

Issues raised & responses by second committee to consider a cross-college environment major

- Comment: Keep science in the name of the major.
Response: We now suggest to name the major "*Environmental Studies and Sciences*"
Discussion: Some students and faculty in current ESS major (Environmental and Sustainability Science) felt strongly that "science" needs to remain in the name of the major to make clear to both prospective students and to future employers that there are science concentrations within this new/revised major. Based on previous experience with SUNY, we must separate "Environment" from "Science". Hopefully this name will satisfy that need. Incidentally, another benefit of this name is that the abbreviation for the major remains ESS.
- Comment: Consider two parallel majors.
Response: We continue to support the value of expanding the current ESS major into A&S
Discussion: Attached is a consideration of the pros and cons of different models for bringing an environment major to both CALS and A&S. In the end this committee, though acknowledging some of the challenges that a single cross-college major entails, reaffirmed the recommendation for adopting this approach.
- Comment: The lack of comparable credit hours in the different concentrations creates unevenness
Response: Keep the credit requirements within concentrations as proposed in the Goodale Report.
Discussion: Part of the challenge of embracing diverse disciplines, each of which brings something important and different to an interdisciplinary major such as that envisioned, is the necessity of recognizing and respecting different traditions and ways of thinking and educating. Credit requirements is just one very small example. Both CALS and A&S have strong traditions of excellence and rigor worthy of being respected. It is very unlikely that students interested in a particular aspect of the environment will take a concentration different from that interest simply to avoid taking two courses. In the end all Cornell students must take 120 credit hours, and essentially all are concerned about having a transcript that represents rigorous training.
- Comment: Statistics is generally a more useful course for quantitative training than calculus. Make statistics a requirement and let concentrations where calculus is essential require or recommend it.
Response: The quantitative requirement in "Disciplinary Training" is now a course in statistics. Any of several different courses can satisfy this requirement.
Discussion: We received this comment from a wide diversity of commenters. All students in an environment major will need statistics, while only some in more quantitative concentrations will need calculus, so it makes sense to let the concentrations decide that.
- Comment: There continued to be strong opinions about the idea of requiring one or two Social Sciences courses within Disciplinary Training, with the primary point of discussion being whether Environmental Economics should be required
Response: We proposed that there be a two course requirement in Social Sciences with Environmental Economics being one of them.
Discussion: The two primary points of discussion are on the one side that Environmental Economics is central to understanding how humans value and manage the environment, so that all students in

the major should be familiar with this way of thinking about our world. On the other side, the concern is that requiring two Social Science course creates a lack of parallelism between the one course requirement in Environmental Humanities, one in Biology and one in Physical/Chemical sciences but two course in Social Sciences. It can be argued (and has been) that Biology and Physical/Chemical Sciences constitute two courses in the Natural Sciences, and that makes the lack of a parallel requirement for Humanities even more stark. One solution would be to require two Humanities courses, but this would increase the number of courses required when the limits of what possible within A&S guidelines is already strained. Also noted in our deliberations is the point that environmental humanities will be an important part of the new integrative introductory course, the colloquium, and the capstone course. A decision had to be made and we chose to require both Environmental Economics and another Social Science course, while retaining requirements for a single Environmental Humanities course and one course each in Biology and Physical/Chemical Sciences.

7. Comment: Concern was expressed by several people that if in making it possible for A&S students to join the revised major, the size of the major grow substantially, and it will not be possible to have all students fulfill a Field Course requirement with the existing Field Biology course and its staffing.
Response: We propose to restate this as a “Field or Engaged Learning Experience”
Discussion: The idea is that this can be fulfilled with an approved field or engaged course OR with some other rigorous experience to be approved by the student’s advisor and by the Chair of the Curriculum Committee. Many students would still fulfill this requirement by taking Field Biology, but having other options available will make it possible for all students to complete this requirement.

8. Comment: The value and future of the Colloquium course was discussed primarily in the context of keeping course and credit requirements within the bounds of A&S rules.
Response: We decided that the Colloquium course is a valuable part of the students’ shared experience in the major and that its importance would grow when humanities becomes a formal component of the major. We propose to expand this to a two credit course with appropriate financial support and teaching credit from the colleges.
Discussion: We also discussed increasing this to a three credit course, but decided that this put too much stress on the credit/course limit for the major, but at the same time pointed out to the colleges that a mechanism be found for faculty leading the colloquium to get teaching recognition for it as a 2-credit offering.

9. Comment: The desirability for a senior-year Capstone course or practicum was discussed at length, particularly in the context of past efforts by the current ESS major, and by other majors, that proved difficult to sustain.
Response: We propose that a 3-credit senior-year Capstone course or practicum be required for the major.
Discussion: We discussed several options for the senior–year “Capstone” course or practicum, which would expand on or substitute for the current Sustainability course, but drawing on many of its excellent aspects. Probably more than one such offering will be required, given the likely size of the major. Because this would be a senior course, there is time to work out the details even as the major gets under way. We discussed various models for what a capstone could be that would not be overly

demanding of instructor time, given the likely number of seniors in the major (ca. 120) and that (1) the meeting -group size(s) should be kept small and (2) any offering should span the diversity of environment and sustainability perspectives and approaches. Possibilities include (i) an array of seminar sections each taught by a different faculty member (or pair of faculty members) with readings, debates, etc., (ii) a single large lecture format with smaller discussion sections led by TAs, and (iii) Tim suggested that we use the current Sustainability course in something like its current form (i.e. highly interdisciplinary and not a lecture course) as one of a few different options available to meet the capstone requirement, e.g., such as a combination of (i) and (iii). We should aim that each option meets similar learning objectives. Other models may exist. The design for the SNES capstone that Tim circulated is impressive, but likely overly complex and time consuming for what would be a much larger major.

2. Comment: Consider two parallel majors.

Rationale for a single cross-college “Environmental Studies and Sciences” undergraduate major

We agree with the conclusion of the 22 February 2016 report of the “Goodale committee” that a single cross college major is the most logical and productive structure for advancing student educational opportunities in environment and sustainability. The opportunities, challenges, logic and spirit of creating a single cross-college major can be described by borrowing and expanding language from the Goodale Report.

Rationale: *The natural sciences, humanities, arts, and social sciences separately and together have crucial roles to play in understanding how environmental problems arose and in envisioning sustainable solutions to them. The success of approaches to the maintenance of biodiversity, sustainable agriculture, renewable energy and the application of cost-benefit analyses depend also on the stories different cultures tell themselves about climate; on the way in which they have been affected by their histories of colonialism; on dominant ethical frameworks; on political will; on their assumptions about human and natural agency. 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 career in the world in which we live.*

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, profit from, and protect it, and how we can do so sustainably. Students will receive foundational training in environmental natural sciences, social sciences and humanities, and then focus in one of five concentrations including Biogeochemical Sciences, Environmental Biology and Applied Ecology, Environmental Humanities, Environmental Economics and Environmental Policy and Governance. Finally they will come back together in their senior year to discuss, debate and conceptualize the challenges of environmental sustainability.*

Here we lay out the advantages and disadvantages of three different 2-college models for a major or majors in Environment

1. Single cross-college major

Advantages:

- Students and faculty from diverse backgrounds, areas of expertise and experiences will study and work together to understand and engage with critical issues in environment and sustainability

- Provides cohesion and integration of various disciplinary perspectives, whereas splitting the major would hinder integration and ultimately reinforce disciplinary separation and hierarchies
- Provides a clear single “home” and advising structure for those with an interest in environment and sustainability
- Reduced need for potentially duplicative faculty hires in two colleges

Disadvantages:

- Compromise is necessary to reconcile course limits in A&S with breadth and depth desired by some in CALS
- A resulting imbalance in proposed number of courses required among concentrations
- Necessity for compromise in choosing a name for a single major

2. Two separate majors - one in each college

Advantages:

- ESS in CALS can remain unchanged
- A&S students can have a credit count that is fully consistent with other A&S majors without impacting CALS students
- A&S can design an interdisciplinary major that best suits their students
- Possible increase in combined applicant pool for two majors rather than a single major

Disadvantages:

- Students and faculty will have less interaction across colleges than with other models
- Different perspectives on common problems will tend to be lost
- Students from each college may have reduced access to courses in the other college
- Majors will have a tendency to drift apart in terms of interactions and courses in common

3. Two separate cross-college majors – one in humanities and interpretative social sciences, the other in quantitative social sciences and natural sciences

Advantages:

- A separate major that is clearly designated as science focused (addresses concerns of some students and faculty ... not an advantage for others)
- Could avoid some complications of number of required courses, if sciences within A&S traditionally require more than humanities within A&S.
- Resolves potentially distinct perspectives on suitable core course requirements

Disadvantages:

- Students and faculty will have less interaction across disciplines than with other models
- Different perspectives on common problems will tend to be lost
- Majors will have a tendency to drift apart in terms of interactions and courses in common

Next page: Organization, courses and credits of revised ESS major

Organization and numbers of courses and credits (CR) in the shared core in the version of the proposed cross-college major in *Environmental Studies and Sciences*. This is modified from Table 2 in the 22 February 2016 report of the “Goodale committee” to take account of the proposed modifications discussed above.

	No. Courses	No. Credits	Specific Requirement
<u>Introductory Course(s)</u>			
Introductory Course	1	3	new integrative course building off of NTRES 1101
<u>Disciplinary Training</u>			
Env. Biology	1	3	1 of 3 in ecology
Env. Physics/Chemistry	1	3-4	1 of 3 options
Env. Humanities	1	3-4	1 of 5 options
Env. Social Sciences	1	3	current NTRES 2201 and maybe one other
Env. Economics	1	3	1 of 2 options
Statistics	1	3-4	1 of several options
<u>Integrative or Immersive Training</u>			
Colloquium	1	2	Expanded existing course
Field or Engaged Experience	1	3-4	Field Biology or other course or rigorous experience
Senior Capstone Course	1	3	Build from ESS 2000 and/or add additional options
Core total	10	29-33	
Concentrations			
(see Table 2 of Goodale Report)			
Biogeochemical Sciences (BGSC)	9	30-35	
Env. Biol. & Appl. Ecol. (EBAE)	9	30-37	
Environmental Economics (EE)	8	25-28	
Environmental Humanities (EH)	6	18-24	
Env. Policy & Governance (EPG)	6-7	19-26	
Indiv. Student-Designed (ISD)	TBD	TBD	
Major Total	16-19	47-70	