

UNIVERSITY CURRICULUM COMMITTEE

Proposal for New Course

1. Is this course being proposed for Liberal Studies designation? Yes ☐ No ☒
If yes, route completed form to Liberal Studies.
2. New course effective beginning what term and year? (ex. Spring 2008, Summer 2008) Fall 2007
[See effective dates schedule.](#)
3. College CENS 4. Academic Unit CENS
5. Course subject/catalog number CENS 460 6. Units 3
7. Co-convened with _____ 7a. Date approved by UGC _____
(Must be approved by UGC prior to bringing to UCC. Both course syllabi must be presented.)
8. Cross-listed with _____
(Please submit a single cross-listed syllabus that will be used for all cross-listed courses.)
9. Long course title Sustainability in Natural and Built Systems
(max 100 characters including spaces)
10. Short course title (max. 30 characters including spaces) Sustainable Systems
11. Catalog course description (max. 30 words, excluding requisites).

Examines characteristics of ecosystems that enhance stability, endurance and resilience and applies these qualities to human-made systems including farming, buildings, industries and communities.

12. Grading option: Letter grade ☒ Pass/Fail ☐ or Both ☐
(If both, the course may only be offered one way for each respective section.)
13. Is this a topics course? Yes ☐ No ☒
14. May course be repeated for additional units? yes ☐ no ☒
a. If yes, maximum units allowed? _____
b. If yes, may course be repeated for additional units in the same term? (ex. PES 100) yes ☐ no ☐

15. Please check **ONE** of the following that most appropriately describes the course:

Lecture w/o unit embedded lab ☐ Lecture only ☐ Lab only ☐ Clinical ☐ Research ☐
Seminar ☒ Field Studies ☐ Independent Study ☐ Activity ☐ Supervision ☐

16. Prerequisites (must be completed **before** proposed course) 1) ENV101, CENE150, ENV181 or ENV230
2) BIO326, CENE280, or ENV330 (note: to be changed to ENV326)
17. Corequisites (must be completed **with** proposed course) _____
18. If course has no requisites, will all sections of the course require (If course has pre or co requisite, skip to question 19):

instructor consent ☐ department consent ☐ no consent ☐

19. Is the course needed for a plan of study (major, minor, certificate)? yes ☐ no ☒

Name of new plan? _____

Note: A new plan or plan change form must be submitted with this request.

20. Does course duplicate content of existing courses within or outside of your college? yes ☒ no ☐

If yes, list any courses this course may have duplicative material with and estimate percentage of duplication:

Review of community ecology duplicates a small section of BIO326 and ENV326. Consitutes about 5% of course.

Please attach letters of support from each department whose course is listed above.

21. Will this course affect other academic plans, academic units, or enrollment? yes ☐ no ☒

If yes, explain in justification and provide supporting documentation from the affected departments.

22. Is a potential equivalent course offered at a community college (lower division only)? yes ☐ no ☒

If yes, does it require listing in the *Course Equivalency Guide*? yes ☐ no ☐

Please list, if known, the institution, subject/catalog number of the course. _____

23. Justification for new course, including unique features if applicable. (Attach proposed syllabus in the approved university format).

The course will be offered under the CENS prefix, which is intended for courses that address mutple academic disciplines within the College of Engineering and Natural Sciences. By examining structures and processes promoting sustainability in natural and human systems, the course will enable students to compare recent systems thought within ecology and environmental science and how that thought has been applied in architectural design, product manufacturing, agriculture and community planning. No similar course takes a systems approach to bridge disciplines in science and engineering.

24. Names of current faculty qualified to teach this course Gary Deason, Gary Nabhan, Deb Larson, Bill Auberle, Bridget Bero, Steve Mead

25. If course will require additional faculty, space, or equipment, how will these requirements be satisfied? **none**

26. Will present library holdings support this course? yes ☒ no ☐

If the course being submitted for approval is NOT a LIBERAL STUDIES course, please go to step 42.

LIBERAL STUDIES ONLY

Contact name: _____

Contact email: _____

Dept. Chair name: _____

Dept. Chair email: _____

College Contact name : _____

College Contact email: _____

27. This course is a ☐ Single section ☐ Multi-section

28. List names of faculty who may teach this course: _____

29. Section enrollment cap: _____

If this course is being submitted for approval as a new LIBERAL STUDIES course, please complete questions 30-33.

OR

If this course is being submitted for approval as a new JUNIOR LEVEL WRITING course, please complete questions 37-38.

OR

If this course is being submitted for approval as a new SENIOR CAPSTONE course, please complete questions 39-41.

NEW LIBERAL STUDIES COURSE

30. Thematic Focus (check all that apply): *If a topics course, must apply to ALL sections.*

Environmental Consciousness ☐ Technology and Its Impact ☐ Valuing the Diversity of Human Experience ☐

31. Distribution Block (check one): *If a topics course, must apply to ALL sections.*

Aesthetic and Humanistic Inquiry ☐ Cultural Understanding ☐ Lab Science ☐

Science/Applied Science ☐ Social and Political Worlds ☐

32. Skills (check two): *If a topics course, must apply to ALL sections.*

Creative Thinking ☐ Critical Reading ☐ Effective Oral Communication ☐ Effective Writing ☐ Critical Thinking ☐

Ethical Reasoning ☐ Quantitative/Spatial Analysis ☐ Scientific Inquiry ☐ Use of Technology ☐

33. Is this a topics course? Yes ☐ No ☐

If YES, please complete questions 34-36. If NO, please go to question 42.

TOPICS COURSE ONLY

34. Identify the Student Learning Outcomes that will be found in ALL topic syllabi offered under this course number. _____

35. Explain by what method(s) Student Learning Outcomes will be assessed in ALL topic syllabi offered under this course number.

36. Please attach an example of a Topic Syllabus offered under this course number.

NEW JUNIOR LEVEL WRITING COURSE (refer to question 19)

37. To which degree programs offered by your department/academic unit does this proposal apply? _____
38. Do you intend to offer ABC 300 and ABC 300W? yes ☐ no ☐
If no, please submit a course delete form for the ABC 300.

GO TO question 42

NEW SENIOR CAPSTONE COURSE (refer to question 19)

39. To which degree programs offered by your department/academic unit does this proposal apply? _____
40. Does this proposal replace or modify an existing course or experience? yes ☐ no ☐
If yes, which course(s)? _____
41. Do you intend to offer ABC 400 and ABC 400C? yes ☐ no ☐
If no, please submit a course delete form for the ABC 400.

42. Approvals

Department Chair (if appropriate)	Date
Chair of college curriculum committee	Date
Dean of college	Date

For Committees use only

For Liberal Studies Committee	Date
Action taken: _____ Approved as submitted _____ Approved as modified	

For University Curriculum Committee	Date
Action taken: _____ Approved as submitted _____ Approved as modified	

Subject:
support for proposed sustainability courses
From:
Maribeth Watwood <Maribeth.Watwood@NAU.EDU>
Date:
Tue, 03 Oct 2006 16:16:09 -0700
To:
barry.lutz@NAU.EDU
CC:
gary.deason@NAU.EDU

Dear colleagues on the CENS curriculum committee and UCC (via Barry Lutz),

Gary Deason has informed me of plans to offer a new sustainability theory course and a sustainability research course as CENS courses (ie. with CENS prefixes), which could count for various credits and requirements in several different departments.. He has indicated that our Ecology course (BIO 326) should be listed as a prerequisite for these courses.

I am writing to support support the development of these interdisciplinary CENS courses. Listing the BIO 326 as a prerequisite for these proposed courses will not put undo pressure on our situation; we would welcome the opportunity to enroll additional students in our Ecology course!

I am hoping that this email letter will suffice in offering my support for this curricular issue. please inform me if you need more information or a different format.

Best wishes,
Maribeth Watwood

Maribeth Watwood, PhD
Professor and Chair
Department of Biological Sciences
Northern Arizona University
Flagstaff, AZ 86011-5640

928-523-9322

Subject:
Re: Letter for Proposed CENS courses
From:
Debra Larson <Debra.Larson@NAU.EDU>
Date:
Thu, 12 Oct 2006 09:20:33 -0700
To:
Barry L Lutz <Barry.Lutz@NAU.EDU>
CC:
Gary Bruce Deason <Gary.Deason@NAU.EDU>

Barry -

As the Chair of CENE, I am very supportive of the two proposed CENS courses - CENS 460: Sustainability in Natural and Built Systems and CENS 480: Undergraduate Research in Campus Sustainability. The students here in engineering that might be interested in taking either or both courses would be our undergraduate Environmental Engineering students. Their program of study permits two technical electives. The department is currently reviewing its curriculum and will give consideration for recognizing these courses as approved technical elective courses. I am hopeful that this approval will be granted by the ENE faculty.

The CENE is able to handle the extra students that would be taking CENE 150 and CENE 280 as prerequisites to CENS 460. In fact, we welcome these additional students.

Thank you.

Debra Larson

Gary Bruce Deason wrote:

- > Hi Debra,
- > The two undergraduate courses in sustainability that I am proposing will be considered by the CENS curriculum committee at their next meeting, then by the UCC committee. The syllabi are attached.
- > Could you send a note of support for the two courses to Barry Lutz with a copy to me? It should indicate that listing CENE 150 and CENE 280 as prerequisites will not overtax those courses. I anticipate that only students who have already completed the CENE courses will consider CENS460; I can't imagine they would take the CENE courses in order to take CENS460.
- > Barry needs the note Monday October 16; I think email is fine.
- > Thank you Deb.
- > Gary



NORTHERN
ARIZONA
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CENTER FOR ENVIRONMENTAL
SCIENCES & EDUCATION

FLAGSTAFF, ARIZONA 86011-5694
(928) 523-3329 ROD.PARNELL@NAU.EDU

Memo to: NAU University Curriculum Committee

Via College of Engineering and Natural Sciences Curriculum Committee

From: Rod Parnell, Director, Center for Environmental Sciences and Education

A handwritten signature in black ink that reads "Rod Parnell".

Date: October 16, 2006

Re: Proposal for new CENS courses in sustainability

The faculty of the Center for Environmental Sciences and Education strongly support the proposal for two new courses in sustainability to be offered as College-wide courses with the CENS prefix: CENS 460, Sustainability in Natural and Built Systems and CENS 480, Undergraduate Seminar and Research in Sustainability. These courses begin an important new initiative in cross-department studies in sustainability and will be very useful additions to our curricula in environmental sciences and environmental studies. The College-level course designation should help to create a more interdepartmental mix of students and faculty in these courses, a real asset to all our students.

The CENS 460 course does have some overlap with our ENV 330, but the redundant material will be very useful in setting the stage for more applied studies in 460.

The ENV / ENVSTU prerequisites for these proposed courses will not put significant pressure on the prerequisite courses. We in CESE really doubt anyone will take the prerequisites in order to take these CENS courses; rather they will take these courses because they already happen to have the prerequisites.

ENV 480 is the permanent course line for the ENV 499 seminar/research experience Gary Deason has been running for the past two years. It has been and will continue to be an excellent option for our students in completing their ENV 408 or 485 degree requirement. It will also be an option for students in the environmental studies program. Once this course is established, CESE will submit a program change form to formally allow the use of this course in fulfilling the undergraduate research, internship, or fieldwork experience required of all undergraduate environmental sciences and studies majors and minors.

Please contact me if you require further information.

College of Engineering and Natural Science
CENS 460: Sustainability in Natural and Built Systems
Fall, 2007
3 credit hours, TTh 2:20-3:35PM (tentative)
Dr. Gary B. Deason
P.O. 5765 ARD Building
Office Hours: M-Th 1-4PM

Prerequisites:

- 1) ENV101, CENE150, ENV181 or ENV230
- 2) BIO326, CENE280, or ENV330 (note: to be changed to ENV326)

Description

This course examines structures and processes that enhance stability, endurance and resilience in natural communities, such as species diversity, community organization, food webs, feedback mechanisms, nutrient cycling, and energy flows. Characteristics promoting ecological sustainability are then compared and adapted to human-made systems and processes to assess how they can be designed and constructed more sustainably. Human systems and processes include agriculture, buildings, industries, and communities. Students will choose one ecosystem and one built system to analyze in more depth during the semester.

Student Learning Expectations

1. Gain familiarity with systems thinking
2. Acquire workable knowledge of community ecology
3. Acquire specific knowledge of factors promoting stability, endurance and resilience in ecosystems
4. Gain familiarity with applications of ecological principles to agriculture, building design, manufacturing processes and community planning
5. Acquire deeper knowledge of one area in no. 4 above.
6. Establish a conceptual foundation for further study of sustainable systems (e.g. in new NAU Master of Engineering in Sustainable Systems)

Approach

1. Seminar format
2. Limited to 22 students
3. Readings, lectures and discussions
4. Presentations by individuals and small groups
5. In depth and creative analysis in mid-term and semester papers
6. Class discussion and course requirements will promote interdisciplinary and comparative systems thinking in natural science and engineering disciplines

Required Texts (preliminary listing)

1. Molles, Ecology (chapters 12-17 on community ecology)
2. SCOPE, Resilience and the Behavior of Large Scale Systems (selected chapters)
3. Jackson, Wes, et al, Farming in Nature's Image
4. McLennan, Jason F., 2004. The Philosophy of Sustainable Design, Ecotone.

5. McDonough, W. and Braungart, M. 2002. Cradle to Cradle: Remaking the Way We Make Things, New York: North Point Press.
6. Beatley, Timothy and Manning, Kristy, 1997. The Ecology of Place: Planning for Environment, Economy and Community

Recommended Readings (preliminary listing)

1. Benyus, J. M. 1997. Biomimicry: Innovation Inspired by Nature, NY: Quill, William Morrow.
2. Hawken, P. 1994. The Ecology of Commerce: A Declaration of Sustainability, Harper.
3. Hawken, P., Lovins A. and Lovins L. H. 1999. Natural Capitalism, Boston: Little, Brown
4. Van der Ryn, Sim, 1995. Ecological Design, Island Press.
5. Graedel, Thomas E. and Allenby, Braden, 2002. Industrial Ecology, 2nd ed., NY: Prentice Hall
6. Maser, Chris, 1997. Sustainable Community Development: Principles and Concepts, St. Lucie.
7. Jackson, Dana L. and Jackson, Laura L. , 2002. The Farm as Natural Habitat: Reconnecting Food Systems With Ecosystems, Island Press.

Outline by Week

1. Introduction to systems approaches in natural science and engineering.
Community ecology. Molles, Chapter 12-13
2. Community ecology. Molles, Chapters 14-17
Guest speaker: Tom Sisk, Environmental Science
3. Resilience in large-scale systems. SCOPE, Chapters 1-2.
4. Resilience in large-scale systems. SCOPE, Chapters 3-6
5. Resilience in large-scale systems. SCOPE, Chapters 7-8
Mid-term exam on resilience in a particular ecosystem.
6. Employing natural systems in agriculture. Jackson.
7. Employing natural systems in agriculture. Jackson..
Guest speaker: Gary Nabhan, Center Sustainable Environments
8. Natural systems and building design. McLennan..
9. Natural systems and building design McLennan.
Guest speaker: Steve Mead, Construction Management
10. Green manufacturing. McDonough and Braungart.
11. Green manufacturing. McDonough and Braungart.
Guest speaker: John Neville, former 3M V.P. for sustainability
12. Ecological principles in community design. Beatley and Manning.
13. Ecological principles in community design. Beatley and Manning.
Guest speaker: Tony Brown, ECOSA Design Institute
14. Individual appointments. Research and writing of final paper.

15. A final examination applying principles of ecological sustainability to a specific case study in agriculture, building design and construction, manufacturing, or community planning.

Requirements and Grading

1. Regular class attendance (10% of grade)
2. Participation in class discussions (10%)
3. A class presentation on a case study of resilience in a particular ecosystem (15%)
4. A mid-term examination assessing resilience in a particular ecosystem (25%)
5. A final examination applying principles of ecological sustainability to a specific case study in agriculture, building design and construction, manufacturing, or community planning. (40%).

90%-100%	A
80%-90%	B
70%-80%	C
60%-70%	D
Below 60%	F

Course policy

1. Homework and class preparation must be completed in time for the class meeting in which it is due. No late homework will be accepted. This is because homework preparation is designed to contribute to class discussion.
2. The mid-term exam must be completed at the scheduled time. Without a doctor's note, it cannot be scheduled at a different time.
3. The final exam must be completed at the scheduled time and date. Without a doctor's note, it cannot be scheduled at a different time. This is required for the instructor to meet university deadlines for grade submission.
4. Up to 3 absences during the semester is permissible. Without a doctor's note, every 3 absences thereafter will result in a penalty of one letter grade.
5. Plagiarism or cheating will result in failure of the course.

University Policies

Please refer to additional university policies governing teaching and learning at:

<http://jan.ucc.nau.edu/academicadmin/plcystmt.html>

Please refer to the following statement about classroom management in the NAU student handbook:

<http://www4.nau.edu/stulife/handbookmanagement.htm>