

A cross-college major in *Environment and Sustainability*.

**Proposed changes to the
major in *Environmental and Sustainability Sciences* in CALS
to make it a cross-college major open to students in both CALS and A&S,
and
to broaden the scope of the major to include Humanities while retaining the current
science-focused concentrations,
and
to rename the major to reflect that broadening**

Prepared for the Curriculum Committee of the College of Agriculture and Life Sciences
and
for the Educational Policy Committee of the College of Arts and Sciences

14 November 2016

This document is organized as follows:

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Section I: Background and Rationale for Proposed Changes

Rationale: Sustainability, the envisioning and implementation of long-lasting solutions to the earth's environmental problems, requires an integrated understanding of natural sciences, humanities, and social sciences. The success of approaches to the maintenance of biodiversity, sustainable agriculture, renewable energy and the application of policy analyses depend on understanding both patterns and processes in natural and managed social-ecological systems as well as the stories different cultures tell themselves about environment and climate; on the way in which they have been affected by histories; on dominant ethical frameworks; on political will; on economic frameworks; on their assumptions about human and natural agency.

The goal of this major is to provide students with a basis for understanding the earth's environment, its structure and functioning, how humans value, use, benefit from, and protect it, and how we can do so sustainably. Students with the full range of disciplinary interests will receive foundational training in environmental natural sciences, social sciences and humanities and how these disciplines intersect. They will then focus in one of six concentrations including (1) Land, Air and Water Resources, (2) Environmental Biology and Applied Ecology, (3) Environmental Humanities, (4) Environmental Economics, (5) Environmental Policy and Governance, and (6) an Individual Student-Designed concentration. Finally, students will come back together in their senior year to discuss, debate and conceptualize the challenges of environmental sustainability. A student well trained to understand and appreciate this complex topic, critical to ourselves and our planet, will be well positioned to pursue a productive life and an influential career in the world in which we live.

Expanding the existing major: The current major in Environmental and Sustainability Sciences (CALSA&S) has developed in just a few years into a highly successful program of study for CALS students wishing to learn about natural and constructed environments and how we affect and manage them. The revised major described here would make it possible for students in the College of Arts and Sciences to obtain a degree focused on environment and sustainability, topics relevant to students within both colleges. Departmental and interdisciplinary expertise in both colleges have much to contribute and learn from effective interaction and collaboration. To that effect, this proposal would not only open the major to A&S students, but expand its scope by adding to the existing ESS concentrations the possibility for students in both colleges to concentrate in environmental humanities. The major will foster cross-college collaboration among faculty co-teaching courses and engaged in ongoing discussions of the objectives of the major. This has great potential to provide students with opportunities to participate in collaborative research with faculty from both colleges.

History of this proposal: This proposal is presented by a cross-college committee of faculty created by the Deans of CALS and A&S. The committee (made up of 5 faculty members and 2 undergraduates, one a CALSA&S major, the other an A&S Government major) is a continuation of the A&S-CALS committee for "Interdisciplinary Curricula in Environmental Studies and Environmental Sciences" whose membership consisted of 3 A&S faculty from the humanities, 3 CALS faculty from social sciences, and 2 A&S faculty from a CALSA&S cross-college department in the environmental natural sciences. All committee members were ESS faculty advisors during the period that the committee met, and 4 concurrently served on the CALSA&S

Curriculum Committee. Prior to the deliberations of these two consecutive committees, an earlier committee met in 2014 to explore the creation of an Environmental Studies major within A&S, but ultimately recommended against that idea in favor of a cross-college major that would both avoid having redundant majors in two colleges while at the same time fostering cross-college collaboration on a broad topic critical to students in both CALS and A&S. The current proposal is presented after considerable commentary and feedback from faculty participating in the current CALS ESS major and/or A&S or CALS faculty interested in participating in this revised cross-college ES major.

Section II: Overview of the Structure of the Existing CALS Major in Environmental and Sustainability Sciences

The existing ESS major is structured so that students take a common core of 18 courses (57-64 credits) that include integrative and immersive courses at the intersection of social and natural sciences, as well as disciplinary training in the natural sciences, the social sciences and economics, and quantitative approaches. This core also includes one upper-level course from each of three areas: biology, chemistry/physics, and social science or humanities. This is followed by an additional 5 courses (15-20 credits) within one of five concentrations in either the natural or social sciences (or an advisor-guided, student-designed concentration). The total requirement for the major amounts to 23 courses (72-84 credits).

Section III: Proposed Revised Structure necessary to open the ESS major to A&S Students and Overview of the Most Significant Changes

Because of differences between CALS and A&S in the number of required courses for a major, some adjustment to the current CALS ESS major is necessary for it to fit within A&S limits. A&S stipulates that no major may require more than 60 credits (or a maximum of 70 if no more than 40 are in any single department): this is below the current ESS requirement of 72-84 credits (see above). In practice, most science-based majors in A&S fall close to the 60 credit limit and some majors in the humanities fall closer to 40 credits. To accommodate this difference while minimizing changes to the existing ESS program, especially within the existing concentrations, the structure proposed here, moves many of the courses currently in the “core” that all students in the major take, into the individual concentrations which now have up to 9 courses. This makes it possible for the concentrations focused on natural sciences or economics (for example) to retain nearly all of their coverage, while accommodating a new concentration in Environmental Humanities that more closely parallels the number of required courses in other humanities majors (though still at the upper end of that number).

In this revised structure (*see Table on last page*), the common core is comprised of 10 courses (30-34 credits) that include 4 integrative and immersive courses (these include an even more integrative introductory course, an expanded interdisciplinary colloquium, an expanded field/engaged learning course or experience, and a capstone course or practicum that would expand on or substitute for the current CALS ESS Sustainability course, but draw on many of its excellent aspects: probably more than one such offering will be required, given the likely size of the major), as well as one course each of disciplinary training in environmental biology, physics

(possibly chemistry to be added as option), and humanities, and two social sciences, plus a statistics course. The number of courses in the concentrations is increased to between 6 and 9 courses (19-37 credits), for a total requirement for the major of 16-19 courses (48-70 credits).

All five concentrations in the current CALS ESS major (listed above in “Goal of this Major”) are retained, while a new concentration in Environmental Humanities is added. Guidelines for proposing and approving additional concentrations are laid out in the founding CALS ESS document and can be followed by this major or modified as necessary.

To ensure unfettered access by students in both A&S and CALS to all courses that count toward this major, these courses will have their own ES prefix and number, or will be cross-listed using this prefix. Any course taken with an ES prefix will count as an A&S course (for A&S students) or a CALS course (for CALS students), eliminating issues of course accessibility.

A research-based Honors Program will be put in place and administered by the ES Curriculum Committee (committee described below).

Section IV: Renaming the major.

There has been much discussion of what the name of this expanded cross-college major should be. The report of the committee on “Interdisciplinary Curricula in Environmental Studies and Environmental Sciences” proposed “*Environment and Sustainability*.” That name garnered considerable support from faculty and students engaged in the current CALS ESS major, but also generated marked concern from a subset who felt that “science” needed to be included in the name to signal to prospective students and to potential employers that the major includes concentrations focused in the sciences. Adding just sciences to the name, however, creates a false impression about the content of the major since it leaves out the humanities. As a result, the follow-on committee, which is submitting this proposal, first proposed “*Environmental Studies and Sciences*” as the name. That name, however, also met with resistance since it omits “sustainability” and some felt it was awkward. When asked, faculty suggested 17 different names. For this document, we have adopted “*Environment and Sustainability*” as the provisional name of this major, but should the major be approved by both colleges and by the university, we will poll the faculty again to settle on a final name.

Section V: Overview of Proposed Administration of the cross-college major

The major in Environment and Sustainability will be managed by a faculty Director of Undergraduate Studies, who chairs a Curriculum Committee comprised of faculty engaged in advising and/or teaching in the major. This committee will presumably be chosen by a procedure similar to that of the current CALS ESS major, with representation from each of the concentrations plus several “at large” members. All decisions about the structure of the major, courses that fulfill requirements of the major, the addition of concentrations to the major, and other matters of consequence to the major will come before the Curriculum Committee.

To accommodate an expected substantial increase in the number of students in the major, the Office of the ES Major will be staffed by a minimum of two full time non-faculty employees who report to the DUS. They will manage all matters of routine administration of the major including (but not limited to) serving as the point of first contact for students with questions

about the major, assigning students to faculty advisors, advising the DUS and Curriculum Committee on any course staffing challenges, organizing group meetings of students and faculty, and guiding student majors toward research opportunities with faculty.

The ES Major does not share a name with any single department. Some departments will likely be deeply engaged in the major, such as the Department of Natural Resources, which has a particularly strong investment in the current CALS ESS major that will presumably continue. Other departments may only have a single faculty member engaged in the major through team-teaching. To ensure that the courses necessary to fulfill requirements are offered on a schedule that permits students to complete the major as seamlessly as possible, a Memorandum of Understanding (MOU) will be agreed to and signed by the Chairs of all departments in which these courses are offered. The MOU will commit departments to offering required courses on the necessary schedule. With guidance from the CALS and A&S Deans, adequate credit will be given to faculty teaching within the ES major.

Table with Proposed Course Requirements of the Major on Next Page

Subjects	Courses	Credits	Comments
CORE – all students take:			
<u>Introductory Course</u>			
Interdisciplinary Introduction	1	3	Existing ESS course expanded to integrate humanities, social sciences and natural sciences considerations of environment and sustainability. Team taught by faculty from distinct disciplines.
<u>Disciplinary Training</u>			
Environmental Biology	1	3	Choose 1 of 3 approved courses in Ecology & Environment (<i>recommended</i>), <u>or</u> Evolution & Diversity, <u>or</u> DNA Genes & Genetic Diversity
Environmental Physics	1	3-4	Choose 1 of 3 approved courses in Environmental Physics (<i>recommended</i>), <u>or</u> General Physics, <u>or</u> Fundamentals of Physics [Awaiting development of intro environmental chemistry course]
Environmental Humanities	1	3-4	Choose 1 of 5 courses in Ecological Anthropology, <u>or</u> Ethics and Environment (2 possibilities), <u>or</u> Environmental Literature, <u>or</u> Environmental History
Environmental Social Sciences	2	6-7	(1) Society and Natural Resources, <u>and</u> (2) Economics of Environment and Natural Resources, <u>or</u> Environmental and Natural Resources (latter has pre req.)
Statistics	1	3	Introductory Statistics (2 courses with same name), <u>or</u> Statistical Theory and Application in the Real World, <u>or</u> Biological Statistics, <u>or</u> Introductory Statistics for Biology.
<u>Integrative and Engaged Learning</u>			
Colloquium	1	2	Speakers from the diversity of environment and sustainability disciplines with opportunity for in depth discussion by students.
Field or Engaged course	1	4	Field Biology (<i>recommended</i>) or an ecosystem-based course with field labs \geq half of course time, <u>or</u> Environmental Policy and Process, <u>or</u> an international community engaged environmental course, <u>or</u> other
Senior-year Capstone course or practicum	1	3	Several possibilities exist: expand on, or substitute for, the current CALS ESS Sustainability course while drawing on many of its excellent aspects. Probably more than one such offering will be required, given the likely size of the major.
Core total		10	30-34
CONCENTRATIONS – students take one			
6 Concentrations	6-9	18-37	Students concentrate in one of six areas each with its own requirements and electives determined by the participating faculty. Concentrations are (1) Land, Air and Water Resources, (2) Environmental Biology and Applied Ecology, (3) Environmental Economics, (4) Environmental Humanities, (5) Environmental Policy and Governance, (6) Individual Student Designed concentration.
Totals for Major		16-19	48-70