

Request for Authorization to Establish a Bachelor of Arts in Intelligence Studies at Fayetteville State University

Fayetteville State University requests authorization to establish a B.A. in Intelligence Studies degree program (CIP 44.0401) effective January 2010.

Program Description

The proposed multidisciplinary program is designed to provide students with conceptual and analytic skills for entry-level positions as intelligence analysts in public and private organizations. The curriculum will address contemporary principles of intelligence, history of U.S. intelligence and national security, intelligence research methods, strategic intelligence, and U.S. intelligence and foreign policy. A senior-year internship and two semesters of a strategically important language will be required. The program will seek accreditation with the National Association of Schools of Public Affairs and Administration. FSU faculty developing the program includes two former military officers with extensive experience in intelligence and security studies.

UNC Tomorrow Relevance

The proposed degree addresses the UNC Tomorrow goal of making FSU and its students fully competitive in the global marketplace. With applications in government, military, and business functions, Intelligence and related Security studies have become critical aspects of the expanding inter-relationship between nations, societies, and peoples. The program is capable of expansion to include partnering with other UNC campuses as well as universities around the world. In particular the program addresses the FSU goal of serving the large military population based in N.C. because it is anticipated that a substantial number of enrollees will be either active duty or veterans. Close collaboration with the community colleges and K-12 systems will support the goal of increasing access to higher education.

Highlights from UNC-GA Data Template

There are no other similar programs in UNC and the program would be only one of five degree programs in the nation. FSU discontinued three baccalaureate programs in the last three years and did not establish any new degree programs. The federal Intelligence Authorization Act of 2004 emphasized the need to develop programs that will enhance ethnic and cultural diversity throughout the Intelligence Community through the recruitment of individuals with diverse ethnic and cultural backgrounds, skills, and language proficiency.

Outcome of Consultation with Disciplinary Panels

The disciplinary panel included faculty representatives from ECU, UNC-CH, UNCC, and UNCP. Participants included authors of a recent book on terrorism and an ECU faculty member who is considering planning a Security Studies degree program. Panel members generally agreed that this is a needed program. They noted the need for a GIS faculty member (which FSU will hire as the program grows) and the importance of distance education in reaching working students and sharing courses with other campuses. When questioned about the various languages that will be taught, FSU representatives gave assurances that instructors are available.

Student Demand

FSU started a minor in Intelligence Studies in fall 2009, which has attracted approximately 20 students in its first semester. A 2005 survey of FSU students demonstrated widespread support for such a degree with more than four-fifths of the military respondents noting that such a degree would be important to their career advancement. With increasing numbers of military personnel moving to N.C. military installations in the next few years, it is likely this program will be in even greater demand. It is anticipated that 100 students will be in the program by its fourth year.

Opportunities for Graduates of the Program

The 9/11 Commission Report noted that one way to address the failure to properly analyze collected intelligence data is through formal education that produces well trained intelligence analysts from diverse groups in society. The growth in security threats, both domestically and internationally, creates a need for professional intelligence analysts who can operate effectively in both arenas. Military personnel and their dependents will seek this program either as second careers or as a way to advance their current careers.

Resource Implications

Resource needs: FSU representatives agreed with panel members that an instructor in GIS is needed as the program develops. Because this is a multidisciplinary program, courses across the curriculum will absorb program majors, probably without the need for additional class sections.

Resources allocated: For the first year of the program, \$322,000 will be reallocated for two current faculty positions and one support person. An additional faculty position will be funded from enrollment expansion funds, although the FSU Provost and Chancellor have verified that they will support the needs of the program even if enrollment expansion funding is not available. A reallocation of \$25,000 will be made for library materials. Adequate space has been allocated in the newly refurbished Knuckles Science Annex including several “smart” classrooms and a lab for spatial analytical research. Some classes will be offered online, which will reduce the need for classroom space.

Estimated cost to the State: By the fourth year, it is projected that the program will generate approximately 1,920 SCH’s annually in courses in the major. A portion of these SCH’s will be generated by FSU students who would otherwise be generating SCH’s in other FSU majors. Assuming that a third of the students by the fourth year of the program would be students who would not have otherwise enrolled at FSU, these “new” SCH’s would require about \$246,000 in state appropriation.

Recommendation

It is recommended that the Board of Governors approve Fayetteville State University’s request to establish a B.A. in Intelligence Studies degree program (CIP 44.0401) effective January 2010.

General Information Template for Academic Program Review

US Labor Department Analysis:

- *Summary* – Based on the CIP code, the Occupational Supply Demand System puts this degree program in a broad category of Public Administration and they do not provide a narrative for this cluster.
- *Summary Data* – Source: U.S. Department of Labor and America's Career InfoNet – None provided

Availability of Program Statewide:

- *Public universities* – Not offered at any UNC institution.
- *Private universities* – Not offered at any private institution in the State.

FSU Campus enrollment and degrees awarded in similar programs at the Bachelors level:

(Based on two CIP digits – CIP 44 is the summary group for Public Administration and Services under which Intelligence Studies is listed as a program.)

FSU does not offer any other Bachelors programs in the CIP 44 category.

Campus Average of enrollment and degrees awarded in this degree area at the Bachelors level: (Based on CIP 44 - over the last 3 Academic Years, Fall 2005-Fall 2008)

| Campus Average | | | |
|-----------------------|---------------------------------|-------------------------------|-----------------------------|
| | Number of Active Programs | Enrollment per Semester | Degrees Awarded per Year |
| ASU | 1 | 136 | 52 |
| ECSU | 1 | 59 | 23 |
| ECU | 1 | 100 | 46 |
| NCA&T | 1 | 129 | 43 |
| NCCU | 1 | 91 | 29 |
| NCSU | 1 | 72 | 25 |
| UNC-C | 1 | 130 | 44 |
| UNC-CH | 1 | 99 | 41 |
| UNC-G | 1 | 155 | 60 |
| UNC-P | 1 | 124 | 42 |
| UNC-W | 1 | 70 | 42 |
| WCU | 2 | 59 | 20 |
| WSSU | 1 | 11 | N/A |
| Campus Average | | 95 | 39 |

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FSU Campus Degree Programs added in the past three years:

- *Bachelor*
 - none
- *Master*
 - none
- *Doctoral*
 - none

FSU Campus Degree Programs discontinued in past three years:

- *Bachelor*
 - BS Business Education, Secondary (03/20/2009)
 - BA Health Education K-12 (03/20/2009)
 - BS Marketing Education for Teachers (03/20/2009)
- *Master*
 - none
- *Doctoral*
 - none

Request for Authorization to Establish a Bachelor of Science in Genetics at North Carolina State University

North Carolina State University requests authorization to establish a B.S. in Genetics degree program (CIP 26.0801) effective January 2010.

Program Description

NCSU is requesting to expand a highly enrolled minor program in Genetics into a new major program. The proposed Genetics major will prepare students for careers in genetics by providing classroom training in the fundamentals of genetics and other sciences, as well as requiring in-depth study in specialized areas of genetics research, including state-of-the-art laboratory techniques. Writing and communication will also be emphasized. Because NCSU, as it planned the curriculum, consulted with the NC Biotechnology Center, with out-of-state academic institutions offering a Genetics major, and with North Carolina biotechnology employers, graduates will possess the skills desired by today's biotechnology sector.

UNC Tomorrow Relevance

Research in genetics and human DNA is expected to be at the forefront of many new medical advances that will contribute to the improvement in health and wellness of all people and communities in our state, nation, and world (UNC Tomorrow Mandate 4.5). Examples are the new endeavors of personalized medicine, genetic testing, and genetic counseling. The program's primary goal is to prepare graduates who are ready for the 21st century workplace and who possess the critical skills needed to adapt to the ever-changing requirements of a technology-rich and international area of competition (Mandate 4.1). Clearly, the dynamic biotechnology/ pharmaceutical sector is important globally, as well as to North Carolina, which ranks third in the nation in number of biotechnology companies.

Highlights from UNC-GA Data Template

There are no undergraduate major programs in Genetics currently offered in North Carolina. In the past three years, NCSU has discontinued one doctoral, one baccalaureate, and eight masters programs, and has established one doctoral, four masters, and five baccalaureate programs.

Outcome of Consultation with Disciplinary Panels

The panel included faculty members from ECU, UNCC, UNCG and UNCW in addition to the NCSU faculty presenter. Overall comments were very positive, discussing how this degree program fits nicely into the NCSU portfolio of science/technology programs. Moreover, because the minor is already in place, only three new courses need to be developed for the proposed major program. There was also discussion on how this new program would interface with other biology-related programs at NCSU.

Student Demand

At NCSU, the Genetics minor has steadily grown over the past ten years to become the largest minor program in the College of Agriculture and Life Sciences, with 310 advised students during 2007-08. The minor averages approximately 100 graduates per year, and enrollment in Genetics courses is at an all-time high. An undergraduate Genetics Club was established in 2006. A petition, signed by 270 students from a variety of majors at NCSU requesting that an undergraduate major in genetics be established, led to the convening of a committee in the Department of Genetics to investigate the feasibility of a new major in genetics. The current proposal is the result of that committee's work. Also, each year several prospective NCSU students and their parents inquire as to whether an undergraduate major in genetics is offered at NCSU.

Opportunities for Graduates of the Program

The accelerating revolution in medicine and scientific applications that advances in genetics are leading means that employment opportunities for Genetics B.S. graduates are numerous and varied. Examples are medicine; agriculture and wildlife; computational biology (including bioinformatics); various engineering disciplines; business; law and justice (including forensics); history and anthropology; military; space exploration; bench science; and bioscience communication.

Resource Implications

Resource needs: It is anticipated that by its fourth year, the program will enroll 80 full-time upper division students. Ongoing financial support for the new program will be mainly enrollment growth funding.

Resources allocated: The Department of Genetics is housed in Gardner Hall Addition; a major modernization renovation was completed in 2008 which provided two new state-of-the-art Genetics teaching laboratories. NCSU has identified and committed the start-up funding necessary to begin the program in Spring 2010, including two new non-tenure track lecturer positions (\$139,387) and equipment funds to equip the two new Genetics teaching labs (\$126,000). No additional library support is needed for the new program.

Estimated cost to the State: As is the case with most baccalaureate programs, many of these Genetics majors (perhaps 70% or more) will likely come from students who are already enrolled at NCSU. Assuming 30% of the 80 majors are students who would not have attended NCSU otherwise, in the fourth year, according to the enrollment funding formula, new state appropriations of approximately \$205,000 will be generated by this program.

Recommendation

It is recommended that the Board of Governors approve North Carolina State University's request to establish a B.S. in Genetics degree program (CIP 26.0801) effective January 2010.

General Information Template for B.S. in Genetics at NCSU

US Labor Department Analysis:

- *Summary* – The Occupational Supply Demand System puts this degree program in a broad category of Biological/Life Sciences so demand results are not specific to a Genetics degree.

According to the OSDS, “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

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

- *Public universities* – Not offered at any other institution in the system.
- *Private universities* – Not offered at any other institution in the State.

Available in Online or Distance Format from UNC institutions:

Not available

NCSU Campus enrollment and degrees awarded by similar programs at the Bachelor level:

(Based on two CIP digits – 26 CIP is the summary group for Biological and Biomedical Sciences under which Genetics is listed as a program.)

| Enrollment | | Academic Year | | | | | | |
|------------|--------------------------------------|---------------|--------|---------|--------|---------|--------|---------|
| | | Fall 05 | Spr 06 | Fall 06 | Spr 07 | Fall 07 | Spr 08 | Fall 08 |
| NCSU | Biology/Biological Sciences, General | 624 | 654 | 635 | 661 | 698 | 730 | 749 |
| | Biochemistry | 221 | 230 | 215 | 239 | 232 | 243 | 233 |
| | Botany/Plant Biology | 27 | 28 | 25 | 29 | 21 | 16 | 16 |
| | Microbiology, General | 118 | 120 | 109 | 110 | 93 | 92 | 88 |
| | Zoology/Animal Biology | 163 | 176 | 189 | 177 | 177 | 193 | 199 |

| Number of Degrees Awarded | | | Academic Year | | |
|---------------------------|--------------------------------------|----|---------------|-----------|-----------|
| | | | 2005-2006 | 2006-2007 | 2007-2008 |
| NCSU | Biology/Biological Sciences, General | BS | 259 | 264 | 266 |
| | Biochemistry | BS | 91 | 82 | 81 |
| | Botany/Plant Biology | BS | 23 | 13 | 20 |
| | Microbiology, General | BS | 53 | 48 | 53 |
| | Zoology/Animal Biology | BS | 65 | 70 | 64 |

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Campus Average of enrollment and degrees awarded in this degree area at the Bachelor level:
(Based on two CIP digits - 26 CIP is the summary group for Biological and Biomedical Sciences under which Genetics 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 |
| ASU | 2 | 64 | 19 |
| ECSU | 1 | 73 | 24 |
| ECU | 3 | 130 | 67 |
| FSU | 2 | 54 | 18 |
| NCA&T | 1 | 103 | 29 |
| NCCU | 2 | 67 | 35 |
| NCSU | 5 | 244 | 97 |
| UNC-A | 1 | 80 | 17 |
| UNC-C | 2 | 166 | 57 |
| UNC-CH | 3 | 448 | 189 |
| UNC-G | 2 | 187 | 43 |
| UNC-P | 2 | 82 | 54 |
| UNC-W | 2 | 190 | 83 |
| WCU | 1 | 82 | 24 |
| WSSU | 3 | 28 | 8 |
| Campus Average: | | 133 | 51 |

NCSU Campus Degree Programs added in the past three years:

- *Bachelor*
 - BS Agricultural Science (06/08/2007)
 - BA German Studies (06/08/2007)
 - BA Leadership in the Public Sector (08/11/2006)
 - BS Bioprocessing Science (10/13/2006)
 - BA Design Studies (03/16/2007)
- *Master*
 - MS Analytics (02/09/2007)
 - MAT - Master of Arts in Teaching (10/17/2008)
 - MA Anthropology (08/11/2006)
 - MGIM - Master of Global Innovation Management (01/11/2008)
- *Doctoral*
 - PhD Fisheries and Wildlife Sciences (01/12/2007)

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NCSU Degree Programs discontinued in past three years:

- *Bachelor*
 - BS Health Occupations Education (03/20/2009)
- *Master*
 - MS Agricultural and Resource Economics (03/20/2009)
 - MEd in Special Education, Behavior Disorders (03/20/2009)
 - MS Behaviorally/Emotionally Handicapped (03/20/2009)
 - MEd Mentally Handicapped (03/20/2009)
 - MS Mentally Handicapped (03/20/2009)
 - MEd Specific Learning Disabilities (03/20/2009)
 - MS Specific Learning Disabilities (03/20/2009)
 - MS School Psychologist (05/11/2007)
- *Doctoral*
 - PhD School Psychologist (05/11/2007)

Request for Authorization to Establish a Bachelor of Science in Entrepreneurship at UNC Greensboro

UNC Greensboro requests authorization to establish a B.S. in Entrepreneurship degree program (CIP 52.0701) effective January 2010.

Program Description

UNCG proposed to convert a highly enrolled concentration (Entrepreneurship/Small Business) in the Business Administration major into a separate major. The proposed degree will be a cross-disciplinary program with approximately half the courses taken in the Bryan School of Business & Economics and the other half taken in Arts & Sciences. In addition to a required internship, a unique feature of the program is that majors must take at least one specially designed course selected from seven profile areas: creative industries, family business, franchising, health care, international, social, or technology and innovation. Graduates of the program will be able to conduct feasibility analyses, develop a business plan, prepare a financial forecast, and communicate effectively.

UNC Tomorrow Relevance

In the UNC Tomorrow Commission Final Report section, “Our Communities and Their Economic Transformation,” the first recommendation is that “UNC should increase its capacity and commitment to respond and lead economic transformation and community development,” and the first suggested strategy noted is “Promote and educate communities and students (both at the public school and at the higher-education levels) in entrepreneurship and innovation to ensure that they can adjust to and compete in the knowledge-based global economy” (p. 28).

Highlights from UNC-GA Data Template

In 2007-08 UNCG awarded 223 degrees in Business Administration, the third highest total of the 16 programs offered by UNC constituent institutions. One other campus (WCU) offers a B.S. in Entrepreneurship, which started in fall 2008 with 9 majors enrolled. In the past three years, UNCG has discontinued two baccalaureate programs and established one master’s and three doctoral programs.

Outcome of Consultation with Disciplinary Panels

The panel included faculty members from ASU, ECU, NCSU, UNC-CH, UNCC, and UNCW in addition to the UNCG faculty presenter. Overall comments were very positive. Two faculty from WCU compared their curricular approach with that of UNCG, and other faculty discussed the skills that a graduate of the program would most need. The UNCG representative emphasized the importance of working with the external business community and generating support from across the campus for the cross-disciplinary approach. In response to a question about specialization at the undergraduate level, it was noted that program graduates will possess skills that will be needed even in established businesses because people have to be creative and entrepreneurial in every environment today.

Student Demand

Of the 667 Business Administration majors in fall 2008, 206 were in the Entrepreneurship/Small Business concentration, an 85 percent increase in five years. This is the fastest growing major in accredited schools of business. Approximately one-third of the 189 African-American Business majors chose this concentration. As North Carolina continues to attract immigrants, entrepreneurship is traditionally an important focus for this population. An even greater demand for these courses is anticipated when they are developed online over the next several years.

Opportunities for Graduates of the Program

The Bryan School has excellent placement of students with Triad businesses and will develop an internship program that targets the industry clusters of health care and biotechnology, logistics, wholesale trade, finance and insurance, food processing, and the arts. The Final Report of the Entrepreneurism Committee of the Greensboro Partnership in fall 2007 noted, “The role of Entrepreneurism in Greensboro, Guilford County, and North Carolina has never been more important than it is right now. Other evidence indicates that the Triad needs to build upon its existing entrepreneurial base and develop a stronger entrepreneurial environment to develop jobs, especially to replace traditional industry sectors.”

Resource Implications

Resource needs: Current Entrepreneurship faculty are sufficient for teaching and related responsibilities for the first two years of the program; it is anticipated that a new tenure-track faculty person will be needed by the third year if enrollments grow as expected.

Resources allocated: Jackson Library will continue to build its bound and electronic Entrepreneurship resources: \$30,000 is reallocated in the first year for this purpose with additional amounts in later years. Over \$312,000 will be reallocated for 3.5 faculty positions. The Bryan School has committed facility space and technology for the program that are deemed adequate for the next decade. Faculty in the seven profile areas have received assistance in developing appropriate courses.

Estimated cost to the State: It is anticipated that by its fourth year, the program will enroll 227 full-time and 23 part-time students (upper division). Assuming all courses are taken in the major in the junior and senior years, this would generate approximately 7,140 SCH's annually in fundable student credit hours (SCH's). Many of these SCH's would be generated by UNCG students who would be enrolled at UNCG in any case generating SCH's in other majors. Assuming that one in five students majoring in Entrepreneurship in the fourth year of the program would be students who would not have otherwise enrolled at UNCG, these “new” SCH's would require about \$477,000 in state appropriation.

Recommendation

It is recommended that the Board of Governors approve UNC Greensboro's request to establish a B.S. in Entrepreneurship degree program (CIP 52.0701) effective January 2010.

General Information Template for Academic Program Review

US Labor Department Analysis:

Summary – The Occupational Supply Demand System puts this degree program in a broad category of Business Management and Administration so demand results are not specific to an Entrepreneurship degree.

According to the OSDS, “Employment of administrative services managers is projected to grow 12 percent over the 2006-16 decade, about as fast as the average for all occupations.”

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

- *Public universities* – The BS in Entrepreneurship program at WCU received approval to establish in September 2007, and had 9 students enrolled in the Fall 2008 semester.
- *Private universities* – Offered at High Point University and according to IPEDS reports, they had one completer in 2007-2008.

Available in Online or Distance Format from UNC institutions:

Not available

UNC Greensboro Campus enrollment and degrees awarded by similar programs at the Bachelor level:

(Based on two CIP digits – 52 CIP is the summary group for Business, Management, Marketing, and Related Support Services under which Entrepreneurship is listed as a program.)

| Enrollment | | | Academic Year | | | | | | |
|------------|---|----|---------------|-----------|------------|-----------|------------|-----------|------------|
| | | | Fall 05 | Spr 06 | Fall 06 | Spr 07 | Fall 07 | Spr 08 | Fall 08 |
| UNCG | Business Administration and Management, General | BS | 543 | 537 | 560 | 595 | 602 | 614 | 667 |
| | Accounting | BS | 212 | 199 | 218 | 198 | 200 | 204 | 204 |
| | Business/Managerial Economics | BS | 25 | 29 | 20 | 28 | 32 | 36 | 40 |
| | Finance, General | BS | 84 | 51 | 87 | 90 | 99 | 108 | 112 |
| | Hospitality Administration/Management General | BA | 51 | 64 | 66 | 72 | 83 | 101 | 110 |
| | International Business/Trade/Commerce | BS | 48 | 47 | 45 | 40 | 47 | 66 | 74 |

APPENDIX G

| Number of Degrees Awarded | | | Academic Year | | |
|---------------------------|---|----|---------------|-----------|-----------|
| | | | 2005-2006 | 2006-2007 | 2007-2008 |
| UNC-G | Business Administration and Management, General | BS | 194 | 183 | 223 |
| | Accounting | BS | 53 | 46 | 49 |
| | Business/Managerial Economics | BS | 10 | 10 | 12 |
| | Finance, General | BS | 48 | 41 | 42 |
| | Hospitality Administration/Management, General | BA | 15 | 22 | 30 |
| | International Business/Trade/Commerce | BS | 19 | 21 | 18 |

Campus Average of enrollment and degrees awarded in this degree area at the Bachelor level:
(Based on CIP 52 - over the last 3 Academic Years, Fall 2005-Fall 2008)

| Campus Average | | | |
|-----------------|---------------------------|-------------------------|--------------------------|
| | Number of Active Programs | Enrollment per Semester | Degrees Awarded per Year |
| ASU | 10 | 135 | 54 |
| ECU | 9 | 145 | 67 |
| ECSU | 2 | 103 | 45 |
| FSU | 5 | 77 | 31 |
| NCA&T | 6 | 125 | 37 |
| NCCU | 3 | 156 | 45 |
| NCSU | 3 | 668 | 157 |
| UNCA | 3 | 48 | 22 |
| UNCC | 8 | 227 | 91 |
| UNC-CH | 2 | 405 | 187 |
| UNCG | 7 | 174 | 58 |
| UNCP | 2 | 164 | 43 |
| UNCW | 6 | 147 | 69 |
| WCU | 10 | 54 | 29 |
| WSSU | 2 | 142 | 37 |
| Campus Average: | | 185 | 65 |

APPENDIX G

UNC Greensboro Degree Programs added in the past three years:

- *Bachelor*
 - none
- *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)

UNC Greensboro Degree Programs discontinued in past three years:

- *Bachelor*
 - BS Dance Education (03/16/2007)
 - BA German, Secondary Education (03/20/2009)
- *Master*
 - none
- *Doctoral*
 - none

Request for Authorization to Establish a Master of Science in Nanoscience at UNC Greensboro

UNC Greensboro requests authorization to establish an M.S. in Nanoscience degree program (CIP 40.9999) effective January 2010.

Program Description

Nanoscience is the investigation, fabrication, and characterization of matter structured at dimensions below 100 nanometers (100 billionths of a meter). The proposed M.S. in Nanoscience will be a professional science master's program designed for students with strong backgrounds in science, engineering or technology, who seek additional specialized training to qualify them for technical marketing and manufacturing management positions in nanoscience or nanotechnology development or manufacturing companies. The curriculum of this 33 graduate credit hour non-thesis program will be a combination of science, technology, and business courses; an internship or special project is required. The program is being established in conjunction with the Joint School of Nanoscience and Nanoengineering (JSNN), established by UNCG and NCA&T. This multidisciplinary program will utilize many courses already being taught at UNCG and NCA&T.

UNC Tomorrow Relevance

While research laboratories across North Carolina, particularly at its public and private universities, are "leading performers" in quality nanotechnology research and development (*A Roadmap for Nanotechnology in North Carolina's 21st Century Economy*. NC Board of Science & Technology, April 2006), the state lags other regions in the commercialization of these nanoscience research efforts in terms of nanotechnology-based business startups and in employment opportunities for North Carolina's citizens that such startups would offer. The professional M.S. in Nanoscience is intended to help enable the commercialization of R&D innovations in many industries. JSNN, of which this proposed program is a component, addresses the "global readiness", "economic transformation and community development", "health", "environment", "outreach and engagement" and "changes to internal policies and processes" aspects of the UNC Tomorrow initiative.

Highlights from UNC-GA Data Template

There are no other M.S. in Nanoscience degree programs currently offered in North Carolina. In the past three years, UNCG has discontinued two baccalaureate programs, and has established one masters and three doctoral programs.

Outcome of Consultation with Disciplinary Panels

The panel included faculty members from ASU, ECU, UNCC, and NCSU in addition to the UNCG presenter. Overall comments were positive, with consensus agreement on the need for this degree program. Questions from panel members elucidated the four major focus areas of this program: nanobioscience, nanopetrology, nanomaterials, and nanoelectronics. These four areas were selected to meet state and local business interests.

Student Demand

UNCG and NCA&T state that there is a huge demand for “nano-trained” workers in the nanoelectronics, biotechnology, medical devices, pharmaceutical, defense, and materials industries, and that by 2015 nano-containing products will be commonly commercially available. From working with local businesses on developing the program’s curriculum, UNCG anticipates the following likely pool of potential students: 1) workers (including recently unemployed workers) from local industries; 2) undergraduate students at both campuses; and 3) currently-enrolled graduate students who may want to change programs.

Opportunities for Graduates of the Program

UNCG’s and JSNN’s professional M.S. in Nanoscience degree program is designed to produce graduates with advanced training who are prepared to enter private enterprise in nanoscale commercialization and manufacturing. There is currently an important need in North Carolina for such graduates. The diverse array of disciplines in biology, chemistry, physics, engineering, nutrition, and technology that are converging to form the interdisciplinary enterprises of nanoscience and nanotechnology are rapidly spawning an array of materials and techniques in research laboratories globally which hold the promise, and increasingly the reality, for new materials and new products. Commercial opportunities that could flow from the state’s research enterprise in nanoscience are particularly bright in the areas of medicine and chemistry. To make the leap from the research laboratory to new products, and new jobs, requires an appropriately educated managerial workforce. It is the central objective of the professional M.S. in Nanoscience degree program to produce such managers for North Carolina businesses and manufacturing operations.

Resource Implications

Resource needs: By year four, the estimated enrollment should be approximately 30 FTE (a combination of full-time and part-time students). The only new faculty positions required in this multidisciplinary program will be those to teach the four new nanoscience survey courses. Ongoing financial support for the new M.S. program will be mainly enrollment growth funding.

Resources allocated: A new building for the JSNN including the M.S. in Nanoscience degree program has been funded by the North Carolina General Assembly. That action also funds new equipment for the program. Current library holdings at UNCG and NCA&T are adequate for the proposed M.S. program.

Estimated cost to the State: In the fourth year, according to the enrollment funding formula, state appropriations of approximately \$434,000 will be generated to support this program.

Recommendation

It is recommended that the Board of Governors approve UNC Greensboro’s request to establish an M.S. in Nanoscience degree program (CIP 40.9999) effective January 2010.

General Information Template for M.S. in Nanoscience at UNCG

US Labor Department Analysis:

- *Summary* – The Occupational Supply Demand System puts this degree program in a broad category of Physical Sciences and they do not provide a narrative for this cluster.
- *Summary Data* – Source: U.S. Department of Labor and America's Career InfoNet – None provided

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

- *Public universities* - Not offered at any UNC institution.
- *Private universities* – Not offered at any private institution in the State.

Available in Online or Distance Format from UNC institutions:

Not available

UNC Greensboro Campus enrollment and degrees awarded in similar programs at the Masters level:

(Based on two CIP digits – 40 CIP is the summary group for Physical Sciences under which Nanoscience is listed as a program)

| Enrollment | | | Academic Year | | | | | | |
|------------|--------------------|----|---------------|--------|---------|--------|---------|--------|---------|
| | | | Fall 05 | Spr 06 | Fall 06 | Spr 07 | Fall 07 | Spr 08 | Fall 08 |
| UNC-G | Chemistry, General | MS | 25 | 25 | 26 | 24 | 29 | 30 | 32 |

| Number of Degrees Awarded | | | Academic Year | | |
|---------------------------|--------------------|----|---------------|-----------|-----------|
| | | | 2005-2006 | 2006-2007 | 2007-2008 |
| UNC-G | Chemistry, General | MS | 4 | 9 | 9 |

APPENDIX G

Campus Average of enrollment and degrees awarded in this degree area at the Masters level:

(Based on two CIP digits – 40 CIP is the summary group for Physical Sciences under which Nanoscience 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 |
| ASU | 1 | 13 | 5 |
| ECU | 3 | 20 | 6 |
| NCA&T | 2 | 9 | 3 |
| NCCU | 3 | 9 | 3 |
| NCSU | 3 | 25 | 7 |
| UNC-C | 4 | 14 | 5 |
| UNC-CH | 4 | 8 | 6 |
| UNC-G | 1 | 27 | 7 |
| UNC-W | 3 | 34 | 8 |
| WCU | 1 | 14 | 4 |
| Campus Average | | 17 | 5 |

UNC Greensboro Campus 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)

UNC Greensboro 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