UNIVERSITY AT ALBANY
State University of New York

College of Nanoscale Science and Engineering

Alain E. Kaloyeros, Ph.D.
Vice President and Chief Administrative Officer

May 28, 2008

Program Review & Planning Group
Office of the Provost and Vice Chancellor for Academic Affairs
State University of New York
Albany, NY 12246

Dear Program Review and Planning Group Members:

On behalf of the College of Nanoscale Science and Engineering (CNSE) of the University at Albany (UAlbany), it is my pleasure to submit for your consideration the Program Announcement for a proposed baccalaureate program in nanoscale engineering (attached).

The proposal for a baccalaureate degree in nanoscale engineering was prepared in accordance the policies and guidelines of the University at Albany, including its University Senate, the State University of New York, and the New York State Education Department. As such, it is being submitted in line with the approved mission of the University at Albany, as documented in the "Memorandum of Understanding between the University at Albany and the State University of New York" (November 2006).

The proposal has been duly reviewed and unanimously approved by all required UAlbany faculty and administrative governance bodies, including the Undergraduate Academic Council of the UAlbany University Senate, the University Planning and Policy Council (UPC) of the UAlbany University Senate, the Executive Committee of the UAlbany University Senate, the UAlbany University Senate, and the UAlbany Interim President.

Please note that the proposed baccalaureate degree in nanoscale engineering does not lead to New York State licensure for practicing engineers in civil construction, surveying, or the trades.

I look forward to working with the Office of the Provost and Vice Chancellor toward the successful review and implementation of this exciting and impactive undergraduate program.

Sincerely,

Alain E. Kaloyeros, Ph.D.

Cc: George M Philip, UAlbany Interim President
Risa Palm, SUNY Provost
Susan Phillips, UAlbany Interim Provost
Sue Faerman, UAlbany Dean of Undergraduate Studies

NanoFab 300 South, Suite 214
255 Fuller Road, Albany, NY 12203
PH: 518-437-8686 FX: 518-437-8603
www.albanynanotech.org

APPENDIX A

PROGRAM ANNOUNCEMENT
For Undergraduate Programs

Name of Institution:
University at Albany, State University of New York

Date:
March 31, 2008

Proposed program title:
Nanoscale Engineering

Proposed degrees or other awards:
Bachelor of Science

Total Credits:
132

If baccalaureate degrees are proposed, will a waiver of external review be requested: (Y/N) N
{*If 'Yes', complete the waiver request section on the reverse.*}

Academic unit(s) that will offer program: College of Nanoscale Science and Engineering

Proposed HEGIS codes: 0915.00

Proposed beginning date: September 1, 2009

Program summary: {*Attached as Appendix A.1*}

Projected enrollment:	When the program begins	After five years
Full-time students	20	150
Part-time students		

Will programs lead to certification/licensure? __Yes _X_No If Yes, in what field or specialty?

Will special accreditation be sought? X Yes __No If Yes, by what group? By what date?

Accreditation for the B.S. program in Nanoscale Engineering will be sought from ABET (*Accreditation Board for Engineering and Technology*) by the close of the fifth full year of instruction.

Will programs or any constituent courses be offered off-campus? __Yes _X_No
If Yes, at what address?
How much? {*Specify number of courses and related credits*}
Via telecommunications? __Yes __No If Yes, to what location(s)?

For more information, contact the following academic officer:
Name: Alain E. Kaloyeros **E-mail: AKaloyeros@uamail.albany.edu**
Title: Vice President and CAO **Voice: 518-442-4533**

Response to Announcement *(requested of other State University campuses)*

Do you have a similar or related program? What has been your experience with the program? Would the introduction of this program have any effect, positive or negative, on your institution? Please specify. Do you perceive a need for this kind of program? Is there opportunity for articulation or inter-institutional cooperation? The response should be addressed to the proposing campus' President with a copy to the University Provost, The State University of New York, State University Plaza, Albany, NY 12246.

Nanoscale Engineering Curriculum

LOWER DIVISION	
Course Title	**Cr**
Nanotechnology Survey	3
Societal Impacts of Nanotechnology	3
Economic Impacts of Nanotechnology	3
Disruptive Nanotechnologies	3
Chemical Principles of Nanoscale Science and Engineering I	4
Chemical Principles of Nanoscale Science and Engineering II	4
Physical Principles of Nanoscale Science and Engineering I	4
Physical Principles of Nanoscale Science and Engineering II	4
Biological Principles of Nanoscale Science and Engineering I	4
Introduction to Nanoengineering Design and Manufacturing	3
Introduction to Nanoengineering Design and Manufacturing (Honors)	3
Introduction to Computer Programming for Engineers	3
Introduction to Computer Programming for Engineers (Honors)	3
Introduction to Nanoengineering Electronics	3
Introduction to Nanoengineering Electronics (Honors)	3

UPPER DIVISION	
Course Title	**Cr**
Thermodynamics and Kinetics of Nanomaterials	3
Electronic, Optical and Magnetic Properties of Nanomaterials	3
Mechanics of Nanomaterials	3
Fluid Mechanics and Transport Processes	3
Micro and Nanomaterials Processing Technology	4
Fundamentals of Nanoelectronics	4
Thin Film and Nanomaterials Characterization	4
Industrial Nanomanufacturing	3
Nanoelectronic IC Fabrication Processes	3
Micro and Nano Devices and Circuits	3
Nanoscale Optical and Optoelectronic Devices	3
Applications of Fields and Waves to Nanoscale Systems	3
Nanoelectronic Devices	3
Introduction to Solar Cell Nanotechnology	3
Introduction to Fuel Cell Nanotechnology	3
Renewable & Alternate Energy Nanotechnologies	3
Nanoscale Chemical and Biological Sensors	3
Advanced Materials Processing for NEMS/MEMS	4
Interfacial Engineering in Nanobiological Systems	3
NEMS/MEMS for Chemical and Biological Sensors	3
BioMEMS and BioNEMS	3
Nanobiological Systems	3
Nanoscale patterning	3
Light Optics for Nanoengineering	3
Charged Particle Optics for Nanoengineering	3
Electron Beam Pattern Generation	3
Nanophotonics	3
Magnetic Nanostructures	3
Organic Semiconductors	3
Analysis of Thin Film and Interfaces	3
Nanoscale Polymer Science & Engineering	3
Nanoscale Interfacial Engineering	3
Modeling of Nanomaterials and Systems	3
Capstone Research I: Introduction and Literature Review	3
Capstone Research II: Team Research and Project Review	3
Capstone Research III: Team Research and Final Report	3
Capstone Research III: Team Research and Final Report (Honors)	3
Current Topics in Nanoscale Science and Engineering	1-6
Independent Study and Research	1-6

APPENDIX A.1

Program Summary for Baccalaureate in Nanoscale Engineering
(Non-Licensure: the proposed baccalaureate degree in nanoscale engineering does not lead to New York State licensure for practicing engineers in civil construction, surveying, or the trades)

The College of Nanoscale Science and Engineering (CNSE) of the University at Albany (UAlbany) proposes an academic curriculum leading to the degree of Bachelor of Science in Nanoscale Engineering. This degree program will NOT lead to NYS licensure in engineering. The curriculum is intended to attract and retain an undergraduate student population that is presently inaccessible to SUNY and most of the private institutions of learning in New York State due to the lack of interdisciplinary nanoscale engineering degrees, as documented by virtually each study, blueprint, report, and analysis published by every governmental body, corporate organization, academic entity, and think tank across the globe – including the National Science Foundation, which forecasts the need for more than two million nanotechnology educated professionals in the U.S. by 2014, with another five million nanotechnology jobs being required worldwide in supporting fields.

The curriculum represents a 132-credit program designed for completion in eight academic semesters, is consistent with the SUNY General Education Program requirements, and comprises a cutting-edge, interdisciplinary, academic program centered on scholarly excellence, educational quality, and technical and pedagogical innovation. The outcome is a unique undergraduate experience that taps into CNSE's global academic leadership in nanoscale engineering to attract and educate a diverse and talented pool of qualified engineers at the baccalaureate level.

The blueprint of the curriculum is comprised of four basic components: *"Foundational Principles,*" *"Core Competencies," "Concentrations"* and *"Capstone Research/Design."* The first two components integrate the dissemination of fundamental, cross-disciplinary, nanoscale science and engineering principles with the cultivation of the skill set necessary for advanced undergraduate coursework and interdisciplinary research. The remaining two components expand on these foundational skills to develop the topical expertise, technical depth, and independent research abilities essential to a well-rounded undergraduate education. This combination results in a customizable and coherent undergraduate degree programa that trains the student how to explore, discover, and innovate, while ensuring proficiency in a specific nanoscale engineering discipline.

The baccalaureate curriculum in nanoscale engineering exploits the unparalleled academic, professional, and infrastructural resources of the CNSE and its $4B research, development and education complex. By leveraging CNSE's one-of-a-kind physical infrastructure, world-class interdisciplinary faculty, and extensive public-private partnerships, the proposed undergraduate curriculum will hold a scholarly profile and pedagogical impact distinct from and highly complementary to current academic offerings at the remaining SUNY campuses and other New York State institutions of higher learning. The curriculum will also serve as an effective tool in the attraction of the highest quality undergraduate students from around the world to UAlbany, advancing its stature as a top flight research university.