THE UNIVERSITY OF ARIZONA

FORM TO REQUEST SUBSTANTIAL CHANGES TO AN EXISTING UNDERGRADUATE MAJOR

A request for substantial changes to an existing program requires approval from the school director/department head (managing administrator), college academic dean, Curricular Affairs, Undergraduate Council (UGC), and College Academic Administrators Council (CAAC). Additional approvals may be required, depending on the requested changes. Complete this form and submit to Martin Marquez (martinmarquez@email.arizona.edu) no later than October 25, 2019 to be considered for inclusion in the 2020-2021 Academic Catalog.

I. Requested by (College & School/Department): Biosystems Engineering Department, Environmental Science Department, and the School of Plant Sciences, College of Agriculture and Life Sciences

II. Proposer's name, title, email and phone number:
Dr. Kitt Farrell-Poe, Head of Biosystems Engineering Department, kittfp@email.arizona.edu, 626-9120
Dr. Jon Chorover, Head of Environmental Science Department, chorover@email.arizona.edu, 621-7228
Dr. Matt Jenks, Director of the School of Plant Sciences, jenksm@email.arizona.edu, 621-1977

III. Degree, major and number of students enrolled in the major. If you have emphases (sub-plans), list the number of students enrolled by emphasis:

Sustainable Plant Systems, 58 majors
Emphasis areas:

Agronomy	**9**
Controlled Environment Agriculture	**22**
Environmental Horticulture	**6**
Fresh Produce Safety	**11**
Undeclared	**10**

IV. Describe proposed changes to the major. Provide a rationale and explanation for making changes to the major and include any relevant supporting data. Are the changes proposed a result of Annual Program Review (APR) and/or a result from the assessment of programmatic outcomes? If you are requesting a name change, please indicate if the subject code (course prefix) will also change. Include requested new prefix code and description.

The Sustainable Plant Systems (SPS) BS degree *Controlled Environment Agriculture* (CEA) emphasis area changes are being proposed in response to recommendations by CEA industry stakeholders, including those who are members of the UA Controlled Environment Agriculture Center Industry Advisory Board. These stakeholders have indicated that graduates need more coursework and hands-on experience with hydroponic systems, plant production, sensors and control systems, and data analytics skills. There is no BS degree option at the UA that is specific to CEA and hydroponics; rather the majority of students interested in this area major in *Sustainable Crop Production Systems* with a CEA subplan or some major in *Agricultural Technology Management* (AGTM) and complete a CEA emphasis. However, in both cases, currently only one CEA-oriented course (PLS 217: *Introduction to Controlled Environment Agriculture and Hydroponics*) is required. While students have an option to take more CEA courses, and many do, there is no requirement for them to do so. Thus, students can currently earn a degree with a CEA emphasis without adequate credentials to successfully compete for employment.

In addition to PLS 217, required courses in the current *Sustainable Plant Systems* CEA emphasis area relate to soil-based systems which are rarely part of this emerging, high tech industry. Therefore, changes are being proposed, in an effort to give all students depth of knowledge in soil-less, hydroponic CEA Systems. The new CEA subplan will be less flexible but rather provide the essential content knowledge and skills needed for working in the industry by requiring 27 units of CEA/hydroponic coursework. In this way, employers can be assured that students completing this emphasis area have solid background knowledge supported by hands-on learning in CEA.

The proposed changes to the CEA emphasis area will require basic computer language, data, and analytical skills; hydroponic crop production principles, and hands-on experience; system design and control systems; food safety; and examination of emerging issues in the CEA industry.

Several existing courses have been modified and new courses have been developed for the CEA emphasis area:

- PLS 217 (3 credit): *Introduction to Hydroponics and Controlled Environment Agriculture* has been re-designed to focus solely on hydroponics and greenhouse/indoor production. This course has been moved to the BE department and starting Fall 2020 will be BE 217R (3 credit): *Introduction to Hydroponics* and BE 217L (1 credit): *Introduction to Hydroponics Laboratory* which will focus on tomato production in a greenhouse setting.
- Building upon BE 217R and L (*Introduction to Hydroponics*), a new course (BE 350R and L *Advanced Hydroponic Crop Production*) will give students more in-depth understanding of topics including: design of fertigation systems; nutrient management of recirculating systems; "reading" the plant and managing systems based on data; organic crop production methods; and hands-on experience cultivating various specialty crops in different types of systems.
- BE 310 (3) *Introduction to Biosystems Analytics* has been developed to build upon students programming and statistics coursework to teach students how to manage, sort, and analyze and interpret data in order to make system-based decisions.
- A new course BE XXX (1 credit): *Emerging Opportunities: Controlled Environment Agriculture* is being developed to familiarize students with emerging businesses and technologies and to examine the larger picture of business development and management.

V. Comparison Chart–complete the chart below using your existing academic advisement report. You may not need to complete all portions. Highlight row(s) indicating the proposed significant changes. You can find course information to help complete the chart below by using the UA course catalog or UAnalytics (Catalog and Schedule Dashboard> "Printable Course Descriptions by Department" On Demand Report; right side of screen). Proposed changes resulting in similar curriculum with other plans (within department, college, or university) may require completion of an additional comparison chart.

	Existing Major Requirements	**Requirements For Modified Major**
Major, emphasis (if applicable) and degree *	UGRD.UAGSC.SPSBS.CEAG Controlled Environment Ag	UGRD.UAGSC.SPSBS.CEAG Controlled Environment Ag
CIP Code –lookup here or contact Martin Marquez for assistance, if needed	01.9999 Agriculture, Agriculture/Operations/and Related Sciences	01.9999 Agriculture, Agriculture/Operations/and Related Sciences
Total units required to complete the degree*	120	120
Upper -division units required to complete the degree	*42*	42
Total CC transfer units that may apply to this degree*	*64*	64
Foundation courses		
Math	Substantial Math Strand	Substantial Math Strand

Second Language	Second Semester Proficiency	Second Semester Proficiency
General Education		
Tier I GE Requirements (150, 160, 170)	2- Tier 1 150 (INDV) 2- Tier 1 160 (TRAD) 0- Tier 1 170 (NATS)	2- Tier 1 150 (INDV) 2- Tier 1 160 (TRAD) 0- Tier 1 170 (NATS)
Tier II GE Requirements (Arts, HUMS, INDV, NATS)	3 units -Tier II Arts 1-Tier II Humanities 1- Tier II Individuals and Societies 0-Tier II Natural Sciences	3 units -Tier II Arts 1-Tier II Humanities 1- Tier II Individuals and Societies 0-Tier II Natural Sciences
Pre-major? (Yes/No)	No	No
List any special requirements to declare or gain admission to this major (completion of specific coursework, minimum GPA, interview, application, etc.)	None	None
Minimum # of units required in the major (units counting towards major units and major GPA)	57	67
Minimum # of upper-division units required in the major (upper division units counting towards major GPA)	33	46 or 47
Minimum # of residency units to be completed in the major	18	18
Required supporting coursework (courses that do not count towards major units and major GPA, but are required for the major). Courses listed must include prefix, number, units, and title. Include any limits/restrictions in place/needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department.	Supporting Coursework: refer to SPSBS Core modification request.	Supporting Coursework: refer to SPSBS Core modification request.
Major requirements. List all major requirements including core and electives. If applicable, list the emphasis^ requirements. Courses listed count towards major units and major GPA. Courses listed must include prefix, number, units, and title. Mark new coursework (New). Include any limits/restrictions in place/needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses being added and are not owned by your department. Recommend ordering requirements in the same order as your advisement report.	Core: refer to the SPS BS Core modification request. ENVS 401 (3) Sustainable Management of Arid Lands & Salt-Affected Soils ENVS 431 (3) Soil Genesis, Morph, & Classification PLS 217 (3) Introduction to Hydroponics & Controlled Environment Agriculture --- Physics, complete 1 of the following:	Core: refer to the SPS BS Core modification request. CSC 250 (3) Essential Computing for the Sciences (New) BE 310 (3) Intro to Biosystems Analytics PLS 235 (3) Introduction to Horticulture BE 217R (3) Introduction to Hydroponics (Lecture) (New) BE 217L (1) Introduction to Hydroponics (Lab)

	ENVS 420 (3) Environmental Physics ENVS 470 (3) Soil Physics --- Complete 15 units from the following BE 120 (3) Basic Computer Skills for Office Applications ENVS 195A (1) Careers in Environmental Science PLS 217 (3) Introduction to Hydroponics & Controlled Environment Agriculture RNR 230L (1) Field Botany Laboratory RNR 230R (2) Field Botany ENVS, PLP, PLS 299 (1 – 3) Independent Study ENTO 300 (3) Insect Pest Management for Desert Cropping Systems PLP 329A (3) Microbial Diversity PLS 340 (3) Introduction to Biotechnology PLS 359 (3) Plant Cell Structure and Function PLS 360 (3) Plant Growth and Physiology ENVS 397S (3) Sustainability Workshop I: Students for Sustainability ENVS, PLP, PLS 399 (1 – 3) Independent Study PLS 405 (3) Weed Science PLS 424L (2) Plant Biotechnology Laboratory	(New) BE 350R (3) Advanced Hydroponic Crop Production Lecture (New) BE 350L (1) Advanced Hydroponic Crop Production Lab BE 479 (3) Applied Instrumentation for CEA BE 483 (3) Controlled Environment Systems PLS 467 (3) Fresh Produce Safety (New) BE 3XX (1) Emerging Opportunities: Controlled Environment Agriculture

	PLS 424R (3) Plant Biotechnology PLP 427R (3) General Mycology PLP 428L (2) Microbial Genetics Laboratory PLP 428R (3) Microbial Genetics AIS 431A (3) Traditional Ecological Knowledge ENTO 436 (3) Agro-ecology ENVS 454 (3) Water Harvesting PLS 480 (3) Medicinal Plants BE 483 (3) Controlled Environment Systems REM 490 (3) Remote Sensing for the Study of Planet Earth PLS 491 (1 – 8) Preceptorship ENVS, PLS 492 (1 – 6) Directed Research ENVS, PLS 493 (1 – 6) Internship ENTO 497C (3) Greenhouse Pest Management: Methods and Practice GEOG 497F (2 – 6) Community and School Garden Workshop ENVS, PLP, PLS 499 (1 – 5) Independent Study ---	
Internship, practicum, applied course requirements. (Yes/No). If yes, provide description.	No	This requirement is intended to expose students to activities directly applicable to commercial

		plant production and management, or to related research. Selected activities must be approved by the Sustainable Plant Systems Academic Advisors.
Senior thesis or senior project required (Yes/No). If yes, provide description.	No	No
Additional requirements (provide description)		
Minor (optional or required)	Optional	Optional

*May require Arizona Board of Regents (ABOR) approval

^Emphases are officially recognized sub-specializations within the discipline. ABOR Policy 2-221 c. Academic Degree Programs Subspecializations requires all undergraduate emphases within a major to share at least 40% curricular commonality across emphases (known as "major core"). Total units required for each emphasis must be equal.

VI. Peer institution comparison- describe how your modified major requirements are similar and different from major requirements of two peer institutions. Select peers from (in order of priority) ABOR approved institutions, AAU members, and/or other relevant institutions recognized in the field.

There are currently no similar *Controlled Environment Agriculture* (CEA) focused programs offered at any of our peer institutions or at any universities or colleges in the state of Arizona. While peer institutions have been investing and growing their CEA undergraduate and graduate programs (e.g. The Ohio State University, University of California Davis, University of Florida, Michigan State University, and Texas A&M), their programs contain only minimal CEA courses and the CEA programs buried in general horticulture degree options. There are, however, no peer institution offering a CEA program or emphasis area similar to that proposed at the University of Arizona. The proposed UA *Sustainable Plant Systems*, *Controlled Environment Agriculture* (CEA) degree was compared with programs at two peer institutions: Michigan State University and Ohio State University.

The Ohio State University *Sustainable Plant Systems*, *Horticulture* emphasis area requires courses in data analysis, plant physiology, horticulture, plant propagation, soil science, entomology, weed science, plant pathology, and pest management. Courses relevant to controlled environment production are limited to optional courses in greenhouse pest management, greenhouse production, advanced greenhouse production, advanced horticultural systems, plant propagation, and crop ecology. They require no courses in controlled systems design, hydroponics, greenhouse instrumentation, or food safety, all features of the UA *Sustainable Plant Systems* CEA emphasis area.

Michigan State University's *Horticulture* BS degree includes a *Horticultural Science* emphasis area. This curriculum requires courses plant genetics, entomology, plant pathology, and greenhouse management. Selectives are available in specialized plant production (nursery management; floriculture; tree fruit, grape, berry, vegetable, landscape, and organic plant production). In addition, selectives are available in irrigation systems, greenhouse systems, crop physiology, crop handling and storage, marketing, and crop genetics.

The proposed UA emphasis area requires courses in data collection and handling (CSC 250 *Essential Computing for the Sciences* and BE 310 *Introduction to Biosystems Analytics*), horticulture (PLS 235 *Introduction to Horticulture*), food safety (PLS 467 *Fresh Produce Safety*), hydroponic plant production systems (BE 217R *Introduction to Hydroponics* and BE 350R *Advanced Hydroponic Crop Production* and accompanying laboratory classes), and various aspects of controlled environment systems development, maintenance, and operation (BE 479 *Applied Instrumentation for Controlled Environment Agriculture*, and BE 483 *Controlled Environment Systems* BE xxx *Emerging Opportunities: Controlled Environment Agriculture*). Both the hydroponics classes combine lecture with hand-on laboratory experiences that are critical to development of career skills.

The Controlled Environment Agriculture Center, Biosystems Engineering Department, and School of Plant Sciences offer unique facilities and expertise within the emphasis area to provide the industry basics to students who want to succeed in the high tech field of CEA and hydroponics. We will be the only program to provide such in-depth treatment in a 4-year

degree-seeking program. Other institutions only offer a handful of CEA courses. The industry looks to the University of Arizona for graduates because of the programs we offer. The industry is looking to us to provide an even more robust program in order to meet their ever-increasing need for highly-skilled employees.

VII. **Faculty impact**– indicate if new faculty hires will be required to deliver the proposed modified/new curriculum.

No new faculty hires will be required to deliver the modified SPS curriculum.

VIII. **Budgetary impact**– indicate new resources needed and source of funding to implement the proposed changes. If reallocating resources, indicate where resources will be taken from and the impact this will have on students/faculty/program/unit.

No new resources will be needed to implement the proposed SPS curriculum modifications.

IX. Required signatures

Managing unit administrator (print name and title): Dr. Kitt Farrell-Poe, Head of Biosystems Engineering Department

Managing administrator's signature: K. L. Farrell-Poe Date: 10/16/19

Managing unit administrator (print name and title): Dr. Jon Chorover, Head of Environmental Science Department

Managing administrator's signature: Jon Chorover Date: 10/16/ 2019

Managing unit administrator (print name and title): Dr. Matt Jenks, Director of the School of Plant Sciences

Managing administrator's signature: Matthew A. Jenks Date: 10/16/2019

Dean (print name): Michael Staten, Associate Dean

Dean's signature: Michael Staten Date: 10/16/2019

Dean (print name): _____

Dean's signature: _____ Date: _____

Note: In some situations, signatures of more than one unit head and/or college dean may be required.

For use by Curricular Affairs:

Committee	Approval date
Academic Programs Subcommittee	
Undergraduate Council	
College Academic Administrators Council	
Arizona Board of Regents (if applicable)	

☐ Notify proposers of approval
☐ Upload proposal documents to relevant UAccess tables
☐ Notify ADVIP team and proposers

If ABOR approval required :
☐ If applicable, create approval memo
☐ Send memo to college/dept and acad_org listserv.
☐ If applicable, create new plan code (secondary too)
☐ If applicable, update emphases
☐ If applicable, add last admit term to prior plan code(s)
☐ Upload proposal docs to relevant UAccess table values
☐ Notify ADVIP team and proposers

Sustainable Plant Systems Major

Department/School	Class	Contact	Date Sent	Response Date
Animal & Comparative Biomedical Sciences	ACBS 411 ACBS 437 ACBS 456 MIC 430	spstock@email.arizona.edu	10/9/2019 11/13/2019	11/14/2019
Agricultural Education	AGTM 200 AGTM 330 AGTM 375 AGTM 350 AGTM 351 ASM 392, 3 ASM 404 ASM 499	rtorres@email.arizona.edu	10/9/2019	10/11/2019
American Indian Studies	AIS 441A	sakiestewa@email.arizona.edu	10/9/2019	10/14/2019
Agricultural & Resource Economics	AREC 239	garyt@ag.arizona.edu	10/9/2019 11/13/2019	11/13/2019
Chemistry & Biochemistry	BIOC 384	sanov@u.arizona.edu	10/9/2019	10/9/2019
Computer Science	CSC 250	proebsting@email.arizona.edu	10/9/2019	10/16/2019
Ecology & Evolutionary Biology	ECOL 414	worobey@email.arizona.edu	10/9/2019 11/13/2019	11/26/2019
Entomology	ENTO 300 ENTO 310 ENTO 468	brucet@ag.arizona.edu	10/9/2019	10/9/2019
School of Geography & Development	GEOG 330	liverman@email.arizona.edu	10/9/2019	10/10/2019
Landscape & Architecture Planning	LAR 350 LAR 420 LAR 423 PLG 408 SBE 201	ljohnson@email.arizona.edu	10/9/2019	10/10/2019
School of Natural Resources & the Environment	RNR 310 RNR 400 RNR 403 RNR417 RNR 483	squirrel@ag.arizona.edu	10/9/2019	10/9/2019

THE UNIVERSITY OF ARIZONA.

Trent Patrick Rodriguez <trentrodriguez@email.arizona.edu>

Use of ACBS course in the B.S. Sustainable Plant Systems curriculum

8 messages

Trent Patrick Rodriguez <trentrodriguez@email.arizona.edu> Wed, Oct 9, 2019 at 10:09 AM
To: environmentalscience@email.arizona.edu

spstock@email.arizona.edu
Dear Dr. Stock,

The Department of Environmental Science is proposing significant changes to the Sustainable Plant Systems BS program. We would like to include one or more courses offered by your academic unit as subplan selectives and a subplan requirement in the major. Currently, there are 48 majors in the program, so the enrollment will not be significant. As part of the approval process we need to include a memorandum of support from you. We would be grateful if you would please review the attached information and sign the attached memorandum if you can. An electronic signature is fine. If you have any questions or concerns about our request, please let me know.

Once you have signed the memorandum, please return to me by email.

Sincerely,

Jon Chorover

Professor and Head

Department of Environmental Science

University of Arizona

Tucson, AZ 85721-0038

Phone: (520) 621-1646

Fax: (520) 621-1647

Email: chorover@email.arizona.edu

ACBS major selective request 10.4.2019.docx
24K

Environmental Science <EnvironmentalScience@email.arizona.edu> Wed, Oct 9, 2019 at 10:30 AM
To: "Stock, S. Patricia - (spstock)" <spstock@email.arizona.edu>

Dear Dr. Stock,

The Department of Environmental Science is proposing significant changes to the Sustainable Plant Systems BS program. We would like to include one or more courses offered by your academic unit as subplan selectives and a subplan requirement in the major. Currently, there are 48 majors in the program, so the enrollment will not be significant. As part of the approval process we need to include a memorandum of support from you. We would be grateful if you would please review the attached information and sign the attached memorandum if you can. An electronic signature is fine. If you have any questions or concerns about our request, please let me know.

Once you have signed the memorandum, please return to me by email.

Sincerely,

Jon Chorover
Professor and Head
Department of Environmental Science
University of Arizona
Tucson, AZ 85721-0038
Phone: (520) 621-1646
Fax: (520) 621-1647
Email: chorover@email.arizona.edu<mailto:chorover@email.arizona.edu>

ACBS major selective request 10.4.2019.docx
24K

Landeen, Kathleen A - (klandeen) <klandeen@email.arizona.edu> Wed, Nov 13, 2019 at 10:16 AM
To: "Stock, S. Patricia - (spstock)" <spstock@email.arizona.edu>
Cc: "Rodriguez, Trent Patrick - (trentrodriguez)" <trentrodriguez@email.arizona.edu>

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ACBS major selective request 10.4.2019.docx
24K

Stock, S. Patricia - (spstock) <spstock@email.arizona.edu> Wed, Nov 13, 2019 at 2:48 PM
To: "Landeen, Kathleen A - (klandeen)" <klandeen@email.arizona.edu>
Cc: "Rodriguez, Trent Patrick - (trentrodriguez)" <trentrodriguez@email.arizona.edu>

Dear Kathleen:
We can allow the listing of these courses but with some limitations. Please see below:

ACBS 411 Agriculture, Environmental and Legal Issues; subplan option - Can be used but this will be reserved for all ACBS students first

ACBS 437 Food Safety Laws and Legal Policies; subplan option Can be used but this will be reserved for all ACBS students first

ACBS 456 Aquaculture; subplan option- Can be used but this will be reserved for all ACBS students first

MIC 430 Micro & Food; subplan requirement- This is in Food Safety Core and would like to reserve this for our students, being only available if our cap enrollment is not met.

If this still works for you, I am OK with signing the form. Just let me know.

Cheers,

Dr. S. Patricia Stock
Director and Professor, School of Animal and Comparative Biomedical Sciences
Weiler Endowed Chair for Excellence in Agriculture and Life Sciences
The University of Arizona
1117 E. Lowell St. P.O. Box 210090 Tucson, AZ 85721
Office: +1-520-621-0868 Fax:+1- 520-626-5602
e-mail: spstock@email.arizona.edu
URL: https://acbs.cals.arizona.edu/people/s-patricia-stock

Additional Appointments:
Professor, Department of Entomology
Professor, Honors College

Lab address: Marley Bldg. Room 718/720/724
1145 E. 4th Street, Tucson AZ 85721
Lab Phone (+1-520) 621-1317

_____
From: Landeen, Kathleen A - (klandeen) <klandeen@email.arizona.edu>
Sent: Wednesday, November 13, 2019 10:16 AM
To: Stock, S. Patricia - (spstock) <spstock@email.arizona.edu>
Cc: Rodriguez, Trent Patrick - (trentrodriguez) <trentrodriguez@email.arizona.edu>
Subject: Use of ACBS course in the B.S. Sustainable Plant Systems curriculum
[Quoted text hidden]

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Landeen, Kathleen A - (klandeen) <klandeen@email.arizona.edu> Thu, Nov 14, 2019 at 9:11 AM
To: "Stock, S. Patricia - (spstock)" <spstock@email.arizona.edu>
Cc: "Rodriguez, Trent Patrick - (trentrodriguez)" <trentrodriguez@email.arizona.edu>, "Walworth, Jim - (jlw1)" <Walworth@ag.arizona.edu>

Good morning:

The limitations you described are reasonable. Thank you for allowing SPS students to use ACBS courses as allowed by seat availability. We look forward to receiving you signed form and will include a copy of this thread with the MEMO.

Kathleen Landeen

From: Stock, S. Patricia - (spstock) <spstock@email.arizona.edu>
Sent: Wednesday, November 13, 2019 2:48 PM
To: Landeen, Kathleen A - (klandeen) <klandeen@email.arizona.edu>
Cc: Rodriguez, Trent Patrick - (trentrodriguez) <trentrodriguez@email.arizona.edu>
Subject: Re: Use of ACBS course in the B.S. Sustainable Plant Systems curriculum

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MIC 430 Micro & Food; subplan requirement- This is in Food Safety Core and would like to reserve this for our students, being only available if our cap enrollment is not met.

If this still works for you, I am OK with signing the form. Just let me know.

Cheers,

_____
Dr. S. Patricia Stock
Director and Professor, School of Animal and Comparative Biomedical Sciences
Weiler Endowed Chair for Excellence in Agriculture and Life Sciences

The University of Arizona
1117 E. Lowell St. P.O. Box 210090 Tucson, AZ 85721
Office: +1-520-621-0868 Fax:+1- 520-626-5602
e-mail: spstock@email.arizona.edu<mailto:spstock@email.arizona.edu>
URL: https://acbs.cals.arizona.edu/people/s-patricia-stock

Additional Appointments:
Professor, Department of Entomology
Professor, Honors College

Lab address: Marley Bldg. Room 718/720/724
1145 E. 4th Street, Tucson AZ 85721
Lab Phone (+1-520) 621-1317

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Sent: Wednesday, November 13, 2019 10:16 AM
To: Stock, S. Patricia - (spstock) <spstock@email.arizona.edu<mailto:spstock@email.arizona.edu>>
Cc: Rodriguez, Trent Patrick - (trentrodriguez) <trentrodriguez@email.arizona.edu<mailto:trentrodriguez@email.arizona.edu>>
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Stock, S. Patricia - (spstock) <spstock@email.arizona.edu> Thu, Nov 14, 2019 at 11:01 AM
To: "Landeen, Kathleen A - (klandeen)" <klandeen@email.arizona.edu>
Cc: "Rodriguez, Trent Patrick - (trentrodriguez)" <trentrodriguez@email.arizona.edu>, "Walworth, Jim - (jlw1)" <Walworth@ag.arizona.edu>

Kathleen: please find attached signed memo.
Cheers,

Patricia

_____

Dr. S. Patricia Stock
Director and Professor, School of Animal and Comparative Biomedical Sciences
Weiler Endowed Chair for Excellence in Agriculture and Life Sciences
The University of Arizona
1117 E. Lowell St. P.O. Box 210090 Tucson, AZ 85721
Office: +1-520-621-0868 Fax:+1- 520-626-5602
e-mail: spstock@email.arizona.edu
URL: https://acbs.cals.arizona.edu/people/s-patricia-stock

Additional Appointments:
Professor, Department of Entomology
Professor, Honors College

Lab address: Marley Bldg. Room 718/720/724
1145 E. 4th Street, Tucson AZ 85721
Lab Phone (+1-520) 621-1317

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From: Landeen, Kathleen A - (klandeen) <klandeen@email.arizona.edu>
Sent: Thursday, November 14, 2019 9:11 AM
To: Stock, S. Patricia - (spstock) <spstock@email.arizona.edu>
Cc: Rodriguez, Trent Patrick - (trentrodriguez) <trentrodriguez@email.arizona.edu>; Walworth, Jim - (jlw1) <Walworth@ag.arizona.edu>
Subject: RE: Use of ACBS course in the B.S. Sustainable Plant Systems curriculum

THE UNIVERSITY OF
ARIZONA®
TUCSON ARIZONA

Department of Environmental Science

428 Shantz Building, #38
1200 E. South Campus Drive
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1606
FAX: (520) 621-1647
swes.cals.arizona.edu

MEMO

DATE: **October 4, 2019**

TO: **S. Patricia Stock, Professor and Director, Animal & Comparative Biomedical Sciences**

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of ACBS course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS, as specified below:

ACBS 411 Agriculture, Environmental and Legal Issues; subplan option
ACBS 437 Food Safety Laws and Legal Policies; subplan option
ACBS 456 Aquaculture; subplan option
MIC 430 Micro & Food; subplan requirement

Managing Administrator: Patricia Stock, Ph.D.

Managing Administrator's Signature: _____ Date:_____

Department of Environmental Science

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

428 Shantz Building, #38
1200 E. South Campus Drive
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1606
FAX (520) 621-1647
swes.cals.arizona.edu

MEMO

DATE: October 4, 2019

TO: Robert Torres, Professor and Head, Agricultural Education

FROM: Jon Chorover, Professor and Head, Environmental Science

RE: Use of AED course in the B.S. Sustainable Plant Systems curriculum

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

AGTM 200 Solar Photovoltaic Energy Systems with Applications to Agriculture; subplan option
AGTM 330 Turf and Landscape Technology; subplan option
AGTM 375 Agriculture Law; subplan option
AGTM 350 Applications in Agricultural Mechanics; subplan option
AGTM 351 Operations in Agricultural Mechanics; subplan option
ASM 392,393, 399, 492, 493, 498H, 499 Experiential Learning; core option
ASM 404 Irrigation Principles and Management (Yuma); core option
ASM 499 Independent Study; core requirement

Managing Administrator: Robert Torres, Professor and Head, AED

Managing Administrator's Signature: Robert Torres Date: 10/11/19

Department of Environmental Science

THE UNIVERSITY OF
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TUCSON ARIZONA

428 Shantz Building, #38
1200 E. South Campus Drive
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1606
FAX: (520) 621-1647
swes.cals.arizona.edu

MEMO

DATE: **October 4, 2019**

TO: **Matthew Sakiestewa Gilbert, Professor and Head, American Indian Studies**

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of AIS course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

AIS 441A Natural Resource Management in Native Communities; subplan option

Managing Administrator: Matthew Sakiestewa Gilbert, Professor and Head, American Indian Studies

Managing Administrator's Signature: _____ Date: 10/10/2019

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MEMO

DATE: **October 4, 2019**

TO: **Gary Thompson, Professor and Department Head, Agricultural & Resource Economics**

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of AREC course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

AREC 239 Introduction to Statistics and Data Analysis; core option

Managing Administrator: Gary Thompson, Professor and Department Head, Agricultural & Resource Economics

Managing Administrator's Signature: _____ Date: 11-13-19

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MEMO

DATE: **October 4, 2019**

TO: **Andrei Sanov, Professor and Head, Chemistry & Biochemistry**

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of BIOC course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

BIOC 384 Foundations in Biochemistry; subplan option

Managing Administrator: Andrei Sanov, Professor and Head, Chemistry & Biochemistry

Managing Administrator's Signature: A. Sanov Date: 10/9/2019

THE UNIVERSITY OF ARIZONA.

Trent Patrick Rodriguez <trentrodriguez@email.arizona.edu>

Use of CSC course in the B.S. Sustainable Plant Systems curriculum

4 messages

Trent Patrick Rodriguez <trentrodriguez@email.arizona.edu> Wed, Oct 9, 2019 at 10:16 AM
To: environmentalscience@email.arizona.edu

proebsting@email.arizona.edu
Dear Dr. Proebsting,

The Department of Environmental Science is proposing significant changes to the Sustainable Plant Systems BS program. We would like to include one or more courses offered by your academic unit as a requirement in the major. Currently, there are 48 majors in the program, so the enrollment will not be significant. As part of the approval process we need to include a memorandum of support from you. We would be grateful if you would please review the attached information and sign the attached memorandum if you can. An electronic signature is fine. If you have any questions or concerns about our request, please let me know.

Once you have signed the memorandum, please return to me by email.

Sincerely,

Jon Chorover

Professor and Head

Department of Environmental Science

University of Arizona

Tucson, AZ 85721-0038

Phone: (520) 621-1646

Fax: (520) 621-1647

Email: chorover@email.arizona.edu

CSC major selective request 10.4.2019.docx
24K

Trent Patrick Rodriguez <trentrodriguez@email.arizona.edu> Wed, Oct 9, 2019 at 10:44 AM
To: environmentalscience@email.arizona.edu

[Quoted text hidden]

CSC major selective request 10.4.2019.docx
24K

Environmental Science <EnvironmentalScience@email.arizona.edu> Wed, Oct 9, 2019 at 10:48 AM
To: "Proebsting, Todd A - (proebsting)" <proebsting@email.arizona.edu>

Dear Dr. Proebsting,

The Department of Environmental Science is proposing significant changes to the Sustainable Plant Systems BS program. We would like to include one or more courses offered by your academic unit as a requirement in the major. Currently, there are 48 majors in the program, so the enrollment will not be significant. As part of the approval process we need to include a memorandum of support from you. We would be grateful if you would please review the attached information and sign the attached memorandum if you can. An electronic signature is fine. If you have any questions or concerns about our request, please let me know.

Once you have signed the memorandum, please return to me by email.

Sincerely,

Jon Chorover
Professor and Head
Department of Environmental Science
University of Arizona
Tucson, AZ 85721-0038
Phone: (520) 621-1646
Fax: (520) 621-1647
Email: chorover@email.arizona.edu<mailto:chorover@email.arizona.edu>

CSC major selective request 10.4.2019.docx
24K

Environmental Science <EnvironmentalScience@email.arizona.edu> Wed, Nov 13, 2019 at 10:08 AM
To: "Rodriguez, Trent Patrick - (trentrodriguez)" <trentrodriguez@email.arizona.edu>

From: Todd Proebsting <proebsting@cs.arizona.edu>
Sent: Wednesday, October 16, 2019 11:15 AM
To: Environmental Science <EnvironmentalScience@email.arizona.edu>
Subject: Re: Use of CSC course in the B.S. Sustainable Plant Systems curriculum

Jon,
We can certainly handle more students in CSC 250. We should note that Computer Science is very likely to revisit the content of 250 in the next year or two to better serve our constituents. Are you OK with that uncertainty?

Cheers,
Todd
[Quoted text hidden]

winmail.dat
15K

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MEMO

DATE: **October 4, 2019**

TO: **Michael Worobey, Professor and Head, Ecology & Evolutionary Biology**

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of ECOL course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

ECOL 414 Plants of the Desert; subplan option

Managing Administrator: Michael Worobey, Professor and Head, EEB

Managing Administrator's Signature: _____ Date: 11/26/2019

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MEMO

DATE: **October 9, 2019**

TO: **Jon Chorover, Professor and Head, Environmental Science**

FROM: **Bruce Tabashnik, Regents' Professor and Head, Entomology**

RE: **Use of ENTO courses in the B.S. Sustainable Plant Systems curriculum**

We approve the courses for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

ENTO 300 Insect Pest Management for Desert Cropping Systems; core option
ENTO 468 Integrated Pest Management; core option
ENTO 310 Living in Symbiosis; subplan option

Managing Administrator: Bruce Tabashnik, Regents' Professor and Head, Entomology

Managing Administrator's Signature:  Date: 10-9-19

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MEMO

DATE: **October 4, 2019**

TO: **Diana Liverman, Director & Regents' Professor,**
School of Geography and Development

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of GEOG course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

GEOG 330 Introduction to Remote Sensing; subplan option

Managing Administrator: Diana Liverman, Director & Regents' Professor, SGD

Diana Liverman

October 10, 2019

Managing Administrator's Signature: _____ Date:_____

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MEMO

DATE: **October 4, 2019**

TO: **Lauri Johnson, Professor and Director, Landscape Architecture & Planning**

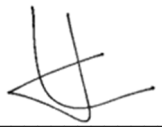
FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of LAR course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

LAR 350 Parks and Urban Public Spaces; subplan option
LAR 420 Plant Materials; subplan requirement
LAR 423 Landscape Ecology; subplan option
PLG 408 Planning for Urban Resilience; subplan option
SBE 201 Sustainable Design and Planning; subplan option

Managing Administrator: Lauri Johnson, Professor and Director, Landscape Architecture & Planning

Managing Administrator's Signature:  Date: 10/10/2019

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MEMO

DATE: **October 4, 2019**

TO: **John Koprowski, Professor and Director,**
School of Natural Resources and the Environment

FROM: **Jon Chorover, Professor and Head, Environmental Science**

RE: **Use of RNR course in the B.S. Sustainable Plant Systems curriculum**

We approve the course(s) for use in the undergraduate curriculum for the **Sustainable Plant Systems** degree, SPSBS as specified below:

RNR 310 Agave, Cacti, and Other Succulents of Southern Arizona; subplan option
RNR 400 Noxious Invasive Plants of Arizona; subplan option
RNR 403 Applications of Geographic Information Systems; subplan option
RNR 417 Geographic Information Systems for Natural and Social Sciences; subplan option
RNR 483 Geographic Applications of Remote Sensing; subplan option

Managing Administrator: John Koprowski, Professor and Director, SNRE

Managing Administrator's Signature:  Date: 9 October 2019