

APPENDIX F

North Carolina A & T State University Request to Establish a Doctoral Program in Energy and Environmental Studies

Introduction

Following a recommendation from the Graduate Council and from the Senior Vice President for Academic Affairs, the Committee on Educational Planning, Policies, and Programs approved on November 13, 2003 the request from North Carolina A&T State University to plan a doctoral program in Energy and Environmental Studies. North Carolina A&T State University now seeks approval to establish a doctoral program in Energy and Environmental Studies (CIP: 30.9999) effective August 2005.

Program Description

The institution describes the new program as follows:

This program is designed to prepare men and women for highly specialized positions, for research and consulting in industry, government and service organizations, and for teaching and research positions in Colleges and Universities. The interdisciplinary nature of this program will mean that students from across the Colleges and Schools of the University will be engaged in energy and environmental research. This diversity of backgrounds and training will contribute to a unique teaching and learning environment for students and faculty alike. While students will be permitted to pursue a plan of study individualized to their interests, all will be connected through a required group of selected core courses, common research themes, use of common research laboratories, and a program office housed within the School of Graduate Studies.

The Ph.D program in Energy and Environmental Studies will begin with the following research areas.

1. Energy and Environmental Science and Engineering

This interdisciplinary research area is for students who have previous undergraduate or graduate degrees in science and related engineering disciplines. It is designed to produce professionals who understand basic management skills along with interdisciplinary technical expertise in topics related to energy and complex environmental systems. The goal of this interdisciplinary area is to produce innovators in the application of renewable and non-renewable energy sources, the advancement of energy and environmental security, and the design of sustainable processes. Research topics include, but are not limited to, energy technologies (solar, wind, biomass, fuel cells, and hydrogen fuel infrastructure), energy efficiency, membrane separations, advanced research in experimental nuclear physics, catalysis, reactive separations, multiphase transport, co-generation, energy distribution, power electronics, built environments, advanced pollution control concepts, energy storage technologies, use of nanotechnology, sensors and controls, development of advanced detection systems and sensors for nuclear radiation, innovative waste heat recovery, corrosion prevention, sustainable manufacturing (environmentally benign solvents and processes, life cycle analysis,

remanufacturing, recycling, biodegradable materials, risk assessment), energy and environmental information technology, and systems science and engineering.

2. Pollution Prevention and Remediation

This interdisciplinary research area is for students who have previous undergraduate or graduate education in science and social science disciplines. It is designed to produce professionals with basic management skills along with interdisciplinary technical expertise in topics related to energy and complex environmental systems. The goal of this interdisciplinary area is to produce professionals who are innovators in the application of energy resources, the advancement of energy and environmental security, and the design of sustainable processes. Research topics include, but are not limited to, research and theory applied to supercritical carbon dioxide, separation processes, fate and transport of contaminants, bioremediation, bio-processing, quantitative risk assessments, risk management and economics, waste management, water quality, air quality, ecosystem modeling, risk assessment and economics, bio-processing, bioremediation, fate and transport of contaminants, separation processes, regulatory processes, and long term environmental monitoring, development and application of geophysical techniques, environmental justice, and systems management and economics.

3. Energy and Environmental Education and Security

This interdisciplinary research area is for students with previous undergraduate or graduate education in education, science and social science disciplines. It is designed to produce professionals with a broad education in social and applied sciences with interdisciplinary expertise in topics related to energy and the environment. The goal of this interdisciplinary area is to produce innovators in enhancing effective communication about complex environmental security issues among the scientific community, managers, policy makers, K-12 schools, and the public. Research topics include, but are not limited to, application of technological tools for assessment and evaluation of environmental education and environmental security issues to understand waste management, water quality, air quality, ecosystem modeling, pollution prevention, risk assessment and economics, bio-processing, bioremediation, fate and transport of contaminants, separation processes, regulatory processes, and long term environmental monitoring, environmental justice, and systems education and technology.

Program Review

The review process is designed to surface strengths and weaknesses in proposed new degree programs. Proposals to establish new doctoral programs are reviewed internally and externally. The concerns from the two review processes were summarized in a letter to the Chancellor prior to the presentation to the Graduate Council. That summary follows:

The external and internal reviewers saw a lot of strength in the proposal but several issues were identified for further attention. While there was recognition of the achievements of current faculty, all the reviewers were concerned whether enough additional faculty were scheduled for the program. In part, this was because of the

difficulty of fully developing an interdisciplinary program if a core faculty is not associated with the program. Reviewer 2 developed this concern further by suggesting that a formal interdisciplinary structure may not guarantee that a program really develops interdisciplinary scholarship and training. Reviewer 2 suggests that by focusing on problem-based scholarship and joint training of graduate students more interdisciplinary collaboration is likely to result.

With the cost of financial packages for graduate students in this field rising, one reviewer was concerned about the competitiveness of the proposed support package for potential graduate students.

Regarding the curriculum, there was concern that there might be some duplication and there was a query about whether there was an adequate core of statistical courses that would be required for experimental design and data analysis.

Reviewer 2 suggests more attention should be given to developing global issues and a global perspective to carry out that goal of the program. He also suggests that such an interdisciplinary program has an ideal opportunity to include management and leadership training to help make the graduates even more effective and in demand.

Graduate Council

The Graduate Council had, as a basis for its consideration, the proposal to establish the program, copies of the outside reviews of the program, the summary letter to the Chancellor, and a presentation to the Council by representatives of the program.

Response

The campus response focused on the interdisciplinary nature of the program, additional faculty, student support, and curriculum. NCA&T has embraced interdisciplinary approaches across the campuses and faculty members are hired with the expectation that they will be part of interdisciplinary teams. Several new faculty members have been hired and the Provost is committed to providing the faculty resources to make the program successful. A&T has special support funds including \$1,000,000 Title III funds for student support and additional funds for equipment for start-up packages for faculty. The curriculum will be reviewed for any duplication of courses and specialty courses in experimental design and data analysis will be included. The campus will also explore the recommendation to offer more management and leadership development opportunities for students in the program.

Recommendation by the Graduate Council

After consideration of the issues raised by reviewers and Council members, the Graduate Council voted, without dissent, to recommend approval to establish this doctoral program in Energy and Environmental Studies.

Need for the Program

The program addresses central issues facing our national economy as well as the international economy. It will prepare a cadre of students with interdisciplinary skills of

breath and depth to work on these difficult issues. Interest in the program is strong and there should be very good employment opportunities of graduates.

Resources

From reallocations, enrollment growth funds, and special grants such as Title III funding the campus will have the resources to mount the program. The Provost has committed to needed faculty resources.

Recommendations

The Office of the President recommends that the Board of Governors approve the request from North Carolina A&T State University to establish a doctoral program in Energy and Environmental Studies effective August 2005.

Approved to be Recommended to the Committee on Educational Planning, Policies, and Programs of the Board of Governors

Senior Vice President Gretchen M. Bataille

November 2, 2004