

Request by the University of North Carolina at Greensboro to Establish a Doctoral Degree Program in Environmental Health Science

Introduction

Following recommendations from the Graduate Council and from General Administration, the Committee on Educational Planning, Policies, and Programs approved in the request from the University of North Carolina at Greensboro to plan a doctoral degree program in Environmental Health Science. The University of North Carolina at Greensboro now seeks approval for a doctoral degree program in Environmental Health Science (CIP: 26.9999).

Program Description

Environmental Health Science (EHS) is viewed broadly, spanning research on environmental health issues from the molecular to the global scale, for example from studies of environmental damage on cellular function the effects of global warming. Environmental health research includes the identification of causes underlying environmental problems as well as the characterization of consequences of environmental change at multiple biological levels (ecosystem, community, organism, cell, and molecule) in order to prevent disease and promote human health.

There is strong demand at the regional, state, and national levels for fundamental biological research that provides the foundation for solving environmental health problems and for applied biological research that has immediate potential for translational application to environmental concerns, including human health. This need has been recently articulated in the *UNC Tomorrow Commission Report*. The proposed EHS doctoral program will offer students innovative and biologically based training to help meet these environmental health needs.

The doctoral program draws together the diverse and collaborative research interests and expertise of the UNCG Biology faculty. Research training will focus on four areas of strength within the department's environmental dynamics. Students will learn to conduct research in one of these areas, they will learn the appropriate technologies to solve biological problems in their research, and they will learn how to collaborate with scientists whose research lies outside their chosen area. A core curriculum will ensure that each student has a broad, biologically based foundation in theory and practice in Environmental Health Sciences and a thorough background in the principles and tools required for a research career in a specific Environmental Health Science sub-discipline. The curriculum will also help students to think critically and ethically about their science and to communicate their knowledge to others. Together the research and core curriculum will prepare students for environment and health-related jobs in industry and academia. We expect that some graduates of the program will find employment in the biotechnology workforce within the Triad, thereby strengthening the regional economy.

By emphasizing the interface between health and the environment, the proposed doctoral program will serve as an important link between existing UNCG undergraduate and graduate programs, e.g., in Nutrition, Geography, Medicinal Biochemistry, and UNCG research centers. The program will provide additional teaching and learning opportunities at all levels, undergraduate and graduate, and in multiple departments. Opportunities associated with interdisciplinary research will expand for students and faculty members in multiple departments and centers. Also, because of the complementarity of the proposed program to existing related programs in North Carolina, the program will help to foster inter-institutional collaborations within the state. These collaborations will help to address the state's environmental challenges and the health of its citizens.

UNC Tomorrow Relevance

Understanding the factors in the environment shaping our health provides the basis for more effective responses to UNC Tomorrow's focus on meeting health needs in North Carolina. Graduates of the program will be prepared to enter a range of businesses and industries such as the biotech industry in North Carolina. It was also clear that there is a growing concern about the environment and its quality, so a program connecting environment and health hits two of the major themes of UNC Tomorrow.

Disciplinary Panels

Not applicable—previously approved for planning by the Committee on Educational Planning, Policies and Programs.

Program Review

The review process for requests to establish is designed to determine whether the proposal is developed to the stage appropriate for taking to the Graduate Council and if so what are the issues that may need further attention. Proposals to establish doctoral programs are reviewed internally and externally. The concerns from the reviewers were summarized in two letters to the Chancellor and Provost prior to the presentation to the Graduate Council. A summary follows:

The first reviewer seemed to be very positive in response to your proposal. The main issue was to push the program to become more interdisciplinary, particularly in regard to including core courses in chemical/physical processes and integrating more with the campus's chemistry and earth sciences program.

The reviewer also raised the issue of support of graduate students and expansion of grant support for developing the program.

The program might clarify that it will have access to the equipment the reviewer iterates.

Other than that this reviewer seemed satisfied with the proposal, even enthusiastic.

The second reviewer was concerned for the program being more interdisciplinary, which overlapped the views of the other reviewer. This reviewer seems to have two related

concerns: will biologists committed to this new program expand their focus beyond fundamental biology to a commitment to biological approaches to environmental health sciences, and will other areas such as toxicology and human disease caused by environmental exposure be adequately developed and represented in the program?

While the reviewer acknowledges a strong and well-funded faculty for the new program, the issue of whether the program has a cohesive theme in Environmental Health Sciences is raised. As the reviewer puts it, "The program is heavy in ecology, which is not a bad thing, but is not [in] environmental health as a consideration of effect of the environment on human health."

While the reviewer recognizes that the program has state-of-the-art research facilities; there is a question about toxicology facilities.

The reviewer provides a discussion of the curriculum that you will want to review.

The request for student learning outcomes may take on a larger role for this reviewer since it might be another way of getting at the breadth and focus of the program.

Graduate Council

The Graduate Council had, as a basis for its consideration, the proposal to establish the program, the summary letters to the Chancellor and the Provost, two external reviews, and a presentation to the Council by representatives of the program. The Graduate Council focused on the issues raised by the reviewers.

Response

Representatives of the program made the case that there was a lot of interdisciplinary activity within and without the university by the environmental health scientists. They offered the example of collaboration with UNC Chapel Hill on climate change and lake productivity and having adjunct faculty from area businesses such as Syngenta. On the other hand the breadth of the program was one of its strengths. In response to the need to focus more on toxicology, the program indicated the next three to four hires will be in the area of toxicology. UNCG has pledged four new faculty positions over the next four years and \$400,000 in program support, which will provide support to graduate students. With a doctoral program, the funding level will very likely go up as well. While there will be several areas of focus, water supply and water quality will be important ones.

Recommendation by the Graduate Council

After consideration of the issues raised by previous reviewers and Council members, the Graduate Council voted, without dissent, to recommend approval for the University North Carolina at Greensboro to establish a doctoral program in Environmental Health Sciences.

Student Demand

The master's degree program that will support this program has averaged about 40 students per year, many of whom will want to go on to graduate school. And interest in

the life sciences is growing and large numbers of graduates are being produced at the undergraduate level, many of whom are interested in a career related to health but not in a direct helping profession.

Opportunities for Graduates of the Program

Given the prowess of the biotechnology field in North Carolina, there will be plenty of opportunities for graduates in North Carolina in that industry. Graduates of a doctoral program will provide research leadership for that industry in the Triad and throughout North Carolina. There will be plenty of opportunity beyond our state's borders, but there will be a good fit between this program and the needs of business and industry as well as the health care field in North Carolina.

Resource Implications

Resource Needs: Since the core of this doctoral program is being built on the program in biological sciences, it will begin with a distinguished faculty with an accomplished research agenda. More faculty will be added, particularly in toxicology. The labs and centers at UNCG will support this program. Library resources appear to be adequate for the program.

Funding for the Program: The program will need funding for graduate student support and for expanding the faculty into specialty areas. UNCG has pledged to make those resources available to the program.

Estimated Cost to the State Based on the University Funding Formula: Based on the credit hours that will be generated it is estimated that the program will generate approximately \$500,000 in state resources.

Recommendation

The staff of General Administration recommends that the Board of Governors approve the request from the University North Carolina at Greensboro for a doctoral program in Environmental Health Sciences.

Approved to Be Recommended for Establishment to the Committee on Educational Planning, Policies, and Programs



Senior Vice President for Academic Affairs

December 15, 2009

General Information Template for Academic Program Review

Degree Area and Level:

PhD in Environmental Health Sciences (CIP 26.9999) at UNC Greensboro.

Addressing UNC Tomorrow:

This proposed program would address several Recommendations within the UNC Tomorrow Report including the components to enhance our Global Readiness (Recommendation 4.1), Our Communities and Their Economic Transformation (Recommendation 4.4), Our Environment (Recommendation 4.6), Our Health (Recommendation 4.5), and Our University's Outreach and Engagement (Recommendation 4.7).

Role of Program in Relation to State and Regional Needs:

According to the proposal, "many of the students who complete the proposed doctoral program will help to satisfy the need for highly qualified EHS researchers in industry, especially the biotech industry." Additionally the proposal states, "The biotechnology business sector is rapidly growing in the Piedmont Triad. The proposed doctoral program will train students in the new technologies needed to enter this sector, and the program will help provide the workforce that is need for continued growth in this sector. The program will increase opportunities for technology transfer, and the development of public-private partnerships. Both will strengthen the regional economy. The program will also help to address some of the environmentally related concerns that must be addressed in order to sustain a high quality of life for Piedmont residents. A high quality of life is important for attracting and retaining industries in the Triad."

US Labor Department Analysis:

- *Summary* - The Occupational Supply Demand System puts this degree program in a broad category of Biological/Life Science which states, "Employment of biological scientists is projected to grow 9 percent over the 2006-16 decade, about as fast as the average for all occupations, as biotechnological research and development continues to drive job growth. The Federal Government funds much basic research and development, including many areas of medical research that relate to biological science. Recent budget increases at the National Institutes of Health have led to large increases in Federal basic research and development expenditures, with research grants growing both in number and dollar amount. Nevertheless, the increase in expenditures has slowed substantially and is not expected to match its past growth over the 2006-16 projection period. This may result in a highly competitive environment for winning and renewing research grants."

Source: http://www.occsupplydemand.org/OSD_UnitOfAnalysis.aspx?CLUSCODE=095A-15&ST=NC&PathNo=1

- *Summary Data* – Source: U.S. Department of Labor and America's Career InfoNet

Availability of Program Statewide (Enrollment and Degrees Awarded in Last 3 Years):

- *Public universities* – Not available.
- *Private universities* – Not available.

Available or not from Academic Common Market:

Not available on the Academic Common Market.

UNC Greensboro Campus enrollment and degrees awarded in similar programs at the Doctoral level:
(Based on two CIP digits – 26 CIP is the summary group for Biological and Biomedical Sciences under which Environmental Health Sciences is listed as a program)

The PhD in Medicinal Biochemistry was approved for establishment on 1/11/2008. They had 7 students enrolled in fall 2008.

Campus Average of enrollment and degrees awarded in this degree area at the Doctoral level:
(Based on two CIP digits – 26 CIP is the summary group for Biological and Biomedical Sciences under which Environmental Health Sciences is listed as a program - over the last 3 Academic Years, Fall 2005-Fall 2008)

Campus Average			
	Number of Active Programs	Enrollment per Semester	Degrees Awarded per Year
ECU	8	12	1
NCSU	13	23	4
UNC-C	1	24	3
UNC-CH	14	55	9
UNC-G	1	7 (Fall 2008)	N/A
UNC-W	1	11	1
Campus Average		22	4

UNCG Degree Programs added in the past three years:

- *Bachelor*
 - N/A
- *Master*
 - MSAT Athletic Training (06/08/2007)
- *Doctoral*
 - PhD Medicinal Biochemistry (01/11/2008)
 - PhD Computational Mathematics (01/11/2008)
 - PhD Communications Sciences and Disorders (01/12/2007)

UNCG Degree Programs discontinued in past three years:

- *Bachelor*
 - BS Dance Education (03/16/2007)
 - BA German, Secondary Education (03/20/2009)
- *Master*
 - N/A
- *Doctoral*
 - N/A