

THE UNIVERSITY OF NORTH CAROLINA AT ASHEVILLE  
FACULTY SENATE

Senate Document Number        6513S

Date of Senate Approval        4/11/13

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Statement of Faculty Senate Action:

**APC Document 56:                    Request to Establish a Graduate Certificate Program in  
Climate Change and Society**

The Master of Liberal Arts Program requests the establishment of a graduate Certificate in Climate Change and Society. The Institutional Development Committee of the Faculty Senate has reviewed the Request to Establish a Graduate Certificate Program in Climate Change and Society, which provided information as required in the new program and certificate approval process, as outlined in SD0512F, Institutional Development Committee Statement on Planning and Approval of New Degree and Certificate Programs at UNC Asheville. IDC unanimously approved moving the request to establish the certificate program in CCS to APC.

**1. The Certificate in Climate Change and Society**

The Certificate in Climate Change in Society would be awarded to those students enrolled in the program who successfully complete the following courses, with a grade of 3.0 overall in the four courses:

- a) CCS 560, Seminar on Climate Change and Society—Fundamentals of Climate Change Science
- b) CCS 560, Seminar in Climate Change and Society—Tools for Climate Change Information and Decision-Making
- c) CCS 560, Seminar on Climate Change and Society—Decision Modeling and Statistics
- d) CCS 560, Seminar on Climate Change and Society—Communicating Science

Satisfactory completion of the four-course sequence and the awarding of the certificate will be noted on the student's academic record with an appropriate transcript remark.

**Rationale:** This program is designed for individuals currently employed in or interested in employment in climate and environmental fields, or in fields—such as

land use planning, government, transportation, insurance, and other industries—in which climate and climate change represent a substantive issue and challenge. There is agreement among experts in climate change science and adaptation that there is a profound need for programs that bridge the gap between the generators of information on climate change science, impacts, and control strategies and the users of that information at local, state and national levels. Currently, no similar climate change program exists in the southeast. The CCS Certificate represents a step toward meeting this need. The program design—four courses offered to students in cohorts—is intended to be attractive to both full-time and part-time students.

Asheville is a center of climate change data collection and activity. UNC Asheville's co-location with the National Climatic Data Center uniquely positions us to play an important contributing role in climate education, research, and decision-making. This opportunity is enhanced with the recently established Cooperative Institute for Climate and Satellites (CICS), located in downtown Asheville, adding to the resources offered by NCDC. CICS is a consortium that includes NC State University and University of Maryland, College Park, and brings with it resources from the National Oceanic and Atmospheric Administration (NOAA) and its many services and programs. The proximity of these organizations provides rich opportunities for our students and faculty to benefit from an array of research and educational collaborations.

As climate variability and climate change continue to present larger challenges to local, state and regional communities, there will be a growing demand for knowledge of climate change science, and for skills with the technological tools for engaging in meaningful decision-making and communication about it. Therefore, this request is being made to allow the Master of Liberal Arts Program to offer a graduate Certificate in Climate Change and Society. This certificate would be established and conducted through the enrollment of students into courses already offered through the University, in the MLA Program. This approach would also enable those individuals who do not as yet possess a masters degree to apply the credit obtained through the successful completion of these courses toward an MLA degree if they wish to continue their education beyond the Certificate. Successful completion requires a grade of 3.0 overall in the four courses.

Through adhering to the values of an interdisciplinary liberal arts education at the graduate level, the chief goal of the program is to educate students to understand and address the impacts of climate change on society and the environment through the incorporation of materials from multiple disciplines. Our objectives for the program include training our Certificate graduates to be knowledgeable in the following areas:

- The interaction of earth systems that function to cause regional and global climate change.
- Past climates their use to understand that feedback systems between the earth, atmosphere, biosphere, and cryosphere that drive natural climate change.

- The use of theory, modern observations, and computer projections based on human activities, to predict future climates, their impacts and uncertainties.
- The use of technologies and datasets for projecting, visualizing, and analyzing climate change
- The use of technologies and tools, such as geographic information systems and others, for climate change decision-making.
- The use of statistical inference, including regression analysis, correlation, classification, filtering and smoothing, for the analysis of climate data.
- Effective modes of communication about climate change science to bridge the gap between scientific findings and their understanding by the general public, as well as by targeted audiences.
- An understanding of the psychological and sociological foundations of decision-making from scientific information.

The benefits of the Certificate Program in Climate Change and Society include:

- Creation of an opportunity to use the University's expertise in interdisciplinary teaching and learning to support graduate-level study of climate change, its impact, and its mitigation.
- Enhanced ability to collaborate with the numerous climate- and environmental-related entities in Asheville, in North Carolina, and across the nation. These include NEMAC, NCDC, NC-CICS, USDA-Forest Service, and others, as noted above.
- Enhanced ability to attract funding to support educational and research activity for faculty and students in the climate change field.
- Extending the University's ability to train students to participate in the area's already strong or emerging economic sectors devoted to sustainability, climate, and the environment, as well as sectors that must engage these issues.
- Providing students with courses that can transfer into full master's programs in climate change science, environmental studies, and sustainability-related fields at other institutions.
- The generation of student contact hours in this graduate-level certificate program, as provided for by the North Carolina Student Credit Hour Funding Model using the federal Classification of Instruction Programs (CIP) structure, through the use of the CCS prefix, which will allow us to generate instructional revenue and faculty FTE at a more advantageous rate than is possible for courses offered with the MLA prefix. This will allow us to support the MLA Program at levels adequate to accommodate the growth it is currently experiencing. Moreover, because we do not distinguish between graduate- and undergraduate-level faculty, the rate at which we generate faculty FTE will allow us to generate positions that can be used through the entire curriculum.

IDC, in its review of the CCS certificate, suggested that the rationale for this proposal include comment on evidence that the CCS certificate was of value for job placement and possible salary adjustment, acknowledging of course that it might be difficult to

predict these results at this point. They also asked how the certificate program might benefit the undergraduate program. It is already possible to see some of these emerging outcomes, which we outline below:

Even at this early point, we can see some concrete ways in which the four-course sequence is benefiting students who have completed them. Two of the students who have already finished the requirements for the proposed certificate work at NCDC, one in a NOAA/NCDC leadership position, where the course content has assisted her in understanding the foundational science and in communicating it to wider lay constituencies. This has been an area of historical concern to NCDC scientists and having this skill set among their staff has allowed them to deepen the effectiveness of their outreach efforts. This student is using the content of the proposed certificate to establish a local climate services company and consulting service. Another student, since completing the four-courses, has been engaged to do contract writing for NCDC; this student began taking these courses as an undergraduate, with approval from the chair of his department, for which he received elective credit toward the major, and he is currently completing his MLA degree. A third student works for the US Forest Service, which paid for the four-course sequence, so that the agency could benefit from the expertise offered by the proposed certificate; this student is hoping to enroll in the Professional Science Master's degree offered by NCSU, should it come to the Asheville Graduate Center. A fourth student—an alum of our undergraduate program—won an internship, and then a fellowship, and finally a job through the Appalachian Sustainable Agriculture Project because of the expertise she gained in the CCS sequence and then extended by going on to complete a full MLA degree. Lastly, a fifth student works for our National Environmental Modeling and Analysis Center, which was greatly benefited by increasing the number of their research staff with knowledge in climate change science, statistics, GIS modeling and visualization, and the communication of science to a non-specialist audience. As a result of his enhanced skills and knowledge, he was promoted to a higher level position within the Center. Currently, another NEMAC staff person and an employee of the Cooperative Institute for Climate and Satellites (CICS, a subcontractor for NCDC) are enrolled in the CCS program. These examples illustrate the benefits of the sequence content to the individuals who complete the required courses and to the organizations that employ them.

The four-course sequence has benefited our undergraduates as well. The MLA program has ended a practice of cross-listing graduate courses with Honors courses, so as to eliminate possible confusion between the two very different levels of student and instructional expectation. (This is also important to accrediting bodies such as SACS.) Instead, qualified undergraduates are allowed to enroll in graduate courses, if they receive the approvals of their chairs, the course instructor, and the director of the MLA program. This ensures that all students who enroll in a graduate course at UNC Asheville are capable of performing at the required level and are able to contribute positively to the overall quality of the seminar experience. Students in ATMS, ENVR, and other departments who possess the qualifications and receive the necessary approvals are able now to take CCS courses in satisfaction of electives in

their major; this accomplishment can be included to positive effect in applications to graduate or professional programs, or in the context of workforce and professional development. As noted above, one CCS student began his work as an undergraduate, completed both the sequence and a full MLA degree, and now contracts as a technical writer for NOAA/NCDC. Moreover, the CCS certificate affords us rich opportunities to extend our relationships with NOAA, NCDC, CICS, the US Forest Service, and regional entities such as Land of Sky, which creates avenues for us to increase funding, such as we have already successfully received, to support internships and research opportunities for our students. These opportunities can be directed both to graduate students and undergraduates for their mutual benefit. Moreover, a strong certificate program in this field, over time, may also attract well-prepared undergraduates interested in this emerging area of study, thereby supporting the goals of departments such as ATMS, ENVR and others.

While there are numerous benefits to offering a certificate program in Climate Change and Society, it is true that the four courses comprising the certificate do not provide the breadth and depth that would be offered in a full master's degree program. A certificate is generally not enough of a program to attract students from other regions, and is likely to remain of primary interest to students in our region. On the other hand, of the six students who have already completed the four courses, all six have declared their intention to complete the MLA degree. This demonstrates that the CCS Certificate is a useful recruitment tool for our traditional MLA degree program.

**Impact:** As noted above, SACS has determined that UNC Asheville has the faculty, research and assessment resources needed to offer the Certificate in Climate Change and Society. (See **Appendix A: Letter from the Southern Association of Colleges and Schools, Approving the Offering of a Graduate Certificate in Climate Change and Society**) Currently, the MLA Program is offering the four courses with a cohort model: the four courses are offered one each semester, over a two-year period.

The CCS prefix carries with it a Category III designation in the UNC-system funding model, as opposed to the MLA prefix, which is in Category II. Category III courses generate an instructional position for every 186.23 new student SCH, whereas Category II courses generate a position for every 303.93 new student SCH. In 2011-12, CCS prefix courses generated 76 SCH. At that level of SCH generated, CCS SCH provided funding for the equivalent of .408 FTE, or \$32,010 in instructional salary (at a 2011-12 average salary rate of \$78,436 for a full position); and \$14,369 in other academic costs, such as salary benefits, classroom supplies, etc., for a total of \$46,379 in total direct academic support. Moreover, it also provides \$5,324 for Library resources and \$25,068 for general institutional support, including ITS, classroom maintenance, utilities and similar support items. The total funds provided by these SCH comes to \$76,771. Of this amount, \$15,542 comes from student tuition and the balance of \$61,229 comes from state appropriations. In contrast, the same 76 SCH in MLA prefix courses generates only .250 instructional positions and \$47,040 in total institutional support, \$15,542 of which come from tuition and \$31,498 of

which come from state appropriations. CCS-prefix courses generate both faculty positions and state appropriations at an advantageous rate over the MLA-prefix courses.

The program intends to continue offering the courses, so there are no additional resources needed at this point. CCS 560, Tools for Climate Change Information and Decision-Making, formerly taught by Todd Pierce in NEMAC, is now taught by Derek Morgan, also of NEMAC: the MLA program provides funds for adjunct salary for Dr. Morgan, which costs the program \$4200 for three credit hours, every two years. In addition, the MLA and the Asheville Graduate Center have funds to provide adjuncts, when needed, to departments whose faculty teach in the MLA program, including these CCS courses. An adjunct to backfill an undergraduate course in a department would run \$840 at the Assistant Professor rate, or \$2520 for a 3 credit-hour course. To date, this has not been necessary. In the event that this becomes necessary, these costs will be offset as student contact hours in CCS and MLA increase. The MLA program also allocates a small amount of its budget to advertise the degree and courses each semester so as to attract new students: the Certificate in Climate Change and Society (not just the courses themselves) would be part of this marketing. There would not, however, be an increase in allocation of funds for this, as the program is already advertising in a variety of venues.

**Appendix A: Letter from the Southern Association of Colleges and Schools,  
Approving the Offering of a Graduate Certificate in Climate Change and Society**