UNIVERSITY SENATE

UNIVERSITY AT ALBANY
STATE UNIVERSITY OF NEW YORK

Introduced by: Graduate Academic Council

Date: May 2005

PROPOSAL TO ESTABLISH A DUAL DEGREE PROGRAM
M.S. NANOSCIENCES & NANOENGINEERING / M.B.A.

IT IS HEREBY PROPOSED THAT THE FOLLOWING BE ADOPTED:

1. That the University Senate approve the attached proposal to establish the above named dual degree program, as approved by the Graduate Academic Council, to be effective upon NYS registration.

2. That this proposal be forwarded to the President for approval.
Proposed Dual Degree
Master of Science in Nanosciences and Nanoengineering
and
Master of Business Administration

Proposed program title: NanoTechnology Management Program

Titles and program code numbers of currently registered programs which are to be combined: Master of Science in Nanosciences and Nanoengineering 28096 and Master of Business Administration 02955.

HEGIS classifications and numbers: M.S. in Nanosciences and Nanoengineering 0915 (Materials Engineering) and Master of Business Administration 0506 (Business Management and Administration).

Academic units that will offer the program: College of Nanoscale Science and Engineering, University at Albany, State University of New York and School of Business, University at Albany, State University of New York.

Proposed beginning date: September 1, 2005.

Summary of the program: The College of Nanoscale Science and Engineering, University at Albany, offers M.S. and Ph.D. programs in Nanosciences and Nanoengineering. The School of Business, University at Albany, State University of New York, offers approved B.S., M.S., M.B.A., and Ph.D. programs in Business Administration and Accounting.

The proposed NanoTechnology Management Program (NTMP) combines masters-level programs in Nanoscale Science and Engineering and Business Administration. The proposed NTMP dual degree program is 63 credits: 36 credits will be offered in the School of Business (SOB) and 27 credits will be offered in the College of Nanoscale Science and Engineering (CNSE). The NTMP program will take 2 academic years to complete on a full time basis.

Rationale for the program: The NanoTechnology Management Program is an interdisciplinary program linking the M.B.A. and M.S. in Nanosciences and Nanoengineering degree programs. It is a cooperative effort between the College of Nanoscale Sciences and Engineering and the School of Business at the University at Albany. The goal of the program is to develop “industry ready” graduates who will be facilitators of change with the ability to integrate engineering, business, and people issues. The objectives of this program are to:

(i) Integrate knowledge and skills from nanotechnology and business disciplines for effective responses to rapidly changing environments; and
(ii) Prepare engineers for effective participation in the management of nanotechnology based organizations.
The proposed joint program in business and nanotechnology offers an attractive option for graduate studies. This program trains students in one of the fastest growing technology areas and provides business skills combined with technical knowledge needed to succeed in a highly competitive technology environment. The pace at which nanotechnology products and processes are generated has grown exponentially, creating new markets and rapidly changing sources of competition. Innovation, competitive pressures and disruptive technologies are creating new challenges for leaders and professionals in this area. New management skills combined with the latest technical knowledge in nanotechnology are needed for companies to compete in this fast paced, global environment. The joint program will meet the needs of nanotechnology driven companies by focusing on technology related issues with critical business insights. This program will provide students and organizations an education and training experience focused on specific issues relevant to nanotechnology driven industries. The program is designed for technical individuals who want a deeper appreciation for management issues and their impact on the latest emerging nanotechnology areas. The NTMP will train engineers to become skilled managers and executives.

The potential benefits of this partnership include an increase in research collaboration between the School of Business and CNSE that is already underway, as well as exchange of students between the two schools. The proposed program should also increase enrollments in each academic unit.

Potential demand: Establishing the NTMP program at the University at Albany will bolster already established reputations in nanotechnology and business and allow for growth throughout the northeast region and eventually the United States. The NTMP will attract students with undergraduate degrees in the sciences and engineering. Local institutions of higher education, including the University at Albany, Rensselaer Polytechnic Institute, and Union College produce significant numbers of the qualified candidates. With the technical requirements of jobs growing, more and more students are acquiring technical knowledge. This creates a growing resource pool for the NTMP program. Similarly, with the increasing number of new businesses within the nanotech sector being generated in the Capital Region, the possibilities for interaction and opportunity are substantial.

The NTMP requires no incremental instructional resources; students will take courses offered in the existing M.B.A. and M.S. in Nanosciences and Nanoengineering programs. The goal is to build enrollments over 5 years to 30 new students annually. When the program reaches a sustained level of 30 students per year, the School of Business and the College of Nanoscale Sciences and Engineering will evaluate the need to establish separate course offering for the program.

Student recruitment: The ability of educational institutions to utilize existing partnerships with organizations that can provide “real world” applications enhances the knowledge base each student receives and adds value to the NTMP program. Implementation of a highly innovative degree program with large scale technical, educational, and organizational resources within existing curricula will stimulate student interest. The proposed program objectives and existing resource pools provide opportunities not readily available and will distinguish the program from others. Marketing of NTMP benefits by highlighting UAlbany’s nanotechnology resources and capabilities will demonstrate enhanced educational training and
career advancement; increasing the availability of applicants. Student recruitment will be through program
brochures, web site development, local information sessions, and on site program directive presentations.

Another attractive element of the program is the opportunity to complete a funded internship during the
summer between the first and second year. There are several funded research programs in the College of
Nanoscale Science and Engineering. The students in the program will spend their summers with an internship
doing funded research with sponsoring faculty members.

Administrative support: All administrative aspects of the NanoTechnology Management Program,
including the processing of admissions applications, student advisement, and degree clearance, will be
handled by the College of Nanoscale Science and Engineering. The School of Business will provide support
through the establishment of joint committees.

General requirements for program completion of each separate program: The University at Albany
School of Business currently offers a 48-credit Master of Business Administration (M.B.A) program. The
requirements for completion of the M.B.A. degree are shown in Table 1.

The College of Nanoscale Science and Engineering offers a 30-credit Master of Science in Nanosciences and
Nanoengineering. The requirements for completion of the M.S. in Nanosciences and Nanoengineering degree
are shown in Table 2.

Specific requirements for the proposed program:

a. Required courses: The required courses for the proposed NanoTechnology Management Program are
listed in Tables 3 and 4. As shown in these tables, the program requires the completion of 36 credits in the
School of Business and 27 credits in the College of Nanoscale Science and Engineering. All 36 credits in the
School of Business are required courses; there are no electives. Of the 27 credits in the CNSE, 12 are
required (CNSE 699); 3 credits are a seminar/external course, 3 credits are an elective course, and 9 credits
are concentration courses. The list of permissible concentration courses is shown in Table 2.

b. Supporting courses and electives: The seminar/external course will be approved by the NTMP program
advisor from master-level courses offered by the CNSE. The elective course will be selected from one of the
following courses:

- CNSE 517 Science and Nanoengineering of Semiconductor Materials and Nanostructures (3)
- CNSE 601 Chemical Vapor Deposition of Nanostructured Materials (3)
- CNSE 528 Nanosystems Science and Technology (3)
- CNSE 519 Principles of Materials NanoEngineering (3)
- CNSE 541 Introduction to Nanoelectronics (3)
- CNSE 605 Integrated Circuit Manufacturing I (3)
- CNSE 606 Integrated Circuit Manufacturing II (3)
- CNSE 631 Science and Technology of MEMS and NEMS (3)
- CNSE 614 Materials for Alternate Energy and Environmental Applications (3)
- CNSE 661 Semiconductor Metrology (3)
- CNSE 560 NanoTech Materials Processing Economics (3)
- CNSE 555 Principles of NanoTech Project Management (3)
- CNSE 565 Managing Adoption of NanoTech Innovation and R&D Management (3)

c. Courses and credits that will be used to satisfy requirements for both degrees: Table 4 displays how
credit will be allocated toward each degree program. The 5 courses (15 credits) that will be used to meet
requirements in both programs are shown in the center column. The elective requirements for the School of
Business M.B.A program are met with CNSE concentration courses; the research project requirement (BUS
698) is met with 3 credits of CNSE thesis research (CNSE 699). One elective course requirement in the M.S.
in Nanosciences and Nanoengineering program is met with School of Business course MGT 682 Strategic
Management.

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d. **Number of semesters required for dual program completion:** The model program is laid out in Table 3. The degree will take two academic years and one summer to complete.

e. **Assuring program quality:** Program evaluation will occur at the end of each of the first three years. There are several means available to assure program quality. Metrics to be considered include: student placement success, including average placement salary of students; student quality in terms of the standardized test scores; and student satisfaction as measured by survey results. The School of Business and the CNSE will also get a pedagogical evaluation of the curriculum from external reviewers. The NTM program will also be subject to review and accreditation by AACSB International, the accrediting body of the School of Business.

f. **Admissions:** Students must be eligible to matriculate in both programs and must be accepted through the admissions process of each program. Applicants to the M.S. in Nanosciences and Nanoengineering program must have an undergraduate degree in a science or engineering and they must submit a score from the GRE examination. Applicants to the M.B.A. program normally submit scores from the GMAT examination. In order to avoid having students take both examinations, the School of Business will accept the GRE examination results.
### Table 1

**School of Business**  
**University at Albany, State University of New York**  
**Master of Business Administration Curriculum (48 credits)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 523</td>
<td>Presentation Skills (1) *</td>
<td></td>
</tr>
<tr>
<td>ITM 510</td>
<td>Computer Skills (1)*</td>
<td></td>
</tr>
<tr>
<td>ITM 520</td>
<td>Database Management (1)*</td>
<td></td>
</tr>
<tr>
<td>ACC 518</td>
<td>Financial Statements and Management Accounting (3)*</td>
<td></td>
</tr>
<tr>
<td>FIN 515</td>
<td>Economic Analysis (3)*</td>
<td></td>
</tr>
<tr>
<td>ITM 513</td>
<td>Statistical Analysis (3)*</td>
<td></td>
</tr>
<tr>
<td>MGT 513</td>
<td>Organizational Behavior (3)</td>
<td></td>
</tr>
<tr>
<td>ITM 522</td>
<td>Information Decision Systems (3)</td>
<td></td>
</tr>
<tr>
<td>FIN 525</td>
<td>Financial Management (3)</td>
<td></td>
</tr>
<tr>
<td>MGT 514</td>
<td>Human Resources Mgt (3)</td>
<td></td>
</tr>
<tr>
<td>MKT 522</td>
<td>Marketing Management (3)</td>
<td></td>
</tr>
<tr>
<td>ITM 514</td>
<td>Operations Management (3)</td>
<td></td>
</tr>
<tr>
<td><strong>BUS 675</strong></td>
<td><strong>International Business (3)</strong></td>
<td></td>
</tr>
<tr>
<td>BUS 698</td>
<td>Research Project (3)</td>
<td></td>
</tr>
<tr>
<td>MGT 682</td>
<td>Strategic Management (3)</td>
<td></td>
</tr>
</tbody>
</table>

| Electives   | (9)                                              |         |

*Courses may be waived with appropriate academic coursework (decided during the admission process)
Table 2
College of Nanoscale Science and Engineering
University at Albany, State University of New York
Master of Science in Nanosciences and Nanoengineering Curriculum (30 credits)

Concentration: 3-course sequence selected from one of the following sets of courses (9 credits)
- CNSE 501 Mechanics of Finite-Size Elements (3)
- CNSE 511 Quantum Theory of Solids I (3)
- CNSE 512 Quantum Theory of Solids II (3)
- CNSE 519 Principles of Materials Nanoengineering (3)
- CNSE 525 Experimental Methodologies for Non-Biological Nanosciences (3)
- CNSE 528 Nanosystems Science and Technology (3)
- CNSE 541 Introduction to NanoElectronics (3)

Seminar/External course (3 credits)
CNSE Thesis Research (12 credits)
- CNSE 699* Masters Thesis (3)
- CNSE 699* Masters Thesis (3)
- CNSE 699* Masters Thesis (3)
- CNSE 699* Masters Thesis (3)

Electives (6 credits)

*Substitution allowed: CNSE 695 Introduction to Research Problems in Nanoscience and Nanoengineering (for non-thesis M.S. route)
# Table 3
## Proposed NanoTechnology Management Program
### Curriculum and Model Program

<table>
<thead>
<tr>
<th>Term</th>
<th>Master of Business Administration</th>
<th>Master of Science in Nanoscience and Nanoengineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td>ACC 518 Financial Statements and Management Accounting (3)*</td>
<td>CNSE Concentration (3)</td>
</tr>
<tr>
<td>18 credits</td>
<td>BUS 523 Presentation Skills (1) *</td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td></td>
<td>FIN 515 Economic Analysis (3)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ITM 510 Computer Skills (1)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ITM 520 Database Management (1)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MGT 513 Organizational Behavior (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNSE Concentration (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNSE 699 Masters Thesis (3)</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>ITM 513 Statistical Analysis (3)*</td>
<td>CNSE Concentration (3)</td>
</tr>
<tr>
<td>15 credits</td>
<td>ITM 522 Information Decision Systems (3)</td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td></td>
<td>MGT 514 Human Resources Mgt (3)</td>
<td></td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td>BUS 675 International Business (3)</td>
<td>CNSE Seminar/External Course (3)</td>
</tr>
<tr>
<td>6 credits</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td>ITM 514 Operations Management (3)</td>
<td>CNSE Concentration (3)</td>
</tr>
<tr>
<td>15 credits</td>
<td>FIN 525 Financial Management (3)</td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td></td>
<td>MKT 522 Marketing Management (3)</td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>MGT 682 Strategic Management (3)</td>
<td>Course in Nanosciences (3)</td>
</tr>
<tr>
<td>9 credits</td>
<td></td>
<td>Elective (3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>36 credits</td>
<td>27 credits</td>
</tr>
<tr>
<td><strong>credits</strong></td>
<td>63</td>
<td></td>
</tr>
</tbody>
</table>

* Course may be waived with approved prior academic coursework (decided during admission process)
### Table 4
Proposed NanoTechnology Management Program
Allocation of Credits to Each Degree Program

<table>
<thead>
<tr>
<th>Credits counting toward Master of Business Administration only</th>
<th>Credits counting toward both degrees</th>
<th>Credits counting toward Master of Science in Nanosciences and Nanoengineering only</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 518 Financial Statements and Management Accounting (3)</td>
<td>CNSE Concentration (3)</td>
<td>CNSE Seminar/External (3)</td>
</tr>
<tr>
<td>BUS 523 Presentation Skills (1)</td>
<td>CNSE Concentration (3)</td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td>FIN 515 Economic Analysis (3)</td>
<td>CNSE Concentration (3)</td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td>MGT 513 Organizational Behavior (3)</td>
<td>CNSE 699 Masters Thesis (3)</td>
<td>CNSE 699 Masters Thesis (3)</td>
</tr>
<tr>
<td>ITM 510 Computer Skills (1)</td>
<td>MGT 682 Strategic Management (3)</td>
<td>Elective (3)</td>
</tr>
<tr>
<td>ITM 513 Statistical Analysis (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITM 520 Database Management (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITM 522 Information Decision Systems (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUS 675 International Business (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIN 525 Financial Management (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MGT 514 Human Resources Mgt (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MKT 522 Marketing Management (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITM 514 Operations Management (3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

33 credits

15 credits

15 credits
TO: Professor Louise-Anne McNutt  
Chairperson, University at Albany Graduate Academic Council  

FROM: Paul A. Leonard  
Dean, School of Business  

DATE: 29-November-2004  

SUBJECT: NanoTechnology Management Program Proposal  

CC: Jon Bartow  
Director of Graduate Academic Services  

Attached is a proposal for the creation of a dual degree program between the School of Business and the College of Nanoscale Science and Engineering (CNSE). The proposed name for the dual degree program is the NanoTechnology Management Program (NTMP). This proposal has been approved by the faculty of the School of Business and it has my full support. I request that GAC review and approve the proposal.

The NTMP dual degree would combine the School of Business 48-credit M.B.A. program with the 30-credit M.S. in Nanosciences and Nanoengineering offered by the CNSE. No new courses are required to undertake this initiative. Under existing University at Albany policies, there are two avenues available to students who wish to obtain two masters-level degrees: a second master’s degree and a dual master’s degree. The policies governing each of these options are shown in Appendix A. Since it is our desire to offer the NTMP as a single, integrated program, we are proposing the dual master’s degree program option for this joint venture. We intend to register the NTMP as a separate program with the NYS Education Department.

As discussed in the proposal, this program is intended for students with undergraduate degrees in the sciences and engineering, with a primary focus on those with an engineering background. The NTMP will educate “industry ready” graduates who will have the ability to integrate the technical aspects of the nanoscience field with the managerial aspects of business. The NTMP is an important strategic initiative for the School of Business. Increasingly, the University and School are being looked to support economic development efforts in the Capital Region, especially the Harriman Campus development. The NTMP and the elective track in entrepreneurship-technology management-innovation being developed for the evening MBA program are our initial efforts to develop academic programs to support UAlbany’s efforts.

There is no immediate cost to establish this program. NTMP students will enroll in existing sections of courses offered for our evening M.B.A. students. These sections will retain existing maximum enrollment limits, so larger sections are not anticipated. The addition of NTMP students will reduce the number of traditional evening M.B.A. students admitted to the School, which should allow us to improve our selectivity statistics. All administrative aspects of the program (e.g., application processing, advisement, degree clearance) will be handled by the CNSE. When enrollments in the NTMP approach 30 students, separate sections of some courses, such as MGT 682 Strategic Management, may be created to provide an increased focus on nanotechnology management issues. These sections may also be suitable for the new evening M.B.A. elective track in innovation and technology management. I will seek additional resources from the Provost to support these special sections.

Please let me know if you require additional information. I am also available to attend a GAC meeting if you believe that it would be helpful.
Appendix A

DUAL MASTER'S DEGREE PROGRAMS

Standards and Requirements
1. In qualifying for dual master's degrees (DMDP), students will meet all University and school requirements, including completing a minimum of 30 graduate credits for each degree, and other such conditions as a research seminar, thesis, comprehensive examination, other professional experience where required, and residency requirements for each master's degree.

2. Total minimum credit-hour requirements for dual master's degrees programs will be 48 credits. Up to 20 percent of the total graduate credits normally required for dual programs may be applied simultaneously to both graduate programs. Although it is permissible for some dual degrees programs to require as few as 48 total credits, faculties responsible for specific dual master's degrees programs may require more than 48 total credits to satisfy the unique characteristics of differing graduate areas.

3. Exceptions to the program minimum stated in section 2 may be approved by the Graduate Academic Council.

4. All dual master's degrees programs must be approved by the Graduate Academic Council. Programs will be monitored under procedures established by the Graduate Academic Council.

5. These programs are not student initiated.

Admissions and Administrative Procedures
1. Students may be admitted to a dual master's degrees program at the beginning of their graduate studies, but no later than after completing 20 graduate credits applicable to a dual master's degrees program. Work done for an awarded master's or doctoral degree may not be used for this program. A minimum GPA of 3.0 and three supportive letters of recommendation from faculty are required. GRE scores may be required also. Faculty from both participating academic units will form the admission committee for each dual master's degrees program.

2. A student admitted to a dual master's degrees program may receive a graduate assistantship from either or both of the participating units; the total sum cannot exceed what each unit provides for a graduate assistant for an academic year.

3. For purposes of headcount identification, each participating unit will receive a headcount for an admitted dual master's degrees program student.

4. Students admitted to a DMDP will receive a single transcript identifying both degrees and programs titles.

5. Both participating academic units in a DMDP will receive recognition for one awarded master's degree when a DMDP student has completed her/his full program.

6. A student may leave the program before completion of both degrees. If the requirements for one degree have been fulfilled, that degree may be awarded.

POLICY OF ADVANCED STANDING AND RESIDENT STUDY FOR A SECOND MASTER'S DEGREE

Applicants for admission to a master's degree program who have already completed one master's degree program may apply for admission with advanced standing. The award of advanced standing to a successful applicant for a second master's degree program is governed by the following conditions:

1. Up to 30 percent of the credits required for a second master's degree may be allowed for advanced standing by the application of appropriate courses from the first completed master's degree program. All remaining course requirements must be completed satisfactorily in resident graduate study at the University at Albany.

2. Courses applied to a second master's degree program from a completed first master's degree program must be approved by the faculty responsible for the second program.

3. Courses accepted for advanced standing may not be used normally to satisfy a second master's degree program's requirements of such key courses as research seminars, theses, field courses, clinical courses, student teaching internships, and practicums.
4. Courses allowed for advance standing status must be graduate courses completed with a B, or better, or S grade at accredited institutions authorized to grant graduate degrees.
5. All courses, both those qualifying for advanced standing status and resident study, must be completed within the six-year statute of limitations applicable to the second master’s degree.
6. A graduate student may not apply both conventional transfer credit and advanced standing credit to the second master's degree program: the former or the latter, but not both, can be applied to a single program.
7. Exceptions to criteria governing advanced standing may be approved by the Graduate Academic Council.
8. The amount of advanced standing awarded will be placed on the student's second program transcript.