APPENDIX B

UNC Board of Governors Policy on Academic Program - **12-point plan**

(1) What are the number, location, level, and mode of delivery of existing programs within North Carolina A&T State University and the triad that complement or that competes with this proposal?

There are no other existing programs at North Carolina A&T State University and the Triad that complement and compete with this proposal. In fact, there are no other interdisciplinary graduate programs in computational science and engineering elsewhere in North Carolina.

For further details, see section B, Page 13 in this proposal.

(2) How well does the proposed program relate to the distinctiveness of the campus and the mission of the campus?

The proposed program is a result of interdisciplinary synergistic collaboration among the School of Arts and Sciences, College of Engineering, the School of Business and Economics, and the School of Technology. It will enhance and supplement current graduate research and educational programs in physical and life sciences, mathematics, technology and business, and further the nurturing of cross-disciplinary interaction and collaboration in computational science and engineering (CSE) among faculty and graduate students. North Carolina A&T State University is the only UNC institution in the Triad area with academic programs in engineering and technology that are distinctive components of the proposed Ph.D. program.

(For further details, see page 1, section 1-A of this proposal). The proposed program dovetails well with the mission of North Carolina A&T State University as outlined in its vision is to be a premier interdisciplinary university that builds upon its competitive advantages in engineering, technology and business. (For further details, see page 8, section II.A of this proposal).

(3) What is the current and projected demand for graduates of the program in the triad, region, or State as a whole, and in what is it's probable impact on the triad, region, or State as a whole?

Computational methods have become an accepted and widely used solution methodology joining analytical and experimental techniques as the basic techniques in scientific, engineering research, discovery, design and applications as well as to problems in many other non-traditional areas, such as human behavior, health sciences, energy, etc. As the triad region and the state of NC is expanding into the

high and knowledge based technical areas (aerospace, pharmaceuticals, engineering design, bioinformatics, etc.) the current and projected demand for graduates with Ph.D. in computational science and engineering has been increasing not only in the state but also across the nation. The focus research areas identified in (section 1, page 2) in this proposal are current and projected demand areas and the program will generate graduates to meet the interdisciplinary demands of the current market place and global economy. The demands for these graduates in these high tech, high paying areas impacts the triad, NC economy as well as act as a catalyst to attract new high tech industrial sectors to the triad region and the state.

(For further details, see section II-A-3, page 11 of this proposal).

(4) Does this program create wasteful or unnecessary duplication?

No. This program does not create wasteful or unnecessary duplication. There are no other formal, interdisciplinary, Ph.D. programs in Computational Science and Engineering as proposed elsewhere in North Carolina.

(For further details, see section B, page 13 of this proposal).

(5) What are the projected near-term and long-term employment opportunities for program graduates?

New emerging industries in the state and across the nation such as aerospace, bio-informatics, research and federal defense, energy and environment sectors, NASA and other laboratories, pharmaceutical industries, etc, are in need of computationally oriented and trained scientists and engineers that are graduated by the proposed program. The successful placement of all the current M.S. CSE graduates in major industries is a clear indicator of the near-term and long-term employment opportunities. The employment opportunities are expected to further increase due to the demand and limited supply of CSE graduates and in the new industrial sectors of NC but also across the nation. Nationally, there is an increased demand for doctoral trained students in Computational Science and Engineering and is exemplified establishment of a Ph.D. program in Computational Science and Engineering by Georgia Tech. The projected retirement of several Ph.D. level scientists and engineers over the next decade and the increased demand of computational scientists in various current and new industries further enhance the long-term employment opportunities.

(6) Does the university have the necessary number and quality of faculty to offer the program? If not, how will faculty resources be added or developed?

Yes. The participating faculty of this interdisciplinary program from engineering, arts and sciences, technology and business are listed in section IV-A. In addition, new targeted faculty hiring has already been initiated.

(7) What is the availability of campus resources (library, teaching, and student office space, labs, equipment, external funding, and the like) to support the program?

The required campus resources are available to support the proposed program.

The details of the library resources are listed in section V (page 27), and facilities and equipment are listed in section VI (page 28).

(8) Is the number and quality of lower-level and cognate programs that are currently in place or are there plans to create these lower-level programs as part of the program phase-in. Please elaborate.

The proposed CSE Ph.D. program will be built around the existing Computational Science and Engineering (CSE) M.S. program and its strengths in computational science and engineering research, the lateral use of existing Ph.D. programs, existing governmental and industrial partnerships in computational research areas, and the innovative use of distance education courses as appropriate.

For further details, see section C, page 5 of this proposal).

(9) Were access to the program and affordability by potential students included in the decision to propose it? Please elaborate.

The enrollment access and admission requirements to the program follow similar guidelines to that of the other Ph.D. programs at North Carolina A&T State University. The affordability is at the same level of other Ph.D. and graduate programs at the university. No additional costs are required from the students pursuing this program. In addition, the students will have similar opportunities for graduate assistantships and fellowships available to doctoral students.

(10) Discuss the anticipated quality of the proposed program. Include accreditation, the ability of the program to bolster the academic enterprise of the campus, and the expectation for a high level of success.

The requirements for the proposed program have been formulated to meet the graduate school standards for a doctoral program and meet the SACS (Southern Association of Colleges and Schools) graduate program requirements. The program requirements were developed in consultation with an interdisciplinary committee of faculty from School of Arts and Sciences, College of Engineering, School of Technology and School of Business.

(For further details, see section C, page 18 of this proposal). For discussions on accreditation, see section VIII of this proposal.

(11) Is this program proposed as a joint or collaborative program by two or more campuses? If not, is it feasible to organize the proposal so that one or more additional campus can participate?

No. This program is not proposed as a joint or collaborative program by two or more campuses. In the Triad region and in the state of NC, NCA&T is the only institution with a formal master's program in computational science and engineering. NCA&T is also the only institution in the triad region with academic programs in engineering and technology. Under the current infrastructure, it is not feasible to organize the proposal so that one or more additional campus can participate.

(12) Provide other relevant information to support the need for this new program.

Please see, Section II, page 7 of the proposal

References:

1. UNC Response Plan NC AT Su Final ver22.doc
2. UNC T Response Plan Summary NC A&T SU2.doc
3. NCAT UNCT Phase 1 UNC-GA Staff Observations – jjg notes1.docx
4. North Carolina A&T State University Proposal to Establish a Computational Science and Engineering Ph.D. Program