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Central University

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North Carolina
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University of
North Carolina
at Greensboro

University of
North Carolina
at Pembroke

University of
North Carolina
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University of
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University

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GENERAL ADMINISTRATION

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MEMORANDUM

TO: Members, Committee on Educational Planning, Policies, and Programs

FROM: Alan Mabe

DATE: February 1, 2011

SUBJECT: UNC Degree Program Proposals for Discontinuations and New Programs

Background: There are sixty proposals for discontinuation and two proposals for new degree programs. The discontinuations grow out of a campus review based on our biannual program review process that identifies programs whose productivity is low and asks the campuses to carefully review the programs. The productivity standards are included in the report. When programs have very little enrollment campuses have typically moved the resources from these programs to other programs so there is very little direct savings in these discontinuations. Faculty members serving these programs have other assignments which will expand as these programs are discontinued. Students currently enrolled in a program will have the opportunity to complete the degree even when a program is discontinued.

Jurisdictional Authority: The Code 100.1, 301 C: It [Committee on Educational Planning, Policies, and Programs] shall receive the advice and recommendations of the president and make recommendations to the board in all areas pertaining to the development of a coordinated system of higher education in North Carolina, including...the review of requests for the initiation of new degree programs and recommendations for the termination of existing programs....

Issues Involved: Some of these proposals are outright discontinuations while others will be merged into other degree programs. For example, instead of having a separate program for teacher licensure in a subject, some campuses are moving those licensure programs to the subject area program and discontinuing the separate licensure program. Student will still be able to pursue licensure in those subject areas.

Recommended Action: All the discontinuations are recommended as are the two proposed new degree programs.

Request for Authorization to Establish a Master of Science in Nanoengineering at NC A&T State University

NC A&T State University requests authorization to establish a Master of Science in Bioengineering degree (CIP 14.9999).

Program Description

The proposed MS in Nanoengineering is designed for students with strong backgrounds in either engineering or science who seek additional specialized education and training to qualify them for positions in the field of nanoengineering or nanotechnology design, research and development, or manufacturing. The program will produce graduates who are technically prepared and proficient with the principles and practices of engineering at the nanoscale to harness the unique and enabling aspects of nanoengineered materials, structures and their characteristics in engineering applications, enabling them to directly enter industrial, government, and private enterprises. The proposed program meshes well with NCA&T's educational and research thrusts in engineering, physical and biological sciences, and computational science and engineering. Although the degree is an NCA&T degree, it will be offered through the UNCG/NCA&TSU Joint School of Nanoscience and Nanoengineering. NCA&TSU is also preparing a proposal to establish a Ph.D. degree in Nanoengineering.

UNC Tomorrow Relevance

This degree program addresses several recommendations in the UNC Tomorrow Final Report including 4.1 Our Global Readiness and 4.4 Our Communities and Their Economic Transformation.

Highlights from UNC-GA Data Template

Overall job growth in engineering from 2006 to 2016 is expected to be about 11%, but there will be a higher rate of growth in emerging areas such as nanotechnology. Average salaries are substantially higher than the overall state average. In the last three years, NCA&T has added one baccalaureate, one master's, and one doctoral program and has discontinued four baccalaureate and three master's programs.

Outcome of Consultation with Disciplinary Panel

Faculty from ECU, NCSU, and UNCC participated in the panel discussion with NCA&T and UNC-GA representatives. Topics covered included: support from the private sector (General Dynamics, Lockheed Martin, Zeiss, and RF Micro Devices); military applications (helicopters from Cherry Point); overlap with UNCG's Nanoscience programs (minimal overlap); medical applications (yes, nano-bioscience is covered); thesis requirements; and differences with the NCSU offerings in Materials Science. Opportunities to share courses with NCSU were discussed.

Student Demand

NCA&T anticipates enrolling 15 students in the first year of the program. It is expected that students will be interested in pursuing the degree as both part-time and full-time students to further educate and train in the different nanoengineering disciplines beyond their undergraduate engineering, science or technology degrees. By the fourth year of the program, 25 full-time and 5 part-time students are expected to be enrolled.

Opportunities for Graduates of the Program

North Carolina lags other regions in the commercialization of nanoengineering research efforts in terms of nanotechnology-based business start-ups and in employment opportunities that such start-ups would offer. Commercial opportunities that could flow from the state's research enterprise in nanoengineering disciplines are particularly bright in the areas of advanced materials and manufacturing, aerospace, medicine and chemistry. To make the leap from the research laboratory to new products requires an educated and well qualified workforce that this program will prepare. There is a huge demand for "nano-trained" engineers in the rapidly emerging nanotechnology revolution in the areas of nanoengineered materials, nanoelectronics, aerospace, biotechnology, medical devices, pharmaceutical, and defense and materials industries.

Resource Implications

Resource needs: The Joint School of Nanoscience and Nanoengineering (JSNN) has allocated six new faculty positions in the areas of nanoengineering.

Resources allocated: In the 2007-09 biennium, JSNN received a \$50 million allocation for construction of the JSNN facility and \$8 million for equipment (reduced by \$3.7 million in 2009-11 budget cuts). In 2009, NCA&T and UNCG added \$10 million (originally intended for a joint interdisciplinary science building) to the JSNN facility with the provision that the interdisciplinary researchers be accommodated. The JSNN recurring budget in 2010-11 is \$4.9 million.

Estimated cost to the State: Based on the University funding formula, when the program reaches full enrollment, NCA&TSU would receive additional State appropriations of approximately \$298,769 if fully funded by the General Assembly.

Recommendation

It is recommended that the Board of Governors approve NCA&TSU's request to establish a Master of Science in Nanoengineering degree (CIP 14.9999) subject to the availability of funding.

General Information Template for Academic Program Review

Degree Area and Level:

Master of Science in Nanoengineering at North Carolina A&T State University (CIP 14.9999)

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 University's Outreach and Engagement (Recommendation 4.7).

Role of Program in Relation to State and Regional Needs:

According to the proposal this degree program, "Nanoengineering is an evolving field for the 21st century, a discipline that drives many engineering and science activities, the impact and associated technologies that will draw the industries of future growth as well as draw most creative minds. The educational programs of JSNN and the Masters and Ph.D. program in nanoengineering will drive the associated knowledge based economy."

US Labor Department Analysis:

- *Summary* – Overall engineering employment is expected to grow by 11 percent over the 2006-16 decade, about as fast as the average for all occupations. Engineers have traditionally been concentrated in slower growing or declining manufacturing industries, in which they will continue to be needed to design, build, test, and improve manufactured products. However, increasing employment of engineers in faster growing service industries should generate most of the employment growth. Job outlook varies by engineering specialty.

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

NC A&T State University Campus enrollment and degrees awarded in similar programs at the Masters level:

(Based on two CIP digits – 14 CIP is the summary group for Engineering under which Nanoengineering is a program.)

Enrollment			Academic Year						
			Fall 06	Spr 07	Fall 07	Spr 08	Fall 08	Spr 09	Fall 09
NCA&T	Chemical Engineering	MS	10	11	10	10	16	19	20
	Civil Engineering, General	MS	32	27	28	24	27	38	40
	Electrical and Electronics Engineering	MS	56	61	47	38	44	46	40
	Mechanical Engineering	MS	25	30	23	19	28	17	18
	Industrial Engineering	MS	38	43	42	36	48	39	36
	Engineering, Other	MS	13	11	11	10	12	11	17

Number of Degrees Awarded			Academic Year		
			2006-2007	2007-2008	2008-2009
NCA&T	Chemical Engineering	MS	5	5	2
	Civil Engineering, General	MS	17	13	11
	Electrical and Electronics Engineering	MS	26	22	22
	Mechanical Engineering	MS	5	11	8
	Industrial Engineering	MS	14	8	20
	Engineering, Other	MS	6	10	2

Campus Average of enrollment and degrees awarded in this degree area at the Masters level:
(Based on two CIP digits – 14 CIP is the summary group for Engineering under which Nanoengineering is a program - over the last 3 Academic Years, Fall 2006-Fall 2009)

Campus Average			
	Number of Active Programs	Enrollment per Semester	Degrees Awarded per Year
ECU	1	14	Degree established by BOG in 2006 – No graduates yet
NCA&T	6	28	12
NCSU	15	64	25
UNC-CH	1	5	3
UNCC	4	48	21
Campus Average:		32	15

NCA&T Degree Programs added in the past three years:

- *Bachelor*
 - BS Motorsports Technology (11/05/2010)
 - BS Bioengineering (06/11/2010)
 - BS Atmospheric Sciences and Meteorology (11/09/2007)
- *Master*
 - MS Bioengineering (06/11/2010)
 - MS Information Technology (09/07/2007)
- *Doctoral*
 - Ph.D. Computational Science and Engineering (01/08/2010)

NCA&T Degree Programs discontinued in past three years:

- *Bachelor*
 - BS Visual Arts, Art Education (03/20/2009)
 - BS Music Education (03/20/2009)
 - BS Romance Languages and Literatures, French Secondary Education (03/20/2009)
 - BS Romance Languages and Literatures, Spanish Secondary Education (03/20/2009)
- *Master*
 - MS English Education (03/20/2009)
 - MS Mathematics Education (03/20/2009)
 - MS History Education (03/20/2009)
- *Doctoral*
 - N/A