

BOARD OF HIGHER EDUCATION

REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Academic Affairs

NO: AAC 13-18

COMMITTEE DATE: March 5, 2013

BOARD DATE: March 12, 2013

APPLICATION OF UNIVERSITY OF MASSACHUSETTS AMHERST TO AWARD THE BACHELOR OF SCIENCE IN TURFGRASS SCIENCE AND MANAGEMENT

MOVED: The Board of Higher Education hereby approves the application of **the University of Massachusetts Amherst** to award the **Bachelor of Science in Turfgrass Science and Management**

Upon graduating the first class for these programs, the University shall submit to the Board a status report addressing its success in reaching program goals as stated in the application and in the areas of enrollment, curriculum, faculty resources, and program effectiveness.

Authority: Massachusetts General Laws Chapter 15A, Section 9(b)

Contact: Aundrea Kelley, Deputy Commissioner for P-16 Policy and Collaborative Initiatives

BOARD OF HIGHER EDUCATION
March 2013
University of Massachusetts Amherst
Bachelor of Science in Turfgrass Science & Management

INTENT AND MISSION

The University of Massachusetts Amherst (UMA) has filed an expedited application for the approval of a proposed Bachelor of Science in Turfgrass Science & Management

The UMA College of Natural Sciences plans to merge the agricultural teaching programs in the Plant, Soils and Insect Sciences Department (PSIS) and the Stockbridge School of Agriculture (SSA) to better serve the needs of students today and into the future. Faculty will be assigned to a new agriculturally focused department to be called the Stockbridge School of Agriculture. This restructuring proposal has received unanimous support from the members of the PSIS faculty.

The proposed Turfgrass Science and Management degree addresses the UMA mission of serving the public good in ways that are explicitly dedicated to the three “pillars” of sustainability: economic viability, environmental integrity, and social equity. UMA believes that a baccalaureate degree program will be recognized as a significant contribution to the life and vitality of the Commonwealth.

The proposed Bachelor of Science in Turfgrass Science and Management has obtained all necessary governance approvals on campus and was approved by the University of Massachusetts Board of Trustees on December 12, 2012. The required letter of intent was circulated on August 6, 2012. No comments were received.

NEED AND DEMAND

National and State Labor Market Outlook

UMA finds that Turfgrass Management occurs on over 40 million acres of managed turf areas in the United States with over 775,000 sports fields, 17,000 golf courses, 40,000 landscape contracting companies, and 4500 lawn care operators. Based on a 2006 survey, the economic impact of the golf industry within the Commonwealth of Massachusetts was approximately 2.8 billion dollars with a total impact on jobs generated to be over 29,000. UMA also finds that the recreational and landscape turf grass industries recognize the value of well trained employees who have specialized training in the science, ecology, and business of turfgrass management.

The proposed Turfgrass Science & Management degree program will complement and build upon the current SSA Associate in Science (AS) in Turfgrass Management. UMA noted that the proposed baccalaureate degree program will be a draw for students in the existing AS degree program because it is offered within the same academic unit and articulation will be simple. The proposed reconfiguration will allow students in the AS program to transfer into the proposed BS program. UMA finds that employers in the turfgrass industry have an increased interest in graduates with a BS degree because they exhibit greater maturity and more advanced knowledge.

Student Demand

The existing turfgrass concentration in the baccalaureate PSIS program has had a consistent enrollment of 40-60 students and UMA believes that this enrollment consistency will be reflected in the proposed program. UMA believes that opportunities for growth in turfgrass as a specialty will increase as urbanization and competition for limited green space increases.

Duplication

UMA finds that only two institutions in New England offer a similar baccalaureate program:

- University of Rhode Island – The *Environmental Horticulture and Turfgrass Management* major is a program in the Department of Plant Sciences and Entomology.
- University of Connecticut – The *Turfgrass and Soil Science* major is housed in the Department of Plant Science and Landscape Architecture.

UMA finds these programs to be significantly smaller in student enrollment than the UMA proposed major in Turfgrass Science & Management. In a survey of 27 institutions offering baccalaureate programs conducted in 2005 and 2006, the top five institutions in total student enrollment in Turfgrass Science were the Pennsylvania State University (92), Iowa State University (55), University of Massachusetts (48), Kansas State University (43) and Michigan State University (41). Connecticut graduated fewer than 15 students while Rhode Island graduated fewer than 10.

ACADEMIC AND RELATED MATTERS

Admission

Admission for new freshmen is determined in accordance with the Massachusetts Board of Higher Education minimum standards which emphasize strong academic preparation while in high school. Priority consideration for transfer admission is given to Massachusetts community college graduates who participate in the Joint Admissions or MassTransfer programs.

Program Enrollment Projection

	# of Students Year 1	# of Students Year 2	# of Students Year 3	# of Students Year 4*
New Full Time	20	22	25	30
Continuing Full Time	30	38	45	50
New Part Time				
Continuing Part Time				
Totals	50	60	70	80

Program Effectiveness

Goal	Measurable Objective	Strategy for Achievement	Timetable
Increase student enrolment	Enrollment target of 80 students	Marketing	Year 1-4
Maintain dominance in providing turf grass industries with trained employees	Of all trained employees hired by turf grass industries, 80% will be UMass Turf grass Science & Management graduates	Marketing graduates to industries Maintain a future-focused educational program that addresses industry needs	Year 1-4
Continue to provide individuals for graduate education	Twenty percent of graduates will pursue advanced degrees	Provide greater opportunities for fundamental scientific education and science-based internships	Year 1-4
Develop a specialty regarding sustainable Turf grass management	Twenty percent of graduates employed in sustainable management jobs	New coursework and internship opportunities	Year 2-6

Curriculum (Attachment A)

The proposed degree program is a science-based program with primary emphasis on General Turfgrass Education, Pest Management Education, and Soil Sciences Education. Students in the proposed Turfgrass program will take courses in chemistry, biology, plant physiology, soil sciences, and business management as well as specific turf-related courses in weed science, plant pathology, entomology, and irrigation technology. Degree completion requires a total of 120 credits.

Students who plan on pursuing graduate degrees will be encouraged to choose the *Science* focus, which requires a greater number of basic science courses in chemistry, mathematics, and biology. Undergraduate students who are preparing to be managers of turf facilities will be encouraged choose the *Business* focus, requiring course work in business management, marketing, accounting, and economics.

Field Resources and Internships

An opportunity for education and training is provided by a turf internship (or practicum) at a turf-related facility such as a golf course, sports, or turfgrass maintenance facility. The proposed degree program includes guidelines for the student and for the sponsor-facility supervisor.

RESOURCES AND BUDGET

Fiscal (Attachment B)

The proposed Bachelor of Science in Turfgrass Science and Management is built upon the existing Turfgrass concentration within the current PSIS baccalaureate degree program. Staff, facilities, equipment and library and information technology resources will be reallocated from the PSIS department to the SSA.

Faculty and Administration (Attachment C)

Faculty will be assigned to the proposed program from the existing PSIS major (which will cease to exist). No other administrative changes are planned.

Affiliations and Partnerships

UMA plans an annual survey of representatives of the various turfgrass industries to determine employer perceptions regarding UMass graduates. Annually after graduation, UMA plans to track graduates to determine their success in acquiring employment and completing graduate degree programs. UMA plans to engage businesses known for providing sustainable turfgrass management to help develop and keep current a curriculum that is particularly suited to this sector.

EXTERNAL REVIEW AND INSTITUTIONAL RESPONSE

The proposed Bachelor of Science in Turfgrass Science and Management program was reviewed by Dr. Jack Fry, Professor in the Department of Horticulture, Forestry & Recreation Resources at Kansas State University and Dr. Haibo Liu, Professor of Turfgrass Science and Management at Clemson University.

Both reviewers agreed that the proposed program is well prepared with appropriate degree requirements and a strong faculty for research and teaching. Both reviewers recommended a more detailed turf practicum plan to include a minimum requirement of 3 credits. One reviewer additionally suggested coursework in Spanish proficiency to align with current workforce needs.

Dr. Wesley R. Autio, Director of SSA at UMA, expressed appreciation for the positive reviews and responded that the suggested change to the practicum plan can be easily implemented. The university plans to address the reviewer's concern about Spanish language proficiency by calling on advisors to recommend that students pursue basic Spanish proficiency as part of their career path.

Curriculum Outline (Attachment A)

Core Courses (# Total courses required = 7)		
Course Number	Course Title	Credit Hours
Biological Sciences:		
PLSOILIN 102	Introductory Botany	4
STOCKSCH 105	Introductory Soil Science	4
Ecosystem Studies -- select one of the following courses:		3-4
PLSOILIN 115	Environmental Biology (SI)	3
ENVIRSCI 101	Introduction to Environmental Biology (BS)	3
ENVIRSCI 214	Principles of Environmental Biology	3
NRC 100	Society and Environment (SI)	3
BIOLOGY 287	Introductory Ecology	3
Math, Statistics, and Reasoning:		
Basic math	R1 course (MATH 101/102 or MATH 104)	3-4
Analytical reasoning	R2 course (RES-ECON 211, STATISTICS 111, or STATISTICS 240)	3
Chemistry – select one of the following:		4
CHEM 110	General Chemistry	4
CHEM 111	General Chemistry	4
Junior Writing:		3
STOCKSCH 380	Junior Writing	3
		Sub Total Core Credits
		24-26
Required Courses (# Total courses required = 9)		
Course Number	Course Title	Credit Hours
Turf Courses:		
STOCKSCH 230	Introduction to Turf Management	3
STOCKSCH 275	Turfgrass Physiology and Ecology	3
STOCKSCH 310	Weed Management	3
STOCKSCH 340	Advance Turf Management	3
Plant Physiology:		
PLSOILIN 397P	Introductory Plant Physiology	3
Plant Nutrition (select one):		3-4
STOCKSCH 530	Plant Nutrition	4
STOCKSCH 580	Soil Fertility	3
Pest Management		
PLNTSOIL 505	General Plant Pathology	4
STOCKSCH 107	Turf Insects	2
One of the following:		2-3
PLSOILIN 326	Insect Biology	3
PLSOILIN 397K	Insect Ecology and Management	3
STOCKSCH 101	Insect and Related Forms	2

	Sub Total Required Courses Credits	26-28
Restricted Elective Courses (# Total courses required = 4)		
<i>Course Number</i>	<i>Course Title</i>	<i>Credit Hours</i>
Restricted Electives		12
Students in the Turfgrass Science and Management major must select at least 12 credits from those listed below. Of the 12 credits, 6 must be at or above the 500 level, and no more than 6 can be taken outside the School. Credits taken to satisfy concentration requirements in other areas of the Core and for other Requirements cannot be counted as Restricted Electives.		
BIOLOGY 283	Genetics 3	
ENVIRDES 335	Plants in the Landscape I 4	
ENTOMOL 581	Integrated Pest Management 4	
NRC 232	Principles of Arboriculture 3	
PLSOILIN 385	Introductory Biotechnology Laboratory 4	
PLNTSOIL 510	Management and Ecology of Plant Diseases 3	
PLNTSOIL 535	Diagnostic Plant Pathology 4	
PLNTSOIL 540	Plant Breeding 3	
PLNTSOIL 555	Urban Environment and Plant Growth 3	
PLNTSOIL 590A	Plant Stress Physiology 3	
PLNTSOIL 597A	Phyto-Bioremediation 3	
PLNTSOIL 597G	Plant Biotechnology 3	
PLNTSOIL 597M	Topics in Turf Pathology 2	
STOCKSCH 200	Plant Propagation 3	
STOCKSCH 234	Irrigation and Drainage 2	
STOCKSCH 240	Turf Calculations 2	
STOCKSCH 255	Herbaceous Plants 3	
STOCKSCH 515	Soil Microbiology 4	
STOCKSCH 530	Plant Nutrition 4	
STOCKSCH 550	Plant Growth Regulators 3	
STOCKSCH 560	Advanced Weed Science 3	
STOCKSCH 565	Soil Formation and Classification 4	
STOCKSCH 570	Soil Physics 3	
STOCKSCH 575	Environmental Soil Chemistry 3	
STOCKSCH 580	Soil Fertility 3	
STOCKSCH 585	Inorganic Contaminants in Soil, Water, & Sediment 3	
STOCKSCH 597V	Integrated Turf Management 3	
	Sub Total Restricted Elective Credits	12
Science or Business Courses (# Total courses required = 4-5)		
A focus area is not a formal designation in the University, but students in Turf Sci. & Mgmt. must complete a focus area of either Science or Business within this concentration selection.		
Science Option:		
CHEM 112	General Chemistry II (PS) 4	
MATH 127 or 131	Calculus I 3	
One of the following:		3

CHEM 250	Organic Chemistry	3	
CHEM 261	Organic Chemistry I	3	
BIOCHEM 285	Cell and Molecular Biology	3	
One of the following:			4
BIOLOGY 100	General Biology	4	
BIOLOGY 103	Plant Biology	4	
Business Option:			
MANAGMNT 301	Business Management	3	
One of the following:			3
MANAGMNT 314	Personnel Management	3	
RES-ECON 142	People in Organizations	3	
One of the following:			3
MARKETNG 301	Marketing	3	
RES-ECON 241	Introduction to Food Marketing	3	
STOCKSCH 397M	Marketing for Green Industries	3	
One of the following:			3
RES-ECON 324	Small Business Finance	3	
ACCOUNTG 221	Accounting I	3	
One of the following:			3
RES-ECON 102	Introduction to Resource Economics	3	
ECON 103	Microeconomics	3	
ECON 104	Macroeconomics	3	
Sub Total Science or Business Elective Credits			12-14
Advanced Elective Courses (# Total courses required = 2)			
<i>Course Number</i>	<i>Course Title</i>		<i>Credit Hours</i>
STOCKSCH 500+	Students must select two additional courses at the 500-level or higher including those that have being used to satisfy a previously listed requirement. Courses not from STOCKSCH must be approved by the Academic Adviser.		6-8
Sub Total Advanced Elective Credits			6-8
Distribution of General Education Requirements			# of Credits
Attach List of General Education Offerings (Course Numbers, Titles, and Credits)			
Writing			6
Arts and Humanities, including Literature and Foreign Languages			8
Mathematics and the Natural and Physical Sciences			6
Biological and Physical Sciences			8
Social Sciences			8
Sub Total General Education Credits			36
Curriculum Summary			
Total number of courses required for the degree		30-40	
Total credit hours required for degree		120	
Prerequisite or Other Additional Requirements:			
Note that students must take a minimum of 30 credits from within the Stockbridge School of Agriculture.			

Program Budget (Attachment B)

EXPENDITURE ESTIMATES										
	Year 1 2013		Year 2 2014		Year 3 2015		Year 4 2016		Year 5 2017	
	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources
Personnel Services										
Faculty	\$0	\$145,994	\$0	\$151,104	\$0	\$156,392	\$0	\$161,866	\$0	\$167,531
Administrators	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Support Staff	\$0	\$9,188	\$0	\$9,510	\$0	\$9,842	\$0	\$10,187	\$0	\$10,543
Others <i>Lecturers</i>	\$0	\$14,578	\$0	\$15,015	\$0	\$15,466	\$0	\$15,930	\$0	\$16,408
Fringe Benefits ____%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Personnel	\$0	\$169,760	\$0	\$175,629	\$0	\$181,700	\$0	\$187,983	\$0	\$194,482
Operating Expenses										
Supplies	\$0	\$5,100	\$0	\$5,000	\$0	\$5,000	\$0	\$5,000	\$0	\$5,000
Library Resources	\$0	\$500	\$0	\$400	\$0	\$400	\$0	\$400	\$0	\$400
Marketing/Promotional Expenses	\$0	\$1,000	\$0	\$1,000	\$0	\$1,000	\$0	\$1,000	\$0	\$1,000
Laboratory Expenses	\$0	\$5,200	\$0	\$5,400	\$0	\$5,400	\$0	\$5,400	\$0	\$5,400
General Administrative Overhead	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other (specify)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Operating Expenses	\$0	\$11,800	\$0	\$11,800	\$0	\$11,800	\$0	\$11,800	\$0	\$11,800
Net Student Assistance										
Assistantships	\$0	\$22,137	\$0	\$22,912	\$0	\$23,714	\$0	\$24,544	\$0	\$25,403
Fellowships	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stipends/Scholarships	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Student Assistance	\$0	\$22,137	\$0	\$22,912	\$0	\$23,714	\$0	\$24,544	\$0	\$25,403
Capital										
Facilities / Campus recharges	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Capital	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Expenditures	\$0	\$203,697	\$0	\$210,341	\$0	\$217,214	\$0	\$224,327	\$0	\$231,685
BUDGET SUMMARY OF NEW PROGRAM ONLY						Justification of Financial Projections:				
	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	The expenses and revenues presented in this worksheet are based on an existing B.S. subplan. Expenses and revenues will be similar. It is expected, however, that enhanced visibility and marketing will result in an increase in the number of students enrolled in the program.				
Total of newly generated revenue	\$151,768	\$366,808	\$657,944	\$949,080	\$1,113,884					
Total of additional resources required for program Excess/ (Deficiency)	\$0	\$0	\$0	\$0	\$0					
	\$151,768	\$366,808	\$657,944	\$949,080	\$1,113,884					

REVENUE ESTIMATES

	Year 1 2012		Year 2 2013		Year 3 2014		Year 4 2015		Year 5 2016	
<i>Full-Time Tuition Rate: In-State</i>	\$1,714		\$1,714		\$1,714		\$1,714		\$1,714	
<i>Full-Time Tuition Rate: Out-State</i>	\$9,973		\$9,973		\$9,973		\$9,973		\$9,973	
<i>Mandatory Fees per Student (In-state)</i>	\$10,898		\$10,898		\$10,898		\$10,898		\$10,898	
<i>Mandatory Fees per Student (out-state)</i>	\$15,463		\$15,463		\$15,463		\$15,463		\$15,463	
<i>FTE # of New Students: In-State</i>	8		19		32		45		50	
<i>FTE # of New Students: Out-State</i>	2		5		10		4		19	
<i># of In-State FTE Students transferring in from the institution's existing programs</i>	31		27		21		15		12	
<i># of Out-State FTE Students transferring in from the institution's existing programs</i>	9		9		7		5		4	
	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs
Tuition and Fees										
First Year Students										
Tuition										
In-State	\$13,712	\$0	\$18,854	\$0	\$22,282	\$0	\$22,282	\$0	\$22,282	\$0
Out-of-State	\$19,946	\$0	\$29,919	\$0	\$49,865	\$0	\$49,865	\$0	\$49,865	\$0
Mandatory Fees	\$118,110	\$0	\$166,267	\$0	\$218,989	\$0	\$218,989	\$0	\$218,989	\$0
Second Year Students										
Tuition										
In-State	\$0	\$13,712	\$13,712	\$3,428	\$18,854	\$3,428	\$22,282	\$6,856	\$20,568	\$6,856
Out-of-State	\$0	\$19,946	\$19,946	\$9,973	\$29,919	\$9,973	\$49,865	\$9,973	\$49,865	\$9,973
Mandatory Fees	\$0	\$118,110	\$118,110	\$37,259	\$166,267	\$37,259	\$218,989	\$59,055	\$208,091	\$59,055
Third Year Students										
Tuition										
In-State	\$0	\$18,854	\$0	\$22,282	\$13,712	\$8,570	\$18,854	\$10,284	\$22,282	\$5,142
Out-of-State	\$0	\$29,919	\$0	\$39,892	\$19,946	\$9,973	\$29,919	\$19,946	\$49,865	\$9,973
Mandatory Fees	\$0	\$166,267	\$0	\$203,526	\$118,110	\$69,953	\$166,267	\$96,314	\$218,989	\$48,157
Fourth Year Students										
Tuition										
In-State	\$0	\$18,854	\$0	\$18,854	\$0	\$22,282	\$13,712	\$6,856	\$18,854	\$8,570
Out-of-State	\$0	\$29,919	\$0	\$29,919	\$0	\$39,892	\$19,946	\$9,973	\$29,919	\$19,946
Mandatory Fees	\$0	\$166,267	\$0	\$166,267	\$0	\$203,526	\$118,110	\$59,055	\$166,267	\$85,416
Fifth Year Students										
Tuition										
In-State	\$0	\$1,714	\$0	\$1,714	\$0	\$1,714	\$0	\$1,714	\$1,714	\$0
Out-of-State	\$0	\$9,973	\$0	\$9,973	\$0	\$9,973	\$0	\$9,973	\$9,973	\$0
Mandatory Fees	\$0	\$26,361	\$0	\$26,361	\$0	\$26,361	\$0	\$26,361	\$26,361	\$0
Gross Tuition and Fees	\$151,768	\$619,896	\$366,808	\$569,448	\$657,944	\$442,904	\$949,080	\$316,360	\$1,113,884	\$253,088
Grants	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Contracts	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Campus budget allocation	\$0	\$189,119	\$0	\$195,326	\$0	\$201,748	\$0	\$208,397	\$0	\$215,277
Other Revenues (specify)	\$0	\$14,578	\$0	\$15,015	\$0	\$15,466	\$0	\$15,930	\$0	\$16,408
Total	\$151,768	\$823,593	\$366,808	\$779,789	\$657,944	\$660,118	\$949,080	\$540,687	\$1,113,884	\$484,773

Faculty Form (Attachment C)

Name of faculty member (Name, Degree and Field, Title)	Tenured Y/N	Courses Taught Put (C) to indicate core course. Put (OL) next to any course currently taught online.	# of sections	Division or College of Employment	Full- or Part-time in Program	Full- or part- time in other department or program (Please specify)	Sites where individual will teach program courses
Barker, Allen Ph.D. in Soil Science Professor	Y	<ul style="list-style-type: none"> •Plant Nutrients •Org Farm & Gardeners (OL) •Plant Nutrition •Soil Fertility •Hydroponics 	(1) (5) (1) (1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Bhowmik, Prasanta Ph.D. in Weed Science Professor	Y	<ul style="list-style-type: none"> •Principals Weed Managmnt •Organic Weed Control •Advanced Weed Science 	(1) (1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Childs, Robert M.S. in Entomology Extension Educator	N	<ul style="list-style-type: none"> •Insects & Related Forms •Insects of Ornamentals •Prin. Pesticide Man 	(1) (1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Cox, Douglas Ph.D. in Floriculture Associate Professor	Y	<ul style="list-style-type: none"> •Plant Propagation •Greenhouse Management •Herbaceous Plants 	(1) (1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Craker, Lyle Ph.D. in Agronomy Professor	Y	<ul style="list-style-type: none"> •Herbs/Spice/Med Plant •Technical Writing (C) 	(2) (1)	College of Natural Sciences	Full-time	No	• Main Campus
DaCosta, Michele Ph.D. in Turfgrass Sci. Assistant Professor	Y	<ul style="list-style-type: none"> •Turfgrass Physiology/Ecology (C) •Turf Challenge Preparation •Introductory Plant Physiology •Plant Stress Physiology 	(1) (1) (1) (1)	College of Natural Sciences	Full-time	Yes	• Main Campus
Ebdon, J. Scott Ph.D. in Turfgrass Sci. Associate Professor	Y	<ul style="list-style-type: none"> •Intro to Turfgrass Manag (C) •App Calc in Turfgrass Manag •Advanced Turfgrass Man (C) •Integrated Turf Management •Turf Practicum 	(1) (1) (1) (1) (1)	College of Natural Sciences	Full-time	Yes	• Main Campus
Gerger, John Ph.D. in Olericulture Professor	Y	<ul style="list-style-type: none"> •Botany for Gardeners (OL) •Sustainable Living •Sustainable Agriculture •Writing for Sustain (C) •Project Development in SFF 	(6) (1) (2) (1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Greene, Duane Ph.D. in Horticulture Professor	Y	<ul style="list-style-type: none"> •Deciduous Orchard Science •Small Fruit Production •Plant Growth Regulators 	(1) (1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Griffin, Thomas M.S. in Turf Science Instructor	N	<ul style="list-style-type: none"> •Turf Machinery •Irrigation and Drainage 	(1) (1)	College of Natural Sciences	Full-time	No	• Main Campus
Hashemi, Masoud Ph.D. in Agronomy Ext. Assistant Professor	N	<ul style="list-style-type: none"> •Crop & Soil Management •Pasture Management 	(1) (1)	College of Natural Sciences	Full-time	No	• Main Campus

Herbert, Stephen Ph.D. in Agronomy Professor	Y	<ul style="list-style-type: none"> •Tropical Agriculture •Crop Physiology 	(1) (1)	College of Natural Sciences	Full-time	No	<ul style="list-style-type: none"> • Main Campus
Jung, Geunhwa Ph.D. in Plant Pathology Associate Professor	Y	<ul style="list-style-type: none"> •Horticultural Plant Pathology •Topics in Turf Pathology 	(1) (1)	College of Natural Sciences	Full-time	Yes	<ul style="list-style-type: none"> • Main Campus
Simkins, Stephen Ph.D. in Env. Soils Associate Professor	Y	<ul style="list-style-type: none"> •Introductory Soil Science (C) •Soil Microbiology •Environmental Toxicology •Organic Contaminants Soil 	(1) (1) (1) (1)	College of Natural Sciences	Full-time	No	<ul style="list-style-type: none"> • Main Campus
Spargo, John Ph.D. in Soil Fertility Ext. Assistant Professor	N	<ul style="list-style-type: none"> •Introductory Soil Science (C) 	(1)	College of Natural Sciences	Full-time	No	<ul style="list-style-type: none"> • Main Campus
Vittum, Patricia Ph.D. in Entomology Professor	Y	<ul style="list-style-type: none"> •Turfgrass Insects •Integrated Turf Management 	(1) (1)	College of Natural Sciences	Full-time	Yes	<ul style="list-style-type: none"> • Main Campus
Xing, Baoshan Ph.D. in Env. Soil Chem. Professor	Y	<ul style="list-style-type: none"> •Environmental Soil Chemistry •Inorganic Contaminants Soil •Advanced Soil Chemistry •Environ Impacts Nanomaterials 	(1) (1) (1) (1)	College of Natural Sciences	Full-time	No	<ul style="list-style-type: none"> • Main Campus