialization in Science and Technology of Horticultural Crops (Proposed)**

	Courses	Credit
Fifth Semester (Fall)		
HOS 3020C	^{TC} Principles of Horticultural Crop Production	4
SWS 3022	Intro to Soils in the Environment	3
SWS 3022L	Intro to Soils Lab	1
PLP 3002C	Fundamentals of Plant Pathology	4
STA 2023	Introduction to Statistics I	3
	Total	15
Sixth Semester (Spring)		
HOS 3430C	Nutrition of Horticultural Crops	3
HOS 4933	^{TC} Professional Development in Horticulture	1
PLS 3223	Plant Propagation	2
PLS 3223L	Plant Propagation Lab	1
ENY 3005	Principles of Entomology	2
ENY 3005L	Principles of Entomology Lab	1
	Practical Experience electives	2-3
	Approved electives	3
	Total	15-16
Seventh Semester (Fall)		
HOS 4304	Horticultural Physiology	3
AGR 3303	Genetics	3
PLS 4601C	Principles of Weed Science	3
HOS 4XXX	^{TC} Capstone Planning	1
	Approved electives	6
	Total	16
Eight Semester (Spring)		
HOS 3222C	Greenhouse and Protected Agriculture	3
HOS 4XXXC	Principles of Postharvest Horticulture	3
HOS 4XXX	^{TC} Horticultural Sciences Capstone	2-4
	Approved electives	3
	Technology electives	3
	Total	14-16

^{TC} Semester tracking course

Practical Experience Electives:

HOS 4911 - Supervised Research in Horticultural Sciences
HOS 4941 - Practical Work Experience in Horticultural Sciences
ALS 4404 - Study Abroad in Horticultural Sciences
HOS 4900 - Supervised Extension Experience in Horticultural Sciences

Technology Electives:

AOM 3333 - Pesticide Application Techniques
AOM 3734 - Irrigation Principles and Practices in FL
AOM 3073 - Safety in Agriculture
AOM 4434 - Precision Agriculture
FOS 4722C - Quality Control in Food Systems
PLS 4404C - Principles of Composting Technology
SUR 4501C - Foundations of UAS Mapping

Approved Electives:

Fruit, Vegetable, and Medicinal Crops

HOS 4341 - Advanced Horticultural Physiology
FRC 3252 - Tropical and Subtropical Fruits
FRC 3274 - Tree and Small Fruit Production
VEC 3221C - Commercial Vegetable Production
PLS 3XXX - Hydroponic Systems
HOS 4XXX - Genetics and Breeding of Vegetable Crops
HOS 3XXX – The Organic Debate: Organic Agriculture Dev. & Regulations
HOS 3XXX – Viticulture for Table Grapes and Wine

Production Technology and Food Systems

AEB 4123 - Agricultural and Natural Resource Law
AGR 4214C - Applied Field Crop Production
AGR 4320 - Genetic Improvement of Plants
AGR 4212 - Alternative Cropping Systems
AGR 4512 - Physiology and Ecology of Crops
ANS 3006 - Introduction to Animal Science
AOM 3220 - Agricultural Construction and Maintenance
AOM 4314C - Power and Machinery Management
AOM 4434 - Precision Agriculture
AOM 4455 - Agricultural Operations and Systems
AOM 4642 - Environmental Systems for Agricultural Structures
BOT 4650 - Plant Symbiosis
ENY 4573 - Beekeeping
ORH 3513C - Environmental Plant ID
PLP 4104 - Applied Plant Disease Management
PLP 3103C - Control of Plant Diseases
SUR 3103C – Geomatics

SUR 3641 – Survey Computations
SWS 4116 - Environmental Nutrient Management
SWS 4207 - Sustainable Agricultural and Urban Land Management

Language and Quantitative Skills

SPN 1130 - Beginning Spanish 1
STA 3024 - Introduction to Statistics 2
AEC 3073 - Intercultural Communication

Bachelor of Science in Horticultural Sciences

Specialization in Organic Crop Production (Current)

	Courses	Credit
Fifth semester (Fall)		
HOS 3020	Principles of Horticultural Crop Production	3
ENY 3005	Principles of Entomology	2
ENY 3005L	Principles of Entomology Lab	1
PLP 3002C	Fundamentals of Plant Pathology	4
	Commodity or approved elective	6
	Total	16
Sixth semester (Spring)		
HOS 3430C	Nutrition of Horticultural Crops	3
HOS 4933	Professional Development in Horticulture	1
AGR 3303	Genetics	3
AGR 4212	Alternative Cropping Systems	3
	Commodity or approved elective	5-6
	Total	15
Seventh semester (Fall)		
HOS 4304	Horticultural Physiology	3
HOS 3281C	Principles of Organic and Sustainable Crop Production	3
SWS 3022	Intro to Soils in Environment	3
SWS 3022L	Intro to Soils Lab	1
	Commodity or approved elective	3
	Practical experience electives	1-3
	Total	14
Eight semester (Spring)		
HOS 4341	Advanced Horticultural Physiology	3
HOS 4283C	Advanced Organic and Sustainable Crop Production	3
	Commodity or approved elective	6
	Pest management course	3
	Total	15

Commented [NG1]: New specialization name: Organic Horticultural Systems

Commented [NG2]: Replaced by HOS3020C – Principles of Horticultural Crop Production (4 credits)

Commented [NG3]: Moved to sixth semester

Commented [NG4]: Moved to sixth semester

Commented [NG5]: Moved to seventh semester

Commented [NG6]: New courses added:
 HOS3XXX – The Organic Debate: Organic Agriculture Dev. & Reg. (1 credit)
 ALS3153 – Agricultural Ecology (3 credits)
 STA2023 – Introduction to Statistics 1 (3 credits)

Commented [NG7]: Moved to approved electives

Commented [NG8]: Moved to fifth semester

Commented [NG9]: Moved to fifth semester

Commented [NG10]: New course added:
 HOS3XXX – Capstone Planning (1 credit)

Commented [NG11]: Changed to 1-2 credits

Commented [NG12]: Moved to approved elective

Commented [NG13]: New courses added:
 HOS4XXX – Organic Weed Management (3 credits)
 HOS4XXX – Horticultural Sciences Capstone (2-4 credits)
 HOS4XXXC – Principles of Postharvest Horticulture (3 credits)

Commented [NG14]: Replaced by approved electives (4 credits)

Bachelor of Science in Horticultural Sciences**Specialization in Organic Horticultural Systems (Proposed)**

	Courses	Credit
Fifth Semester (Fall)		
HOS 3020C	^{TC} Principles of Horticultural Crop Production	4
ALS 3153	Agricultural Ecology	3
SWS 3022	Intro to Soils in Environment	3
SWS 3022L	Intro to Soils Lab	1
STA 2023	Introduction to Statistics I	3
HOS 3XXX	The Organic Debate: Organic Agriculture Dev. & Reg.	1
	Total	15
Sixth Semester (Spring)		
HOS 3430C	Nutrition of Horticultural Crops	3
HOS 4933	^{TC} Professional Development in Horticulture	1
AGR 3303	Genetics	3
ENY 3005	Principles of Entomology	2
ENY 3005L	Principles of Entomology Lab	1
	Approved electives	5
	Total	15
Seventh Semester (Fall)		
HOS 4304	Horticultural Physiology	3
HOS 3281C	Principles of Organic & Sustainable Crop Production	3
PLP 3002C	Fundamentals of Plant Pathology	4
HOS 4XXX	^{TC} Capstone Planning	1
	Practical experience electives	1-2
	Approved electives	3
	Total	15-16
Eight Semester (Spring)		
HOS 4283C	Advanced Organic & Sustainable Crop Production	3
HOS 4XXX	Organic Weed Management	3
HOS 4XXXC	Principles of Postharvest Horticulture	3
HOS 4XXX	^{TC} Horticultural Sciences Capstone	2-4
	Approved electives	4
	Total	15-17

^{TC} Semester tracking course

Practical Experience Electives:

HOS 4911 – Supervised Research in Horticultural Sciences
HOS 4941 - Practical Work Experience in Horticultural Sciences
ALS 4404 - Study Abroad in Horticultural Sciences
HOS 4900 - Supervised Extension Experience in Horticultural Sciences

Approved electives:

Fruit, Vegetable, and Medicinal Crops

HOS 4341 - Advanced Horticultural Physiology
FRC 3252 - Tropical and Subtropical Fruits
FRC 3274 - Tree and Small Fruit Production
VEC 3221C - Commercial Vegetable Production
HOS 3222C - Greenhouse and Protected Agriculture
PLS 3XXXC - Hydroponic Systems
HOS 4XXX – Genetics and Breeding of Vegetable Crops
HOS 3XXX – Viticulture for Table Grapes and Wine

Production Technology and Food Systems

AGR 4214C - Applied Field Crop Production
AGR 4320 - Genetic Improvement of Plants
ANS 3006 - Introduction to Animal Science
AOM 3220 - Agricultural Construction and Maintenance
AOM 4314C - Power and Machinery Management
AOM 4434 - Precision Agriculture
AOM 4455 - Agricultural Operations and Systems
AOM 4642 - Environmental Systems for Agricultural Structures
PLS 3221+L - Plant Propagation and Lab
PLS 4404C - Principles of Composting Technology

Soil and Water Management

AOM 3732 - Agricultural Water Management
AOM 3734 - Irrigation Principles and Practices in Florida
SOS 4116 - Environmental Nutrient Management
SWS 4207 - Sustainable Agricultural and Urban Land Management
SWS 4231C - Soil, Water and Land Use
SWS 4233 - Soil and Water Conservation
SWS 4245 - Water Resource Sustainability
SWS 4303C - Soil Microbial Ecology

Disease and Pest Management

PLP 3103C - Control of Plant Diseases
PLP 4104 - Applied Plant Disease Management
IPM 3022 - Fundamentals of Pest Management
PMA 4570C - Field Techniques in IPM

ENY 4573 - Beekeeping
PLS 4601C - Integrated Weed Management

Environmental/Health Issues /Food Safety

AGR 3501 - Environment, Food and Society
ALS 3133 - Agricultural and Environmental Quality
GEO 3427 - Plants, Health and Spirituality
PKG 3010 - Packaging, Society and the Environment
FOS 4202 - Food Safety and Sanitation (prereq: MCB 2000 and MCB 2000L)
AEB 4274 - Natural Resource and Environmental Policy

Economics and Agribusiness

AEB 3300 - Agricultural and Food Marketing
AEB 3341 - Selling Strategically
AEB 4123 - Agricultural and Natural Resource Law
AEB 4224 - US Food and Agricultural Policy
AEB 4309 - Food Wholesaling and Retail Marketing
AEB 4334 - Agricultural Price Analysis and Consumer Behavior
AEB 4424 - Human Resources Management in Agribusiness

Bachelor of Science in Horticultural Sciences

Specialization in Plant Molecular and Cell Biology (Current)

	Courses	Credit
Fifth semester (Fall)		
HOS 3020	Principles of Horticultural Crop Production	3
CHM 2210	Organic Chemistry 1	3
HOS 3305	Intro. to Plant Molecular Biology	3
HOS4313C	Lab Methods in Plant Mol. Biology	2
AGR 3303	Genetics	3
	Total	14
Sixth semester (Spring)		
CHM 2211	Organic Chemistry 2	3
CHM 2211L	Organic Chemistry Lab	2
HOS 4933	Professional Development in Horticulture	1
	Approved electives	10
	Total	16
Seventh semester (Fall)		
HOS 4304	Horticultural Physiology	3
PLP 3002C	Fundamentals of Plant Pathology	4
BCH 3025	Fundamentals of Biochemistry (or BCH 4024)	4
	Approved electives	3
	Total	14
Eighth semester (Spring)		
MCB 3020	Basic Biology of Microorganisms	3
MCB 3002L	Basic Biology of Microorganisms Lab	1
AGR 4320	Genetic Improvement of Plants	3
	Approved electives	9
	Total	16

Commented [NG13]: New specialization name: Plant Biotechnology and Improvement

Commented [NG1]: Replaced by HOS3020C – Principles of Horticultural Crop Production (4 credits)

Commented [NG2]: Moved to seventh semester

Commented [NG3]: Moved to seventh semester

Commented [NG4]: New courses added:
Approved electives (2 credits)
STA2023 – Introduction to Statistics 1 (3 credits)

Commented [NG5]: New courses added:
STA3024 – Introduction to Statistics II (3 credits)
Approved electives (2 credits)

Commented [NG6]: Moved to approved electives

Commented [NG7]: Replaced by BCH4024 - Biochemistry

Commented [NG8]: New courses added:
Approved electives (2 credits)
HOS4XXX – Capstone Planning (1 credit)

Commented [NG9]: Replaced by Plant breeding elective (3 credits)

Commented [NG10]: Moved to approved electives

Commented [NG11]: Moved to sixth semester

Commented [NG12]: New courses added:
HOS4XXX – Horticultural Sciences Capstone (2-4 credits)

Bachelor of Science in Horticultural Sciences**Specialization in Plant Biotechnology and Improvement (Proposed)**

	Courses	Credit
Fifth Semester (Fall)		
HOS 3020C	^{TC} Principles of Horticultural Crop Production	4
CHM 2210	Organic Chemistry 1	3
STA 2023	Introduction to Statistics I	3
AGR3303	Genetics	3
	Approved electives	2
	Total	15
Sixth Semester (Spring)		
STA 3024	Introduction to Statistics II	3
AGR 4320	Genetic Improvement of Plants	3
HOS 4933	^{TC} Professional Development in Horticulture	1
CHM 2211	Organic Chemistry 2	3
CHM 2211L	Organic Chemistry Lab	2
	Approved electives	3
	Total	15
Seventh Semester (Fall)		
HOS 4304	Horticultural Physiology	3
HOS 3305	Intro. to Plant Molecular Biology	3
HOS 4313C	Lab Methods in Plant Mol. Biology	2
HOS 4XXX	^{TC} Capstone Planning	1
BCH 4024	Biochemistry	4
	Approved electives	2
	Total	15
Eighth Semester (Spring)		
	Plant breeding elective	3
HOS 4XXX	^{TC} Horticultural Sciences Capstone	2 - 4
	Approved electives	10
	Total	15

^{TC} Semester tracking course

Plant Breeding Electives

HOS 4XXX - Genetics and Breeding of Vegetable Crops

Approved Electives:

Practical experience

HOS 4911 - Supervised Research in Horticultural Sciences

HOS 4941 - Practical Work Experience in Horticultural Sciences

ALS 4404 - Study Abroad in Horticultural Sciences

HOS 4900 - Supervised Extension Experience in Horticultural Sciences

Fruit, Vegetable, and Medicinal Crops

PLS 3223 - Plant Propagation

PLS 3223L - Plant Propagation Lab

PLS 4653C - Micropropagation of Horticultural Plants

FRC 3252 - Tropical and SubTropical Fruits

FRC 3274 - Tree and Small Fruit Production

HOS 4341 - Advanced Horticultural Physiology

HOS 3222C - Greenhouse & Protected Agriculture

HOS 3281C - Organic and Sustainable Crop Production

HOS 3221C - Commercial Vegetable Production

HOS 4XXXC - Principles of Postharvest Horticulture

HOS 3XXX - The Organic Debate: Organic Agriculture Dev. & Regulations

HOS 3XXX - Viticulture for Table Grapes and Wine

PLS 3XXXC - Hydroponic Systems

HOS 4XXX - Organic Weed Management

Bioinformatics, Mathematics & Statistics

BSC 2891 - Python for Biology

BSC 4434C - Introduction to Bioinformatics

MCB 4325C - R for Functional Genomics

FNR 4461 - Spatial Models & Decision Analysis

MAP 4484 - Modeling in Mathematical Biology course

Microbiology/Plant Pathology

MCB 3020 - Basic Biology of Microorganisms

MCB 3020L - Basic Biology of Microorganisms Lab

PLP 3002C - Fundamentals of Plant Pathology

PLP 3230 - Survey of Plant Pathogens

PLP 4104 - Applied Plant Disease Mgt

PLP 4222C - Introduction to Plant Virology

PLP 4260C - Introduction to Plant Pathogenic Fungi

PLP 4242C - Bacterial Plant Pathogens

PLP 4653 - Basic Fungal Biology

Entomology

ENY 3005 - Principles of Entomology
ENY 3005L - Principles of Entomology Lab
NEM 3002 - Principles of Nematology
ALS 4161 - Exotic Species and Biosecurity Issues
ALS 4162 - Consequences of Biological Invasions
ALS 4163 - Challenges in Plant Resource Protection

Food Science

FOS 3042 - Introductory Food Science
FOS 4722C - Quality Control in Food Systems
FOS 4936 - Cereal Science and Technology
FOS 4936 - Flavor Chemistry and Technology
FOS 4936 - Topics: Technology of Fats & Oils in Food Applications
ANT 3467 - Food and Culture

Genetics

MCB 4304 - Genetics of Microorganisms
MCB 4522 - Molecular Genetics
AGR 4304 - Plant Chromosomes and Genomes
PCB 4553 - Population Genetics

Botany and Ecology

ALS 3153 - Agricultural Ecology
AGG 3501 - Environment, Food and Society
BSC 3307C - Climate Change Biology
PCB 3601C - Plant Ecology
BOT 4621 - Plant Geography

Economics and Agribusiness

AEB 4123 - Agricultural and Natural Resource Law
AEB 4224 - US Food and Agricultural Policy