New Jersey Institute of Technology
---innovative, entrepreneurial, engaged

Mission

NJIT is the state’s technological research university, committed to the pursuit of excellence —

- in undergraduate, graduate, and continuing professional education, preparing students for productive careers and amplifying their potential for lifelong personal and professional growth;

- in the conduct of research with emphasis on applied, interdisciplinary efforts encompassing architecture, the sciences, including the health sciences, engineering, mathematics, transportation and infrastructure systems, information and communications technologies;

- in contributing to economic development through the state’s largest business incubator system, workforce development, joint ventures with government and the business community, and through the development of intellectual property;

- in service to both its urban environment and the broader society of the state and nation by conducting public policy studies, making educational opportunities widely available, and initiating community-building projects.

NJIT prepares its graduates for positions of leadership as professionals and as citizens; provides educational opportunities for a broadly diverse student body; responds to needs of large and small businesses, state and local governmental agencies, and civic organizations; partners with educational institutions at all levels to accomplish its mission; and advances the uses of technology as a means of improving the quality of life.

Vision

A preeminent technological research university known for innovation, entrepreneurship, and engagement.
NEW JERSEY INSTITUTE OF TECHNOLOGY
BOARD OF TRUSTEES PUBLIC SESSION
June 3, 2010, 11:00 AM

Call to Order

1. Notice of Meeting to Public (Statement to be read by the Chair, a requirement of the NJ Open Public Meeting Act)

2. Public Comments

3. Action Items
   A. Approve minutes of the April 8, 2010 meeting of the Board of Trustees
   B. Approve Promotion and Tenure Recommendations for 2009-2010
   C. Approve Resolution to Establish MS in Pharmaceutical Materials Processing
   D. Approve Resolution to Authorize Expenditure for Electricity and Natural Gas for FY 2011
   E. Approve Resolution to Renew Student Health Insurance
   F. Approve Resolution to Update Bank and Financial Institutions Account Authorizations
   G. Approve Resolution to Establish Gateway Project Special Purpose Corporations

4. Reports
   A. Status of Budget, Tuition and Fee Schedule for FY 2011
   B. Report of Gifts and Fund Raising Activities
   C. Operating Statement Year to Date
   D. Schedule of Short Term Investments

Announcement of Next Meeting

Chair to read resolution regarding Closed Session to discuss Personnel, Real Estate and Contract Matters to be held on Thursday, July 15, 2010, 9:30 AM, Eberhardt Hall NJIT Alumni Center Board Room.

Announce next public meeting: Thursday, July 15, 2010, 11:00 AM, Eberhardt Hall NJIT Alumni Center Board Room.

Adjourn Public Meeting
1. Notice of Meeting to Public
BOARD OF TRUSTEES

STATEMENT TO BE READ AT THE OPENING OF EACH
MEETING OF THE BOARD OF TRUSTEES

"NOTICE OF THIS MEETING WAS PROVIDED TO THE PUBLIC
AS REQUIRED BY THE NEW JERSEY PUBLIC MEETING ACT, IN
THE SCHEDULE OF MEETING DATES OF THE BOARD OF
TRUSTEES OF THE NEW JERSEY INSTITUTE OF TECHNOLOGY
WHICH WAS MAILED TO THE STAR LEDGER, THE HERALD NEWS,
AND THE VECTOR ON NOVEMBER 19, 2008. THIS SCHEDULE WAS
ALSO MAILED TO THE COUNTY CLERK ON NOVEMBER 19, 2008
FOR FILING WITH THAT OFFICE AND POSTING IN SUCH PUBLIC
PLACE AS DESIGNATED BY SAID CLERK."
2. Public Comments
3A. Approve Minutes of the April 8, 2010 Meeting of the Board of Trustees
NEW JERSEY INSTITUTE OF TECHNOLOGY
BOARD OF TRUSTEES
MINUTES - PUBLIC SESSION (DRAFT)
(April 8, 2010)

1. The meeting was called to order by Chairperson Wielkopolski, at 11:30 a.m. Other Trustees in attendance were Vice Chairs DeCaprio and DePalma (telephonically), and Board Members Beachem, Cistaro, Garcia, Sugla and Wolff. Also in attendance were President Altenkirch, Mr. Mauermeyer, Board Treasurer, and Ms. Holly Stern, Board Secretary.

In accordance with the New Jersey Open Public Meeting Act, the Chairperson read the following statement:

“Notice of this meeting was provided to the public as required by the New Jersey Meeting Act, in the schedule of meeting dates of the Board of Trustees of New Jersey Institute of Technology which was mailed to the Star Ledger, The Herald News and Vector on November 19, 2008. The Schedule was also mailed to the City Clerk of Newark on November 19, 2008, for filing with that office and posting in such public place as designated by said Clerk.”

2. BY A MOTION DULY MADE BY MR. SUGLA, SECONDED BY MR. WOLFF AND UNANIMOUSLY PASSED, the minutes of the February 18, 2010 meeting of the Board of Trustees were approved, with a correction noted as follows:

The minutes of February 18, 2010 are amended to reflect that BY A MOTION DULY MADE BY MR. SUGLA, SECONDED BY MR. DePALMA AND UNANIMOUSLY PASSED, the Board voted to Approve RESOLUTION TO APPROVE PURSUING THE JOINT MD DEGREE WITH ST. GEORGE’S UNIVERSITY.

3. BY A MOTION DULY MADE BY DR. DeCAPRIO, SECONDED BY MR. WOLFF AND UNANIMOUSLY PASSED, the Board voted to Approve Resolution to Authorize Exclusive License of University Intellectual Property.

4. BY A MOTION DULY MADE BY DR. DeCAPRIO, SECONDED BY MR. CISTARO AND UNANIMOUSLY PASSED, the Board voted to APPROVE APPOINTMENT OF IAN GATLEY AS DISTINGUISHED PROFESSOR OF PHYSICS WITH TENURE.
5. Board Member Beachem reported that the Building Committee met earlier this morning. They are planning to tour the Central High facility, and he added that the Committee welcomes other Board Members to join them. The Committee is looking at our longer term capital needs.

6. Dr. Sebastian presented an Intangible Asset Review, accompanied by a written report in the Board Book. He began by explaining that the patent policies opened up the floodgates for patent disclosures, and currently, faculty members are aware of how to protect intellectual property on the front end. This year to date, there are 53 disclosures. We’ve become more sophisticated in terms of process, and the number of patents granted have trended upwards. This year, we’ve had 16 patents granted, and 92 licenses and options, and we’ve experienced revenue growth through license income. Generally, it is a “game of numbers”; the more you do, the greater the return on investment.

NJIT has reached the level of approximately $90 million in annual research, which is higher than Stevens, Rice, RPI, Northeastern, Michigan Tech and Lehigh, and comparable to Drexel. We are approaching the second road of Federal funding, and just received a $23 million award for the Health IT Regional Extension Center.

7. Dr. Altenkirch discussed the budget challenges faced by the university. We are projecting a 3% enrollment increase. If we increase tuition by 5%, there will be a $6.8 million shortfall. Yesterday, in the Governor’s budget, it appears that there will be a cap on tuition of 4%, which will result in a $7.5 million shortfall. There will be a schedule of Executive Committee meetings to analyze and address the budget and its impact.

8. Dr. Altenkirch also gave a report on NCAA activities. He apprised the Board of the accomplishments of our student athletes. We have our first Academic All-American, in women’s volleyball. This is an astounding accomplishment. All of our athletic teams have made significant progress, since our move to Division I.

9. Dr. Altenkirch updated the Board with respect to the closing on Central High School, which will occur by June 30, 2010 or earlier. We anticipate 12 to 15 classrooms to be usable in the Fall. We are working with our School of Architecture to do the visioning for the project. Chairperson Wielkopolski asked if there was going to be a press release planned. Dr. Bloom indicated that we were meeting with community representatives, who are interested in keeping the school appearance the same. We will develop a plan for the use of the facility, which may include a public/private partnership opportunity.

10. Dr. Altenkirch provided a status report on the Gateway Plan. We have engaged outside counsel, and submitted a revised business outreach recruiting plan, as well as a phasing plan. We have everything into the city that is required at this time. We are in the process of drafting a PFP for the Greek Village. Jones Lang
LaSalle will not be the developer for the Greek Village, but will be the developer for the parking deck. We plan to come back at the June meeting with a recommendation to set up a special purpose corporation to manage the project.

11. Dr. Altenkirch also reported on the status of the strategic plan and the Middle States Self Study. We had a visit from the liaison from Middle States; Chairperson Wielkopolski met with her as well. We were required to submit a self-study design, which has been posted on the web, and has been approved. The draft of the strategic plan is in the board materials. The plan is structured the same as the last one, and is posted on the web for campus comment. We’ve set up tactics to accomplish each objective noted. Dr. Altenkirch noted that resources are listed as “directed effort”; that is, instead of using money, we are utilizing people and effort. These will be tied into individual performance reviews for the employees affected.

12. Treasurer Mauermeyer reported on the Operating Statement Year to Date and Schedule of Short Term Investments, referring to the board materials. At this time, we monitor the right column most closely in terms of commitments (particularly payroll). We encumber salaries. We are monitoring expenditures and looking to see where we can reserve funds. We did initially plan to carry money forward from FY’09. With regard to tuition and fees, including Continuing Professional Education, we did not make the initial target, but are about $1 million short. In the area of physical plant, we have deferred some projects. We are looking to see how much we can carry forward, until new enrollment catches up. With respect to the Schedule of Short Term Investments, the State fortunately has met its obligations, though payment usually comes at the end of the month. Currently, there is little return to be gained in short term investments. In sum, as most tuition has already been received, at this point, we are looking at mostly expenses, not new revenue for the remainder of the fiscal year.

13. Treasurer Mauermeyer also gave a Report on Endowment. The prior decline in the endowment funds has reversed and we have almost recovered from the market decline.

14. Vice President Dees gave a Report of Gifts and Fund Raising Activities. The Annual Fund is running flat, with exceptions of certain windfalls. Alumni giving is a little below last year. We are hopeful that we will be at or above the previous year. Chairperson Wielkopolski asked if there is a strategy change with respect to foundations. Dr. Dees replied that we look for compatible foundations in general. The Stabile Foundation is somewhat of an anomaly and we have a full time person working with that foundation. He noted that most money comes from individuals, rather than corporations or foundations.
15. The Chairperson announced that the next scheduled closed session would be convened on Thursday, June 3, 2010, at 9:30 AM, at Eberhardt Hall Alumni Center Board Room, to discuss personnel, real estate and contract matters. The following resolution was read and approved by all Trustees present.

WHEREAS, there are matters that require consideration by the Board of Trustees that qualify under the Open Public Meetings Act for discussion at a Closed Session;

NOW, THEREFORE, BE IT RESOLVED, that the Board of Trustees shall have a Closed Session to discuss such matters as personnel, real estate and contract matters on Thursday, June 3, 2010 at 9:30 AM, Eberhardt Hall Board Room.

The next Public Session of the Board will take place on Thursday, June 3, 2010 at 11:00 AM, Eberhardt Hall Board Room, following the Closed Session of the Board.

16. The meeting was adjourned at 12:20 pm.
3B. Approve Promotion and Tenure Recommendations for 2009-2010
To: The NJIT Board of Trustees

From: Robert A. Altenkirch
President

Re: Promotion and Tenure Recommendations

Date: June 3, 2010

After a year-long sequence of deliberations following the policies and procedures for promotion and tenure defined in the Faculty Handbook, those named below are recommended for promotion and/or tenure.

Promotion to Distinguished Professor

Timothy Chang       Electrical and Computer Engineering

Promotion to Professor

James Calvin       Computer Science
Jerry Fjermestad       School of Management
Marvin Nakayama       Computer Science

Promotion to Associate Professor with Tenure

Edgardo Farinas       Chemistry and Environmental Science
Shidong Jiang       Mathematical Sciences
Stephan Kudyba       School of Management
Stephen Pemberton       Federated History
Camelia Prodan       Physics
Usman Roshan       Computer Science
Gareth Russell       Biological Sciences
Yuan Nan Young       Mathematical Sciences
Tao Zhou


Descriptive Information

I. Objectives

The focus of the MS Program in Pharmaceutical Materials Processing is to provide individuals with the knowledge necessary to understand and apply sound engineering and scientific principles to the industrial production of pharmaceutical formulations. The primary objective of the program is to educate professionals and provide them with the skills required to work in the pharmaceutical field, with particular emphasis on understanding the relationships between: a) the properties of the selected raw materials, b) the selected processing method and process conditions, c) the resulting drug microstructure and, d) the drug targeted properties. Since this program is offered through the CBPE Department and has strong ties to the pharmaceutical engineering program, the students will be able to benefit from the use of basic chemical/pharmaceutical engineering approaches, such as transport phenomena and unit-operations principles, in order to understand and design pharmaceutical processes and products.

II. Need

A. Need for the Program

The pharmaceutical/medical technology industry is the largest manufacturing industry in New Jersey. New Jersey is home to the headquarters of more global pharmaceutical and medical technology companies than any other state in the country, or any single country throughout the world. NJIT currently has an MS degree in Pharmaceutical Engineering and another one, to be launched in Spring 2010, in Pharmaceutical Bioprocessing, both housed in the CBPE department. In addition, two pharmaceutically related programs were introduced recently in other departments, i.e., a Pharmaceutical Chemistry MS program and a Pharmaceutical Systems Management MS program. The addition of a third pharmaceutical program in the CBPE department (the fifth overall at NJIT in this area) will augment NJIT’s presence in this important industrial sector and will provide the intellectual climate and the necessary tools needed to prepare students with specialized knowledge for positions and career advancement within the industry, based on the rigorous technological requirements of this highly regulated work environment.
B. Describe the relationship of the program to the following:
   institutional master plans and priorities.

Pharmaceutical companies (including Biotech) in New Jersey (e.g.,
Aventis, Johnson & Johnson, Merck, Novartis, Cytogen, BioDelivery
Sciences International, Becton Dickenson) represent a sizable
percentage of the state's economy. NJIT is committed to contributing
to New Jersey's economic development by creating and maintaining
cutting-edge education in biological and biomedical fields. Its current
curriculum also includes the practical application of preparing
graduates to help solve business challenges of today. The PhMP
program is in line with this strategy and further supports NJIT's vision
of becoming a "preeminent technological research university known for
innovations, entrepreneurship and engagement".

C. List similar programs within the state and in neighboring states.
   How does this program compare to those currently being
   offered?

At this time, no MS program in Pharmaceutical Materials Processing
exist in New Jersey or even in the US. Therefore, the development of
such a program will constitute a unique educational opportunity that
will reinforce NJIT's presence in the pharmaceutical technology
educational area. However, a number of programs exist in Materials
Science and Engineering at different schools. Some of these
programs are listed here:

- **Rutgers University** - Graduate Program in Materials Science &
  Engineering. This is a traditional materials program mainly focused
  on the Ph.D. program and with a strong emphasis on ceramic
  materials.

- **Stevens Institute of Technology** - Their degree in Master of
  Engineering or Master of Science requires a total of 30 credits, 9 of
  which must be from the core with balance in electives and
  research. Candidates may choose either a special topic or thesis
  research with any member of the faculty to satisfy the research
  requirement. Their degree in Master of Engineering or Master of
  Science requires a total of 30 credits, 12 of which must be from the
  core with balance in designated electives in the Materials Science
  Program and the other two participating departments. The
  emphasis of this program is in the conventional material science
  and engineering area.

- **Princeton University** - Certificate Program in Materials Science
  and Engineering. This certificate is offered by the Princeton
  Materials Institute (PMI) and its eight affiliated departments. It
emphasizes the multidisciplinary nature of the study of materials and the engineering exploitation of their properties. This program is designed for students in science and engineering departments who are preparing for careers in research and teaching that will involve the exploration and exploitation of material properties and performance.

- **Drexel University** – M.S. program in the Department of Materials Science and Engineering. A total of 45-quarter credits are required for the M.S. degree. These include two required core courses on Materials at Equilibrium and Solid Sate Materials. Additionally, students choose four courses from a list of nine additional core courses. All full-time students are required to undertake a 9-credit thesis on a topic of materials research supervised by a faculty member.

D. For doctoral programs: Supply a select list of distinguished programs nationally in this discipline.

Not applicable.

III. **Student Enrollment**

This program is expected to attract professionals already working in the pharmaceutical sector and who are interested in seeking additional knowledge on the processing of pharmaceutical materials, their properties, and their testing methods. In addition, the program is expected to attract new full-time students and current NJIT students enrolled in other programs such as chemical and biomedical engineering, chemistry, or material science who may join the program after completing their undergraduate degrees. Since some of the classes in the program have a significant engineering content, students who do not have the appropriate academic background may be required to complete a bridge program specifically designed to fill the gap. Based on previous experience with the Pharmaceutical Engineering program, these bridge courses are needed to provide students who do not have an engineering background with fundamentals engineering concepts that they will need in later courses.

IV. **Resources to Support the Program**

A. **Course Development**

The proposed program will include a number of bridge courses, core courses and a foundation course, some of which are already available in the PhEn, and MtSE graduate programs, as explained in greater detail here and in the sections below. The new program will
additionally require the development of three (3) new core courses (preliminarily identified by the "PhMP" designation, for "Pharmaceutical Materials Processing"), i.e., PhMP 609, PhMP 611 and PhMP 613 as follows:

**PhMP 609 — Pharmaceutical Materials Equipment and Processes**
(Proposed New Course). This course will review the most important processes used in the pharmaceutical industry and the equipment needed to conduct them, for both API synthesis and final product manufacturing. Emphasis is placed on the conceptual aspects of each process rather than the quantitative and modeling aspects. Topics include reactive and catalytic processes (e.g., precipitation, chemical reactors, crystallization, etc.), molecular separation processes (e.g., extraction, membrane processes, adsorption), physical separation processes (sedimentation, filtration, centrifugation), contacting/mass transfer operations including miscellaneous physical processes used in drug manufacturing and liquid or melt mixing), microbial inactivation (terminal sterilization, aseptic processing), and solids processing (solids blending, drying, size reduction/milling, classification, fluidization, size enlargement/granulation, compression and tableting, tablet coating, etc.).

**PhMP 611 — Pharmaceutical Materials and their Properties**
(Proposed New Course). This course will cover the principles and experimental as well as predictive methods applied to the selection of pharmaceutical materials in a given formulation including API's and excipients such as binders, fillers, plasticizers, lubricants, colors and others. Experimental methods of measuring APIs physiochemical properties such as solubility, pH, crystallinity, melting point, dissolution rates, and drug and drug product chemical/physical stability will be discussed with emphasis on the effects of the drug chemical structure on the above properties. Parameters affecting dissolution rates and absorption such as surface area, crystalline or amorphous form, salt forms will be further considered. Rheological properties of importance in formulating solutions and disperse systems will also be presented along with methods of their measurement.

**PhMP 613 — Pharmaceutical Product Design via Process Selection**
(Proposed New Course). This course covers the principles, methods, unit operations and approaches required for designing and producing pharmaceutical products with targeted properties. In-process testing/control methods such as tablet weight and dimensions as well as online methods (e.g. NIR) may be used for product uniformity. Quality control product characterization by microscopy, XRD and calorimetry, hardness, crushing strength and tablet friability measurements may give valuable information on the resultant microstructure and the possibility for its modification via corrective action in the production process. In addition to material related
parameters, process selection and process parameters may affect drug morphology, crystallinity and dispersion, which, in turn may affect target parameters such as dissolution profile, and bioavailability. This course will provide examples on how target parameters can be met by controlling process parameters that would, for example, promote surface area increase or through conversion of a crystalline to an amorphous drug during processing.

B. Faculty

The program will be administered by Professors Marino Xanthos and Piero Armenante, respectively Senior Technical Consultant of the Polymer Processing Institute at NJIT, and Director of the Pharmaceutical Engineering Program at NJIT, both in the Department of Chemical, Biological, and Pharmaceutical Engineering. They will also teach several of the PhEn courses that already exist and are included in the program or that will be developed specifically for the new program, such as and PhMS 611 (Xanthos) and PhEn 618 (Armenante). Additional courses will be taught by other faculty members (e.g., PhEn 500 and PhEn 501 by Prof. Laurent Simon; PhEn 502 by Prof. Boris Khusid). In addition, different faculty members in the same department will also be likely involved in teaching other courses, such as Professors Boris Khusid and Costas Gogos. Prof. Michael Jaffe of the Biomedical Engineering department and possibly other members of that and other departments could also be involved in teaching courses or portions thereof. Several Adjunct Professors currently teaching other current courses such as PhEn 601, PhEn604, and PhEn 605, and, in the future, other adjunct instructors recruited to teach specific PhMS courses will also be recruited. The additional faculty requirements are as follows:

- Qualified adjunct instructors possessing practical experience in the pharmaceutical materials area need to be recruited every semester to teach the newly introduced courses mentioned above whenever they are offered. Similarly, if courses are offered onsite at pharmaceutical companies, instructors should be recruited accordingly.
- It is expected that some of the courses will be offered via distance learning, in which case resources for the instructors should be made available.
- The addition of one faculty member with expertise in pharmaceutical materials will be beneficial.
- Appropriate resources (e.g., release time, staff support) for the faculty member coordinating the program will be needed in order to administer the program, conduct student recruitment activities, advise students, recruit instructors, visit companies, develop brochures, etc.
# RECOMMENDATION FOR PROMOTION TO Distinguished Professor

**2009 - 2010**

<table>
<thead>
<tr>
<th>NAME</th>
<th>DEPT.</th>
<th>CURRENT RANK</th>
<th>DATE OF APPT. TO CURRENT RANK</th>
<th>DATE OF NJIT APPT.</th>
<th>DATE OF TENURE TRACK</th>
<th>DATE OF TERMINAL DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timothy Chang</td>
<td>ECE</td>
<td>Professor</td>
<td>2006</td>
<td>1991</td>
<td>1991</td>
<td>1989</td>
</tr>
</tbody>
</table>

# RECOMMENDATION FOR PROMOTION TO Professor

**2009-2010**

<table>
<thead>
<tr>
<th>NAME</th>
<th>DEPT.</th>
<th>CURRENT RANK</th>
<th>DATE OF APPT. TO CURRENT RANK</th>
<th>DATE OF NJIT APPT.</th>
<th>DATE OF TENURE TRACK</th>
<th>DATE OF TERMINAL DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Calvin</td>
<td>CS</td>
<td>Associate</td>
<td>2001</td>
<td>1996</td>
<td>1996</td>
<td>1990</td>
</tr>
<tr>
<td>Jerry Fjermestad</td>
<td>SoM</td>
<td>Associate</td>
<td>1999</td>
<td>1993</td>
<td>1993</td>
<td>1994</td>
</tr>
</tbody>
</table>

# RECOMMENDATION FOR PROMOTION TO Associate Professor with Tenure

**2009-2010**

<table>
<thead>
<tr>
<th>NAME</th>
<th>DEPT.</th>
<th>CURRENT RANK</th>
<th>DATE OF APPT. TO CURRENT RANK</th>
<th>DATE OF NJIT APPT.</th>
<th>DATE OF TENURE TRACK</th>
<th>DATE OF TERMINAL DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephan Kudyba</td>
<td>SoM</td>
<td>Assistant</td>
<td>2002</td>
<td>2002</td>
<td>2002</td>
<td>1999</td>
</tr>
<tr>
<td>Stephen Pemberton</td>
<td>History</td>
<td>Assistant</td>
<td>2004</td>
<td>2004</td>
<td>2004</td>
<td>2001</td>
</tr>
<tr>
<td>Usman Roshan</td>
<td>CS</td>
<td>Assistant</td>
<td>2004</td>
<td>2004</td>
<td>2004</td>
<td>2004</td>
</tr>
<tr>
<td>Yuan Nan Young</td>
<td>Math</td>
<td>Assistant</td>
<td>2004</td>
<td>2004</td>
<td>2004</td>
<td>2000</td>
</tr>
</tbody>
</table>
SUMMARY INFORMATION ON
PROMOTION AND TENURE CONSIDERATIONS
AY 2009-2010

Submitted to the
COMMITTEE ON ACADEMIC AFFAIRS AND RESEARCH
BOARD OF TRUSTEES
June 3, 2010

Vincent DeCaprio, Chair
Anthony Knapp

Promotion to Distinguished Professor

Three faculty members were under consideration for promotion to distinguished professor, one is being recommended to you:

Timothy Chang, Department of Electrical and Computer Engineering, joined NJIT as an assistant professor in 1991; he was promoted to full professor in 2006. Tim is truly an outstanding researcher as well as a gifted educator as evidenced by his many top-quality journal and conference proceeding papers, the number of issued patents, and numerous teaching awards. Dr. Chang’s major research and laboratory investigations have been on DNA array for liquid dispensing (also called “Smart Pin”) and ultra-precise actuators, and have led to important practical system prototypes. His work on “Smart Pin”, in collaboration with the NJ University of Medicine and Dentistry, has led to a new generation of liquid dispensing/aspiring systems applicable for spotting DNA micro-arrays and molecular beacons, both of great importance in biomedical research. The use of advanced technologies to benefit society has been demonstrated through over twenty years of Dr. Chang’s research and education efforts. He is one of the very few who excel in both research and industrial product development. His achievements are not known only at NJIT, but have been reported on through television news as well as through the newspapers. Dr. Chang is a keen researcher as well as a practitioner whose accomplishments are not limited to the printed word; his accomplishments are three dimensional and have great practical importance. His legacy will continue to benefit society for all time.

Promotion to Professor

Of the four faculty members recommended by their departments for promotion to professor, three are being recommended to you.

James Calvin, Department of Computer Science, joined NJIT as an assistant professor in 1996; he was promoted to associate professor with tenure in 2001. Dr. Calvin’s research is especially distinguished for its application of technically
sophisticated and elegant analysis to fundamental problems in computer simulation and optimization. Based upon the opinions of his outside references, Dr. Calvin is in the top tier of scholars working in the field of statistical analysis of computer simulation. He is currently the PI on one NSF grant and a co-PI on a second; he is also supervising Ph.D. students in the Department. He has published thirty-one papers in highly ranked journals, six book chapters, nineteen refereed conference papers, thirty-one non-refereed conference papers, and made thirty-one professional presentations. In addition he is an associate editor of ACM Transactions on Modeling and Computer Simulation and INFORMS Journal on Computer; he is an editorial board member of Information Technology and Control.

Jerry Fjermestad, School of Management, joined NJIT as an assistant professor in 1993; he was promoted to associate professor with tenure in 1999. The main topics of Dr. Fjermestad’s most recent publications are related to issues that are faced by every large organization: virtual teams, mobile communications, outsourcing, and e-commerce. In addition he has also conducted research in the areas of privacy and security and assessment of system performance. He has published a significant number of articles in journals which are well above the norm in terms of overall impact on the field. Dr. Fjermestad also consistently attends and makes presentations at professional meetings where he has also often chaired tracks and mini-tracks. He sits on editorial boards, acts as a reviewer for a wide variety of journals and has edited a number of special issues of journals. For the last five years his teaching evaluation scores have been excellent and he has been nominated three times for excellence in teaching awards. He actively mentors both masters and doctoral students on their research. Dr. Fjermestad has served on many committees throughout his tenure at NJIT and is a member of the NJIT Middle States Accreditation Committee.

Marvin Nakayama, Department of Computer Science, joined NJIT as an assistant professor in 1994; he was promoted to associate professor with tenure in 1998. Dr. Nakayama studies a number of far-reaching research areas in the field of computer simulation. He is particularly well known for his ground-breaking work in rare-event simulation, steady-state output analysis methods, and ranking and selection theory. He has published twenty-five papers in highly regarded journals and has submitted several others, assuring that he will be productive for years to come. His record of service to the computer simulation community has been exceptional; he has held senior editorial positions at two top journals (ACM Transactions on Modeling and Computer Simulation and INFORMS Journal on Computing) and has coordinated or chaired the Winter Simulation Conference Advanced Tutorial Track. Dr. Nakayama has recently received a significant research grant from the National Science Foundation. Previously, he was awarded an NSF CAREER award as well as additional funding from NSF. He has been instrumental in developing new programs for the College of Computing Sciences as well as recruiting students for these
programs. He has served on numerous University and Department committees including the Committee on Sabbatical Leaves and the NJIT Faculty Council.

**Promotion to Associate Professor**

Of the ten faculty members recommended by their departments for promotion to associate professor with tenure nine are being recommended to you.

*Edgardo Farinas*, Department of Chemistry and Environmental Science, joined NJIT as an assistant professor in 2004. Dr. Farinas’ research is in the area of protein engineering with a focus on directed evolution of enzymes. Research in this area has applications to detergents, chemicals, and therapeutics. When Dr. Farinas arrived at NJIT, he set up the first functional biochemistry laboratory at NJIT and purchased the specialized equipment his work requires with funds garnered from an NSF grant. More recently Dr. Farinas has been submitting papers from his research with three published since coming to NJIT and an additional one under review. Dr. Farinas has been very successful in his efforts to obtain independent, peer reviewed grants. He received the Career Award and a Starter Research Grant from NSF as the sole PI. He was charged with the development of the Biochemistry program at NJIT and was instrumental in developing the BS in Biochemistry and in developing the double major in Chemistry and Biology. He supervises three Ph.D. students with one close to graduation. He serves as a peer reviewer for several journals and was editor of a special issue for *Combinatorial Chemistry and High-Throughput Screening: Directed Evolution Approaches for Protein Engineering*. His service to the Department and the University has been exemplary.

*Shidong Jiang*, Department of Mathematical Sciences, joined NJIT as an assistant professor in 2004. Dr. Jiang’s research involves applying mathematical analysis to the development of fast numerical algorithms to solve practical problems. He is an important member of the Department’s computational mathematics group, has published eight refereed papers in high quality journals since coming to NJIT, has been the recipient of two NSF grants for his work on fast algorithms and has been invited to speak at several highly regarded conferences. Dr. Jiang’s outside references were in agreement that he is a top-notch scientist and one of the strongest analysts working in computational mathematics and algorithm development. He is quickly earning an international reputation. It was also noted that each of his publications in applied mathematics describes a major result. Dr. Jiang’s service to the Department, University and scientific community are also very strong. He has served on the Committee on Student Appeals and the Teaching, Learning and Technology Committee. He served as an undergraduate advisor and has served on the Graduate Admissions Committee within the Department. He has also been a peer reviewer for a number of top journals in applied mathematics and mathematical computation.
Stephan Kudyba, School of Management, joined NJIT as an assistant professor in 2002. Dr. Kudyba's research focus entails the study of the impact of evolving information technologies on organizational performance across industry sectors and aggregate economic productivity. Information technologies include web based applications, data and information management platforms, communications platforms, and advanced analytics such as data mining. The most recent of his five published books addresses healthcare informatics. Dr. Kudyba's publications have included numerous journal articles addressing the research focus described above with a particular emphasis on data mining applications and business process enhancement. He has amassed a sustained record of publications including articles in top journals in his field such as Information Systems Research, Communications of the ACM, and Knowledge and Process Management. His teaching has always been exemplary and he has been nominated as the best graduate teacher in the School of Management for four years. His record is one of sustained service to both the School of Management and NJIT.

Stephen Pemberton, Federated Department of History, joined NJIT as an assistant professor in 2004. His research involves the history of medicine, public health, science, and technology. His most significant contributions lie in his two books on the history of disease, both published by Johns Hopkins University Press. Dr. Pemberton's first book, The Troubled Dream of Genetic Medicine: Ethnicity and Innovation in Tay-Sachs, Cystic Fibrosis, and Sickle Cell Disease, won the 2006 History of Science category of the Professional and Scholarly Publish Awards given by the Association of American Publishers. Since joining NJIT he has had two encyclopedic entries and five book reviews; he has co-organized a conference and a panel at a conference and has written six conference papers. Dr. Pemberton has also delivered three invited talks and has been awarded several fellowships to work at the Institute for Medical Humanities. In addition, Dr. Pemberton has clearly demonstrated teaching excellence and strong service; his interdisciplinary work bridges the humanities and the sciences making him a particularly valuable asset to the NJIT faculty.

Camelia Prodan, Department of Physics, joined NJIT as an assistant professor in 2005. Dr. Prodan's research focuses on theoretical and experimental work in development of a new, fast, non-invasive method of measuring cellular membrane potentials of living cells. This work has important implications in biological applications and Dr. Prodan has begun to extend the influence of the work to biogeophysics applications. She has also made important contributions to the understanding of microtubules – work that may impact the treatment of cancer. Dr. Prodan's teaching is very good; she played a key role in the development of the new BS in Biophysics. Her service to the Department and the University are very strong; she has been very valuable in recruiting women to NJIT. Dr. Prodan has also served on the departmental strategic planning, recruitment, and awards committees and organized the department's colloquium
series. She excels in all three aspects of being a faculty member – teaching, research, and service.

Usman Roshan, Department of Computer Science, joined NJIT in 2004. Dr. Roshan’s work in computational biology has a direct impact on biological research because it provides tools that improve the accuracy and/or speed of computational analyses of biological data. He is an excellent collaborator and has forged new research collaborations with biologists. One hundred percent of his work is interdisciplinary – unlike many computational biologists - and this collaboration is enormously important. Dr. Roshan’s national reputation is highlighted by frequent roles as a peer reviewer for several journals. Also noted by his reviewers is that the software that Dr. Usman’s lab is developing is being widely utilized. The usage statistics for ProAlign are quite impressive. Dr. Roshan has already graduated a PhD student; he advises several MS students. He is a dedicated and popular teacher and serves as the director of the bioinformatics program.

Gareth Russell, Federated Department of Biological Sciences, joined NJIT as an assistant professor in 2005. Dr. Russell’s research interests are in the use of mathematical modeling and statistical techniques in population dynamics and ecology. He has made contributions to the study of island biogeography, population dynamics, and spatial analysis in relation to conservation. He has published sixteen refereed papers including four since coming to NJIT; three others are under review – all in first class journals. Dr. Russell has been awarded eight grants since coming to NJIT, four as a PI; he has received funding from NSF and the US Fish and Wildlife Service. His most recent NSF grant is to explore patterns of community dynamics in urban environments which sets the stage for a long term productive project focusing on the urban ecology of New York City. Dr. Roshan’s teaching evaluations have been excellent in both math and biology courses at both the undergraduate and graduate levels; he has served on five PhD committees; and is the PhD advisor to six others. He has served the Department, the University, and the profession well.

Yuan-Nan Young, Department of Mathematical Sciences, joined NJIT as an assistant professor in 2004. Dr. Young has made significant contributions to the field of computational field dynamics and complex fluid flows. He has studied the dynamics of flexible filaments in viscous fluid systems and has performed work to elucidate the dynamics of interacting elastic filaments. His references consider him to be one of the leading researchers in this emerging field. Since coming to NJIT, Dr. Young has published nine papers in the highest quality fluid dynamics and physics journals, six as lead or sole author. He has received significant funding from the NSF. He has taught an array of courses at both the undergraduate and graduate levels. Dr. Young has served on committees for the Department and the University including membership on the Library Committee, participating in transfer student and recruitment events, and organizing fluid
dynamics seminars. He has also served as a referee for papers and has co-organized mini symposia and sessions at various conferences.

Tao Zhou, Department of Physics, joined NJIT as an assistant professor in 2004. Dr. Zhou's research involves using high pressure Raman spectroscopy, infrared spectroscopy, and far-infrared ellipsometry to study multiferroic oxides and iron based high temperature super conductors. He also works on the design and development of photonic devices used in advanced photolithography with application to nanotechnology and optical telecommunications. He was hired to strengthen NJIT's interdisciplinary optics and materials programs and has been awarded two NSF instrumentation grants. Since coming to NJIT he has published four papers and has submitted five others for publication. He also has one refereed conference paper and three presentations with published abstracts. His teaching is good and he supervises two Ph.D. students as well as two masters degree students; he has served on the Ph.D. committees of ten students as well. He has refereed papers for two journals, worked on summer programs with high school students from Newark, serves as an undergraduate advisor, and has also participated in the University's Miniversity activities.
3C. Approve Resolution to Establish MS in Pharmaceutical Materials Processing
STATEMENT

RESOLUTION TO APPROVE THE MS IN PHARMACEUTICAL MATERIALS PROCESSING

The focus of the MS Program in Pharmaceutical Materials Processing is to provide individuals with the knowledge necessary to understand and apply sound engineering and scientific principles to the industrial production of pharmaceutical formulations. The primary objective of the program is to educate professionals and provide them with the skills required to work in the pharmaceutical field, with particular emphasis on understanding the relationships among: a) the properties of the selected raw materials, b) the selected processing method and process conditions, c) the resulting drug microstructure and, d) the drug targeted properties.

New Jersey is home to the headquarters of more global pharmaceutical and medical technology companies than any other state in the country, or any single country throughout the world. NJIT currently has MS degrees in Pharmaceutical Engineering and in Pharmaceutical Bioprocessing, both housed in the Department of Chemical, Biological, and Pharmaceutical Engineering (CBPE). In addition, NJIT has two related programs – the MS in Pharmaceutical Chemistry and the MS in Pharmaceutical Systems Management. The addition of a third pharmaceutical program in the CBPE department (the fifth overall at NJIT in this area) will augment NJIT’s presence in this important industrial sector and will provide the intellectual climate and the necessary tools needed to prepare students with specialized knowledge for positions and career advancement within the industry, based on the rigorous technological requirements of this highly regulated work environment.

The proposed program is within the mission of the university, has received favorable independent external review, has received the approval of all appropriate standing committees and the faculty as a whole, is not unduly duplicative of other programs offered in the State of New Jersey, and has been the subject of a Program Announcement issued to institutions of higher education in the State of New Jersey. The incremental costs of the new program will be covered from the tuition and fees of the new students.
RESOLUTION TO APPROVE THE MS IN PHARMACEUTICAL MATERIALS PROCESSING

WHEREAS, the Board of Trustees has examined materials provided by the President of the university relative to a proposed program leading to the MS in Pharmaceutical Materials Processing; and

WHEREAS, the Board is satisfied that the proposed program is within the mission of the university, has received favorable independent external review, is not unduly duplicative of other programs offered in the State of New Jersey and that the proposed program has been the subject of a Program Announcement issued to institutions of higher education in the State of New Jersey, and further, the incremental costs of the new program will be covered from the tuition and fees of the new students; and

WHEREAS, the Board of Trustees attests to the foregoing;

NOW THEREFORE BE IT RESOLVED, that the Board of Trustees approves the MS in Pharmaceutical Materials Processing.

June 3, 2010
PROGRAM ANNOUNCEMENT

May 18, 2010

<table>
<thead>
<tr>
<th>Institution:</th>
<th>New Jersey Institute of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Program Title:</td>
<td>Master of Science in Pharmaceutical Materials Processing (PhMP) (formerly referred to as “Pharmaceutical Materials Processing and Properties”)</td>
</tr>
<tr>
<td>Degree Designation:</td>
<td>Master of Science in Pharmaceutical Materials Processing (PhMP) (formerly referred to as “Pharmaceutical Materials Processing and Properties”)</td>
</tr>
<tr>
<td>Degree Abbreviation:</td>
<td>PhMP</td>
</tr>
<tr>
<td>CIP Code and Nomenclature (if possible):</td>
<td>14.1801</td>
</tr>
<tr>
<td>Campus(es) where the program will be offered:</td>
<td>Newark</td>
</tr>
<tr>
<td>Date when program will begin (month and year):</td>
<td>September 2010 (Fall 2010 Semester)</td>
</tr>
<tr>
<td>List the institutions with which articulation agreements will be arranged:</td>
<td>None</td>
</tr>
</tbody>
</table>

Is licensure required of program graduates to gain employment?  ☑ Yes ☐ No

Will the institution seek accreditation for this program?  ☑ Yes ☐ No

If yes, list the accrediting organization:

Program Announcement Narrative
- Objectives  page 2
- Need  pages 2-4
- Student Enrollment  page 4
- Resources to Support the Program  page 4-7
- Admission Requirements, Degree Requirements and Curriculum pages 8-11
PhMS students will be required to take several PhEn classes, some of which already have high enrollment (~35-40 students). This implies that the additional enrollment of PhMS students could make the number of students in these classes too high for an instructor to handle. This would then require that extra sections of the same classes would have to be added in a given semester and/or that some classes would have to be taught every semester instead of once per academic year.

Additional resources should be provided if a unit operation lab is developed (see below).

C. Libraries and Computing Facilities

This program will use computing facilities and resources currently used by other courses and programs at the New Jersey Institute of Technology. Because of existing programs such as Pharmaceutical Engineering, Chemical Engineering, Material Science and Engineering, and Biomedical Engineering, the Van Houten Library already has a collection of books, periodicals and electronic journals that will increase the knowledge of students in the PhMS program. New books will also be acquired.

A number of networked microcomputers are available, giving access to many bibliographical databases and full-text electronics journals. The NJIT community has full access to the internet by using the library’s on-line catalog; CD-ROM based databases and a host of on-line journal databases.

Princeton Review’s Best 361 Colleges recognizes NJIT for its great computing facilities. A large array of applications and services are available across many different operating systems and platforms. Through Remote Desktop on Windows XP Professional or Vista, applications, files, and network resources can be accessed from either home or work.

D. Classrooms and Laboratories

No new classrooms would be needed for this program. However, enrollment of PhMS students in some of the existing PhEn classes would make these classes larger and require the use of larger classroom.

It would be beneficial to develop a unit operation teaching laboratory where students could acquire hand-on experience. The details of this type of activities should be defined at a later stage, if an interest really exists to assemble this type of lab. However, if implemented, this option will require additional resources to assemble the lab and conduct the experiments on a regular basis.
V. Admission Requirements, Degree Requirements and Curriculum

Master of Science in Pharmaceutical Materials Processing (MS PhMS) offered by the Otto H. York Department of Chemical, Biological and Pharmaceutical Engineering

A. Admission Requirements

An undergraduate degree in chemical engineering or materials engineering with a cumulative grade point average (GPA) of at least 3.0 on a 4.0 scale is usually required. Applicants with: (1) a science degree, (2) an engineering degree in a discipline other than chemical engineering or materials engineering, or (3) a GPA below 3.0 but at least 2.8, may be conditionally admitted to the program. Conditions may involve completion of a bridge program designed on a case-by-case basis, and typically requiring taking extra bridge courses, as further explained below. Depending on the background of the student, admission conditions may additionally require taking undergraduate courses (e.g., chemistry) or graduate courses. Bridge and undergraduate courses do not count toward degree credit, graduate-level courses do.

Applicants who have a science background (e.g., biology, chemistry, or material science B.S. degree) or an engineering degree in a discipline other than chemical engineering or materials engineering will typically be required to take the bridge program. Depending on the background of the applicant this bridge program may consist of up to (but, at least for students with engineering degrees, less than) three 3-credit courses (PhEn 500, PhEn 501 and PhEn 502) specifically designed to provide non-chemical/materials engineers with the necessary prerequisites to enter the program. The bridge courses cover a variety of topics, such as differential equations, statistics and business math (PhEn 500), mass balances, thermodynamics, and chemical kinetics (PhEn 501), and fluid flow, heat transfer and mass transfer (PhEn 502).

Submission of Graduate Record Examination (GRE) scores is encouraged in all cases, and required of those seeking financial support and those whose last prior degree is from an institution outside the United States.

B. Degree Requirements

A minimum of 30 credits is required for degree completion. Of these, 21 credits must be obtained by taking seven prescribed Common Core Courses, which include existing pharmaceutical engineering (PhEn)
courses, as well as new PhMS courses, as outlined below. In addition, engineering applicants, but not applicants with materials engineering or material science degrees, are required to take an additional Foundation Course (MtSE 601 - Fundamentals of Engineering Materials), which will count toward the 30 credits required to complete the PhMS program. As already indicated, applicants with a science background or an engineering degree in a discipline other than chemical engineering or materials engineering will typically be required to take one or more bridge courses. Bridge courses do not count toward the 30 credits required to complete the program.

The credits needed to achieve the required 30 credits may be obtained by taking either elective courses only or a combination of an elective plus MS Thesis credits.

The proposed curriculum is described below.

C. Curriculum

**Bridge Courses** (9 Credits; typically required for non-engineering applicants. Bridge courses do not count toward the 30 credits required to complete the PhMP program):

- PhEn 500 — Pharmaceutical Engineering Fundamentals I
- PhEn 501 — Pharmaceutical Engineering Fundamentals II
- PhEn 502 — Pharmaceutical Engineering Fundamentals III

**Foundation Course** (3 Credits; required for applicants with no materials science/ materials engineering background). This course counts toward the 30 credits required to complete the PhMP program:

- MtSE 601 - Fundamentals of Engineering Materials

**Common Core Courses** (21 Credits):

- PhEn 601 — Introduction to Pharmaceutical Engineering
- PhEn 604 — Validation and Regulatory Issues in the Pharmaceutical Industry
- PhEn 605 — Pharmaceutical Packaging Technology
- PhEn 618 — Principles of Pharmacokinetics and Drug Delivery
- PhMP 609 — Pharmaceutical Materials Equipment and Processes (Proposed New Course)
- PhMP 611 — Pharmaceutical Materials and their Properties (Proposed New Course)
- PhMP 613 — Pharmaceutical Product Design via Process Selection (Proposed New Course)

**Electives** (as appropriate to achieve the required number of credits): Students are encouraged to choose electives from a variety of offering departments. In general, all technical and scientific courses that
are relevant to the program could be selected, typically in consultation with the Program Advisor.

The following is a non-exhaustive, partial list of courses that could be taken as elective courses [all courses are 3-credits unless otherwise stated]:

- PhB 615 - Bioseparation Processes
- PhB 610 - Biotechnology/Biopharmaceutical Processes and Products
- PhB 630 - Pharmaceutical Bioprocess Engineering
- PhEn 698 - Special Topics in Pharmaceutical Bioprocessing I
- PhEn 699 - Special Topics in Pharmaceutical Bioprocessing II
- PhMS 701B - Master’s Thesis (3 credits)
- PhMS 701C - Master’s Thesis (6 credits)
- PhMS 702 - Selected Topics in Pharm. Bioprocessing
- PhMS 725 - Independent Study in Pharmaceutical Bioprocessing
- PhEn 602 - Pharmaceutical Facility Design
- PhEn 603 - Pharmaceutical Unit Operations: Liquid and Dispersed Phase Systems
- PhEn 606 - Pharmaceutical Unit Operations: Solids Processing
- PhEn 612 - Pharmaceutical Reaction Engineering
- PhEn 614 - Pharmaceutical Separation Processes
- BME 627 - Introduction to Biomedical Engineering
- BME 651 - Principles of Tissue Engineering
- BME 672 - Biomaterials
- ChE 611 - Thermodynamics
- ChE 624 - Transport Phenomena
- ChE 626 - Math. Methods in Chemical Engineering
- ChE 656 - Catalysis
- ChE 675 - Statistical Thermodynamics
- ChE 681 - Polymerization-Principles and Practice
- Chem 601 - Medicinal Chemistry
- Chem 602 - Advanced Organic Chem. II: Reactions
- Chem 603 - Advanced Organic Chem. Laboratory
- Chem 606 - Physical Organic Chemistry
- Chem 658 - Advanced Physical Chemistry
- Chem 661 - Instrumental Analysis
- Chem 664 - Advanced Analytical Chemistry
- Chem 673 - Biochemistry
- Chem 677 - Introduction to Medicinal Chemistry
- EM 636 - Project Management
- EM 637 - Project Control
- EM 640 - Distribution Logistics
• EM 6P1 - Pharmaceutical Product Management
• IE 604 - Advanced Engineering Statistics
• IE 605 - Engineering Reliability
• IE 618 - Engineer. Cost and Production Economics
• IE 672 - Industrial Quality Control
• IE 673 - Total Quality Management
• IE 674 - Quality Maintenance and Support Systems
• IE 704 - Sequencing and Scheduling
• Math 613 - Advanced Applied Mathematics I: Modeling
• Math 635 - Analytical Computational Neuroscience
• Math 637 - Foundations of Mathematical Biology
• Math 654 - Clinical Trials Design and Analysis
• Math 661 - Applied Statistics
• Math 663 - Introduction to Biostatistics
• Math 664 - Methods for Statistical Consulting
• ME 664 - Experiments and Simulations in Particle Technology
• R120:512 - Mammalian Physiology
• R120:515 - Molecular Biology of Eukaryotes
• R120:601 - Human Molecular Genetics

_M.S. Thesis_ (6 Credits):
Students who are required, or choose, to do a thesis must take 6 credits of PhMS 701 (Master's Thesis) in lieu of 6 credits worth of elective courses. Part-time students working in the pharmaceutical industry are eligible and encouraged to pursue the thesis option. NJIT requires that students who elect to do a thesis must register for thesis during the last semester before graduation, even if this requires taking addition thesis credits beyond the 6 credits required.
Review of the Proposed M.S. Program in Pharmaceutical Materials Processing and Properties

At the New Jersey Institute of Technology

by

Jeffrey T. Koberstein
Percy and Vida Hudson Professor
Department of Chemical Engineering

Columbia University in the City of New York

VISIT DATE: MARCH 27, 2010

REPORT DATE: MARCH 30, 2010
Overview

This document presents a review of the proposed M.S. program in Pharmaceutical Materials Processing and Properties (PhMP) at the New Jersey Institute of Technology in response to the request of Donald H. Sebastian, Interim Provost and Senior Vice President for Research and Development. In preparation for this review, informational materials about the proposed new program and related current programs were provided by Prof. Piero Armenante. The report summarizes findings during my visit of March 27, 2010, during which I met with Profs. Armenante and Xanthos, M.S. and Ph.D. students enrolled in various Pharmaceutical Engineering programs, Prof. Norman Loney, Chair of the Department of Chemical, Biological and Pharmaceutical Engineering (DCBPE), Prof. Sunil Saigal, Dean of the Newark College of Engineering, and Prof. Sebastian.

Jeffrey T. Koberstein
Percy and Vida Hudson Professor of Chemical Engineering, Columbia University
New York, NY
March 30, 2010

RECOMMENDATION

Based upon my review of the proposed program, I recommended that the M.S. in Pharmaceutical Materials Processing and Properties be approved upon minor modification by NJIT. The responses to detailed questions posed by Prof. Sebastian that are contained in the sections to follow provide the basis for this recommendation.

RESPONSES TO THE QUESTIONS POSED

A. Objectives

1. Describe whether or not the objectives and underlying principles of the program are sound and clearly stated

The objectives and underlying principles of the proposed PhMP program are sound and clearly stated. The primary objective of the proposed M.S. is to educate professionals by providing them with the skills required to work in the pharmaceutical field, with particular emphasis on the understanding of the relationships between raw material properties, the processing conditions and method, and the resulting drug microstructure and properties.

2. Discuss whether or not the program is consistent with the institution’s programmatic mission and educational goals.

NJIT is New Jersey’s technological research university committed to:
a) Preparing students for productive careers and amplifying their potential for lifelong personal and professional growth;
b) The conduct of research with emphasis in the health sciences and engineering, among other disciplines; and
c) Contributing to the state's economic development through, among other activities, workforce development actions.

The proposed M.S. in Pharmaceutical Materials (PhMP) is fully consistent with these goals and with NJIT's programmatic mission. It is designed to equip both students and practicing professionals with the tools required for work in the Pharmaceutical industry specifically related to the materials used; students can opt to perform a research project (i.e., thesis) within the program; and the program assists in the development of a workforce for the Pharmaceutical industry, one of the most important industrial sectors in the State of New Jersey.

B. Need for the Program

1. Analyze the need for the program (e.g., student demand), and indicate why it is likely or unlikely that students will be able to secure employment and/or continue advanced study upon graduation.

The proposed new M.S. program is a part of an evolving set of NJIT programs related broadly to the field of Pharmaceutical Engineering (PhEN) that already have a total class enrollment of about 300 students. This compares favorably with typical total chemical engineering class enrollments of 166 and 112, in the fall and spring semesters, respectively. Average enrollments in individual PhEN classes are in the range of 27-37, while similar numbers for the DCBPE are about 16. I believe it can be fairly stated that the current PhEN program is quite healthy. The pharmaceutical industry is an important component of the gross national product of the United States and has a heavy concentration in the State of New Jersey. The pharmaceutical industry is considered to hold promise for strong continual growth and economic development, especially in response to opportunities for the future development of biological drugs and personalized medicine. New Jersey holds a favored position in the field, but will have growing competition both on the national and international levels. At present, the NJIT programs are unique in this country, and the new PhMP program follows suit. Current student demand for the existing pharmaceutical programs is high, to the point where larger classrooms are necessary. The student clientele comes from all over the world, emphasizing the global importance of these NJIT educational and research programs. It is clear that the pharmaceutical industry will need highly skilled employees to develop and manufacture the next generation of drugs and that the proposed program can fill an educational gap for training these future employees in the materials aspects of pharmaceutical engineering. Students in existing M.S. are matriculating into Ph.D. programs and it is reasonable to expect that the PhMP program will also be a feeder for Ph.D. level research.
In the case of career programs:

Do the results of market surveys indicate a sufficient level of student demand to justify creation of the proposed program? (Please explain)

Do employment projections indicate a sufficient number of job opportunities in the region and the State to justify creation of the program? (Please explain)

New Jersey has historically been home to perhaps the highest number of pharmaceutical companies of any state in the entire United States and perhaps in the world, and currently also ranks highly in the number of biotechnology companies. The proposed M.S. program caters specifically to the needs of this important industry by offering a targeted materials education that is not available at any other academic institution. By training pharmaceutical engineers in this new area, NJIT can help to preserve the favored status of pharmaceutical companies in New Jersey by providing employees to fill new job opportunities that arise as pharmaceutical companies turn to the development and manufacturing of biologically based drugs and treatments for personalized medicine. The PhMP M.S. is geared to train new students and professionals already working in the pharmaceutical sector, who need to understand the role materials play in drug discovery and biotechnology manufacturing. The new program is therefore an excellent match to expected projections of job opportunities in this important sector of New Jersey industry.

C. Educational Programs

1. Discuss the distribution and nature of required courses, electives, and research (if appropriate) in terms of meeting the objectives of the program. Compare and contrast the proposed curriculum with recognized programs at other institutions, if appropriate.

The proposed program requires students to take three new core courses (i.e., 9 credits) designed specifically to cover topics specific to pharmaceutical materials and four existing core courses (i.e., 3 credits each) common to existing pharmaceutical engineering programs. In addition to the seven core courses, two to three additional elective courses must be taken to bring the total credit requirement to 30 credits. Students lacking an exposure to a materials education can satisfy three of the required credits by taking a so-called Foundation course designed to provide the student with a general materials background. Students can also choose a thesis option in which 6 credits of thesis research are taken as part of the total 30 credits. Because the program is a logical extension of the NJIT Chemical Engineering degree, students entering the program with a materials science or chemistry degree need to take a number of bridge courses that offer condensed versions of standard chemical engineering undergraduate course material. The distribution and nature of the courses enables students with virtually any undergraduate background to be successful in the program. To my knowledge there are no programs
similar to the proposed PhMP program within the state of New Jersey or even nationally. Extant pharmaceutical programs identified in the proposal at Princeton, Rutgers, Stevens Institute of Technology and Drexel do not instruct students in the materials aspects of the pharmaceutical industry.

2. Are the instructional modes and credit distribution consistent with the objectives of the curriculum? (Please explain).

The specialized courses in the curriculum are designed to be taught by adjunct professors who are working professionals in the pharmaceutical industry in order to bring hands on experience into the classroom. Evening classes at NJIT will be offered once a week to attract working professionals, consistent with program objectives. Distance learning is a viable option for expanding enrollment and may be considered in the future. The distribution of credits is consistent with the objective of enabling students and practicing professionals with a broad range of backgrounds to learn about pharmaceutical materials.

3. Does the curriculum represent a suitable approach to professional study in the particular field, if appropriate? (Please explain).

The proposed curriculum includes four existing courses necessary to provide students with a broad understanding of the general field of pharmaceutical engineering as well as three new courses created to focus on the materials aspects of pharmaceutical engineering. The new courses proposed are:

PhMP 611-Pharmaceutical Materials and their Properties-This course covers the principles used to select pharmaceutical materials for given formulations, the properties of pharmaceutical materials and methods used to measure their properties.

PhMP 609-Pharmaceutical Materials Equipment and Processes- This course reviews important processes and equipment used to synthesize component materials and for final product manufacturing.

PhMP 613-Pharmaceutical Product Design via Process Selection-This course covers the principles, methods, unit operations and approaches required for the design and manufacturing of pharmaceutical products with targeted material properties.

The three new courses specific to the program appear to be well designed and have reasonable and sufficient content to fulfill the needs and objectives of the program. The four additional core courses are common with the existing M.S. in Pharmaceutical Engineering program and are thus time tested. Applicants that do not have a basic understanding of materials science are required to take a so-called Foundation course:

I do feel that it is necessary to voice one concern related to the Foundation course, MtSE 601, an existing survey course offered by the Materials Science Program. Having seen the syllabus for the course, I do not think that the content is a good match to the needs of the proposed PhMP. While the course is typical of the offerings of many materials science courses in that its focus is on hard and crystalline materials, most of the materials encountered in pharmaceutical applications will be soft materials. I recommend that either the content of the course be altered to include more emphasis on soft matter, or that a new course be evolved to provide a materials background that is more pertinent to pharmaceutical engineering.

4. Does the curriculum meet certification and/or accreditation standards, if appropriate? (Please explain).

There are no current standards for certification or accreditation in Pharmaceutical Materials Processing and Properties.

5. Are the requirements for admission to the program clearly defined and appropriate to ensure a student body capable of meeting the objectives of the program, without such requirements being artificially strict, rigid, or discriminatory? (Please explain).

The admission requirements are appropriate and clearly defined. The curriculum has purposely been designed with flexibility in mind so as to permit students with virtually any background to be admitted. Applicants lacking the required prerequisite background can take a number of bridge and foundation courses to fill the knowledge gap before entering the M.S. program courses. The program also accommodates the participation of working professionals from local industry.

6. Discuss whether or not standards for completion of the program are clearly defined and consistent with the objectives of the program.

The standards for completion of the program are clearly defined and consistent with program objectives. Students enrolled in current similar programs have no difficulty understanding what is expected of them.

7. Discuss whether or not an appropriate mechanism for transfer students to enter the program exists and comment upon the suitability of any articulation arrangements between this and other existing programs.

As mentioned above, the curriculum is very flexible to allow students from any background to be successful.

8. If other academic units within the university are to provide educational services to the program, describe whether or not their commitment to participate is consistent with offering a program of quality in this field.

The program relies on the M.S. Pharmaceutical Engineering program to provide four of
its core courses. The latter program is already in place, within the auspices of the Department of Chemical, Biological and Pharmaceutical Engineering. Aside from handling increased enrollments, which might require larger classrooms, there should not be any intrinsic problems with the new arrangement. I met with the director of the Materials Science program, who showed me a syllabus for the MtSE 601-Fundamentals of Engineering Materials foundation course, and he assured me of his enthusiasm and intention to participate actively in the new program.

9. If a program has a clinical component, discuss the adequacy of facilities and the arrangements to support the objectives of the program.

Not applicable.

D. Students

1. Is the percentage of part-time students projected for the program consistent with the goals of the program? (Please explain).

No information was provided to break down the composition of the student body.

2. Comment upon the adequacy of provisions made to ensure successful target population (e.g., minorities and women) participation in the program.

While no specifics were provided with respect to targeting specific student groups, I met with about a half dozen articulate students that were very content with their existing Pharmaceutical Engineering program and spoke highly of virtually all program aspects. Half of this group was female and I was impressed with the diversity. Each student came from a different background and in fact a different country.

3. Comment upon the adequacy of counseling and advisement to be provided to students enrolled in the program.

The program is to be administered by Prof. Piero Armenante and Prof. Marino Xanthos. Both are full-time faculty members with many years of experience in student advising, including the existing Pharmaceutical Engineering program.

E. Faculty

1. Describe whether or not the faculty possesses the appropriate (terminal) degrees and other academic credentials to provide a program of high quality.

The program faculty members are full-time tenured/tenure-track faculty in the Department of Chemical, Biological and Pharmaceutical Engineering (DCBPE). It is expected that Prof. Xanthos will teach or help teach one of the new core courses and that Prof. Costas Gogos will also assist in teaching the new core courses. Much of the responsibility for teaching with fall on a number of adjunct faculty members that will
need to be hired. The adjunct faculty are essential to provide the experiential basis for these courses to make them relevant to industry. Adjunct faculty will also decrease the responsibilities of participating DCBPE faculty that already have heavy teaching loads. Based upon past experience that was related to me and the high density of pharmaceutical industries in the area, there should be no problem recruiting prospective instructors. The major difficulty I foresee in this process is determining the quality of adjunct teaching. It is likely that this will be based upon word of mouth recommendations and trial and error feedback in the classroom. The students I spoke with were quite pleased with the quality of instruction they received in the core courses that will also be used in the new PhMP program.

2. Comment upon the faculty's involvement in research, teaching, scholarship, creative activity, and community service and whether or not it is appropriate to the discipline and to the proposed program.

The DCBPE faculty involved in the program are tenured NJIT faculty that are fully engaged in carrying out the NJIT mission: teaching, research and scholarly activities. A number of students I spoke with have made the transition from M.S. to Ph.D. research advised by these faculty members. The adjuncts involved will all be practicing pharmaceutical engineers that provide a community service to NJIT students by teaching and bring the requisite knowledge of industrial processes and materials to the program.

3. Discuss whether or not the number of faculty and the amount of time to be devoted by each to the program are compatible with the goal of offering a program of quality.

Because Prof. Armenante is involved with administration of the other M.S. programs in Pharmaceutical Engineering, I feel that faculty time commitment may become an issue. As an administrator he already has to identify and hire adjuncts for existing programs and will have to do the same for the new programs. Hopefully, Prof. Xanthos will take over some of this responsibility. If the sum of all of these programs in Pharmaceutical engineering is to grow however, for example, to increase the research content, additional permanent faculty will most likely be required. For example, a faculty member in the area of soft materials would be able to cover the potential deficiency in the foundation materials course alluded to earlier in this report. I would recommend that the program directors develop a personnel plan that considers future expansion of permanent faculty. An additional concern that I would voice is that all of the Pharmaceutical programs rely heavily on the considerable skills and efforts of Prof. Armenante. The program students might be put in jeopardy if he were to lose interest or decrease his level of effort for whatever reason. I feel that a more permanent personnel structure should be considered, for example hiring a program coordinator (e.g., early retiree from the Pharmaceutical Industry) that would help to ensure program longevity and relieve Prof. Armenante of some of the day to day administrative tasks so he can focus his energies on leading the intellectual aspects of the program.

F. Support Personnel. Discuss the adequacy of support personnel to be associated with the program, e.g., secretaries, administrative assistants, bookkeepers, technicians, etc. as
appropriate.

In its current manifestation, the program does not require support personnel. In the long run, however, the set of M.S. programs might benefit from hiring a non-academic "center" coordinator to manage some of the day to day aspects and finances of the program. If the program decides to include hands on experience with processing equipment, the equipment could probably be obtained by donation from industry, but oversight of a processing laboratory experience would require a technician.

G. Finances

1. Discuss the institution's commitment to provide the resources necessary to guarantee a program of high quality (e.g., faculty, equipment, library support, staff for the program, below-the-line support for faculty travel, research, etc.).

A budget has not been developed for the new program. This is a concern that needs to be addressed as the combined set of Pharmaceutical Engineering programs is reaching a size that requires a more permanent infrastructure. I recommend that the program administrators prepare and submit a budget that will take the program to a more permanent and stable status. The budgeting process should track the costs of program resources as well as revenues generated by the program. It is essential that program administrators understand the resources available to them, especially with regard to hiring the essential adjunct faculty required to teach in the program. Some release time should also be considered for Professors Armenante and Xanthos so they can carry out their duties as program administrators, as the teaching load within the relatively small CBPE department is already high with respect to other research universities.

The program coordinators should seek a commitment of resources from Dean Saigal and Provost Sebastian.

The future development of a hands-on laboratory course will require additional resources for oversight and maintenance of such a laboratory experience.

2. Discuss the possible need for significant additional financial support from the State of New Jersey.

No plans were indicated to seek additional support from the State of New Jersey, however, such support could be useful to solidify the permanent status of these programs. Given a reasonable budgeting process it is likely that the program will be self-sufficient and in fact generate more income than its expenditures.

H. Physical Facilities

1. Discuss the adequacy of laboratory, special facilities, and equipment intended to support the program and indicate if they are consistent with offering a program of high quality.
The initial program description does not require laboratory space. I was told that space is available should the program decide to develop a laboratory course involving process equipment. Should students choose the 6 credit thesis option, their research will be carried out in existing laboratories under the direction of their research sponsors.

2. Comment upon the adequacy of classroom facilities.

Classroom facilities are adequate for the new courses, however, it is likely that larger classrooms will be necessary for the four core courses that are common with the Pharmaceutical Engineering and Pharmaceutical Bioprocessing programs.

3. Comment upon any evidence to suggest that an existing program at the university will be adversely affected in terms of resources by the implementation of the program under review.

No evidence to this effect was found.

4. Comment upon the accessibility to program facilities by the handicapped.

Program facilities appear to be sufficiently accessible to handicapped individuals.

1. Library. Discuss the adequacy of library holdings and other library resources available to support the program and indicate if they are consistent with offering a program of high quality.

I do not believe that there will be a large need for new library holdings for the new program as many of the required resources have been secured by the existing pharmaceutical engineering programs.

J. Computer Facilities

1. Discuss the adequacy of computer facilities and other computer resources available to support the program and indicate if they are consistent with offering a program of quality.

Computer facilities are adequate for the proposed program.

K. Administration

1. Comment upon the administrative structure of the program and indicate if it is sufficiently defined and reasonable.

The program will be under the auspices of the Department of Chemical, Biological and Pharmaceutical Engineering and be administered by Professors Armenante and Xanthos. Because Prof. Armenante is already an integral part of the M.S. Pharmaceutical
Engineering program, it is important that his duties and those of Prof. Xanthos be clearly defined for the new program. Again there is some concern that the sum of all the pharmaceutical programs is getting large enough to consider hiring a “center” coordinator to assist with the overall management, maintaining Prof. Armenante as the intellectual leader of the program.

2. If inter-institutional or intra-institutional cooperation is involved, describe whether or not the administrative and budgetary responsibilities for the program are clearly defined and adequate.

There is no inter-institutional component to the program. Cooperation with the Materials Science program will be required to offer the foundation course. Cooperation with DCBPE will be required to offer the bridge courses and secure the support of the Department chair. Cooperation with the Pharmaceutical Engineering program is necessary to make the additional core courses available. There should be some budget coordination for the shared core courses between the various pharma-based programs.

L. Evaluation. In what way has an appropriate mechanism been developed to evaluate the success or failure of the program?

An evaluation plan specific to the program has not been developed, however, individual courses are evaluated by several means through the overseeing department. DCBPE sponsors regular discussions between program faculty and students to evaluate courses, especially those involving adjunct faculty. I recommend that an industrial advisory board be created that involves alums and local industry to provide a feedback mechanism. Such a board also offers opportunities to develop joint research programs and to secure industrial funding to support the program as was done successfully in the Pharmaceutical Engineering Program that received several $250,000 grants. The board could also be influential in finding internships for participating students as well as positions for program graduates.
Biography, Bibliography and Professional Summary - Jeffrey T. Koberstein

Affiliation and Official Address: Percy and Vida Hudson Professor
Chemical Engineering Department
Columbia University
500 West 120th Street Mail Code 4721
New York, New York 10027

Education: B.S. 1974 University of Wisconsin, Chemical Engineering
Ph.D. 1979 University of Massachusetts, Chemical Engineering
1980 Centre de Recherches sur les Macromolecules, Strasbourg, France, NSF-CNRS and NATO Postdoctoral Fellow

Experience: 1980-86 Assistant Professor of Chemical Engineering, Princeton University
1981 Visiting Assistant Professor, University of Wisconsin
1985 Visiting Research Scientist, IBM Research Labs, San Jose, California
1986-89 Associate Professor Chemical Engineering, University of Connecticut
1989-92 Founding Director, Polymer Compatibilization Research Consortium
1989-99 Professor of Chemical Engineering, University of Connecticut
1993-94 Guest Professor, Max-Plank Instittü, Mainz, Germany
1994-98 Director, Polymer Science Program, University of Connecticut
1994-99 Director, NSF Graduate Traineeship Program in Environmental Aspects of Plastics Recycling, University of Connecticut
1996-99 Co-Director, Biomaterials Design Initiative, University of Connecticut
1998-99 Distinguished Professor of Engineering, University of Connecticut
2000-05 Professor and Chair, Dept. of Chemical Engineering, Columbia University
2002-pres Professor in Residence, Columbia University
2002-pres Co-Director, NSF IGERT grant on Soft Materials, Columbia University
2003-pres Percy and Vida Hudson Professor of Chemical Engineering, Columbia Univ.
2004 Japan Society for the Promotion of Science Fellowship, Kyushu University
2007-2008 IRG leader Columbia NSF MRSEC program

Publications/Presentations: h-index 39
Refereed Journal/Book Articles 123
Conference Presentations 270 (116 invited)
Invited Lectures/Seminars 251

American Cyanamid Academic Award, 1990
Elected Fellow, American Physical Society, 1992
Elected Member, Connecticut Academy of Arts and Sciences, 1994
Rogers Teaching Award, Department of Chemical Engineering, 1998
Distinguished Engineering Professorship, School of Engineering, 1998
Percy and Vida Hudson Chair in Chemical Engineering, 2002
NSF Special Creativity Award, 2005
Stine Award, AIChE, Materials Engineering and Science Division, 2006
Elected Fellow, AIChE, 2007
Selected to Present the 2008 IUPAC Grande Conference at the University of Montreal, March 2008.
Research Interests:

Professional Society Memberships and Offices Held:
American Institute of Chemical Engineers, Material Engineering and Sciences Division
  2nd Vice Chair: 2004
  1st Vice-chair: 2005
  Program Chair: 2005
  Division Chair: 2006
  Past Chair: 2007
American Physical Society, Division of High Polymer Physics
Publication Comm.: Chair-1986
Program Comm.: 1989, 1990-Chair
Education Committee: 1994-Chair
Padden Award Committee: 1994-Chair
Ford Prize Committee: 1995, 1996-Chair
Executive Committee:
  Vice-Chair of Division-1994
  Chair Elect of Division-1995
  Chair of Division-1996
  Past Chair of Division-1997
American Chemical Society, Polymer Division
North American Thermal Analysis Society
  Awards Committee: 1987
Society of Plastics Engineers, Engineering Properties and Structure Division
  Board of Directors: 1989-1990
Materials Research Society
Adhesion Society
  Program Chair: 2003
Gordon Conference on Adhesion
  Vice-Chair: 2006
  Chair: 2009

Graduate Students Currently Advised/co-advised
1. Nicholas Carbone- PhD Candidate Chemical Engineering
2. Shuo Zhang- PhD Candidate Chemical Engineering
3. Yanir Maidenberg- PhD Candidate Chemical Engineering
4. Jeffrey Lancaster- PhD Candidate Chemistry (co-advised with N. Turro-Chemistry)
5. Ellane Park- PhD Candidate Chemistry (co-advised with N. Turro-Chemistry)
6. Benjamin Dach- PhD Candidate Chemistry (co-advised with N. Turro-Chemistry)

Graduate Students Advised: Princeton University
1. Jen-Kai Chen (MSE, 1984) "Automated Boundary Tension Measurements"
2. Louis Leung (PhD, 1985) "Morphological Behavior of Segmented Polyurethane Block Copolymers"
3. John Owens (PhD, 1986) "Small Angle Scattering Investigation of the Microphase Separation Transition in Diblock Copolymers and Diblock Copolymer/Homopolymer Blends"

4. Xina Quan (PhD, 1986) "Morphological Characterization of Homopolymer-Triblock Copolymer Blends"

5. Bruce Lawrey (Ph.D. 1988) (co-advised with R. K. Prud'homme) "A Study of Polymer Chain Segment Orientation and Relaxation in Isotopically Labelled Block Copolymers Using a Modulated Infrared Dichroism Technique"

6. Spiros Anasastasiadis (Ph.D. 1988) "Interfacial Tension of Immiscible Polymer Blends"

7. Qamardeep Bhatia (Ph.D. 1988) "Surface Studies of Homopolymers and Miscible Polymer Blends"

8. William Stockton (M.S. 1988) "Structural Characterization of Polyether-Polyester Block Copolymers"


Graduate Students Advised: University of Connecticut

10. Daniel Lee (Ph.D. 1990) "Molecular Engineering for Submicron Polymeric Assemblies"

11. R. Balaji (M.S. 1990) "Surface Partitioning in Multiconstituent Polymers"


13. Wenchun Hu (M.S. 1991) "Thermal Analysis of Polyurethane"

14. Cathy Fleischer (Ph.D. 1991) "Modification of Polymer/Polymer Interfaces Utilizing Polymer End Groups"

15. James Elman (Ph.D. 1991) "Functionally Terminated Polymers Confined to Thin Films"

16. Wenchun Hu (Ph.D. 1993) "Interfacial Activities of Block Copolymers in Immiscible Homopolymer Blends"

17. John Baetzold (Ph.D. 1993) "The Effects of Interactions on the Phase Behavior and Morphology of a Block Copolymer Blended with Various Polymers"

18. Claire Jalbert (Ph.D. 1993) "Surface and Interfacial Segregation in End Functionalized Polymers"

19. Christopher Mirley (Ph.D. 1994) "The Tribology of Functionally-Terminated Oligomer Films"

20. Deborah Duch (M.S. 1994) "End Functional Block Copolymers as Adhesion Promoters"


22. Jerry Pickering (PhD 96) "Mixed Monolayer and Multilayer Films of Functionally Terminated Oligomers: Design of Superstructures"

23. Charlie Laub (PhD 96) "End-Tethered Polymers"

24. Rick Muisener (PhD 99) "A Room Temperature Method for the Formation of Ultrathin Silicon Oxide Films"

25. Mark Lee (MS 2000) "End Functional Polymers"

26. Caroline Decker (MS 2000) "Hydrogels for Implantable Glucose Biosensors"

27. Chris Forrey (MS 2001) "The Theoretical Basis of Surface Segregation"

28. Patricia O'Rourke (PhD 2001) "The Molecular Design of Functional Polymer Surfaces"

29. Dawn Allison Smith (PhD 2001) "Surface Modification for Biomedical Applications Using Multicomponent Polymers"

30. Ralf Mason (PhD 2001) "Polymer-Polymer Adhesion Promotion By Block Copolymer Addition"
32. Dongman Cho (PhD 2002) “Modification of Polymeric Surface Using Block Copolymer in Supercritical Carbon Dioxide”
33. Thomas Fabian- (PhD 2003) “In Situ Characterization of Polymer Blend Mixing”
34. Derek Wong- (PhD 2004) “Surface Properties of Functional Polymer Systems”

Graduate Students Advised: Columbia University
35. Feng Pan- PhD in Chemical Engineering 2003 “Surface Patterning on Solid Substrates”
36. Peng Wang- PhD in Chemical Engineering 2004 “Surface Modification with Block Copolymers”
37. Roberto Franz – PhD in Chemistry 2005 “ATRP Synthesis of Macromonomers”
38. Alex Wu- PhD in Chemical Engineering 2006 “Surface Modification of Nanoparticles”
39. Danielle Lewis PhD in Chemical Engineering 2006 “The Design of Poly(tert-butyl acrylate) Networks for Biomedical Applications”
40. Gregory Carroll- PhD in Chemistry PhD 2007 (co-advised with N. Turro-Chemistry) “Photochemical Modification and Stabilization of Polymer Interfaces”
42. Yong Chen- PhD in Chemical Engineering 2008 “Polymer Surface Modification by Adsorption from Supercritical Fluids”.
43. Jeremiah Johnson- PhD in Chemistry PhD 2009 (co-advised with N. Turro-Chemistry) “Designer Polymer Gels Via Click Chemistry”
44. Hernan Rengifo- PhD in Chemical Engineering 2009 “Quantitative Fabrication of Functional Polymer Surfaces”

Patents:
4. “Preparation of α,ω-allyl-terminated macromonomer comprising α,ω-unsaturated carboxylic acid units by macromonomer comprising units of α,ω-unsaturated carboxylic acid ester with mixture comprising trifluoroacetic acid”, KOBERSTEIN J T, VOJTOVA L, TURRO N J, WO2003101934-A1; 2004-081924
5. “Micropatterning of Molecular Surfaces Via Selective Irradiation, filed 2/13/2003
6. “Methods of Modifying Surfaces, Filed 12/16/2004
Referred Publications:


Research Funding


11. "Interfacial Tension in Polymer Blends", DuPont, Polymer Products Department, 1985, $10,000.


17. "Polymer Interface Research", DuPont, 1988, $30,000
19. "Molecular Structure-Property Relationships in Block Copolymer/Homopolymer Blends", July 1, 1988-August 31, 1992, Shell Development Co. $120,000
22. "Development of a Polymeric Thin Film Laboratory, July 1, 1989-June 30, 1990, Department of Higher Education", $127,100
23. "American Cyanamid Academic Award, May 1, 1990, American Cyanamid, $5000
27. "Surfactants for Mechanical Frothing of Polyurethane Foams", June 1, 1990-May31, 1992, Department of Higher Education, $70,000
31. "Polymer Compatibilization Research Consortium", Industrial Consortium, September 1990-present, $950,000 (with R. Weiss and M. Shaw)
33. "Controlled Surface Segregation in Block Copolymer Systems", June 1, 1991- May 31, 1994, 3M, $90,000
39. "Horizons for Environmentally Conscious Polymer Engineering", May 1995, Army Research Office funding for Symposium, $7,000
44. “Room Temperature Preparation of Organoceramic Films”, UCRF, 6/96-1/97, $10,179.
49. “The Molecular Design of Surface Active Polymers that Create Functional Surfaces”, National Science Foundation, 8/98-7/01, $300,000.
50. “Control of Sensor/Tissue Interactions for Extended Lifetimes” (4 co-PI’s), NIH, 9/98-8/01, $1,052,131.
52. “Bioactive Polymer Coatings”, National Science Foundation, 11/02-11/05, $360,000.
53. “Center for Nanostructured Materials", NSF-MRSEC, 9/02-8/08, (one of two cluster leaders among 12 investigators: Total grant- $4,293,318.00), ($75,000/yr. as investigator)
54. “Multiscale Phenomena in Soft Materials”, NSF-IGERT, (co-PI with City College-12 investigators) 12/02-11/07, $2,741,080
55. “Smart Polymer Surfaces”, Army Research Office, 9/04-1/08, $300,000.
56. NSF Special Creativity Award, “Bioactive Polymer Coatings", National Science Foundation, 11/05-11/07, $240,000.

Teaching Duties

Princeton University:

1980-81:  ChE 241 - Introduction to Chemical Engineering (Fall - w/R. Prud'Homme)
          ChE 212 - Introduction to Chemical Engineering (Spring - w/R. Prud'Homme)
          ChE 562 - Special Topics in Polymer Materials (Spring)
          "Physical Chemistry of Polymers in Solution"
1981-82:  ChE 241 - Introduction to Chemical Engineering (Fall)
          ChE 561 - Special Topics in Polymer Materials (Fall)
          "Physical Chemistry of Polymers in the Solid State"
          ChE 241 - Introduction to Chemical Engineering (Spring)
1982-83:  ChE 241 - Introduction to Chemical Engineerinng (Fall)
          ChE 346 - Chemical Engineering Laboratory (Fall) (In charge of control experiment)
          ChE 346 - Chemical Engineering Laboratory (Fall-Spring) In charge of reorganization of course based upon allocation of $20,000 obtained from Amoco for laboratory revitalization
          ChE 564b- Polymer Laboratory (Spring)
1983-84: ChE 241 - Introduction to Chemical Engineering (Fall)  
ChE 561 - Special Topics in Polymer Materials (Fall)  
"Physical Chemistry of Polymer Solutions"

1984-85: ChE 241 - Introduction to Chemical Engineering (Fall)  
ChE 561 - Special Topics in Polymer Materials (Fall)  
"Polymer Morphology"

1985-86: ChE 241 - Introduction to Chemical Engineering (Fall)  
ChE 346 - Chemical Engineering Laboratory (Fall-Spring)  
ChE 561 - Special Topics in Polymer Materials (Fall)  
"Physical Chemistry of Polymer Solutions"

University of Connecticut:

1986-87: CHEG 237 - Undergraduate Laboratory (Fall)  
CHEG 256 - Polymer Materials (Spring)

1987-88: CHEG 237 - Undergraduate Laboratory (Fall)  
CHEG 320 - Polymer Morphology (Spring)

1988-89: CHEG 237W - Undergraduate Laboratory (Fall)  
CHEM 386 - Polymer Microscopy (Spring)

1989-90: CHEM 381 - Polymer Physical Chemistry (Fall)  
CHEG 320 - Polymer Morphology (Spring)

1990-91: CHEM 381 - Polymer Physical Chemistry (Fall)  
CHEG 238W - Undergraduate Laboratory (Spring)

1991-92: CHEM 381 - Polymer Physical Chemistry (Fall)  
CHEG 256 - Polymeric Materials (Spring)

1992-93: CHEM 381 - Polymer Physical Chemistry (Fall)  
CHEG 320-02 - Polymer Properties (Spring)

1994-95: CHEG 357 - Surface and Interfacial Properties of Polymers  
CHEG 256 - Polymeric Materials

1996-97: CHEG 355 - Polymer Structure and Morphology  
CHEG 212 - Thermodynamics II

1997-98: CHEM 381 - Polymer Physical Chemistry  
CHEG 357 - Surface and Interfacial Properties of Polymers

1998-99: CHEM 381 - Polymer Physical Chemistry  
ENGR 151 - Introduction to Engineering

1999-00: CHEM 381 - Polymer Physical Chemistry

Columbia University:

2000-01: CHEN 4640 - Polymer Surfaces and Interfaces

2001-02: CHEN 3210 - Chemical Engineering Thermodynamics

2002-03: CHEN 3210 - Chemical Engineering Thermodynamics

2004-05: CHEN 4680 - Soft Materials Laboratory  
CHEN 4640 - Polymer Surfaces and Interfaces  
CHEN 3210 - Chemical Engineering Thermodynamics

2005-06: CHEN 3210 - Chemical Engineering Thermodynamics  
CHEN 6620 – Physical Chemistry of Macromolecules  
CHEN 4680 - Soft Materials Laboratory
2006-07  CHEN 4680 - Soft Materials Laboratory
         CHEN 4640 - Polymer Surfaces and Interfaces
         CHEN 3210 - Chemical Engineering Thermodynamics
2007-08  CHEN 3210 - Chemical Engineering Thermodynamics
         CHEN 6620 – Physical Chemistry of Macromolecules
2008-09  CHEN 4680 - Soft Materials Laboratory
         CHEN 4645 – Inorganic Polymers, Hybrids and Gels
         CHEN 3210 - Chemical Engineering Thermodynamics
2009-10  CHEN 3100 – Mass and Energy Balances
         CHEN 4640 - Polymer Surfaces and Interfaces
         CHEN 3210 - Chemical Engineering Thermodynamics

University Service

University of Connecticut:

In addition to his efforts in teaching and research, Professor Koberstein has devoted considerable effort to assisting the research enterprise at the University of Connecticut by serving on important committees relating to research infrastructure. His service on University-wide committees is listed as below (service on Departmental and Engineering School Committees is omitted for brevity):

1. Provost’s Program Review Committee (1993) served as the University’s research representative and only one of two faculty members on this committee that met for 5-10 hours per week over a period of eighteen months. The committee presented recommendations on how the University could reorganize its financial resources.
2. Graduate Coordinator for Chemical Engineering Department (1988-1991)
6. Founding Director of the Polymer Compatibilization Research Consortium (1989). Founded the first industrial research consortium at the University of Connecticut. At its peak the consortium had as many as ten industrial companies as members.
9. Founding Co-Director of Biomaterials Design Initiative (1995-99). Founded this research enterprise, a joint effort with the UConn Health Center that involved more than 20 faculty members.

Columbia University:

4. Resident Faculty, Hartley-Wallach Living Learning Center (2002-2007)
5. One of two cluster leaders in interdisciplinary MRSEC grant on “Chemical Assembly of Thin Films Using Interacting Nanoparticles”
7. Organized, designed and led five major renovation projects for Chemical Engineering Department. Department renovation was awarded national academic design award in 2004.
9. Advisor for First and Second Year Undergraduates (2006-present)
10. Chair, search committee (2010)
Reply to the Consultant's Report on the Proposed Master of Science Degree Program in Pharmaceutical Materials Processing

(Formerly Referred to as "Pharmaceutical Materials Processing and Properties")

by

Piero M. Armenante and Marino Xanthos
Otto H. York Department of Chemical, Biological and Pharmaceutical Engineering
New Jersey Institute of Technology

General Comments
We would like to express our appreciation for the careful review of the proposed MS degree program in Pharmaceutical Materials Processing (PhMP) by Prof. Jeffrey Koberstein, the evaluating consultant for the program. In the detailed review document that Prof. Koberstein prepared, he expressed a strong support for the program that we are developing, which, in his words, "is unique in this country". We are clearly very pleased by his remarks. We are also especially pleased with his recommendation that the program be "approved upon minor modification."

In his report, Prof. Koberstein is generally highly supportive of the program and he makes positive remarks about it. Therefore, the specific comments listed below are mainly in response to those points that he indicated should be addressed.

Specific Comments

1. Page 4, 4th paragraph (end of Section B - Need for the Program). We agree with the consultant that the proposed program "is not available at any other academic institution". We designed this program with this objective in mind, and we appreciate that the consultant noticed it. He reiterated this concept on page 4 (last paragraph) and page 5 (top paragraph; Subsection 1 of Section C-Educational Programs), where he stated that "To my knowledge there are no programs similar to the proposed PhMP program within the state of New Jersey or even nationally." We agree with this statement and we appreciate that he recognized it.
2. Bottom of page 5 and top of page 6 (Subsection 3 of Section C - Educational Programs). Although the consultant felt that the new courses in the program are "well designed" and "fulfill the needs and objectives of the program," he also voiced a concern about the present content of the Foundation Course, MtSE 601, which, he feels, is not considered to be a good match to the needs of the proposed PhMP program. This course is an existing NJIT course, and future PhMP students lacking a materials background will be required to take it. We fully agree with the consultant on the need to incorporate more information on soft materials in this course, since these materials are commonly encountered in pharmaceutical applications. We plan to make recommendations to redesign the course syllabus accordingly. We have already discussed this issue with Dr. Trevor Tyson, former director of the Materials Science and Engineering (MtSE) program at NJIT, who is in full agreement with the consultant and with us on this issue.

3. Page 8, 1st paragraph (Subsection 1 of Section E - Faculty). The consultant correctly pointed out that adjunct faculty will be needed to offer some of the courses in the new program. We agree with him. Therefore, adequate resources are expected to be provided by the NJIT administration to hire qualified adjunct instructors and/or lecturers. One of us (PMA) has been involved in hiring adjunct faculty for the Pharmaceutical Engineering program for a number of years now. The quality of instruction provided by the adjunct instructors has been typically very high, and we expect that this will continue in the new program as well.

4. Page 8, 5th paragraph (Subsection 3 of Section E - Faculty). The consultant correctly pointed out that the administration of the proposed program as well the administration of the already existing Pharmaceutical Engineering and Pharmaceutical Bioprocessing MS programs rely mainly on one faculty member (Prof. Armenante) and possibly and partially a second faculty member (Prof. Xanthos). He feels that this administrative structure could be strengthened by hiring a program coordinator, or "center coordinator", as the consultant mentioned several times in the report, since three distinct, pharmaceutically related MS programs are involved. This coordinator (for example, an early retiree from the pharmaceutical industry) would take over some of day-to-day administrative issues associated with all these programs, which have experienced a sustained student enrollment growth in recent years. We strongly agree with this recommendation. Accordingly, we will develop a personnel plan considering hiring such a professional, and we will propose such a plan to the NJIT administration. We additionally agree with the consultant that we should consider future expansion of permanent faculty in this and the other existing pharmaceutical engineering programs.
5. Page 9, 3rd paragraph (Section G - Finances). We agree with the consultant that release time should be provided to the faculty administering the program and developing courses, and that a budget should be developed, tracking the costs of program resources as well as revenues generated by the program. We are ready to work with the NJIT administration to implement these recommendations.

6. Page 10, last paragraph and page 11, first paragraph (Section K - Administration). Here, the consultant reiterated the need for an administrative structure incorporating a program coordinator and for a clear definition of the duties of all personnel involved. We agree with this recommendation and we will work with the NJIT administration toward this goal.

7. Page 11, last paragraph (Section L - Evaluation). The consultant recommended that an Industrial Advisory Board be created, involving alums and local industry to provide a feedback mechanism. We agree with this excellent suggestion and we will work on the development of such a board.
3D. Approve Resolution to Authorize Expenditure for Electricity and Natural Gas for FY 2011
STATEMENT
RESOLUTION TO AUTHORIZE EXPENDITURES FOR ELECTRICITY and NATURAL GAS, FY 2011

There exists a need to purchase electricity and natural gas for the campus from PSE&G, Natural Gas Supply Company, Hess Corporation and other electricity and natural gas suppliers and transporters. Shown below is the actual cost for FY 2008, FY 2009 and projections for FY 2010 and FY 2011.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility Cost - $ for Natural Gas &amp; Electricity ($000's)</td>
<td>7,487,170</td>
<td>7,927,634</td>
<td>7,800,000</td>
<td>9,050,000</td>
</tr>
<tr>
<td>Sq. Ft. (000’s)</td>
<td>2,640</td>
<td>2,640</td>
<td>2,640</td>
<td>2,890*</td>
</tr>
<tr>
<td>$/sq. ft.</td>
<td>$2.84</td>
<td>$3.00</td>
<td>$2.95</td>
<td>$3.13</td>
</tr>
<tr>
<td>Cost of Electricity $/kwh</td>
<td>$0.152</td>
<td>$0.157</td>
<td>$0.158</td>
<td>$0.157</td>
</tr>
<tr>
<td>Cost of Natural Gas $/Therm</td>
<td>$1.47</td>
<td>$1.65</td>
<td>$1.71</td>
<td>$1.73</td>
</tr>
</tbody>
</table>

*Additional square footage of 225,000 sq ft and 25,000 sq ft for Central High School and the Naimoli Family Athletic and Recreational Facility respectively.

New and previously implemented energy conservation measures continue to have a positive effect on controlling costs, resulting in $1.3 million savings versus FY 2010 Budget:

- Oak Hall energy efficiency and renewable energy project. Under ARRA program NJIT received a $1.67 million grant to renovate and upgrade equipment in Oak Hall.
- Third party contract for natural gas is due this year, resulting in a lower commodity price for natural gas.
- Closure of one-half of the floors at the parking deck during the summer
- Closure of Redwood (partial) and Oak Residence Halls for the summer
- Summer compressed 4 day work week which decreases the greenhouse effect by 8,573 tons of carbon dioxide emissions.
- Installation of energy efficient lighting
- Use of solar energy
- Use control systems (both on-campus and remotely) to scheduling of building systems operations based on schedule of actual events.
- GITC - Implementation of new DDC zone controls
• GITC Installation of the new high efficiency chillers and variable drive cooling system pumps and variable speed controls for the air handling units.
• New control strategies in Fenster Hall, GITC and the Campus Center have increased efficiency resulting in savings of approximately $300,000 annually.
• Installation of a new heat recovery unit in Oak Hall.
• Installation of new boilers in Kupfrian Hall eliminates heat losses associated with the remnants of the old campus wide steam loop.

Factors having a negative impact on cost include:

• Addition of 225,000 sq ft for Central High School
• Addition of 25,000 sq ft for the Naimoli Family Athletic and Recreational Facility
• Continuing uncertainties of energy markets
• Continuing increase in the use of facilities to accommodate a 24/7 occupancy.
• PSE&G tariff changes
RESOLUTION TO AUTHORIZE EXPENDITURES FOR ELECTRICITY AND NATURAL GAS FOR FY 2011

WHEREAS, there exists a need to purchase electricity and natural gas through Public Service Electric & Gas Company, Hess Corporation and GDF Suez Energy Resources NA; and

WHEREAS, a cost effective combination of suppliers and transporters will be used to provide needed utilities; and

WHEREAS, it is estimated that amounts will not exceed $9,050,000; and

WHEREAS, funds for these utilities have been provided in the FY 2011 budget.

NOW, THEREFORE, BE IT RESOLVED that the Board of Trustees of New Jersey Institute of Technology authorizes the President to execute the necessary contracts to purchase these utilities in an amount not to exceed $9,050,000.
3E. Approve Resolution to Renew Student Health Insurance
STATEMENT

T.L Groseclose Associates, Inc. has completed a review of the Group Sports Accident Insurance Program and Student Accident and Sickness Insurance program.

The 2010-2011 NJIT Student Accident & Sickness Insurance Plan has the same medical benefits provided as the expiring policy year. While the general coverage remains the same, the time a student has to file a claim has been reduced from 104 weeks to 52 weeks. Owing to loss experience there is a 10% increase in premium. This is the first increase in premiums the program has experienced within the past two years.

The Intercollegiate Athletic Accident Insurance Plan has a new maximum benefit of $90,000 for the 2010-2011 policy year to accommodate the change by the NCAA in their catastrophic coverage which is moving from coverage for claims over $75,000 to $90,000.
RESOLUTION TO AUTHORIZE
RENEWAL OF STUDENT HEALTH INSURANCE

WHEREAS, there exists a continuing need to provide accident insurance for full-time undergraduate students and insurance coverage for athletic activities, and

WHEREAS, pursuant to public law, the university is required to ensure that all full-time, undergraduate and graduate students have basic health and hospitalization coverage insurance, and

WHEREAS, the cost of this insurance is covered by student fees, and

WHEREAS, a review of the existing insurance policies by our risk management consulting firm determined the existing policy to be adequate in coverage and the level of service provided by T.L. Groseclose Associates, Inc. to NJIT and its students is as good or better than the other schools polled receive, and

WHEREAS, the agency, T.L. Groseclose Associates, Inc. proposes premiums for accident insurance for full-time undergraduate students of $44 per student for the accident coverage, $306 for the required health care coverage for students not demonstrating evidence of the statutory coverage, and the lump sum Intercollegiate Athletic Policy is not to exceed $350,000, and

WHEREAS, said agency now provides such coverage and claims services has performed satisfactorily and after a review with the Dean of Students Office and Health Service Department, it is recommended that the proposal be accepted, and

WHEREAS, there will be funds budgeted for this purpose in Fiscal Year 2011,

NOW, THEREFORE, BE IT RESOLVED, that the Board of Trustees authorizes the President and Treasurer to renew the Student Health Insurance Program with T.L. Groseclose Associates, Inc. for the period ending August 2011 for accident insurance not to exceed $44 for each full-time undergraduate student, $306 per full-time student for students not presenting evidence of the statutorily required health insurance and $350,000 lump sum for the Athletic Policy.

June 3, 2010
3F. Approve Resolution to Update Bank and Financial Institutions Account Authorizations
STATEMENT

The Board of Trustees has previously approved the maintenance of banking and investment accounts by the University and Foundation at New Jersey Institute of Technology at a variety of banks and financial institutions.

This resolution is an annual update regarding the designation of authorized university personnel to conduct financial business transactions.
RESOLUTION TO UPDATE BANK AND FINANCIAL INSTITUTION ACCOUNT AUTHORIZATIONS

WHEREAS, the Board of Trustees has previously approved the maintenance of banking and investment accounts by the University and Foundation at New Jersey Institute of Technology at a variety of banks and financial institutions; and

WHEREAS, from time to time said banks and financial institutions require updated Resolutions regarding the designation of authorized university personnel to conduct business transactions; and

WHEREAS, it is advisable to have several positions be authorized to execute the necessary documents; and

WHEREAS, it is recommended that the President, Senior Vice President for Administration and Treasurer, Assistant Vice President for Finance and Controller and the Associate Treasurer be so authorized.

NOW, THEREFORE BE IT RESOLVED that the following university personnel, President, Senior Vice President for Administration and Treasurer, Assistant Vice President for Finance and Controller and the Associate Treasurer are designated agent or agents and are authorized to open required University checking and investment accounts in banks, brokerage houses, and other financial institutions and to execute documents as are required by designated financial institutions to transact business.

June 3, 2010
3G. Approve Resolution to Establish Gateway Project Special Purpose Corporations
Statement
Resolution to Authorize Establishment of Campus Gateway Development Corporations

The Campus Gateway Development project is moving forward. The RFP for developers of the Greek Village has been released. Jones Lang LaSalle (JLL) and the City are “shopping” the project and it is a major focus of their efforts at the Global Retail Real Estate Convention held in Las Vegas. This convention is the largest of its kind in the world, and estimates are that over 25% of the industry’s transactions occur there.

To facilitate the involvement of the University on the one hand and to provide appropriate protection it is recommended that two corporations be established one a for-profit and the other a not-for-profit. The purpose of each corporation is listed below.

For Profit Corporation
- It is anticipated that the for-profit entity will be the main vehicle for NJIT’s implementation of the project.
- The formation of a separate entity further insulates NJIT from any liability associated with the project.
- The entity will have its own staff and/or consultant who will handle the day-to-day operations in connection with the redevelopment.
- The for-profit entity allows for the greatest flexibility in leveraging NJIT’s participation to date as well as the rights it holds as Master Redeveloper pursuant to its Redevelopment Agreement with the City of Newark.
- This includes access to certain funding mechanisms available only to those with executed redevelopment agreements with a municipality, including Economic Redevelopment Growth Grants (“ERGG”). The ERGG allows a developer to finance up to 20 percent of a project based upon increased tax revenues generated from the project, and up to 100 percent of public infrastructure improvements and/or publicly owned facilities.

Not-For-Profit Corporation
- The creation of a non-profit entity is useful in that such an entity could be utilized in connection with a project seeking to qualify for long-term tax abatements.
- These extended PILOTs (Payment In Lieu of Taxes), by operation of New Jersey law, are only available to urban renewal entities, of which one form of such entity is a non-profit corporation.
• Further, there may be portions of the Gateway Redevelopment that NJIT may wish to use for university/educational purposes that could qualify for tax-exempt status. Having a non-profit available will allow for this contingency.

• Having a second entity may allow for ownership of certain portions of the project separate from the university, but not co-mingled with the for-profit entity.

It is recommended that the following NJIT employees be named as incorporators and initial board members:

Incorporator

Initial Board Members

The Articles of Incorporation for each entity was drafted by outside counsel and reviewed by the administration.

A resolution to authorize the establishment of the two corporations has been prepared for your consideration.
Resolution to Authorize the Creation of Gateway Development Corporations

Whereas, the Campus Gateway Development Project is an integral part of the development of the university, and

Whereas, NJIT has been designated by the City as the developer of the properties within the Gateway Project footprint, and

Whereas, it is recommended that the participation of NJIT in the development efforts can be managed through related development corporations, one for profit and one not-for-profit, and

Whereas, appropriate incorporation documents have been developed by external counsel and are attached as Exhibits A and B for the for profit and not-for-profit corporations respectively, and

Whereas, the use of these corporations is will facilitate the development of the campus and its environs, and

Whereas, such activities are appropriate and necessary to carry out the mission of the university, and

Whereas, appropriate university personnel will be named as initial incorporators,

Now Therefore Be It Resolved that the Board of Trustees of New Jersey Institute of Technology hereby authorizes the President and appropriate personnel of the university to take any and all steps necessary to formally create, file appropriate documents with the New Jersey Secretary of State and secure the tax-exempt status as applicable for the Campus Gateway Foundation, Inc, a not-for-profit corporation and the Campus Gateway Development, Inc, a for profit corporation for the aforesaid purposes.

3 June 2010
ARTICLES OF INCORPORATION
of
Campus Gateway Development, Inc.
A New Jersey Corporation

The undersigned, for the purpose of forming a corporation pursuant to the provisions of the New Jersey Business Corporation Act, N.J.S.A. 14A:1-1, et seq. (the "Act"), does hereby execute the following Articles of Incorporation:

FIRST: The name of this Corporation is: Campus Gateway Development Inc. (the "Corporation").

SECOND: This Corporation is organized for one or more of the purposes specified in the Act.

THIRD: The registered agent of the Corporation is:

Henry A. Mauermeyer
New Jersey Institute of Technology
323 Martin Luther King Blvd
Newark, NJ 07102-1982

FOURTH: The registered office of the Corporation is:

New Jersey Institute of Technology
211 Warren Street
Newark, NJ 07102-1982

FIFTH: The aggregate number of shares that the Corporation shall have authority to issue is one thousand (1,000), designated as common stock, with no par value.

SIXTH: The method of electing directors shall be as set forth in the bylaws.

SEVENTH: The initial board of directors shall consist of the following:

Robert A. Altenkirch
Joel S. Bloom
William Garcia
Henry A. Mauermeyer
Nicholas P. Tworischuk

EIGHTH: The Board of Directors shall have the power to adopt, amend, or repeal the bylaws.
NINTH: The name and address of the incorporator are:

Henry A. Mauermeyer  
New Jersey Institute of Technology  
323 Martin Luther King Blvd  
Newark, NJ 07102-1982

TENTH: To the full extent from time to time permitted by law and the Act, no director or officer of the corporation shall be personally liable to the corporation or to any of its shareholders for damages for breach of any duty owed to the corporation or its shareholders except for liability for any breach of duty based upon an act or omission (a) in breach of such director's or officer's duty of loyalty to the corporation or its shareholders, (b) not in good faith or that involves a knowing violation of law, or (c) resulting in receipt by such director or officer of an improper personal benefit. The Corporation shall have the authority to indemnify every director, officer, employee or other agent of the Corporation to the fullest extent permitted by law, the Act, or the corresponding section of any subsequent state law. No amendment to or repeal of this Article TENTH shall apply to or have any effect on the liability or alleged liability of any director of the Corporation for or with respect to any acts or omissions of such director occurring prior to such amendment.

ELEVENTH: The duration of the Corporation shall be perpetual.

TWELFTH: These Articles of Incorporation shall be effective as the Certificate of Incorporation of the Corporation upon filing.

IN WITNESS WHEREOF, the undersigned incorporator of the above-named Corporation, has hereunto signed this Certificate of Incorporation on this ___ day of _____________ 2010

________________________
Henry A. Mauermeyer, Incorporator
ARTICLES OF INCORPORATION
of
Campus Gateway Foundation, Inc.
A New Jersey Nonprofit Corporation

The undersigned, for the purpose of forming a nonprofit corporation pursuant to the provisions of the New Jersey Nonprofit Corporation Act, N.J.S.A. 15A:1-1, et seq. (the “Act”), does hereby execute the following Articles of Incorporation:

FIRST: The name of this Corporation is: Campus Gateway Foundation, Inc.

SECOND: This Corporation is organized for one or more of the purposes specified in the Act, specifically for charitable and educational purposes, and organized exclusively for one of the exempt purposes specified in Section 501(c)(3) of the Internal Revenue Code of 1986, or the corresponding section of any future federal tax code.

Without limiting the foregoing, this Corporation’s purposes shall be:

- To promote and effectuate economic development, aesthetic improvement, quality of life and the redevelopment and rehabilitation of the University Heights neighborhood of Newark, New Jersey.

No part of the net earnings of the Corporation shall inure to the benefit of any trustee, officer, or other private person, except as reimbursement for reasonable and necessary expenses incurred in conducting the Corporation’s affairs and in carrying out its exempt purposes, or as reasonable compensation for services rendered.

No substantial part of the activities of the Corporation shall be the carrying on of propaganda or otherwise attempting to influence legislation (except as otherwise provided by Section 501(h) of the Internal Revenue Code), nor shall the Corporation participate or intervene
in any political campaign on behalf of any candidate for public office (including the publishing or distribution of statements).

Notwithstanding any other provision of these Articles, this Corporation shall not carry on any other activities not permitted to be carried on (1) by a corporation exempt from federal income tax under Section 501(c)(3) of the Internal Revenue Code of 1986, or any corresponding section of any future federal tax code, or (2) by a corporation, contributions to which are deductible under Section 170(c)(2) of the Internal Revenue Code or any corresponding section of any future federal tax code.

THIRD: The name and address of the registered agent of the corporation are:

Henry A. Mauermeyer
New Jersey Institute of Technology
323 Martin Luther King Blvd.
Newark, NJ 07102-1982

FOURTH: The registered office of the Corporation is:

New Jersey Institute of Technology
323 Martin Luther King Blvd.
Newark, NJ 07102-1982

FIFTH: The Corporation shall not have members.

SIXTH: The method of electing trustees shall be as set forth in the bylaws.

SEVENTH: The initial board of trustees shall consist of the following

Robert A. Altenkirch
Joel S. Bloom
William Garcia
Henry A. Mauermeyer
Nicholas P. Tworischuk

EIGHTH: The duration of the corporation shall be perpetual.

NINTH: The name and address of the incorporator are:
TENTH: The method of distribution of assets upon dissolution shall be:

Upon dissolution of this Corporation, assets shall be distributed for one or more exempt purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code (i.e., charitable, educational, religious, or scientific) or corresponding section of any future federal tax code, or shall be distributed to New Jersey Institute of Technology or the Foundation at New Jersey Institute of Technology for public purposes.

ELEVENTH: The Corporation shall have the authority to indemnify every trustee, officer, employee or other agent of the Corporation to the fullest extent permitted by New Jersey law, the Act, or the corresponding section of any subsequent state law. No trustee or officer shall be personally liable to the Corporation for damages for breach of any duty owed to the Corporation, except that this provision shall not relieve a trustee or officer from liability for any breach of duty based upon an act or omission (1) in breach of such person’s duty of loyalty to the Corporation, (2) not in good faith or involving a knowing violation of law, or (3) resulting in receipt by such person or an improper personal benefit.

TWELFTH: These Articles of Incorporation shall be effective as the Certificate of Incorporation of the Corporation upon filing.

IN WITNESS WHEREOF, the undersigned incorporator of the above-named Corporation, has hereunto signed this Certificate of Incorporation on this ___ day of __________, 2010.

Henry A. Mauermeyer, Incorporator
4A. Status of Budget, Tuition and Fee Schedule for FY 2011
## New Jersey Institute of Technology

**Unrestricted Expense Budget Rollup with Groupings, and Additional Breakout of Other Major Operating Expenses**

*Excludes Allocated Balances and Restricted Programs*

*As of 5/25/2010*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Committed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure Track Faculty</td>
<td>32,712,968</td>
<td>32,313,182</td>
<td>34,687,168</td>
<td>35,710,729</td>
<td>$38,377,356</td>
<td>(1,482,000)</td>
<td>$36,895,356</td>
</tr>
<tr>
<td>Non -Ten. Track Fac.</td>
<td>4,283,579</td>
<td>4,471,118</td>
<td>4,918,709</td>
<td>5,131,206</td>
<td>5,391,304</td>
<td></td>
<td>5,391,304</td>
</tr>
<tr>
<td>Adjuncts &amp; Teaching Assistants</td>
<td>3,992,563</td>
<td>3,988,733</td>
<td>4,043,524</td>
<td>4,542,740</td>
<td>4,217,385</td>
<td>(639,000)</td>
<td>3,578,385</td>
</tr>
<tr>
<td>Other Faculty Comp.</td>
<td>2,832,463</td>
<td>1,103,735</td>
<td>1,136,077</td>
<td>368,109</td>
<td>75,140</td>
<td></td>
<td>75,140</td>
</tr>
<tr>
<td>Admin. Salaries</td>
<td>28,514,588</td>
<td>33,637,682</td>
<td>34,623,742</td>
<td>34,465,996</td>
<td>37,461,638</td>
<td>(884,000)</td>
<td>36,577,638</td>
</tr>
<tr>
<td>Other Admin. Comp.</td>
<td>793,825</td>
<td>599,466</td>
<td>826,238</td>
<td>392,950</td>
<td>391,000</td>
<td></td>
<td>391,000</td>
</tr>
<tr>
<td>Staff Salaries</td>
<td>13,473,481</td>
<td>13,437,093</td>
<td>13,711,352</td>
<td>13,902,313</td>
<td>14,415,912</td>
<td>(110,000)</td>
<td>14,415,912</td>
</tr>
<tr>
<td>Hr/Hr/Temp/Overtime</td>
<td>1,146,896</td>
<td>1,323,446</td>
<td>1,398,374</td>
<td>1,233,143</td>
<td>1,332,311</td>
<td>(110,000)</td>
<td>1,222,311</td>
</tr>
<tr>
<td>Other Staff Comp.</td>
<td>182,345</td>
<td>236,521</td>
<td>412,200</td>
<td>260,399</td>
<td>103,000</td>
<td></td>
<td>103,000</td>
</tr>
<tr>
<td>Student Workers</td>
<td>5,477,791</td>
<td>5,889,504</td>
<td>6,096,683</td>
<td>5,509,377</td>
<td>5,566,000</td>
<td>(33,000)</td>
<td>5,533,000</td>
</tr>
<tr>
<td><strong>Subtotal Salaries</strong></td>
<td>93,410,499</td>
<td>96,739,481</td>
<td>100,676,058</td>
<td>101,517,503</td>
<td>107,431,057</td>
<td>(3,168,000)</td>
<td>104,263,035</td>
</tr>
<tr>
<td>Fringe Benefits</td>
<td>24,996,390</td>
<td>25,724,695</td>
<td>26,495,029</td>
<td>27,162,021</td>
<td>28,348,887</td>
<td></td>
<td>28,348,887</td>
</tr>
<tr>
<td><strong>Restricted Use Budget</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>7,326,082</td>
<td>8,613,215</td>
<td>9,049,025</td>
<td>9,598,698</td>
<td>10,587,023</td>
<td>(220,000)</td>
<td>10,367,023</td>
</tr>
<tr>
<td>Insurance</td>
<td>1,943,342</td>
<td>2,013,174</td>
<td>1,659,771</td>
<td>1,685,243</td>
<td>2,085,930</td>
<td></td>
<td>2,085,930</td>
</tr>
<tr>
<td>Library Collections</td>
<td>1,149,065</td>
<td>1,159,205</td>
<td>1,119,771</td>
<td>953,095</td>
<td>1,084,400</td>
<td></td>
<td>1,084,400</td>
</tr>
<tr>
<td>Student Awards</td>
<td>14,040,945</td>
<td>15,956,826</td>
<td>17,325,024</td>
<td>19,551,267</td>
<td>20,671,390</td>
<td>(407,000)</td>
<td>20,264,390</td>
</tr>
<tr>
<td>Rest. Trans.,Debt Svc. &amp; Other</td>
<td>14,390,826</td>
<td>20,787,940</td>
<td>21,020,808</td>
<td>19,788,321</td>
<td>22,881,838</td>
<td></td>
<td>22,881,838</td>
</tr>
<tr>
<td>Indirect Costs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>(81,023)</td>
<td></td>
<td>(81,023)</td>
</tr>
<tr>
<td><strong>Subtotal Restricted Use Budgets</strong></td>
<td>38,277,375</td>
<td>48,072,435</td>
<td>49,766,619</td>
<td>52,091,716</td>
<td>56,796,961</td>
<td>(627,000)</td>
<td>56,169,961</td>
</tr>
<tr>
<td><strong>General Operating Budgets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td>3,105,691</td>
<td>2,697,718</td>
<td>3,118,724</td>
<td>2,611,797</td>
<td>2,859,054</td>
<td>(312,000)</td>
<td>2,547,054</td>
</tr>
<tr>
<td>Materials/Supplies</td>
<td>2,617,102</td>
<td>2,541,712</td>
<td>2,595,045</td>
<td>2,476,283</td>
<td>2,710,711</td>
<td>(31,000)</td>
<td>2,679,711</td>
</tr>
<tr>
<td>Travel/Conferences</td>
<td>2,226,500</td>
<td>2,654,467</td>
<td>2,462,258</td>
<td>2,244,058</td>
<td>2,456,501</td>
<td>(463,000)</td>
<td>1,993,501</td>
</tr>
<tr>
<td>Professional Services</td>
<td>5,204,256</td>
<td>5,563,022</td>
<td>6,123,648</td>
<td>5,664,343</td>
<td>6,200,583</td>
<td>(599,000)</td>
<td>5,601,583</td>
</tr>
<tr>
<td>Facility Maintenance, Repairs, Rentals &amp; Leases</td>
<td>4,066,077</td>
<td>4,245,021</td>
<td>4,142,357</td>
<td>4,085,855</td>
<td>4,472,661</td>
<td>(250,000)</td>
<td>4,222,661</td>
</tr>
<tr>
<td>Computer Hardware, Software, and Maintenance</td>
<td>1,356,775</td>
<td>1,169,515</td>
<td>1,317,611</td>
<td>1,390,638</td>
<td>1,522,289</td>
<td></td>
<td>1,522,289</td>
</tr>
<tr>
<td>General Advertising</td>
<td>1,014,330</td>
<td>887,853</td>
<td>996,610</td>
<td>856,552</td>
<td>937,641</td>
<td></td>
<td>937,641</td>
</tr>
<tr>
<td>Other Operating Expenses</td>
<td>3,208,776</td>
<td>4,347,900</td>
<td>5,726,221</td>
<td>3,695,788</td>
<td>3,740,666</td>
<td>(319,000)</td>
<td>3,421,666</td>
</tr>
<tr>
<td><strong>Subtotal General Operating Expenses</strong></td>
<td>22,799,508</td>
<td>24,107,206</td>
<td>26,482,475</td>
<td>23,025,314</td>
<td>24,900,106</td>
<td>(1,944,000)</td>
<td>22,956,106</td>
</tr>
<tr>
<td>University Reserve</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,000,000</td>
<td></td>
<td>1,000,000</td>
</tr>
<tr>
<td>Department Reserves</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>179,483,773</td>
<td>194,643,818</td>
<td>203,620,180</td>
<td>203,796,554</td>
<td>218,477,000</td>
<td>(5,739,000)</td>
<td>212,738,000</td>
</tr>
</tbody>
</table>

**FY11 Proposed Additional Revenue Enhancements**

(767,000)

**Total Net Impact**

(6,506,000)

**Total Target for Pro-Rata Reduction**

(6,506,000)
4B. Report of Gifts and Fund Raising Activities

#### Comparison of Total Giving Year to Date:

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Sources</td>
<td>$11,474,642</td>
<td>$8,727,956</td>
<td>$6,694,871</td>
</tr>
<tr>
<td>All Sources without Gifts in Kind:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$9,397,826</td>
<td>$7,184,995</td>
<td>$5,754,601</td>
</tr>
<tr>
<td>Matching Gifts:</td>
<td>$143,359</td>
<td>$138,983</td>
<td>$130,452</td>
</tr>
</tbody>
</table>

#### Category Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>$ Giving</th>
<th>%</th>
<th>#</th>
<th>$ Giving</th>
<th>%</th>
<th>#</th>
<th>$ Giving</th>
<th>%</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alum</td>
<td>$2,832,450(^1)</td>
<td>24.68</td>
<td>4,343</td>
<td>$2,461,820(^2)</td>
<td>28.21</td>
<td>3,854</td>
<td>$2,446,679(^3)</td>
<td>36.55</td>
<td>3,693</td>
</tr>
<tr>
<td>Corp</td>
<td>$3,975,757(^4)</td>
<td>34.65</td>
<td>400</td>
<td>$3,542,537(^5)</td>
<td>40.59</td>
<td>340</td>
<td>$2,993,304(^6)</td>
<td>44.71</td>
<td>297</td>
</tr>
<tr>
<td>Foundations</td>
<td>$2,830,865(^7)</td>
<td>24.67</td>
<td>22</td>
<td>$2,004,658(^8)</td>
<td>22.97</td>
<td>17</td>
<td>$480,003</td>
<td>7.17</td>
<td>11</td>
</tr>
<tr>
<td>Friends</td>
<td>$1,520,328(^9)</td>
<td>13.25</td>
<td>747</td>
<td>$511,825</td>
<td>5.86</td>
<td>381</td>
<td>$589,367</td>
<td>8.80</td>
<td>407</td>
</tr>
<tr>
<td>Other</td>
<td>$315,242(^10)</td>
<td>2.75</td>
<td>20</td>
<td>$207,116</td>
<td>2.37</td>
<td>23</td>
<td>$185,517</td>
<td>2.77</td>
<td>16</td>
</tr>
<tr>
<td>Totals:</td>
<td>$11,474,642</td>
<td>100.00</td>
<td>5,532</td>
<td>$8,727,956</td>
<td>100.00</td>
<td>4,615</td>
<td>$6,694,871</td>
<td>100.00</td>
<td>4,424</td>
</tr>
</tbody>
</table>

#### Year End Total Comparison to 2007 Base Year

<table>
<thead>
<tr>
<th>Total Dollars</th>
<th>% of FY 07 Funds Raised</th>
<th>% of Year Elapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$8,205,293</td>
<td>100%</td>
</tr>
<tr>
<td>2008</td>
<td>$13,324,197</td>
<td>163%</td>
</tr>
<tr>
<td>2009</td>
<td>$9,391,314</td>
<td>114%</td>
</tr>
<tr>
<td>2010</td>
<td>$6,694,871</td>
<td>81%</td>
</tr>
</tbody>
</table>

---

1. Alumni – Spatz Bequest $1M
2. Alumni – Spatz Bequest $977K, Nudenberg Bequest $284K
3. Alumni – Reif Bequest $1.1M, Nudenberg Bequest $75K
4. Corporations – Anonymous $1.9M
5. Corporations – Anonymous $1.2M
6. Corporations – Anonymous $314K, FMC Corp $504K
7. Foundations – Stabile $1.5M, Lir $499K
8. Foundations – Stable $1M, Ridgefield $505K
9. Friends – Murawski $700K
10. Other – Dow Charitable Fund $100K
4C. Operating Statement
Year to Date
New Jersey Institute Of Technology
Statement of Current Fund Revenues and Expenditures
For the Ten Months Ended April 30, 2010
[Dollars in Thousands]

|                  | FY2010 Budget | FY2010 YTD | FY2010 | FY2009%
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Restricted Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education and General</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuition and Fees</td>
<td>$116,110</td>
<td>$114,159</td>
<td>98%</td>
<td>101%</td>
</tr>
<tr>
<td>Appropriations, Contracts, Gifts</td>
<td>70,470</td>
<td>58,914</td>
<td>84%</td>
<td>81%</td>
</tr>
<tr>
<td>Other sources</td>
<td>12,176</td>
<td>10,109</td>
<td>83%</td>
<td>78%</td>
</tr>
<tr>
<td>Allocated Balances</td>
<td>2,408</td>
<td>2,007</td>
<td>83%</td>
<td>39%</td>
</tr>
<tr>
<td>Total</td>
<td>$201,164</td>
<td>$185,189</td>
<td>92%</td>
<td>91%</td>
</tr>
<tr>
<td>Auxiliary Enterprises</td>
<td>12,744</td>
<td>12,626</td>
<td>99%</td>
<td>97%</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>$213,908</td>
<td>$197,815</td>
<td>92%</td>
<td>92%</td>
</tr>
<tr>
<td><strong>Expenditures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational and General</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>72,900</td>
<td>65,495</td>
<td>90%</td>
<td>87%</td>
</tr>
<tr>
<td>Research</td>
<td>6,300</td>
<td>5,201</td>
<td>83%</td>
<td>47%</td>
</tr>
<tr>
<td>Public Service</td>
<td>2,607</td>
<td>2,845</td>
<td>109%</td>
<td>84%</td>
</tr>
<tr>
<td>Academic Support</td>
<td>19,300</td>
<td>14,937</td>
<td>77%</td>
<td>73%</td>
</tr>
<tr>
<td>Student Services</td>
<td>14,000</td>
<td>11,582</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>Institutional Support</td>
<td>33,507</td>
<td>22,881</td>
<td>66%</td>
<td>88%</td>
</tr>
<tr>
<td>Operation and Maintenance of Physical Plant</td>
<td>15,796</td>
<td>11,888</td>
<td>75%</td>
<td>66%</td>
</tr>
<tr>
<td>Financial Aid to Students</td>
<td>20,279</td>
<td>20,059</td>
<td>99%</td>
<td>95%</td>
</tr>
<tr>
<td>Total Educational and General</td>
<td>$184,689</td>
<td>$154,888</td>
<td>84%</td>
<td>82%</td>
</tr>
<tr>
<td>Transfers</td>
<td>16,475</td>
<td>11,891</td>
<td>72%</td>
<td>111%</td>
</tr>
<tr>
<td>Total</td>
<td>$201,164</td>
<td>$166,779</td>
<td>83%</td>
<td>84%</td>
</tr>
<tr>
<td>Auxiliary Enterprises</td>
<td>7,427</td>
<td>6,249</td>
<td>84%</td>
<td>85%</td>
</tr>
<tr>
<td>Auxiliary Transfers</td>
<td>5,317</td>
<td>4,431</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>Total Auxiliary</td>
<td>$12,744</td>
<td>$10,680</td>
<td>84%</td>
<td>84%</td>
</tr>
<tr>
<td>Total Expenditures &amp; Transfers</td>
<td>$213,908</td>
<td>$177,459</td>
<td>83%</td>
<td>84%</td>
</tr>
<tr>
<td>Excess Of Revenues Over Expenditures And Transfers</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
New Jersey Institute Of Technology
Expense Report
For the Ten Months Ended April 30, 2010
(Dollars In Thousands)

<table>
<thead>
<tr>
<th></th>
<th>Current Month</th>
<th>FY2010 YTD</th>
<th>FY2010 Budget</th>
<th>84% of Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Actual Year to Date</td>
<td>Prior Year</td>
<td>Current Year</td>
</tr>
<tr>
<td><strong>Academic</strong></td>
<td></td>
<td>$12,830</td>
<td>$89,533</td>
<td>$99,340</td>
</tr>
<tr>
<td>Salaries &amp; Fringe Benefits</td>
<td>$12,830</td>
<td>$89,533</td>
<td>$99,340</td>
<td>90%</td>
</tr>
<tr>
<td>Equipment Purchases</td>
<td>153</td>
<td>1,181</td>
<td>2,676</td>
<td>44%</td>
</tr>
<tr>
<td>Financial Aid to Students</td>
<td>68</td>
<td>20,059</td>
<td>20,279</td>
<td>99%</td>
</tr>
<tr>
<td><strong>Other Operating Expenses:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>72</td>
<td>1,049</td>
<td>1,348</td>
<td>71%</td>
</tr>
<tr>
<td>Travel &amp; Development</td>
<td>201</td>
<td>1,581</td>
<td>1,589</td>
<td>71%</td>
</tr>
<tr>
<td>Library Collections</td>
<td>26</td>
<td>791</td>
<td>1,084</td>
<td>71%</td>
</tr>
<tr>
<td>Other General Operating</td>
<td>719</td>
<td>5,925</td>
<td>9,070</td>
<td>71%</td>
</tr>
<tr>
<td><strong>Total Other Operating</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,018</td>
<td>9,346</td>
<td>13,091</td>
<td>71%</td>
</tr>
<tr>
<td><strong>Total Academic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14,069</td>
<td>120,119</td>
<td>135,386</td>
<td>89%</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries &amp; Fringe Benefits</td>
<td>3,306</td>
<td>23,877</td>
<td>29,000</td>
<td>82%</td>
</tr>
<tr>
<td>Equipment Purchases</td>
<td>61</td>
<td>223</td>
<td>502</td>
<td>44%</td>
</tr>
<tr>
<td>Utilities</td>
<td>660</td>
<td>6,896</td>
<td>10,311</td>
<td>67%</td>
</tr>
<tr>
<td><strong>Other Operating Expenses:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>76</td>
<td>709</td>
<td>1,030</td>
<td>49%</td>
</tr>
<tr>
<td>Travel &amp; Development</td>
<td>41</td>
<td>305</td>
<td>370</td>
<td>49%</td>
</tr>
<tr>
<td>Other General Operating</td>
<td>103</td>
<td>2,759</td>
<td>6,253</td>
<td>49%</td>
</tr>
<tr>
<td><strong>Total Other Operating</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>220</td>
<td>3,773</td>
<td>7,853</td>
<td>49%</td>
</tr>
<tr>
<td><strong>Total Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,247</td>
<td>34,769</td>
<td>47,466</td>
<td>73%</td>
</tr>
<tr>
<td><strong>Transfers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>996</td>
<td>11,891</td>
<td>16,475</td>
<td>72%</td>
</tr>
<tr>
<td><strong>Total Academic, Support &amp; Transfers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19,312</td>
<td>166,779</td>
<td>199,327</td>
<td>84%</td>
</tr>
<tr>
<td><strong>Auxiliary Enterprises</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary Enterprises</td>
<td>598</td>
<td>6,249</td>
<td>7,427</td>
<td>84%</td>
</tr>
<tr>
<td><strong>Total Auxiliary Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,041</td>
<td>10,680</td>
<td>12,744</td>
<td>83%</td>
</tr>
<tr>
<td><strong>FY2011 Reserve</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>1,837</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total Unrestricted Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20,353</td>
<td>177,459</td>
<td>213,908</td>
<td>83%</td>
</tr>
<tr>
<td><strong>Restricted Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,937</td>
<td>64,952</td>
<td>71,222</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Total Expenses And Transfers</strong></td>
<td>$25,290</td>
<td>$242,411</td>
<td>$285,130</td>
<td>85%</td>
</tr>
</tbody>
</table>
4D. Schedule of Short Term Investments
NEW JERSEY INSTITUTE OF TECHNOLOGY

SCHEDULE OF INVESTMENTS
AS OF APRIL 30, 2010

<table>
<thead>
<tr>
<th>TYPE OF INVESTMENT</th>
<th>USBANK</th>
<th>WACHOVIA BANK</th>
<th>CITY NATIONAL BANK</th>
<th>WELLS FARGO</th>
<th>JP MORGAN CHASE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Deposit Sweep Account</td>
<td>A/C 2556520331</td>
<td>DDA#203019939018</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Treasury Notes</td>
<td>$164,889</td>
<td></td>
<td>$164,889</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate of Deposit</td>
<td></td>
<td></td>
<td></td>
<td>$4,293,295</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prime Money Market Fund</td>
<td>$500,000</td>
<td></td>
<td>$2,286,055</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Treasury &amp; Agency Short Term Obligations-Disc Notes</td>
<td>$2,057,842</td>
<td></td>
<td>$2,057,842</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Government Issues</td>
<td>$1,051,966</td>
<td></td>
<td>$1,051,966</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Paper</td>
<td>$249,975</td>
<td></td>
<td>$249,975</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evergreen Inst'l Money Market Class institutional</td>
<td>$1,163,412</td>
<td>$20,807,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL INVESTMENTS</td>
<td>$4,512,995</td>
<td>$20,807,000</td>
<td>$500,000</td>
<td>$4,458,184</td>
<td>$2,286,055</td>
<td>$32,564,234</td>
</tr>
</tbody>
</table>

Note:
Investments as of April 30, 2009 were $39,782,449
Chairperson’s Closing Statement
RESOLUTION RE: CLOSED SESSION TO DISCUSS PERSONNEL MATTERS, REAL ESTATE AND CONTRACT MATTERS.

WHEREAS, THERE ARE MATTERS THAT REQUIRE CONSIDERATION BY THE BOARD OF TRUSTEES THAT QUALIFY UNDER THE OPEN PUBLIC MEETINGS ACT FOR DISCUSSION AT A CLOSED SESSION.

NOW, THEREFORE, BE IT RESOLVED, THAT THE BOARD OF TRUSTEES SHALL HAVE A CLOSED SESSION TO DISCUSS MATTERS INVOLVING PERSONNEL, REAL ESTATE AND CONTRACTS TO TAKE PLACE ON JULY 15, 2010 AT 9:30 AM, EBERHARDT HALL NJIT ALUMNI CENTER BOARD ROOM.