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 November 5, 2009 meeting of the Board of Trustees
   B. Approve Sabbatical Leave applications
   C. Approve Resolution to Authorize New BS in Biochemistry
   D. Approve Resolution Selecting an External Auditor
   E. Approve Resolution to Authorize Exclusive License of University Intellectual Property
   F. Approve Resolution to Approve Guidelines for Graduate Faculty at NJIT

4. **Reports**
   A. Update on MD Degree joint with St. George's University
   B. Update on Middle-States Self Study (Robert Altenkirch)
   C. Update on purchase of Central High School (Robert Altenkirch)
   D. Update on status of NJIT Campus Gateway Plan (Robert Altenkirch)
   E. Honorary Doctorate Degrees for 2010 (Donald Sebastian)
   F. Operating Statement Year to Date (Henry Mauermeyer)
   G. Schedule of Short Term Investments (Henry Mauermeyer)
   H. Spring 10 enrollment (Joel Bloom)
   I. Report on gifts and fund raising activities (Robert Altenkirch)

5. **Announcement of Next Meeting**

Chair to read resolution regarding Closed Session to discuss Personnel, Real Estate and Contract Matters to be held on Thursday, April 8, 2010, 9:30 AM, Eberhardt Hall NJIT Alumni Center Board Room

Announce next public meeting: Thursday, April 8, 2010, 11:00 AM, Eberhardt Hall NJIT Alumni Center Board Room

**Adjourn Public Meeting**
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.
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 JANUARY 21, 2010. THIS SCHEDULE WAS
ALSO MAILED TO THE COUNTY CLERK ON JANUARY 21, 2010
FOR FILING WITH THAT OFFICE AND POSTING IN SUCH PUBLIC
PLACE AS DESIGNATED BY SAID CLERK.”
2. Public Comments
3A. Approve Minutes of the November 5, 2009 Meeting of the Board of Trustees
NEW JERSEY INSTITUTE OF TECHNOLOGY
BOARD OF TRUSTEES
MINUTES - PUBLIC SESSION (DRAFT)
(November 5, 2009)

1. The meeting was called to order by Chairperson Wielkopolski, at 11:40 a.m. Other Trustees in attendance were Vice Chairs DeCaprio and DePalma, and Board Members Bone, Cistaro, Garcia, Knapp, 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. WOLFF, SECONDED BY MR. BONE AND UNANIMOUSLY PASSED, the minutes of the September 17, 2009 meeting of the Board of Trustees were approved.

3. BY A MOTION DULY MADE BY MR. KNAPP, SECONDED BY MS. GARCIA AND UNANIMOUSLY PASSED, the minutes of the October 19, 2009 meeting of the Board of Trustees were approved.

4. BY A MOTION DULY MADE BY MR. DEPALMA, SECONDED BY MR. WOLFF AND UNANIMOUSLY PASSED, the Board voted to APPROVE SCHEDULE OF MEETINGS FOR FY 2012.

5. BY A MOTION DULY MADE BY MR. WOLFF, SECONDED BY MR. DEPALMA AND UNANIMOUSLY PASSED, the Board voted to APPROVE THE RESOLUTION TO AUTHORIZE EXCLUSIVE LICENSE OF UNIVERSITY INTELLECTUAL PROPERTY.

6. BY A MOTION DULY MADE BY MR. BONE, SECONDED BY MR. CISTARO AND UNANIMOUSLY PASSED, the Board voted to APPROVE THE BOARD OF TRUSTEES BYLAWS CHANGES.
7. BY A MOTION DULY MADE BY MR. WOLFF, SECONDED BY MR. CISTARO AND UNANIMOUSLY PASSED, the Board voted to APPROVE AN INCREASE IN FEE FOR THE SCHOOL OF MANAGEMENT EMBA PROGRAM.

8. Dr. Bloom introduced Ms. Vera Lynn DeFilippo, recipient of the Board of Trustees Scholar presentation. Ms. DeFilippo is a residential freshman student. She is a Dorman Honors College scholar, undecided major in NCE. Vera graduated from the High Tech Magnet High School, Monmouth County, having already achieved 8 college credits through Advanced Placement exams in biology and calculus. She is currently taking 17 credits in her first semester at NJIT. Ms. DeFilippo thanked the Board for their generous contribution, and discussed her studies and her involvement in activities around campus.

9. Dr. Norbert Elliot, the Chair of the Steering Committee, presented slides regarding the Middle States Self Study process, describing the Rapid Assessment and Steering Committee coordination, as well as describing the NJIT self study design model, the composition of the working groups, and the proposed timeline for completion.

10. Dr. Altenkirch discussed the FY 10 Appropriations Act requirements, implications and salary delay program. We plan a personnel cost reduction equivalent to the savings achieved through the state program which entailed employee furloughs. This has already been implemented for the non-aligned employees. Instead of adopting furloughs and delaying a July 1st increase for eighteen months which would cause large increases in FY 2011, we plan to delay salary increases four times over the next two fiscal years, which would produce a 5.25% reduction in take home pay. The Governor’s Office of Employee Relations has indicated that this program would meet the requirements of the mandated personnel savings.

11. Dr. Altenkirch discussed the NJIT Campus Gateway project. The redevelopment agreement is now signed and the City ordinance has been adopted. The Board, at its last special meeting approved the agreement with Jones Lang LaSalle. Currently, it is moving through the corporate governance structure at JLL for execution of the plan.

12. Dr. Altenkirch also discussed strategic planning. As part of the university plan, it will dovetail with the current Middle States self-study. Two documents were distributed, including a draft updated version of the plan. This will become part of the Middle States report. The Plan will be presented for adoption at the February meeting. The work of the Task Force is three quarters completed. Dr. Elliot is using the same planning principles. Chair Wielkopolski questioned whether there was an element dealing with cost and financial health.
13. Dr. Altenkirch discussed the status of the purchase of Central High School. We have been working to come up with a plan so that a new West Side High School can be constructed side by side with the existing school. In that way, current students would not have to leave campus, and there would be no need to use Central High School for swing space, allowing us to close on the property.

14. Dr. Sebastian gave a presentation of Research Growth Strategies. In FY 09, research and development expenditures again grew to record heights. Overall expenditures topped $93 million for the first time. This growth was achieved in an era where federal funding has been on the decline, and State support is disappearing. Dr. Sebastian detailed research expenditures per unit, and highlighted opportunities created through the American Recovery and Reinvestment Act for university competitive grant funding. We've submitted three separate proposals for capital construction projects that will upgrade our research laboratory facilities. These include proposals to the NIH, NIST, and the NSF. Academic themes for research include alternative energy, sustainable systems, applied life sciences and engineering, healthcare systems, and design processes.

15. Dr. Bloom discussed Spring enrollment targets. Currently, we are expecting an enrollment of 8179 students, up from 7769 from the same time last year, but showing a 7.5% decrease from the Fall. Retention remains an issue. Dr. Bloom discussed retention tactics, which include replicating the freshman experience in later years; initiate cohorts similar to EOP and the Honors College; revise the financial aid website, establish a financial hardship committee, sending e-mail blasts to high school students, expand marketing of e-tuition, market to alumni, purchase additional lead generators, expand marketing on internet and radio, retaining a consultant for critical review of graduate recruiting and retention, and hold additional open houses for instant decision and weekend university.

16. Treasurer Mauermeyer reported upon the Operating Statement Year to Date, the Schedule of Short Term Investments. He noted that we have a certified audit.

17. Mr. Cistaro reported on gifts and fund raising activities, as well as the comprehensive campaign. In terms of giving, there is an increase in the number of donors, though the dollar amounts of the individuals' contributions have decreased. With respect to the upcoming Celebration event, the number of tables purchased is the same as last year, though the number of attendees is down at this point in time.

18. The Chairperson announced that the next scheduled closed session would be convened on February 4, 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, February 4, 2010 at 9:30 AM, Eberhardt Hall Board Room.

The next Public Session of the Board will take place on Thursday, February 4, 2010 at 11:00 AM, Eberhardt Hall Board Room, following the Closed Session of the Board.

19. The meeting was adjourned at 1:05 pm.
3B. Approve Minutes Sabbatical Leave Applications
Following our standard procedure of inviting proposals for sabbaticals, 19 proposals have been received from faculty members for sabbatical leave to be taken during Academic Year 2010 – 2011. These proposals were carefully evaluated by the University Committee on Sabbaticals. Based upon the deans', the chairs', and the committee's recommendations and my own review of the proposals, I am pleased to recommend that the following ten faculty members be approved for sabbatical leave for the period indicated.

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ali Abdi</td>
<td>ECE</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Joseph Bozzelli</td>
<td>Chem. and Env. Science</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Steven Chien</td>
<td>CEE</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Roy Goodman</td>
<td>Math</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Gregory Kriegsmann</td>
<td>Math</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Roland Levy</td>
<td>Physics</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Jay Meegoda</td>
<td>CEE</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Marvin Nakayama</td>
<td>CS</td>
<td>Spring 2011</td>
</tr>
<tr>
<td>Zeyuan Qui</td>
<td>Chem. and Env. Science</td>
<td>2010-2011</td>
</tr>
<tr>
<td>MengChu Zhou</td>
<td>ECE</td>
<td>2010-2011</td>
</tr>
</tbody>
</table>
To: Members of the Board of Trustees

From: Donald Sebastian  
Provost (Interim) and Senior Vice President for Research and Development

Re: Sabbatical Leave Recommendations for AY 2010-2011

Date: January 11, 2010

Pursuant to the Faculty Handbook and with the concurrence of Dr. Altenkirch, I am pleased to recommend that the ten faculty members listed on the attached memo be awarded sabbatical leaves during academic year 2010-2011. A total of 19 proposals were received.

As stated in the handbook:

"The purpose of having a system of sabbatical leaves at New Jersey Institute of Technology is to increase the effectiveness of a faculty member's university service as well as to afford them an opportunity for professional development by relieving them of all normal campus activity. This philosophy is in consonance with the University Board of Trustees endorsement which was expressed as "further evidence of the Board's continuing interest in the professional development of the faculty."

I believe that those faculty members recommended for sabbatical leave during the academic year 2010-2011 will be enriched by this opportunity to immerse themselves in creative, scholarly, and research activities and will thus enhance not only their value to NJIT, but this university's image as well.

The number of sabbatical leaves awarded since 1993 - 1994 is shown on the attached table.
### History of Sabbatical Leaves

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Total New Leaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>AY 1993 - 1994</td>
<td>13</td>
</tr>
<tr>
<td>AY 1994 - 1995</td>
<td>15</td>
</tr>
<tr>
<td>AY 1995 - 1996</td>
<td>13</td>
</tr>
<tr>
<td>AY 1996 - 1997</td>
<td>14</td>
</tr>
<tr>
<td>AY 1997 - 1998</td>
<td>12</td>
</tr>
<tr>
<td>AY 1998 - 1999</td>
<td>14</td>
</tr>
<tr>
<td>AY 1999 - 2000</td>
<td>15</td>
</tr>
<tr>
<td>AY 2000 - 2001</td>
<td>4</td>
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<td>AY 2001 - 2002</td>
<td>13</td>
</tr>
<tr>
<td>AY 2002 - 2003</td>
<td>17</td>
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<tr>
<td>AY 2003 - 2004</td>
<td>20</td>
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<tr>
<td>AY 2004 - 2005</td>
<td>9</td>
</tr>
<tr>
<td>AY 2005 - 2006</td>
<td>9</td>
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<tr>
<td>AY 2006 - 2007</td>
<td>13</td>
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<tr>
<td>AY 2007 - 2008</td>
<td>14</td>
</tr>
<tr>
<td>AY 2008 - 2009</td>
<td>16</td>
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<tr>
<td>AY 2009 - 2010</td>
<td>6</td>
</tr>
</tbody>
</table>
Professor Ali Abdi is an active and respected researcher in wireless communications, signal processing and computational biology area, with an impressive record of publications. His proposal is to develop research skills in the area of Systems Biology and Molecular Networks with Professor Tavazoie at Princeton University. Dr. Abdi has already started work in this research area and has several publications. He has a clearly articulated research plan and a formal invitation letter for collaboration from Professor Tavazoie, a well known researcher in the field. The interdisciplinary research proposed by Dr. Abdi is consistent with the current strategic goals of NJIT and a win for the researchers as well as collaborators. Professor Abdi plans to produce joint publications and proposals, in addition to some IPs.

Professor Joseph Bozzelli's proposal includes three important projects to be carried out in three different locations. His first project is to update codes on his reaction kinetics computer program. He will be working with Dr. Sunathy Raman, an expert in Thermochemistry and Kinetics at ExxonMobil Corporation. Professor Bozzelli has been working with Dr. Sunathy for the past five years. Bozzelli's second project is to work on another of his programs at the Rice Rampserger Kassell Marcus Code Writing (RRPM Code) Center with Professor John Baker of the University of Michigan. The MultiWell RRKM Code is based on Bozzelli's work on quantum RRK chemical activation and unimolecular dissociation. Bozzelli plans to bring some modifications to John Baker's code. His third project is to help a student complete a Ph.D. dissertation at the University of Karlsruhe in Germany. Although Professor Bozzelli's proposal does not offer a list of expected publications beyond the software updating, his research record shows vigorous and sustained publications, theses advisement, and funded grants.

Professor Steven Chien is an active researcher in the department of Civil and Environmental Engineering. His current research interests include Intelligent Transportation Systems, Highway Maintenance Decision Support Systems, and Public Transportation Systems. He intends to use his sabbatical to explore Sustainable Transportation Infrastructure and Maintenance. Professor Chien proposes to spend his sabbatical year at the National Cheng Kung University Taiwan (3 months) and Chang'an University, China (9 months). During this time, he plans to develop models for real time stochastic travel time prediction, collect highway traffic and maintenance related data, and to develop and validate models for highway infrastructure and maintenance. The expected results of the sabbatical years are 2 journal articles and 2 grant proposals, in addition to establishing relationships with the two institutions where he will be hosted.
Professor Roy Goodman proposes to apply Computer Aided Geometric Design (CAGD) methods to devise numerical algorithms for computing invariant manifold (surfaces, curves) of nonlinear dynamical systems. They appear, e.g., in nonlinear optical communications and solitary wave collisions. He will collaborate with CAGD experts at Technion, Haifa, the Israel Institute of Technology, the world renowned technological university, and with Dr. Kedar, an expert in dynamical systems at the nearby Weizmann Institute of Sciences. His second research project is on “trapped light” in nonlinear optical systems which might be useful in building all-optical memories or delay lines as part of optical communication systems. He will collaborate with Dr. Moti Segev at the Technion, an eminent physicist and the recipient of the 2009 Max Born Award from the Optical Society of America. Dr. Goodman’s research is supported by an NSF grant and these collaborations will lead to new grant proposals including one to the US-Israel Binational Science Foundation. He also plans to give seminars and interact with the faculty at the University of Tel Aviv and Ben Gurion University, which will help raise NJIT’s profile and attract new graduate students. The Technion is supporting his application for the visiting professorship.

Professor Gregory Kriegsmann proposes to: 1) develop and analyze finite difference schemes in higher dimensions for numerical simulation of the behavior of photonic structures, in particular, meta-materials, man-made important materials used in optical and microwave devices, and 2) to continue his research in electric discharge sintering and microwave heating of ceramics. He will visit and collaborate with Professor Enghta, an expert in photonic structures, at the University of Pennsylvania, and with Professors Olmstead and Kath, experts on mathematics of diffusion and photonic structures, at Northwestern University. Professor Kriegsmann’s research has been funded by the NSF, ONR, Air Force Office of Scientific Research, etc. He is a leader in the Applied Mathematics Community, editor of many first class journals, a recently elected Fellow of the SIAM and a prolific researcher. The proposed research is timely and has attracted a large number of researchers. His research will have a strong impact in the field of material science, create new grant opportunities and, in particular, will suggest new and exciting problems for his graduate students.

Professor Roland A. Levy proposes to work on low temperature vapor deposition of aluminum on steel, which may substitute cadmium deposition (a hazardous substance). Akzo Nobel at Deer park, TX has the necessary research facilities to carry out his physical synthesis work, and he has been offered access to the research infrastructure, and given travel and lodging expenses. For the latter part of his leave, he has been invited to the Surface Interface Ontario Center at the University of Toronto as a visiting professor. In Toronto, Dr. Levy will have access to advanced surface analytical instrumentations for characterization of the newly developed coated materials. He has the expertise to conduct the proposed research. He has recently supervised (2008) two Ph.D. students on low pressure chemical vapor deposition and characterization, submitted two journal papers in 2009, published two conference articles in 2007, and has a patent dated 1987 on the related subject matter. He has a fine publication record and an excellent funding record since his second sabbatical leave. Professor Levy expects to publish
journal and conference articles, submit grant proposals, based on work conducted during the sabbatical leave.

Professor Jay Meegoda is an active researcher in the Department of Civil and Environmental Engineering. He proposes to carry out research at Tsinghua University, Beijing, China, on simulation of air sparging to remediation of contaminated soils using geotechnical centrifuge and field tests. Tsinghua University is one of the top universities of China and Prof. Meegoda is a Co-PI in one of the successful proposals from National Science Foundation of China. He has received letters of invitation from his collaborator Prof. Liming Hu, the Deputy Director of Geotechnical Engineering and Dr. Li Qingbin, Vice-Dean, School of Civil Engineering of Tsinghua University. He has already started publishing on this research with his collaborator. He is currently developing the experimental setup in Beijing and during his sabbatical leave he plans to define some theoretical models. In addition, he intends to write several collaborative research proposals to NSF in US and NSF of China including an international undergraduate research experience site proposal.

Professor Marvin Nakayama is requesting a sabbatical leave for one semester, namely spring 2011. He proposes to work on the modeling and analysis of cascading failures for complex electrical grids. He also plans to update a large scale Computer Simulation Software called DECAF (for Dependability Evaluator for Cascading Failures), and to expand this code for the analysis of electrical power grids. DECAF is a Java code comprising over 10,000 lines developed by Marvin. The updating task he envisions to carry out requires a considerable amount of time away from his regular teaching and related obligations. He has an NSF grant to conduct his research project. Professor Nakayama plans to consult with several faculty members in the Industrial and Operations Research Department at Columbia University. These are people he worked and published with on similar problems in the past. Professor Nakayama has a strong academic record. His research proposal has clearly-stated objectives and deliverables.

Professor Zeyuan Qui proposes to collaborate with scientists at Columbia University’s Water Center. The main goal of his sabbatical leave is to develop a modeling framework based on climate science and engineering and technology. He plans to work on the problem of the impact of future climate change on water resources, including problems of water availability, water quality, flood control issues, and ecosystem functions of stream and river systems. The research will contribute to the assessment of possible management strategies and measure their impact using a local river basin in the Northeast. The expected outcomes include grant proposals, research articles, and partnerships and collaborations with a strong regional science and technology network. Based on his track record in the subject matter and the strength of his proposal, Dr. Qui’s sabbatical leave promises to yield good results.

Professor Meng Chu Zhou is a well-recognized researcher with numerous publications. His current research interests include Petri nets/discrete event systems, embedded systems, sustainability/life cycle analysis, and power systems. He intends to use his sabbatical leave to investigate new research areas such as Petri nets for embedded
systems, service computing and sustainable systems. Prof. Zhou intends to visit Tongji University in Shanghai, China. He has already started working with the host institution and was involved in a joint research proposal that received the support of the Chinese Ministry of Science and Technology. In addition to establishing a strong collaboration with Tongji University, Prof. Zhou expects to publish a book on Intelligent Disassembly for Sustainable Development to be contracted with Springer, between 3 to 6 journal papers, and some conference papers. The sabbatical leave application is strong and the projected outcome is precise.
3C. Approve Resolution to Authorize New BS in Biochemistry
STATEMENT

The BS in Biochemistry is an interdisciplinary program spanning the areas of chemistry, biology, engineering, physics, and computer science. The objective of the program is to provide the theoretical fundamentals and laboratory skills necessary to understand the chemistry of life processes. This program utilizes chemistry as a foundation and integrates biology related topics that include genetic engineering, microbiology, molecular biology, and enzymology. It allows for flexibility to pursue diverse career opportunities and is preparation for careers in such professional fields such as medicine and patent law as well as research in the pharmaceutical and chemical industries.

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 BS in BIOCHEMISTRY

WHEREAS, the Board of Trustees has examined materials provided by the President of the University relative to a proposed program leading to the BS in Biochemistry; 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, that 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 BS in Biochemistry.

February 4, 2010
## PROGRAM ANNOUNCEMENT

**March 2009**

<table>
<thead>
<tr>
<th>Institution:</th>
<th>New Jersey Institute of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Program Title:</td>
<td>Bachelor of Science in Biochemistry</td>
</tr>
<tr>
<td>Degree Designation:</td>
<td>Bachelor of Science in Biochemistry</td>
</tr>
<tr>
<td>Degree Abbreviation:</td>
<td>B. S. in Biochem</td>
</tr>
<tr>
<td>CIP Code and Nomenclature <em>(if possible)</em>:</td>
<td>26.0202 Biochemistry</td>
</tr>
<tr>
<td>Campus(es) where the program will be offered:</td>
<td>New Jersey Institute of Technology, Newark campus</td>
</tr>
<tr>
<td>Date when program will begin (month and year):</td>
<td>September 2010</td>
</tr>
<tr>
<td>List the institutions with which articulation agreements will be arranged:</td>
<td>NA</td>
</tr>
</tbody>
</table>

Is licensure required of program graduates to gain employment?  □ Yes  X No

Will the institution seek accreditation for this program?  □Yes  X No

If yes, list the accrediting organization:

<table>
<thead>
<tr>
<th>Objectives</th>
<th>page: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need</td>
<td>page: 2-3</td>
</tr>
<tr>
<td>Student Enrollment</td>
<td>page: 4</td>
</tr>
<tr>
<td>Program Resources</td>
<td>page: 4-6</td>
</tr>
<tr>
<td>Curriculum</td>
<td>page: 7-8</td>
</tr>
</tbody>
</table>
Descriptive Information

I. Objectives

The Department of Chemistry and Environmental Science at NJIT proposes a Bachelor of Science degree in Biochemistry. It is an interdisciplinary field that derives knowledge from several disciplines that include chemistry, biology, engineering, physics, and computer science. The objective is to present the theoretical fundamentals and laboratory skills necessary to understand the chemistry of life processes.

Biochemistry focuses primarily on a number of topics: (1) chemical and three-dimensional structures of biological molecules, (2) biological molecule interactions with each other, (3) cellular synthesis and degradation of biological molecules, (4) cellular energy conservation and use, (5) mechanisms for controlling and organizing biological molecules for cellular activities, and (6) mechanisms for storage, transmission and expression of genetic information.

II. Need

A. Need for the Program

The proposed B.S. in Biochemistry is designed to provide theoretical background and experimental training. The NJIT Biology program has experienced tremendous growth since its inception, which demonstrates clearly the interest for biology and biology-related programs. This program utilizes chemistry as a foundation and integrates biology-related topics that include genetic engineering, microbiology, molecular biology and enzymology. The program allows flexibility to pursue diverse career opportunities. It is desirable preparation for professional fields such as medicine and patent law, research in the pharmaceutical and chemical industries, secondary school teaching, and other related careers. Furthermore, it is the foundation of further graduate studies, such as NJIT's new M.S. in Pharmaceutical Chemistry. Finally, it is the basis of the ever-expanding field of biotechnology.

B. Describe the relationship of the program to the following: institutional master plans and priorities.

The long-term vision of the College of Science and Liberal Arts is to promote a bioscience theme and the proposed B.S. in Biochemistry facilitates this objective. Furthermore, within the past few years, the Department of Chemistry and Environmental Science has hired faculty whose research interests interface with biology, thus facilitating the goals of NJIT. Faculty areas of expertise within the junior faculty include: Bio-chemistry, Bio-inorganic Chemistry, Microbiology, and Bio-organic Chemistry. The department also has senior faculty with research expertise in Computer-Aided Drug Design and Pharmaceutical Analysis.
The program also supports NJIT's stated missions: (1) to prepare students for productive careers and enhance their potential for lifelong personal and professional growth, and (2) to prepare students in the conduct of interdisciplinary research.

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

Biochemistry is one of the major sub-disciplines of chemistry. Hence, many undergraduate Biochemistry programs are present in the tri-state area. NJIT is New Jersey’s science and technology university which provides a unique atmosphere and educational opportunities that are not offered at other universities found in the vicinity. For example, the program includes a computer science requirement, BNFO 135 Bioinformatics, in the curriculum, and this course is usually not found in a typical Biochemistry degree. In addition, four mathematic courses are required while most programs only have two. Furthermore, undergraduates have opportunities to undertake research with faculty with bio-related research interest in diverse departments including Chemistry, Biology, Engineering (Biomedical, and Chemical, Pharmaceutical, and Biological) and Physics (Biophysics). Finally, it should be noted that an undergraduate Biochemistry major is currently not offered at Rutgers-Newark.

Biochemistry programs in New Jersey: Bloomfield College, College of St. Elizabeth, Drew, Fairleigh Dickinson, Montclair State, Ramapo, Rider, Rowan, Rutgers, Seton Hall, The Richard Stockton College of New Jersey

Biochemistry programs in New York: Barnard College, Canisius College, City University of New York - The City College, City University of New York – Hunter, Hamilton, Hartwick, Hobart and William Smith Colleges, SUNY – Stony Brook, Syracuse, Vassar

Biochemistry programs in Connecticut: Connecticut College, Fairfield, Southern Connecticut State University, Trinity College, Western Connecticut State University, Yale University

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

N/A
III. Students

Estimate anticipated enrollments from the program's inception until a steady state or optimum enrollment is reached.

The estimated anticipated enrollment from the program's inception is approximately five students eventually reaching a steady state of thirty. It is expected that this program will attract excellent students who desire to be at a technology-oriented university. This program is expected to draw students who are interested in attending professional schools or being an active contributor in the biotechnology or pharmaceutical industries.

IV. Resources to Support the Program

Briefly describe the additional resources needed to implement and operate the program during the program's first five years, e.g., the number of full-time faculty, number of adjunct faculty, computer equipment, print and non-print material, etc.

A. Course Development

Biochemistry Laboratory (Chem 475)
Biochemistry Laboratory provides the chemistry and chemistry related (chemical engineering, biology, bioinformatics, bioengineering) majors fundamental laboratory approaches for biochemistry and biotechnology. NJIT seed funds and industrial donations from Purdue Pharma have been supplied to initiate the development. All of the proposed experiments have been chosen and performed. This lab requires approximately $2,000 - $3,000 per year for consumables, enzymes, biological supplies and chemicals.

Biochemistry II (Chem 474)
Biochemistry II is a continuation to Biochemistry 473. Currently, Biochemistry 473 focuses on protein composition and structure, understanding proteins, nucleic acids and the flow of genetic information, exploring genes and genomes, evolution and bioinformatics, hemoglobin, enzymology, regulatory strategies, carbohydrates, lipids, membrane channels, and signal transduction. Biochemistry II will focus on transducing and storing energy, synthesizing the molecules of life, and responses to environmental changes.

Bioorganic Chemistry
Bioorganic Chemistry (Chemistry 4yy Bioorganic Chemistry) will be developed. It is concerned with the design and synthesis of small molecules that mimic biological systems. Topics may include biomolecular interactions, chemical and kinetic studies of the mechanisms of actions of enzymes and coenzymes, and design and synthesis of active-site directed enzyme inhibitors and receptors.

Biophysical Chemistry
Biophysical Chemistry (Chemistry 4zz Biophysical Chemistry) will be developed. This course will examine the physical and chemical behavior of biomolecules from a quantitative perspective emphasizing applications and problem solving. Approximately half the course will focus on understanding biochemical reactions, structures and reactivity from a thermodynamic and kinetic perspective. The other half of the course will consider selected topics from biochemical applications of spectroscopy, crystallography and separations science.

B. Faculty
To support the program, the department already has faculty strength in biochemistry, bioinorganic chemistry, computer-aided drug design, and pharmaceutical analysis. Furthermore, a new faculty member has been appointed in bio-organic chemistry; he will begin in Fall 2009.

C. Library and Computing Facilities

Library
NJIT's Van Houten Library has over 160,000 books and subscribes to more than 1,000 printed periodicals. It also has access to over 15,000 online journals. The library, through SCOPUS and other databases, provides connectivity to wide variety of information services. However, biochemistry related books and journals are required. Some additional funds will need to be allocated for the purchase of biochemistry related books as well as access to biochemistry related journals.

Computing Facilities

The Information Services and Technology (IST) Division provides a full range of central information technology services to support the university's academic, research, student service, administrative, and public services initiatives. The Associate Provost for Information Services & Technology and Chief Information Officer oversees five functional departments: (1) Academic Computing Services, (2) Computer Operations and Production Service, (3) Telecommunications and Networks, (4) University Computing Systems, and (5) University Information Systems. IST partners with several other university organizational units: Instructional Technology and Media Services, University Web Services, and the Van Houten Library. Collaboratively, these organizations provide a seamless and robust information resource and technology infrastructure for all NJIT students, faculty, staff, researchers, and alumni. As one of the most computing-intensive campuses in the country, NJIT has long been recognized as a pioneer in the use of information technologies.

Highlander AFS is the primary academic computing environment at NJIT. Highlander AFS, NJIT's implementation of the Andrew File System (AFS) is a distributed computing environment comprised of multiple file and database servers and several hundred Unix, Windows, Linux, and Macintosh client computers. Highlander AFS provides a very broad
spectrum of both commercial and open source application software, compilers, and utilities. A great number of applications and compilers are available on Highlander AFS. Highlander AFS is a distributed file system consisting of Linux, IRIX and Solaris UNIX operating environments. Software types include desktop publishing, plotting, animation, and statistical analysis. NJIT supports generalized software relevant to the proposed program, such as Excel, Mathematica, Microsoft Office, ChemDraw, as well as specialized software (Gaussian, Sybyl, Spartan, Amber, Autodock, Macromodel, NAMD, and 3DNA) used in computer-aided drug design and biochemical applications.

As New Jersey's science and technology university, NJIT has developed a local cyberinfrastructure well positioned to allow NJIT faculty and students to collaborate at local, national, and global levels on many issues at the forefront of science and engineering research. High performance research computing at NJIT is being facilitated by the creation of a grid of compute clusters, some of which are used in the computer-aided drug design research carried out at NJIT.

NJIT's multi-gigabit wired network connects more than 6,500 nodes in classrooms, laboratories, residence halls, faculty and staff offices, the library, student organization offices and others. With more than 150 access points, the campus wireless network blankets the university's public, classroom and outdoor areas enabling NJIT's users' mobile connectivity. The extensive wireless network has helped to stimulate research towards the development of a wireless NJIT campus community system called SmartCampus. At NJIT, the latest advances in telecommunications and multimedia technologies are used to enhance the delivery of courses and the overall educational experience, allowing students to experience many aspects of a "virtual university" in a traditional campus setting. In addition, with connectivity to the NJEDGE, NJ state-wide higher education network and Internet2, students have the opportunity to work closely with faculty and researchers as new families of advanced applications are developed for an increasingly networked and information-based society.

D. Classrooms and Laboratories

Classrooms
The present facilities are adequate.

Laboratories
The present facilities are adequate. Approximately $2,000-3,000 per year is required for supplies for the Biochemistry Laboratory. The lab requires consumables, enzymes, and chemicals.
V. Curriculum

**Biochemistry Major**
*Under the Department of Chemistry and Environmental Science*

**Year 1**

**First Semester**
- Chem 125 General Chemistry I $3-0-3$
- BNFO 135 Bioinformatics $3-0-3$
- (or)
  - CS 115 Introduction to CS I in C++
  - HUM 101 English Composition: Writing, Speaking, Thinking $3-0-3$
- Math 111 Calculus I $4-1-4$
- Phys 111 Physics I $3-0-3$
- Phys 111A Physics I Laboratory $0-2-1$
- Freshman Seminar $1-0-0$

Subtotal: 17

**Second Semester**
- Chem 126 General Chemistry II $3-0-3$
- Chem 124 General Chemistry Laboratory $0-2-1$
- Math 112 Calculus II $4-1-4$
- Phys 121 Physics II $3-0-3$
- Phys 121A Physics II Laboratory $0-2-1$
- Elective (Cultural History GUR) $3-0-3$
- Physical Education GUR $0-1-1$

Subtotal: 16

**Year 2**

**First Semester**
- Chem 221 Analytical Chemical Methods $0-4-2$
- Chem 222 Analytical Chemistry $3-0-3$
- Chem 243 Organic Chemistry I $3-0-3$
- Math 211 Calculus IIIA $3-0-3$
- R120 101 General Biology I $4$
- Elective (Cultural History GUR) $3-0-3$

Subtotal: 18

**Second Semester**
- Chem 231 Physical Chemistry I $3-0-3$
- Chem 244 Organic Chemistry II $3-0-3$
- Chem 244A Organic Chemistry II Laboratory $0-4-2$
- R120 102 General Biology II $4$
- Elective (Technical) $3-0-3$

Subtotal: 15

**Year 3**

**First Semester**
- Chem 473 Biochemistry $3-0-3$
Ch 235 Physical Chemistry II 3-0-3
Elective (Technical) 3-0-3
R120 301 Foundations Biology 3
R120 302 Foundations of Biology Laboratory 1
Elective (Lit/Hist/Phil/STS) 3-0-3
Physical Education GUR 0-1-1
Subtotal 17

Second Semester
Chem 474 Biochemistry II 3-0-3
Chem 475 Biochemistry Lab 0-4-2
Chem 4xx Bioorganic or Biophysical Chemistry 3-0-3
Econ 201 Economics 3-0-3
R120: 356 Molecular Biology 3-0-3
Elective (Free) 3-0-3
Subtotal: 17

Year 4
First Semester
Chem 235A Physical Chemistry Lab Laboratory 0-4-2
Math 225 Survey of Probability and Statistics. 1-0-1
HSS 202 Society, Technology, and Environment 3-0-3
R120 352 Genetics 3-0-3
Elective (Technical) 3-0-3
Elective (Open GUR) 3-0-3
Subtotal: 15

Second Semester
Chem 480 Instrumental Analysis 0-4-2
Elective (Capstone Seminar GUR) 3-0-3
Elective (Management GUR) 3-0-3
EVSC 385 Environmental Microbiology 3-0-3
Elective (Technical) 3-0-3
Subtotal: 14

Total: 129h
REPORT ON THE PROPOSED BS PROGRAM IN
BIOCHEMISTRY AT NJIT

June 1, 2009

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A. Objectives

The objectives as described in the NJIT Program Announcement (March 2009)
are specific, achievable and probably even a bit understated. Certainly the program
provides both the theoretical fundamentals and laboratory skills to meet the objectives
of providing a solid grounding in the six topics listed under “Objectives” in the NJIT
Program Announcement. The strong math background, coupled with computer science
courses (especially the Bioinformatics course option- BNFO 135) will serve graduates of
this program particularly well in their careers. Moreover, the CHEM 475 (Biochemistry
Lab) will provide a very integrative experience in modern chemistry, biochemistry, and
biotechnology. These objectives fit well with NJIT’s emphasis on bioscience and
biomedical science and in its role as a state-supported institution in New Jersey, where
biomedical research is a vital economic driver now and in the future. The graduates of
this program will find employment at the entering scientist level, but also will be
competitive applicants for graduate programs in biochemistry, chemistry, molecular
biology, pharmaceutical sciences (including the new NJIT MS in Pharmaceutical
Chemistry) as well as medical, law, and business schools.

B. Need for the Program

The twenty-first century is unfolding as the “Century of Biology” just as the
twentieth century could be considered the “Century of Physics.” Chemistry, as a science
poised midway between Physics and Biology has both contributed to and benefited
from these two fields and this will continue throughout the present century.
Biochemistry is, not surprisingly, a popular undergraduate major. At my own institution, the University of New Hampshire, biochemistry majors significantly outnumber chemistry majors. The proposed NJIT Biochemistry B.S. program will be the only such program offered in Newark and the only such program offered by a public university in the populous urban Newark-Hoboken-Jersey City region.

The proposed NJIT program offers an education that is relatively rare among other B.S.-level Biochemistry programs. As the State’s public technological university, NJIT is building on this strength to offer a program that has a particularly strong basis in mathematics and computer science. This is background that will richly serve the “customers” (e.g. the biomedical and pharmaceutical industries). Thus, while my own university provides a well respected program, it is “mathematically soft” requiring at a minimum a one-semester course in calculus for bioscience students and a one semester course in biostatistics. There is no real computer science requirement. In contrast, the NJIT program requires 3 semesters of calculus, 1 semester of computer science (with bioinformatics as an option), and 1 semester of statistics (albeit for 1 credit). Since the extent of mathematical background usually establishes the limits of one’s access to the science of the future, graduates of the proposed NJIT program will face fewer limitations in their future professional growth than graduates of most other Biochemistry degree programs.

Bachelor of Science degree programs in Biochemistry are well established and not uncommon. In New Jersey, Bloomfield College, College of Saint Elizabeth, Fairleigh Dickinson University-Metropolitan Campus, Montclair State University, Ramapo University, The Richard Stockton College of New Jersey, Rider University, Rowan University, Rutgers University-New Brunswick, Seton Hall University, and Stevens Institute of Technology offer B.S. degrees in Biochemistry, Chemical Biology or the equivalent. This begs the question, why should NJIT join this group? The answers are at least four-fold: First, it is fully consistent with the overall strategic goal of the university to emphasize the biological sciences; Second, it is a very popular science major and should remain so for the foreseeable future; Third, NJIT’s close neighbor, Rutgers University-Newark College of Arts and Sciences, does not offer this degree but does offer courses that support the proposed NJIT degree; Fourth, and particularly compelling, as the State’s Public Technological University, NJIT is proposing a distinctive program that is steeped in mathematics and computer science (e.g. bioinformatics) to a far greater extent than almost all of the other biochemistry programs. This last point will be discussed in greater depth later in this report. The proposed degree program may claim a few chemistry majors but will certainly attract additional students. [Chemistry remains a very vital major- for example, the field of nanotechnology springs from
chemistry (see Nobel physicist Richard Feynman’s far-sighted 1959 talk titled “There’s Plenty of Room at the Bottom”) and is an area of focus at NJIT. The proposed Biochemistry major is also likely to contribute to the stream of undergraduates interested in the new M.S. in Pharmaceutical Chemistry at NJIT.

C. Education Program

The education program is a fundamentally sound one and reflects NJIT’s strengths as a technological university. The standard curriculum requires 129 credits which meets NJIT graduation and general education credit requirements without significantly exceeding them. The requirements in Math [3 semesters (11 credits) in calculus; 1 semester (1 credit) in statistics], Physics [2 semesters (8 credits)], and Computer Science [1 semester (3 credits)] provide a very solid and forward-looking foundation that will serve graduates well into the future by allowing access into the more quantitative aspects of biochemistry such as bioinformatics and genomics. The Chemistry requirements include 41 credits with a good balance between classroom and laboratory experiences. The program requires 7 courses in Biology (21 credits), all but 1 course (EVSC 385 Environmental Biology) to be taken at the neighboring Rutgers- Newark campus. While such a program is very highly prescriptive, it recognizes the reality that while education at the B.S. level in Biochemistry must be broad, it must also have depth.

There are challenges to be met in offering this program. However, they are fully consistent with NJIT’s goals, recent hires in the Chemistry Department, future hires to replace anticipated retirements, and future opportunities to make the department a premier NJIT science department. The Department designed a program that makes excellent use of courses already available at NJIT or Rutgers- Newark. New proposed chemistry courses include Biochemistry II (CHEM 474), Bioorganic Chemistry (CHEM 4XX), and Biophysical Chemistry (CHEM 4XY). There will be considerable demands upon the department to offer these new courses. The addition to the department of an excellent new tenure-track assistant professor (Dr. Haidong Huang), a bio-organic chemist, will help this situation. Moreover, since the new program would begin in Fall, 2010 and these specific courses are third-year courses, the Department will have adequate lead time to develop and adapt them.

The Biochemistry Lab (CHEM 475) is presently an official course at NJIT but in its two years of existence has not actually run. This course is very well designed and will be at the core of practical training in this interdisciplinary field. It integrates methods of chemical and spectroscopic separation and analysis, protein (including enzyme) purification and assay, enzyme kinetics and the use of enzymes as tools of analysis, analysis of protein binding (critical in drug design), and modern biotechnology
techniques including recombinant DNA technology, and PCR (Polymerase Chain Reaction) technology (amplification of DNA), as well as modern methods for navigating the scientific literature and databases. This course requires some modest start-up funding for its initial offering and, as is the case for all lab courses- modest continued funding. The course looks like a “winner” that may attract Rutgers- Newark students as well as Chemistry majors and even Chemical Engineering majors.

A curious aspect of the program as presented in its sample curriculum is that most of the chemistry, biology and biochemistry courses are anticipated to be taken during the students’ sophomore and junior years, with general studies electives forming most of the senior courses. I strongly suspect that this will be modified in practice to better distribute the general studies electives over the students’ second through fourth years. At present, there is no research course or thesis requirement proposed for this program.

I learned during my visit on April 13, 2009 that the department has initiated early steps in the process of exploring Approval of its B.S. degree in Chemistry from the American Chemical Society (ACS). This is a very positive initiative. As the Department knows, ACS does not confer “Accreditation” as does ABET in engineering fields. ABET accreditation, although not mandatory, makes the process of licensure a much easier one for engineering graduates and is, of course, a major “seal of approval” for engineering programs. Rare is the program that does not actively seek it. While ACS Approval does not have comparable importance to ABET Accreditation, it is regarded as “certification” of the program and is helpful both in reviewing and marketing the chemistry program. The NJIT Department of Chemistry recently acquired an NMR spectrometer, a major requirement in the Approval process. Although ACS does not confer “Approval” on Biochemistry degree programs, approval of the Chemistry B.S. program will enhance the attractiveness of both degree programs. While ACS Approval (“Certification”) does not require that a student participate in a research experience as one condition of graduation, it certainly encourages it: “The Committee on Professional Training highly recommends that research be part of the education of an ACS-certified chemistry degree” (Source: American Chemical Society web-site). As the Department of Chemistry at NJIT continues to be revitalized, it will be increasingly likely to provide increased research opportunities for its undergraduate Chemistry and Biochemistry majors.

The close geographic relationship between NJIT and Rutgers- Newark, the presence of a federated Department of Biology, the involvement of engineering departments at NJIT in biotechnology and the interest in the NJIT Mathematics Department in biology offer the potential of a wide array of potential elective courses and research
experiences. Although the number of NJIT Chemistry faculty is fairly small, there are many venues and possibilities for research experiences for undergraduates in departmental labs or those of other departments. During my visit, I inquired whether New Jersey Medical School of UMDNJ might allow enrollment of advanced NJIT Biochemistry majors (e.g. seniors) in some of their courses. There had been some previous exploration of these possibilities, but they do not seem likely to available as options. The medical school courses are, by definition, graduate courses and appear to be oriented to the practical needs of medical students.

D. Students

As noted earlier, Biochemistry is a fairly popular undergraduate major. In many universities it is effectively a “half-way” degree interpolating Chemistry and Biology. This often means requiring a mathematics and physical science background more demanding than that for the typical biology major and less demanding than that for the typical chemistry major. The proposed NJIT Biochemistry B.S. degree is every bit as demanding, from this perspective, as is the NJIT Chemistry degree. Given the fact that students come to NJIT with stronger mathematical abilities and interests than at most other colleges and universities, this should not function as a barrier. Indeed, it should be a selling point in providing a very forward-looking degree program.

During my visit, the Department of Chemistry provided me with the opportunity to meet with its undergraduate majors. Seven students spoke with me. The interest in the proposed Biochemistry degree program was high. Two students appeared interested in actually transferring into the program, although one was far enough advanced and had taken relevant electives that transferring from the chemistry major made little sense. Students felt that the Department administration was available as needed for listening to issues of concern for students as they arose and that regularly-scheduled meetings (e.g. once a semester) might also be useful. The Chemistry faculty, only eight tenured and tenure-track faculty, four university lecturers and a few dedicated and much-needed university adjunct faculty members, manages to support a wide array of undergraduate and graduate programs. These include B.S. degrees in Chemistry and in Environmental Science, M.S. degrees in Chemistry, Environmental Science, and now Pharmaceutical Chemistry, as well as Ph.D. programs in Chemistry and in Environmental Science. As the Department successfully replaces retiring faculty and, hopefully, succeeds in obtaining a modest expansion of its faculty, the challenges sometimes experienced offering upper division courses will diminish. In addition, the proposed B.S. in Biochemistry major will add students who will enroll in these upper-division courses, also adding to their viability. In the longer run, the Biochemistry B.S. program will
enhance the revitalization of the NJIT Department of Chemistry in its teaching, research, and its attractiveness to potential majors.

E. Faculty

The present chemistry faculty members, along with the new tenure-track bio-organic chemistry faculty member who will arrive at NJIT for Fall 2009, are judged adequate to teach courses and conduct research in the proposed Biochemistry B.S. and new Pharmaceutical Chemistry M.S. programs. This will be enabled by the addition of two full-time Chemistry lecturers replacing one retiring lecturer in Fall 2009. While these two lecturers will predominantly teach lower division courses, they will help free up time for tenured faculty to teach upper division courses.

The expertise to teach all of the courses in the new program presently resides in the department. Especially noteworthy is the new CHEM 475 (Biochemistry Laboratory). The Chemistry faculty is about half the size of the Chemistry Division of NJIT some twenty years ago. One result is a huge burden of teaching, research and administration resting on the shoulders of a small, hard-pressed sub-group of talented faculty in the Department of Chemistry. Hopefully, the department will continue to evolve an academic plan that will explicitly recognize its developing strengths in biological sciences and recruit faculty to achieve excellence in these areas. The Dean of the College wishes to strengthen the Chemistry Department so that it will one day achieve comparable distinction to the Department of Mathematical Sciences and the Department of Physics at NJIT. The Chemistry Department leadership is working effectively with the Dean to begin to achieve this goal. Appropriate-loading, adequate start-up, and effective mentoring of new faculty will be vital. To be successful, a new chemistry faculty member at NJIT will need to be resourceful and entrepreneurial, adapting to opportunities, collaborating with departmental colleagues and co-investigators from other department, colleges and universities, and with industrial partners (an opportunity enhanced by an Industrial Advisory Board- see below).

F. Support Personnel

Although support personnel are judged adequate, it seems the situation is borderline in nature. The issue of instrumentation (research and instructional) support and maintenance is a crucial one. Strong infrastructure in instrumentation support can boost a department’s competitiveness enormously with the converse also being true. The Chemistry Department is light in support staff as well as faculty and this adds to the faculty workload, subtracting time and energy from research and teaching. Hopefully, as the National and the State economies improve, infrastructure support will improve.
G. Finances

While the additions of a tenure-track bio-organic chemist and two full-time lecturers in Fall, 2009 will meet the needs of the proposed program as well as existing programs, they will do so just barely. As new programs succeed and grow and as some faculty transition into retirement, the addition of new faculty will enhance the Department and provide greater flexibility in meeting its program requirements and competitiveness in gaining research grants.

Modest, but vital, start-up funds are needed for the CHEM 475 (Biochemistry Lab) course and this lab will require very modest continuing costs as all labs do. This laboratory course is at the core of the proposed program. It is useful to once again emphasize the vital need for adequate maintenance support for instructional and research laboratories and equipment. Such investments more than pay for themselves in helping programs attract research and education grants as well as not wasting faculty time on maintenance and increasing student and faculty satisfaction.

H. Physical Facilities

The physical facilities are adequate for the program, relying upon space in Tiernan Hall for teaching and research and the Otto York building for research and some instrumentation support (e.g. NMR). Joint research projects at Rutgers- Newark, New Jersey Medical School of UMDNJ, could further articulate this space. However, the size and research opportunities of the Chemistry faculty remain limited in Tiernan Hall. The desirable goal of increasing the number of NJIT Chemistry faculty members remains tightly constrained by funding but also by limited research space.

There are significant research instrumentation resources at NJIT- 300 MHz Nuclear Magnetic resonance (NMR) Spectrometer, Fourier Transform Infrared (FTIR) spectrometer, High Performance Liquid Chromatography (HPLC) and other significant instrumentation in Tiernan Hall and the Otto York Building. However, the infrastructure for maintaining and running these instruments is minimal and considerable faculty time is lost as a result. New faculty members will need direct and open access to these types of instrumentation and should not have to spend too much time in their maintenance. Hopefully, start-up funds will provide needed instrumentation specific to a faculty member. The specific rules for access (and costs) to instrumentation (e.g. high field NMR; high molecular weight mass spectrometers) at Rutgers- Newark and UMD should be assessed. Perhaps “barter” arrangements involving complementary instrumentation at the three campuses can be arranged. Computing facilities at NJIT are more than adequate for the new program.
I. Library

Library resources are judged just adequate for the proposed program. The NJIT Program Announcement notes the need to acquire a modest number of books each year as well as the need for the Department and the Library to assess journal needs and use. Exchange of subscriptions to minimally-used journals for important biochemical journals lacking at NJIT (and Rutgers- Newark) is a sensible approach. Networked microcomputers in the Van Houten Library are adequate and provide ready access to on-line resources such as SciFinder Scholar. The proximity to Rutgers-Newark and NJ Medical School libraries adds significantly to available resources. Presently, the Technical Reference Librarian at NJIT is a chemist, who is very experienced, sophisticated and eager to work productively with the new program.

J. Computer Facilities

Computer facilities are much stronger than adequate. NJIT has a strong College of Computing Sciences and appropriate university-wide facilities. Within the department of Chemistry, there are at least three faculty members who employ state-of-the-art computational chemistry including specific software relevant to protein structure and drug design.

K. Administration

The Dean of the College of Arts and Sciences is clearly very supportive of the proposed program and will likely be an effective advocate for it with the NJIT executive level. This is part of a broader strategy that aims to raise the level of excellence in the Department of Chemistry to that exemplified by the Departments of Mathematical Sciences and Physics in the College. The Department of Chemistry Chair and other faculty participating in departmental administration and development of this program are supportive and effective. In general, administration of the Department suffers from having only some of its faculty who are willing to participate effectively in these activities.

L. Evaluation

In the Program Announcement (March, 2009), the enrollment projection is for an increase of 5 students per year to attain a steady-state enrollment of 30 Biochemistry majors. One simple evaluation would be to assess by the end of the sixth year of the program's operation, the degree of success in meeting this goal. By the end of the sixth year, there should also be at least one-to-two years of data on the post-graduate
success track record of program participants. In addition to these metrics, exit interviews of students and interviews of employers (or graduate programs) might start the assessment process. Should the Department choose to follow through on its initiative to seek ACS Approval for its B.S. in Chemistry degree, this will also provide another opportunity for evaluation (and periodic reevaluation) of major components of the B.S. in Biochemistry program.

An Industrial Advisory Board (albeit chosen by the department, see below) will also provide useful input to the Department for its degree programs in Chemistry, Pharmaceutical Chemistry and Biochemistry. Although ABET accreditation is not relevant for these programs, the ABET 2000 criteria for assessment are flexible and useful. In particular, ABET now looks for evidence of a “feedback loop” to ensure continual assessment and improvement. Any new or existing academic program will derive benefit from such a process.

CONCLUSIONS AND RECOMMENDATIONS

It is recommended that New Jersey Institute of Technology approve the proposed Bachelor of Science Degree in Biochemistry. The chemical, biochemical and pharmaceutical industries constitute a powerful economic engine in New Jersey and biomedical research and education are important components in NJIT’s master plan. The field of biochemistry is large enough and dynamic enough to continue to offer opportunities for a well-designed new program. NJIT’s status as New Jersey’s public technology and research university offers opportunities for an excellent and distinctive program. Below are some specific conclusions and recommendations:

1. It is vital that NJIT develop a niche in its Biochemistry B.S. program that distinguishes it from other programs and takes advantage of the strengths that already exist at the university. The highly mathematical nature of the program offers one such opportunity.
2. There are numerous opportunities for collaboration in teaching and research with other NJIT departments (e.g. Mathematics, Chemical Engineering) and universities (Rutgers-Newark).
3. The Department of Chemistry has a relatively small number of tenured/tenure-track faculty members with a number of retirements anticipated over the next decade. This presents an opportunity for the department to produce a vision of focused areas of future strength. One of these could certainly be in biological and pharmaceutical chemistry. A vision of focused areas of strength could also help the department determine a “right size” for its future faculty.
4. The constraints on the number of chemistry faculty members should provide impetus for seeking research collaborations with faculty members in other NJIT departments (Chemical Engineering, Mathematics, Computer Science, Biological Sciences are obvious
possibilities). Hopefully, collaborations can be even further enhanced, with faculty members at Rutgers- Newark.

5. The Department of Chemistry would greatly benefit from the formation and operation of an Industrial Advisory Board that is concerned with all departmental academic and research programs. This need not (and should not) become a burden for the department in terms of numbers of meetings and faculty and staff work. One hopes to convince the region’s industry that it has a vested interest in the success of the Chemistry Department’s programs. Such a board is not meant to “run” a department but can provide insights into the state-of-the-art from an industrial perspective, helpful suggestions, contacts, internships, jobs for graduates and help in garnering resources.

6. Serious thought should be given to providing adjunct appointments as well as laboratory space to chemists retiring from the region’s chemical, biomedical and pharmaceutical industries. While space in Tiernan Hall (and the York Building) is clearly at a premium, such appointments offer the opportunity to augment the chemistry faculty with outstanding scientists who might even bring some resources (i.e. their industrial laboratory apparatus), experience, ideas, and contacts without the requirements of a tenure-track position. These scientists could teach special topics courses that could add electives to the proposed program or be offered as continuing education courses for certificates. The opportunities offered by Newark’s geographical location are significant.

7. It will be important that new faculty hired for this program be given the tools to succeed along with careful mentoring. Where equipment is to be made available to and shared by the new faculty member, explicit understandings need to be achieved, concerning availability and use of shared equipment as well as associated costs, prior to hire or at least early in the person’s appointment.

8. Chemistry (and related disciplines) at NJIT would be well served through development of an infrastructure to run and maintain capital items of research and instructional equipment. This reviewer’s own personal experience has demonstrated that poor infrastructure caused a department at a major Research 1 university to operate non-competitively, while strong infrastructure allowed a chemistry department at a predominantly Masters Degree institution to compete with Ph.D.-granting departments.
Response to Consultant’s Report on the Proposed BS in Biochemistry
Department of Chemistry and Environmental Science
New Jersey Institute of Technology

1. It is vital that NJIT develop a niche in its Biochemistry B.S. program that distinguishes it from other programs and takes advantage of the strengths that already exist at the university. The highly mathematical nature of the program offers one such opportunity.

The Biochemistry program contains four mathematics courses, and most universities including Yale University require only two classes in math. In short, the BS Biochemistry degree requires the same amount of mathematics as the BS Chemistry degree. The program also includes a Bioinformatics course, which is offered by the Department of Computer Science. To the best of our knowledge, no Biochemistry program in New Jersey have this built into their curriculum. The close cooperation with Pharmaceutical, Biomedical and other Engineering programs provide additional opportunities that makes our program unique.

2. There are numerous opportunities for collaboration in teaching and research with other NJIT departments (e.g. Mathematics, Chemical Engineering) and universities (Rutgers-Newark).

NJIT Chemistry and Environmental Science faculty already participate in active collaborations with other NJIT departments including Physics, Computer Science, Mathematical Sciences, Mechanical Engineering as well as Chemical, Biological, and Pharmaceutical Engineering. In addition, relationships exist with Rutgers-Newark Chemistry and the International Center for Public Health (New Jersey Medical School, UMDNJ). NJIT also shares an x-ray crystallography facility with Rutgers-Newark. Furthermore, these institutions are one block away from NJIT, which facilitates collaboration since there are no major distance constraints. Finally, unrestricted cross registration exists between NJIT and Rutgers-Newark allowing undergraduate students to take course at either university. The chemistry department also has a direct MD program and a joint program with Physical Therapy department at UMDNJ.

3. The Department of Chemistry has a relatively small number of tenured/tenure-track faculty members with a number of retirements anticipated over the next decade. This presents an opportunity for the department to produce a vision of focused areas of future strength. One of these could certainly be in biological and pharmaceutical chemistry. A vision of focused areas of strength could also help the department determine a “right size” for its future faculty.

The most recent hires in the Department include expertise in biochemistry, bioinorganic, and microbiology. In addition, strengths already exist in computer aided drug design, drug delivery and pharmaceutical analysis. Finally, a bioorganic chemist will be starting Fall 2009 bringing knowledge in organic synthesis and DNA repair.

4. The constraints on the number of chemistry faculty members should provide impetus for seeking research collaborations with faculty members in other NJIT departments (Chemical Engineering, Mathematics, Computer Science, Biological Sciences are obvious
possibilities). Hopefully, collaborations can be even further enhanced, with faculty members at Rutgers- Newark.

See response for (2).

5. The Department of Chemistry would greatly benefit from the formation and operation of an Industrial Advisory Board that is concerned with all departmental academic and research programs. This need not (and should not) become a burden for the department in terms of numbers of meetings and faculty and staff work. One hopes to convince the region’s industry that it has a vested interest in the success of the Chemistry Department’s programs. Such a board is not meant to “run” a department but can provide insights into the state-of-the-art from an industrial perspective, helpful suggestions, contacts, internships, jobs for graduates and help in garnering resources.

An advisory board is being set up.

6. Serious thought should be given to providing adjunct appointments as well as laboratory space to chemists retiring from the region’s chemical, biomedical and pharmaceutical industries. While space in Tiernan Hall (and the York Building) is clearly at a premium, such appointments offer the opportunity to augment the chemistry faculty with outstanding scientists who might even bring some resources (i.e. their industrial laboratory apparatus), experience, ideas, and contacts without the requirements of a tenure-track position. These scientists could teach special topics courses that could add electives to the proposed program or be offered as continuing education courses for certificates. The opportunities offered by Newark’s geographical location are significant.

Industrial chemists have always been a source of qualified adjuncts for the department. We see their continuing participation increasing with the introduction of this BS program. Research is also an exciting possibility.

7. It will be important that new faculty hired for this program be given the tools to succeed along with careful mentoring. Where equipment is to be made available to and shared by the new faculty member, explicit understandings need to be achieved, concerning availability and use of shared equipment as well as associated costs, prior to hire or at least early in the person’s appointment.

Hires are given adequate start-up funds to build a competitive research program. In addition, assistant professors are assigned a faculty mentor for advice. Furthermore, the Department takes an “open door” policy allowing access to equipment needed to conduct research.

8. Chemistry (and related disciplines) at NJIT would be well served through development of an infrastructure to run and maintain capital items of research and instructional equipment. This reviewer’s own personal experience has demonstrated that poor infrastructure caused a department at a major Research 1 university to operate non-competitively, while strong infrastructure allowed a chemistry department at a predominantly Masters Degree institution to compete with Ph.D.-granting departments.
The College of Science and Liberal Arts has a long-term vision to promote a bioscience theme, and NJIT recognizes that a strong infrastructure is necessary for a successful program. NJIT has significant research infrastructure at the Otto York center that is relevant to the Biochemistry program. The federated Biology program gives us access to a variety of instrumentation including transmission electron microscopy. Furthermore, UMDNJ offers services such as DNA sequencing and flow cytometry. The newly hired faculty have been given sufficient start up funds that have (and will) allowed them to set up fully functional laboratories. A biochemistry teaching laboratory has also been set up. Therefore, we feel that we are already in a good position as far as instrumentation for Biochemistry is concerned and our infrastructure continues to improve.
ARTHUR GREENBERG
PROFESSOR OF CHEMISTRY
FORMER DEAN, ENGINEERING AND PHYSICAL SCIENCE (7/00-7/05)
UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NH 03824
(603) 862-1180; (603) 812-5169 (Cell) Art.Greenberg@unh.edu

Education
Doctoral Degree Chemistry 1971 Princeton University
Masters Degree Chemistry 1970 Princeton University
Bachelors Degree Chemistry 1967 Fairleigh Dickinson University

Awards, Recognition and Honors

-Listed Consultant, NOVA (WBGH, Boston) Program Newton’s Dark Secrets (November 15, 2005).


-Co-Organizer with Professor Louise Ball, Sixteenth Meeting of the International Society on Polycyclic Aromatic Compounds, Charlotte, NC, November 4-8, 1997.

-1996 Morris Katz Memorial Lectureship in Environmental Research, York University, Toronto, CANADA, March 6, 1996

-Session Organizer and Session Chair, Gordon Research Conference on Physical Organic Chemistry, Plymouth, NH, June 11, 1991

-1990 Joseph B. Hyman Award, North Jersey Section of the American Chemical Society, one outstanding chemistry college teacher/year

-Appeared in WNET Documentary “Not In Your Backyard”, October, 1990

-1986 Harlan J. Perlis Award Research, New Jersey Institute of Technology.

-My research was highlighted twice in Chemical and Engineering News (September 17, 1979, pp. 25-26; September 19, 1983, pp. 33-34.

-National Science Foundation Trainee, Princeton University, 1967-68

-Bachelors Degree (1967), Magna cum Laude
3D. Approve Resolution Selecting an External Auditor
There is a requirement to retain an independent accounting firm to conduct an annual audit of the university's financial statements. The current firm, KPMG has completed 8 audits; 7 with Paul Merrill as the partner and last year (FY09) Shelly Masi was the partner. The Audit Committee Charter does not have a "term limit" for the firm, but does call for 7 year rotation of the partner (which was done).

The base audit fee for FY 08 and FY 09 was $187,500. There is a required separate engagement of a review (agreed on procedures) of athletics to comply with NCAA reporting for $15,500. They propose the same fee for FY 10 - $187,500 and $15,500, respectively. There will added fees to cover the special requirements of the Stimulus money (ARRA). We have received funds as part of the State for operations, separately funds for financial aid, separately from the BPU for energy retrofit for one of the residence halls and a number of federal grants, primarily from National Science Foundation (NSF). The requirements from the Feds have not been fully developed, but KPMG is estimating $20,000 depending on the level of review for each of the different sources/routes of the Stimulus money.

We will be reviewing the fees for the ARRA funding carefully – getting a sense what is being charged elsewhere - to ensure any extra fee is kept to a minimum. Unfortunately, there most likely be some additional fee.

With respect to staffing, we have been satisfied with the personnel provided- the Partner, Manager and In-Charge will be returning, and the staff will be new.

The Audit and Finance Committee of the Board recommends the selection of the accounting firm KPMG. A resolution for the Board to approve KPMG as the auditor for FY 2010 has been prepared and is attached.
RESOLUTION TO ENGAGE PROFESSIONAL ACCOUNTING FIRM FOR EXTERNAL AUDIT SERVICES

Whereas, there is a requirement to retain an independent accounting firm to conduct an annual audit of the university’s financial statements, and

Whereas, the Audit and Finance Committee of the Board recommends the selection of the accounting firm KPMG, and

Whereas, sufficient funds are available for this purpose,

Now Therefore, Be It Resolved that the Board of Trustees authorizes the retention of KPMG to perform the required independent audits of the University’s financial statements for Fiscal Year 2010.

18 February 2010
3E. Approve Resolution to Authorize Exclusive License of University Intellectual Property
STATEMENT OF INFORMATION FOR
EXCLUSIVE LICENSE OF NJIT INVENTION DISCLOSURES
February 18, 2010

Introduction

As part of its Intellectual Property ("IP") Program, NJIT assesses the commercial value of its Intellectual Property to determine the most appropriate avenue to achieve a return on its investment. Options include the exclusive licensing of Intellectual Property.

A subsidiary of Intellectual Ventures ("IV"), has expressed interest in acquiring an exclusive license to the NJIT Invention Disclosure listed below for the life of each patent issued by the USPTO and/or foreign jurisdiction.

As the exclusive license of the Invention Disclosures and patent applications derived therefrom for the life of the patent essentially represents a disposition of NJIT property, the Board of Trustees is being asked to approve the same. A Resolution has been prepared for consideration.

Background of Intellectual Ventures

IV is a private company founded in 2000 by Nathan Myhrvold and Edward Jung, both former executives of Microsoft. The purpose of the company is to invest in innovations and technologies across a broad spectrum of industries (i.e., technology, biotechnology, consumer electronics, nanotechnology and others). IV has also acquired inventions and related IP from a combination of individual inventors, government agencies, and universities. IV's business plan is to group all acquired patents into clusters of like technology and then license the patents to potential users and/or infringers of each technology cluster. The goal is to derive more value than is likely to be attained from the licensing of any individual patent.

Current Licensing Offer

At its April 10, 2008 meeting the Board of Trustees authorized the execution of a one year Master Patent License Agreement, which was executed on August 15, 2008, and has since been renewed for an additional year.

This request is for the exclusive license of an additional Invention Disclosure with right to sublicense. IV will pay for all on-going patent prosecution costs levied by the USPTO and/or foreign jurisdictions, including issuance fees on allowed patents as well as maintenance fees that become due on any and all issued patents. If any of the patents are sublicensed to third parties, NJIT will also receive an annual royalty payment. The individual Invention Disclosures included in this fifth request under the new Master License Agreement is found below.

Apparatus for Integrated Fiber Optic Spectroscopy and Radiofrequency Ablation of Tissue (Inventors: Edip Niver & Kenneth Lieberman) NJIT Reference 08-062.

Methods and Designs for Maximizing the Capacity of WDM PON (Inventors: Nirwan Ansari and JingJing Zhang) NJIT Reference Number 09-057.

After NJIT's reimbursement of associated out-of-pocket expenses, if any, the remaining net amount derived from the transaction shall be shared with the inventors pursuant to NJIT's current Patent Policy.
RESOLUTION TO AUTHORIZE EXCLUSIVE LICENSE OF UNIVERSITY INTELLECTUAL PROPERTY

WHEREAS, the Board of Trustees of New Jersey Institute of Technology is empowered to direct and control the disposition of NJIT intellectual property if deemed necessary or advisable to carry out the goals of NJIT; and

WHEREAS, the Board of Trustees at its April 10, 2008 approved the execution of a one year Master Patent License Agreement with a subsidiary of Intellectual Ventures, which was executed on August 15, 2008 and subsequently renewed for an additional year; and

WHEREAS, a subsequent transaction under such Master Patent License Agreement is for the exclusive licensing of certain identified NJIT Intellectual Property.

NOW THEREFORE BE IT RESOLVED by the Board of Trustees of New Jersey Institute of Technology that the proposed exclusive licensing of the Intellectual Property (Reference Number 08-062 and Reference Number 09-057) by NJIT is hereby approved; and

THEREFORE BE IT FURTHER RESOLVED by the Board of Trustees of New Jersey Institute of Technology, that the Senior Vice President for Research & Development is hereby authorized to execute any and all agreements or documents on behalf of NJIT to consummate such licensing transactions.

Holly C. Stern, Esq.
General Counsel and
Secretary to the Board of Trustees
New Jersey Institute of Technology

Date
STATEMENT OF INFORMATION
FOR EXCLUSIVE LICENSE OF
NJIT INTELLECTUAL PROPERTY ASSETS

Introduction

As part of its Intellectual Property ("IP") Program NJIT assesses the commercial value of its Intellectual Property Assets to determine the most appropriate avenue to achieve a return on its investment. Options include the exclusive licensing of such assets.

The Iowa Corn Promotion Board ("ICPB") has expressed an interest in acquiring an exclusive license to certain NJIT Intellectual Property Assets (invention disclosures and/or pending patent applications) in accordance with the commercialization and licensing rights granted to it under the terms of a sponsored research agreement. The proposed license would be for the life of each patent issued in exchange for a minimum of 20% of all gross royalties ICPB receives from any and all sublicenses of the technology. In addition, ICPB will pay for all upfront costs associated with the filing, prosecution, maintenance and enforcement of all U.S. and foreign patent rights. NJIT retains the right to use the technology for research and educational purposes and retains a commercial use license with the right to license or sublicense to third parties in those fields of use in which ICPB has been unable to use or sublicense. A list of the individual Intellectual Property Assets follows.

As the exclusive license of the Intellectual Property Assets for the life of any patents derived there from essentially represents a disposition of NJIT property, the Board of Trustees is being asked to approve the same. A Resolution has been prepared for consideration

Background on the Iowa Corn Promotion Board

The Iowa Corn Promotion Board (ICPB) is composed of 17 corn growers, elected by their peers, who direct funds collected through the Iowa Corn Checkoff Program - a program designed to promote Iowa's corn industry. The Iowa Corn Checkoff Program, established in 1977, has been a model for corn checkoff programs in 18 other states. The Iowa Corn Checkoff Program collects one-half cent for each bushel of Iowa corn sold into commercial channels. The ICPB, and the growers it represents, are actively working to create an economic climate in which the Iowa corn industry will flourish through research, market development and education. The ICPB invests approximately $1 million annually in research to develop new products from corn, especially emphasizing research that can lead to value-added opportunities.

Since 2003, ICPB has been sponsoring research at NJIT related to use of corn products to replace petroleum in many industrial applications specifically exploring (i) low molar mass corn-derived (sugar-derived) additives for the commercial polymer industry; (ii) commercially attractive hydrogels based on itaconic acid; and (iii) use of corn-derived chemistries to improve the performance of commercial polymers through antiplastizer and cross-linking effects.

Current Offer

ICPB has presented an offer to NJIT for the exclusive license of nine (9) NJIT Intellectual Property Assets, with right to sublicense, in return for a minimum of 20% of all gross royalties ICPB receives from any and all sublicenses of the technology. In addition, ICPB will pay for all upfront costs associated with the filing, prosecution, maintenance and enforcement of all U.S. and foreign patent rights.

The net amount derived from the transaction(s) shall be shared with the inventors pursuant to NJIT's current Patent Policy.
List of NJIT Intellectual Property Assets

Polyoxazolidones Derived from Bisanhydrohexitols (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond, George Collins, Ronald N. DeMartino and Zohar Ophir) NJIT Reference Number 08-042

Chiral Diamines and Chiral Polyamides (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond, George Collins and Zohar Ophir) NJIT Reference Number 05-010

Asymmetrically Substituted Isosorbide Derivatives (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond, George Collins, Ronald N. DeMartino, Zohar Ophir and Xianhong Feng) NJIT Reference Number 08-032

New Bisanhydrohexitol Fatty Esters as Nonionic Surfactants (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond and Xianhong Feng) NJIT Reference Number 08-043

New Bisanhydrohexitol Long-Chain Fatty Ethers as Nonionic Surfactants (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond and Xianhong Feng) NJIT Reference Number 08-044

New Bisanhydrohexitol Sulfated Fatty Ethers as Anionic Surfactants (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond and Xianhong Feng) NJIT Reference Number 08-045

Polyacrylates Derived from Isosorbide Mono and Diacrylates (Inventors: Anthony J. East, Michael Jaffe and Willis B. Hammond) NJIT Reference Number 08-046

AB Monomers from Bisanhydrohexitols (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond, Xianhong Feng and Ronald N. DeMartino) NJIT Reference Number 09-040

Polyols from Isosorbide Epoxides (Inventors: Anthony J. East, Michael Jaffe, Willis B. Hammond and Xianhong Feng) NJIT Reference Number 09-053
RESOLUTION TO AUTHORIZE EXCLUSIVE LICENSE OF UNIVERSITY INTELLECTUAL PROPERTY

WHEREAS, the Board of Trustees of New Jersey Institute of Technology is empowered to direct and control the disposition of NJIT intellectual property if deemed necessary or advisable to carry out the goals of NJIT; and

WHEREAS, Administration recommends the exclusive licensing of certain identified NJIT Intellectual Property to the Iowa Corn Promotion Board in exchange for a share of revenue received through the Iowa Corn Promotion Board's sublicensing of the technology; and

NOW THEREFORE BE IT RESOLVED by the Board of Trustees of New Jersey Institute of Technology that the proposed exclusive licensing of the Intellectual Property (Reference Number 08-042, Reference Number 05-010, Reference Number 08-032, Reference Number 08-043, Reference Number 08-044, Reference Number 08-045, Reference Number 08-046, Reference Number 09-040, and Reference Number 09-056) by NJIT is hereby approved; and

THEREFORE BE IT FURTHER RESOLVED by the Board of Trustees of New Jersey Institute of Technology, that the Senior Vice President for Research & Development is hereby authorized to execute any and all agreements or documents on behalf of NJIT to consummate such licensing transactions.

Holly C. Stern, Esq.
General Counsel and
Secretary to the Board of Trustees
New Jersey Institute of Technology

Date
3F. Approve Resolution to Approve Guidelines for Graduate Faculty at NJIT
STATEMENT

The document entitled "Guidelines for Graduate Faculty at NJIT" was approved by the Faculty as a whole on October 15, 2008. The document identifies those who may belong to the Graduate Faculty, and what qualifications they must have. The primary purpose of this document is to better identify the role that tenured and tenure track faculty as well as research professors, university lecturers, research scientists or engineers, adjunct faculty and faculty from other institutions may play on dissertation and masters theses committees.
RESOLUTION TO APPROVE THE GUIDELINES FOR GRADUATE FACULTY AT NJIT

WHEREAS, the Board of Trustees has examined materials provided by the President of the University relative to the creation of and guidelines for a Graduate Faculty at NJIT, and

Whereas on October 15, 2008, the NJIT Faculty as a whole approved the Guidelines for Graduate Faculty at NJIT, and

WHEREAS, the Board of Trustees attests to the foregoing;

NOW THEREFORE BE IT RESOLVED, that the Board of Trustees approves the Guidelines for Graduate Faculty at NJIT.

February 18, 2010
Guidelines for Graduate Faculty at NJIT
Approved by the NJIT Faculty on October 15, 2008

The following guidelines for a Graduate Faculty at NJIT were approved by the Faculty at the University Faculty Meeting on October 15, 2008.

Eligibility for Graduate Faculty Status

- All tenured and tenure-track NJIT faculty are automatically members in the Graduate Faculty.
- Non-tenure-track faculty members (e.g., research professors, university lecturers, research scientists or engineers, adjunct faculty, faculty from other institutions) and non-NJIT faculty in federated departments may be appointed to the Graduate Faculty for a finite but renewable term of five years.
  - Such candidates for Graduate Faculty are approved by the Graduate Faculty members of the department, school or interdisciplinary program, endorsed by the appropriate dean of the college or school, and appointed by the Provost.
  - Normal qualifications for appointment are a doctoral degree or accepted terminal degree in the relevant field, and evidence of recent scholarly activity such as peer reviewed journal publications, publication of scholarly books or book chapters, editorial activities, externally-funded research grants, or the equivalent.
  - If the candidate does not hold a doctoral degree, there must be demonstrable evidence of relevant qualifications or experience showing that the candidate can positively contribute to the degree granting program.
- For the purpose of Graduate Faculty activities, all Graduate Faculty members may be associated with a department, school or interdisciplinary program outside of their primary department, school or interdisciplinary program appointment, or to more than one department, school or interdisciplinary program. Such affiliations are established through the normal process.
- Graduate students or students in matriculated degree programs are not eligible for membership in the Graduate Faculty. (This includes students who are also serving as adjunct faculty or other dual roles.)
Privileges and Responsibilities of Graduate Faculty

- Tenured and tenure-track NJIT faculty and research professors are, upon appointment to the graduate faculty, eligible to serve as primary advisor for a Ph.D. dissertation or masters thesis.

- Other non-tenure track Graduate Faculty members may have primary responsibility for delivery of graduate courses and serve on dissertation committees, but they are not eligible to serve as primary advisor for a Ph.D. dissertation or masters thesis, or to chair a doctoral dissertation committee, unless approved by the Graduate Faculty of the relevant department, school, or interdisciplinary graduate program.

- A Ph.D. dissertation or masters thesis may be co-advised by a Graduate Faculty member who is not tenured or tenure-track faculty.

- Other members of doctoral dissertation and masters thesis committees (other than committee chairs) need not be members of the Graduate Faculty, and such membership must be approved by the chair of the degree granting unit or by the Graduate Faculty of the department, school or interdisciplinary program. Doctoral dissertation and masters thesis committees must be formed in accordance with the current approved policy on the makeup of thesis and dissertation committees as described in the university catalog.
4A. Update on MD Degree Joint with St. George’s University
**PROGRAM ANNOUNCEMENT**

November 2009

<table>
<thead>
<tr>
<th>Institution:</th>
<th>New Jersey Institute of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Program Title:</td>
<td>Medical Sciences</td>
</tr>
<tr>
<td>Degree Designation:</td>
<td>Doctor of Medicine (Joint with St. George's University)</td>
</tr>
<tr>
<td>Degree Abbreviation:</td>
<td>MD (Joint with St. George's University)</td>
</tr>
<tr>
<td>CIP Code and Nomenclature (if possible):</td>
<td>51.1201 Medicine (MD)</td>
</tr>
<tr>
<td>Campus(es) where the program will be offered:</td>
<td>St. George's University, Grenada, West Indies and NJIT, Newark</td>
</tr>
<tr>
<td>Date when program will begin (month and year):</td>
<td>Fall 2011</td>
</tr>
<tr>
<td>List the institutions with which articulation agreements will be arranged:</td>
<td>To be determined</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:

New Jersey Board of Medical Examiners

Program Announcement Narrative

- Objectives  page(2)
- Need  page(4)
- Student Enrollments  page(7)
- Program Resources  page(7)
- Curriculum  page(9)
1. **Program Description and Objectives**

Briefly summarize the program and indicate its objectives; e.g., the nature and focus of the program, the knowledge and skills students will acquire, any cooperative arrangements with other institutions or external agencies in offering this program, etc.

The Medical Sciences program proposed is delivered over four calendar years. The first two years, offered at St. George’s University True Blue campus in Grenada, West Indies, covers the Basic Sciences. During the last two years, which cover the Clinical Sciences, students move on to study at NJIT and affiliated hospitals in New Jersey and, potentially, hospitals in states surrounding New Jersey. Following completion of the Basic Sciences, at St. George’s, and the Clinical Sciences, at NJIT, students receive a joint MD.

NJIT and St. George’s currently have a partnership whereby NJIT students are enrolled in an accelerated BS-MD program with the St. George’s School of Medicine, the student earning a BS from NJIT and the MD from St. George’s. Currently there are approximately 20 NJIT students enrolled in the accelerated program, and New Jersey ranks third among the states in applications per year to St. George’s School of Medicine. Establishment of the joint degree with St. George’s School of Medicine is a logical progression of the current partnership, will enhance recruitment of New Jersey residents into medical school, and will provide local advisement of New Jersey students in clinical clerkships.

The first two years of Medical Sciences study concentrate on the traditional basic science disciplines. Laboratory experience is an integral part of these first two years, along with small group discussions designed for problem-based learning and early integration of Basic Sciences into the clinical experience.

The approach to Clinical Sciences education provides students with the opportunity to learn medicine in some of the best and most well known hospitals in New Jersey. Some of these hospitals have already been designated by St. George’s University as Clinical Centers and would be so designated in the joint program in Medical Sciences. A Clinical Center is a hospital or group of hospitals able to provide at least four of the five core rotations, train 80–100 students at all times, and additionally offer sub internships, primary care and elective rotations. The Clinical Centers allow students to complete all of their clinical training at one site if they wish.

During the Clinical Sciences portion of the program, emphasis is on responsibility, maturity and compassion as important attributes in the development of professional excellence. Students are expected to learn
how to conduct themselves in the professional role of physician and are judged on their ability to take responsibility, to relate to and work harmoniously with professional colleagues, to exhibit maturity in conduct on the wards, and to demonstrate the disposition of a mature and qualified physician.

The goals of the curriculum are:

- To provide each student with the information core essential to all practicing physicians.

- To provide each student with the knowledge and experience necessary to advance both scientifically and humanistically in the care and treatment of sick persons.

- To emphasize the mastery of basic competencies necessary for postgraduate training.

- To encourage students to assume responsibility for their own continuing education, thus diminishing dependency on the teacher as a sole source of information and forming the basis for the self-motivated study necessary for the practicing physician's lifelong expansion of knowledge.

- To encourage students to develop a logical approach to the analysis and management of clinical problems.

- To expose students to medicine as practiced throughout the world and to provide them with the experiences necessary for the practice of medicine.

- To create awareness of the preventive aspects of medicine, of the importance of health education in the community and of the role of the physician as a health educator.

St. George's currently has affiliation agreements with over 50 hospitals and clinical centers at which third and fourth year students participate in clinical rotations. A clinical center is a hospital, or group of hospitals, able to provide at least four or five core rotations and train 80 to 100 students at all times. Clinical centers provide sub-internships, primary care rotations and electives. The following are clinical center and hospital affiliates of St. George's in New Jersey:

Clinical Centers

Saint Barnabas Healthcare System:

Saint Barnabas Medical Center

Monmouth Medical Center
St. George's also has joint programs with educational partners in the United States, the United Kingdom, Bermuda, and Africa.

2. Need

A. Need for the Program

*If the program is career-oriented or professional in nature, then in addition to student demand give evidence of labor market need and results of prospective employer surveys. Report labor market need as appropriate on local, regional, and national bases.* Specify job titles
and entry-level positions for program graduates, and/or indicate opportunities for graduates to pursue additional studies.

According to the Center for Workforce Studies, American Association of Medical Colleges (AAMC), 2008 publication *The Complexities of Physician Supply and Demand: Projections Through 2025*, the US is expected to face a shortage of physicians between 124,000 and 159,000. Much of the shortage may be attributed to the aging population in the US with the growth index of those over 65 projected to reach 160 in 2025 compared to a projected growth index of the US population of about 115 and for physicians about 105 (AAMC workforce website: *The Physician Shortage and Healthcare Reform*). In order to address this shortage, the AAMC recommends that “Enrollment in LCME-accredited medical schools should be increased by 30% from the 2002 level over the next decade. This expansion should be accomplished by increased enrollment in existing schools as well as by establishing new medical schools.” (AAMC Statement on the Physician Workforce, June 2006). LCME is the Liaison Committee on Medical Education that accredits US-based medical schools. The St. George’s program is alternatively accredited in NJ as adhering to accreditation standards that have been determined by the National Committee on Foreign Medical Education and Accreditation of the US Department of Education to be comparable to those applied to US medical schools. The proposed joint program is essentially the same as the St. George’s program and so would contribute to addressing the physician shortage in the US, and, particularly in New Jersey.

While New Jersey currently ranks relatively well in the number of physicians per population, it ranks 39th in the percentage of physicians who attended medical school in the state (AAMC workforce website: 2007 State Physician Workforce Data Book). There is no assurance that the high level of in migration of physicians that has taken place in the past will continue, and linking additional medical education to a school within the state would help to ensure that New Jersey continues to rank well in the number of physicians per population.

B. Describe the relationship of the program to the following: institutional master plans and priorities.

New Jersey Institute of Technology currently has approximately 15 degree granting programs that are related to the health and life sciences, a number of which were instituted over the past several years. An important focus of this proposal is to leverage NJIT’s long-standing strength in engineering and the physical sciences to address practical problems at the interface of these disciplines and the health and life sciences. The joint medical program with St. George’s will connect current NJIT faculty and students in health and life sciences.
with clinical practitioners to learn about practical problems faced by health care providers in an effort to address them while NJIT oversees the clinical training in the MD program. This marriage of the engineering and physical sciences with the health and life sciences is anticipated to lead to increased opportunity at NJIT for NIH research funding.

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

The joint program, which is essentially the same program currently being offered by St. George's, is similar to MD programs in surrounding states and the MD programs offered by the University of Medicine of New Jersey.

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

Distinguished Primary Care Programs

- University of Washington
- University of North Carolina-Chapel Hill
- Oregon Health and Science University
- University of Colorado-Denver
- University of California-San Francisco
- University of Vermont
- Michigan State University
- University of Massachusetts-Worcester
- University of Minnesota
- University of California-Los Angeles
- University of Iowa (Carver)

Distinguished Medical Schools for Research

- Harvard University
- Johns Hopkins University
- University of Pennsylvania
- Washington University in St. Louis
- University of California-San Francisco
- Duke University
- Stanford University
- University of Washington
- Yale University
- Columbia University
I. Students

Estimate anticipated enrollments from the program's inception until a steady state or optimum enrollment is reached.

Projected initial enrollments in consultation with St. George's would be approximately 100 students per year, or a total enrollment of 200 in the clinical portion of the program administered by NJIT. Enrollment would ramp up over a three to five year period, increasing incoming class size from about 30 to 100 over that period. Capacity could subsequently rise to as high as 200 students per year, or a total of 400 in the NJIT portion of the program.

II. Resources to Support the Program

Briefly describe the additional resources needed to implement and operate the program during the program's first five years, e.g., the number of full-time faculty, number of adjunct faculty, computer equipment, print and non-print material, etc.

A. Course Development

All courses currently exist as detailed in Section III. Curriculum.

B. Faculty

Basic Science faculty are in place at St. George's University in Grenada. Clinical faculty, who will be NJIT faculty, will be located in hospitals throughout New Jersey and brought on board as they participate in the Clinical Sciences portion of the program. Faculty to oversee the Clinical Sciences portion of the program would be brought on board at NJIT and supported from tuition revenues.

C. Libraries and Computing Facilities

Library and computing facilities are currently in place at both St. George's University in Grenada and at NJIT. Library materials in the teaching hospitals participating in the Clinical Sciences program would be available to students as well.

D. Classrooms and Laboratories

Classrooms and laboratories are in place both at St. George's and NJIT. The St. George's laboratories accommodate the Basic Sciences portion of the educational program, and the NJIT laboratories are predominately in engineering and the physical sciences and offer the
opportunity for research partnerships between faculty in those disciplines and the clinical faculty associated with the program.

Financial Resources/Managerial Structure

The joint program is structured to be self-supporting. St. George’s collects and retains the first two years of tuition, while NJIT, through a non-profit corporation affiliated with NJIT, collects and retains the final two years of tuition. Using current St. George's tuition rates, each clinical student pays $49,333 per year. The clinical program pays each hospital teaching clinical rotations $16,000 per year per student. Net tuition revenue is then $33,333 per student per year. Using an enrollment of 50 students per class, or 100 students, which is less than the anticipated steady state enrollment of 100 students per class, net revenue is $3,333,300 per year. Estimating that eight full-time-equivalent employees will be needed to carry out the clinical program, personnel costs are estimated at $920,000 per year. Adding operating costs at an indirect cost rate of 50%, total personnel and operating costs total $1,380,000. Net revenue over cost then totals $1,953,300 per year with a total enrollment of 100 students. The net revenue to the corporation is available for purchasing services from NJIT or direct allocation back to NJIT.

Managerially, the non-profit corporation is established to oversee the finances of the program and to insulate its assets and liabilities from those of NJIT. Personnel of the program would be NJIT employees through an affiliation agreement between NJIT and the non-profit corporation. Employees would consist of a Dean of Medicine, reporting to the Provost and Sr. Vice President for Academic Affairs, clinical faculty reporting to the Dean, and staff reporting to the Dean.
The curriculum is listed below and is identical to the St. George's current curriculum and is shown for a student entering the current St. George's program in Fall 2009:

**MEDICAL PROGRAM**

### Academic Year One: Basic Sciences

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 531</td>
<td>Histology and Cell Biology</td>
<td>4 cr.</td>
</tr>
<tr>
<td>ANAT 550</td>
<td>Human Gross and Developmental Anatomy</td>
<td>8 cr.</td>
</tr>
<tr>
<td>BCHM 550</td>
<td>Medical Biochemistry</td>
<td>6 cr.</td>
</tr>
<tr>
<td>BIOE 501</td>
<td>Bioethics and the Professional: Medicine in Society I</td>
<td>1 cr.</td>
</tr>
<tr>
<td>PHY 510</td>
<td>Neuroscience</td>
<td>5 cr.</td>
</tr>
<tr>
<td>BCHM 590</td>
<td>Medical Genetics</td>
<td>1 cr.</td>
</tr>
<tr>
<td>MICR 580</td>
<td>Medical Immunology</td>
<td>2 cr.</td>
</tr>
<tr>
<td>PHY 560</td>
<td>Physiology</td>
<td>5 cr.</td>
</tr>
<tr>
<td>PUBH 501</td>
<td>Topics in Community and Preventive Medicine: Medicine in Society II</td>
<td>1 cr.</td>
</tr>
<tr>
<td>MICR 660</td>
<td>Medical Parasitology</td>
<td>1 cr.</td>
</tr>
</tbody>
</table>

### Academic Year Two: Basic Sciences

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEHS 640</td>
<td>MODULE: Behavioral Sciences and Medicine</td>
<td>6 cr.</td>
</tr>
<tr>
<td>MICR 570</td>
<td>Medical Microbiology</td>
<td>5 cr.</td>
</tr>
<tr>
<td>CLSK 653</td>
<td>Communication Skills and Physical Diagnosis</td>
<td>3 cr.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>PATH 640</td>
<td>Pathology</td>
<td>13 cr.</td>
</tr>
<tr>
<td>PATH 693</td>
<td>Medical Nutrition</td>
<td>2 cr.</td>
</tr>
<tr>
<td>PATH 670</td>
<td>Pathophysiology I</td>
<td>4 cr.</td>
</tr>
<tr>
<td>PHAR 680</td>
<td>Pharmacology I</td>
<td>2 cr.</td>
</tr>
<tr>
<td>CLSK 654/655</td>
<td>Introduction to Clinical Medicine</td>
<td>2 cr.</td>
</tr>
<tr>
<td>PATH 674</td>
<td>Pathophysiology II</td>
<td>8 cr.</td>
</tr>
<tr>
<td>PHAR 681</td>
<td>Pharmacology II</td>
<td>4 cr.</td>
</tr>
<tr>
<td>PATH 675/676</td>
<td>Basic Science Foundation for Clinical Reasoning</td>
<td>2 cr.</td>
</tr>
</tbody>
</table>

**Clinical Years**

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>August 2009 Entrants</th>
<th>January 2010 Entrants</th>
<th>August 2010 Entrants</th>
<th>January 2011 Entrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Radiology (Elective)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Year</td>
<td>August 2009 Entrants</td>
<td>January 2010 Entrants</td>
<td>August 2010 Entrants</td>
<td>January 2011 Entrants</td>
</tr>
<tr>
<td>Four</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatrics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatrics Sub-Internship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Care/Family Practice</td>
<td>Nov. 16, 2012</td>
<td>Nov. 15, 2013 – July 18, 2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(Elective)

<table>
<thead>
<tr>
<th>Academic Year Five</th>
<th>August 2009 Entrants</th>
<th>January 2010 Entrants</th>
<th>August 2010 Entrants</th>
<th>January 2011 Entrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematology (Elective)</td>
<td>2012 –</td>
<td>–</td>
<td>2013 –</td>
<td>2014 –</td>
</tr>
<tr>
<td>Cardiology (Elective)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Clinical Years consist of five terms for a total of 80 weeks.

SAMPLE: This listing does not indicate the sequence of courses. The core rotation schedules are determined by the hospital at the time students are admitted into the clinical program. In general, students complete their core rotations before doing additional requirements and electives. Primary Care can be taken at any point in the clinical curriculum. Electives listed above are examples of the many options available. Elective choices and schedules are arranged individually by students in consultation with the hospital administration.

Hospitals have the option of requiring students to attend an orientation. This orientation can last up to a week and is a non-credit experience.
4B. Update on Middle-States Self Study
<table>
<thead>
<tr>
<th>Time</th>
<th>Meeting Location</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM</td>
<td>Eberhardt North Lounge</td>
<td>Breakfast with Drs. Elliot, Tricamo, and Deess</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>President's Office</td>
<td>Meeting with President</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>10:15 AM</td>
<td>Break</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>10:45 AM</td>
<td>425 Fenster</td>
</tr>
<tr>
<td>10:45 AM</td>
<td>10:50 AM</td>
<td>Break</td>
</tr>
<tr>
<td>10:50 AM</td>
<td>11:20 AM</td>
<td>400 Fenster</td>
</tr>
<tr>
<td>11:20 AM</td>
<td>11:25 AM</td>
<td>Break</td>
</tr>
<tr>
<td>11:25 AM</td>
<td>11:55 AM</td>
<td>425 Fenster</td>
</tr>
<tr>
<td>11:55 AM</td>
<td>12:10 PM</td>
<td>Break</td>
</tr>
<tr>
<td>12:10 PM</td>
<td>12:55 PM</td>
<td>Eberhardt South Lounge</td>
</tr>
<tr>
<td>12:55 PM</td>
<td>1:20 PM</td>
<td>Lunch with Representative Governing Board</td>
</tr>
<tr>
<td>1:20 PM</td>
<td>2:50 PM</td>
<td>325 Fenster</td>
</tr>
<tr>
<td>2:50 PM</td>
<td>3:00 PM</td>
<td>Break</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>3:20 PM</td>
<td>325 Fenster</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meeting with Drs. Elliot, Tricamo, and Deess</td>
</tr>
</tbody>
</table>
4C. Update on Purchase of Central High School
4D. Update on Status of NJIT Campus Gateway Plan
Status of NJIT Campus Gateway Plan

- December 2009
  - NJIT enters into Development Agreement with Jones Lang LaSalle, Inc.
  - Jones Lang LaSalle, Inc. enters into a joint venture with Merchant Equity Group to form Merchant Equity Institutional Partners, LLC

  The Merchant Equity Group is a private equity investment and asset management company with interests in a diverse portfolio of commercial real estate, including major urban office buildings, shopping centers and undeveloped land.

  The principals of Merchant Equity have an entrepreneurial and opportunistic investment philosophy, which drives the group toward early stage investment opportunities, value-added development projects, and complex structured finance transactions.

  Merchant Equity also selectively provides strategic asset management advisory and workout services on a fee basis for institutional investors.

  - Jones Lang LaSalle, Inc. assigns development responsibilities to Merchant Equity Institutional Partners, LLC
  - Merchant Equity Institutional Partners, LLC remits first of four installments ($50,000) to initiate repayment of NJIT’s cash advance to Jones Lang LaSalle, Inc. to develop Redevelopment Plan.
  - Merchant Equity Institutional Partners, LLC drafts an Offering Document for development of the Greek Village and Warren St. property

- January 2010
  - NJIT submits Business Reporting and Outreach Plan to City of Newark
  - NJIT submits Phasing Plan to City of Newark
  - NJIT release Request for Qualifications for Outside Counsel to provide legal services on the Gateway Project

- February 2010
  - Merchant Equity Institutional Partners, LLC updating Offering Document/Request for Proposals for development of the Greek Village with input from the Greek Village Task Force for release in March or April
  - NJIT reviews Request for Qualification submissions for Outside Counsel to provide legal services on the Gateway Project
4E. Honorary Doctorate Degrees for 2010
NJIT Honorary Doctorate Degree Candidates
Commencement 2010

Ralph Izzo
Ralph has been chairman, president and chief executive officer of Public Service Enterprise Group Incorporated (PSEG) since April, 2007. He had served as president and chief operating officer of PSEG since October, 2006 when he was also elected to the Board of Directors. Earlier, Mr. Izzo was president and chief operating officer of Public Service Electric and Gas Company.

Mr. Izzo is a well-known leader within the utility industry, as well as the public policy arena. His public policy experience includes service as an American Physical Society Congressional Science Fellow, in the office of U.S. Senator Bill Bradley. He also served four years as a senior policy advisor in the Office of New Jersey Governor Thomas H. Kean, specializing in energy, science and technology.

Mr. Izzo's career began as a research scientist at the Princeton Plasma Physics Laboratory, performing numerical simulations of fusion energy experiments. He has published or presented over 35 papers on magnetohydrodynamic modeling. Mr. Izzo received his Bachelor of Science and Master of Science degrees in mechanical engineering and his Doctor of Philosophy degree in applied physics from Columbia University.

Mr. Izzo is chairman of the board for the Drumthwacket Foundation. He serves on the board of directors for the New Jersey Chamber of Commerce, the New Jersey Utilities Association, the Edison Electric Institute (EEI), the Nuclear Energy Institute (NEI), The Center for Energy Workforce Development, and Rutgers - The State University of New Jersey.

Leon G. Smith
Dr. Leon Smith is Chairman of Medicine at St. Michaels Medical Center in Newark, and Chair of Seton Hall's University School of Graduate Medical Education. He holds academic positions at UMDNJ and at the New Jersey Medical School. He also serves as Executive Vice President for the Catholic Health and Human Services Corporation. Dr. Smith received his B.A. from NYU and his MD from Georgetown University Medical School, graduating magna cum laude. He completed his internship at Georgetown University Hospital, his residency at Yale-New Haven Hospital. He came to Newark in 1962, and has devoted more than 45 years to the Newark community and to New Jersey through his work at St. Michael's. Dr. Smith's support for NJIT programs and students has been strong, including our partnership for the BS/MD program through St. George's University in which students study for three years at NJIT, receive two years of medical training at St. George's, and return to Newark for a two-year internship program at St. Michael's.
4F. Operating Statement
Year to Date
### Restricted Funds

<table>
<thead>
<tr>
<th>FY2010 Budget</th>
<th>FY2010 YTD</th>
<th>50% of Budget</th>
<th>FY2010</th>
<th>FY2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuition and Fees</td>
<td>116,110</td>
<td>108,127</td>
<td>93%</td>
<td>94%</td>
</tr>
<tr>
<td>Appropriations, Contracts, Gifts</td>
<td>70,470</td>
<td>33,227</td>
<td>47%</td>
<td>46%</td>
</tr>
<tr>
<td>Other sources</td>
<td>12,176</td>
<td>5,964</td>
<td>49%</td>
<td>44%</td>
</tr>
<tr>
<td>Allocated Balances</td>
<td>2,408</td>
<td>1,204</td>
<td>50%</td>
<td>32%</td>
</tr>
<tr>
<td>Total</td>
<td>201,164</td>
<td>148,522</td>
<td>74%</td>
<td>72%</td>
</tr>
<tr>
<td>Expenditures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>72,900</td>
<td>37,465</td>
<td>51%</td>
<td>50%</td>
</tr>
<tr>
<td>Research</td>
<td>6,300</td>
<td>3,112</td>
<td>49%</td>
<td>27%</td>
</tr>
<tr>
<td>Public Service</td>
<td>2,607</td>
<td>1,541</td>
<td>59%</td>
<td>50%</td>
</tr>
<tr>
<td>Academic Support</td>
<td>19,300</td>
<td>8,382</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Student Services</td>
<td>14,000</td>
<td>6,547</td>
<td>47%</td>
<td>50%</td>
</tr>
<tr>
<td>Institutional Support</td>
<td>33,507</td>
<td>13,643</td>
<td>41%</td>
<td>55%</td>
</tr>
<tr>
<td>Operation and Maintenance of Physical Plant</td>
<td>15,796</td>
<td>6,717</td>
<td>43%</td>
<td>40%</td>
</tr>
<tr>
<td>Financial Aid to Students</td>
<td>20,279</td>
<td>10,615</td>
<td>52%</td>
<td>49%</td>
</tr>
<tr>
<td>Total Education and General</td>
<td>184,689</td>
<td>88,022</td>
<td>48%</td>
<td>48%</td>
</tr>
<tr>
<td>Transfers</td>
<td>16,475</td>
<td>8,073</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>Total</td>
<td>201,164</td>
<td>146,595</td>
<td>74%</td>
<td>72%</td>
</tr>
</tbody>
</table>

### Unrestricted Funds

<table>
<thead>
<tr>
<th>FY2010 Budget</th>
<th>FY2010 YTD</th>
<th>50% of Budget</th>
<th>FY2010</th>
<th>FY2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuition and Fees</td>
<td>108,127</td>
<td>108,127</td>
<td>93%</td>
<td>94%</td>
</tr>
<tr>
<td>Appropriations, Contracts, Gifts</td>
<td>33,227</td>
<td>33,227</td>
<td>47%</td>
<td>46%</td>
</tr>
<tr>
<td>Other sources</td>
<td>5,964</td>
<td>5,964</td>
<td>49%</td>
<td>44%</td>
</tr>
<tr>
<td>Allocated Balances</td>
<td>1,204</td>
<td>1,204</td>
<td>50%</td>
<td>32%</td>
</tr>
<tr>
<td>Total</td>
<td>148,522</td>
<td>148,522</td>
<td>74%</td>
<td>72%</td>
</tr>
<tr>
<td>Expenditures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>37,465</td>
<td>37,465</td>
<td>51%</td>
<td>50%</td>
</tr>
<tr>
<td>Research</td>
<td>3,112</td>
<td>3,112</td>
<td>49%</td>
<td>27%</td>
</tr>
<tr>
<td>Public Service</td>
<td>1,541</td>
<td>1,541</td>
<td>59%</td>
<td>50%</td>
</tr>
<tr>
<td>Academic Support</td>
<td>8,382</td>
<td>8,382</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>Student Services</td>
<td>6,547</td>
<td>6,547</td>
<td>47%</td>
<td>50%</td>
</tr>
<tr>
<td>Institutional Support</td>
<td>13,643</td>
<td>13,643</td>
<td>41%</td>
<td>55%</td>
</tr>
<tr>
<td>Total Education and General</td>
<td>88,022</td>
<td>88,022</td>
<td>48%</td>
<td>48%</td>
</tr>
<tr>
<td>Auxiliary Enterprises</td>
<td>3,796</td>
<td>3,796</td>
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<td>54%</td>
</tr>
<tr>
<td>Auxiliary Transfers</td>
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<td>2,659</td>
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<tr>
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<td>6,455</td>
<td>6,455</td>
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<td>52%</td>
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<tr>
<td>Total Expenditures &amp; Transfers</td>
<td>102,550</td>
<td>102,550</td>
<td>48%</td>
<td>48%</td>
</tr>
</tbody>
</table>

### Excess Of Revenues Over Expenditures And Transfers

<table>
<thead>
<tr>
<th></th>
<th>FY2010</th>
<th>FY2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditures</td>
<td>0</td>
<td>57,095</td>
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</table>
New Jersey Institute Of Technology  
Expense Report  
For the Six Months Ended December 31, 2009  
(Dollars in Thousands)

<table>
<thead>
<tr>
<th></th>
<th>Current Month</th>
<th>FY2010 YTD</th>
<th>FY2010 Budget</th>
<th>50% of Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Actual Year to Date</td>
</tr>
<tr>
<td>Academic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries &amp; Fringe Benefits</td>
<td>$8,354</td>
<td>$51,167</td>
<td>$99,340</td>
<td>52%</td>
</tr>
<tr>
<td>Equipment Purchases</td>
<td>90</td>
<td>751</td>
<td>2,676</td>
<td>28%</td>
</tr>
<tr>
<td>Financial Aid to Students</td>
<td>248</td>
<td>10,615</td>
<td>20,279</td>
<td>52%</td>
</tr>
<tr>
<td>Other Operating Expenses:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>108</td>
<td>682</td>
<td>1,348</td>
<td></td>
</tr>
<tr>
<td>Travel &amp; Development</td>
<td>172</td>
<td>821</td>
<td>1,589</td>
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<td>Library Collections</td>
<td>1</td>
<td>132</td>
<td>1,084</td>
<td></td>
</tr>
<tr>
<td>Other General Operating</td>
<td>631</td>
<td>3,494</td>
<td>9,070</td>
<td></td>
</tr>
<tr>
<td>Total Other Operating</td>
<td>912</td>
<td>5,129</td>
<td>13,091</td>
<td>39%</td>
</tr>
<tr>
<td>Total Academic</td>
<td>9,604</td>
<td>67,662</td>
<td>135,386</td>
<td>50%</td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries &amp; Fringe Benefits</td>
<td>2,092</td>
<td>13,830</td>
<td>29,000</td>
<td>48%</td>
</tr>
<tr>
<td>Equipment Purchases</td>
<td>13</td>
<td>136</td>
<td>502</td>
<td>27%</td>
</tr>
<tr>
<td>Utilities</td>
<td>673</td>
<td>3,701</td>
<td>10,311</td>
<td>36%</td>
</tr>
<tr>
<td>Other Operating Expenses:</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>56</td>
<td>392</td>
<td>1,030</td>
<td></td>
</tr>
<tr>
<td>Travel &amp; Development</td>
<td>26</td>
<td>155</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Other General Operating</td>
<td>353</td>
<td>2,146</td>
<td>6,253</td>
<td></td>
</tr>
<tr>
<td>Total Other Operating</td>
<td>435</td>
<td>2,693</td>
<td>7,653</td>
<td>35%</td>
</tr>
<tr>
<td>Total Support</td>
<td>3,213</td>
<td>20,360</td>
<td>47,466</td>
<td>43%</td>
</tr>
<tr>
<td>Transfers</td>
<td>1,112</td>
<td>8,073</td>
<td>16,475</td>
<td>49%</td>
</tr>
<tr>
<td>Total Academic, Support &amp; Transfers</td>
<td>13,929</td>
<td>96,095</td>
<td>199,327</td>
<td>48%</td>
</tr>
<tr>
<td>Auxiliary Enterprises</td>
<td>841</td>
<td>3,796</td>
<td>7,427</td>
<td>51%</td>
</tr>
<tr>
<td>Auxiliary Transfers</td>
<td>444</td>
<td>2,659</td>
<td>5,317</td>
<td>50%</td>
</tr>
<tr>
<td>Total Auxiliary Expenses</td>
<td>1,285</td>
<td>6,455</td>
<td>12,744</td>
<td></td>
</tr>
<tr>
<td>FY2011 Reserve</td>
<td>0</td>
<td>0</td>
<td>1,837</td>
<td>0%</td>
</tr>
<tr>
<td>Total Unrestricted Expenses</td>
<td>15,214</td>
<td>102,550</td>
<td>213,908</td>
<td>48%</td>
</tr>
<tr>
<td>Restricted Expenses</td>
<td>4,438</td>
<td>36,929</td>
<td>71,222</td>
<td>52%</td>
</tr>
<tr>
<td>Total Expenses And Transfers</td>
<td>$19,652</td>
<td>$139,479</td>
<td>$285,130</td>
<td>49%</td>
</tr>
</tbody>
</table>
4G. Schedule of Short Term Investments
<table>
<thead>
<tr>
<th>TYPE OF INVESTMENT</th>
<th>USBANK</th>
<th>WACHOVIA</th>
<th>CITY NATIONAL BANK</th>
<th>WELLS CHASE</th>
<th>JP MORGAN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Deposit Sweep Account</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 108,728</td>
</tr>
<tr>
<td>U.S. Treasury Notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 4,269,888</td>
</tr>
<tr>
<td>Certificate of Deposit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 500,000</td>
</tr>
<tr>
<td>Prime Money Market Fund</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 2,285,851</td>
</tr>
<tr>
<td>US Treasury &amp; Agency Short Term Obligations-Disc Notes</td>
<td>$ 1,409,590</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 1,409,590</td>
</tr>
<tr>
<td>US Government Issues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ 498,600</td>
</tr>
<tr>
<td>Commercial Paper</td>
<td>1,549,574</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,549,574</td>
</tr>
<tr>
<td>Evergreen Instl Money Market Class Institutional</td>
<td>1,063,012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7,859,012</td>
</tr>
<tr>
<td><strong>TOTAL INVESTMENTS</strong></td>
<td>$ 4,520,776</td>
<td>$ 6,796,000</td>
<td>$ 500,000</td>
<td>$ 4,378,616</td>
<td>$ 2,285,851</td>
<td>$ 18,481,243</td>
</tr>
</tbody>
</table>

Note: Investments as of December 31, 2008 were $27,268,972.
4H. Spring 10 Enrollment
4I. Report on Gifts and Fund Raising Activities

Comparison of Total Giving Year to Date:

<table>
<thead>
<tr>
<th>Category</th>
<th>All Sources: $9,118,070</th>
<th>All Sources without Gifts in $7,049,077</th>
<th>Matching Gifts: $25,521</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td>$9,118,070</td>
<td>$7,427,135</td>
<td>$4,303,657</td>
</tr>
<tr>
<td></td>
<td>$7,049,077</td>
<td>$5,902,458</td>
<td>$3,448,880</td>
</tr>
<tr>
<td></td>
<td>$25,521</td>
<td>$46,583</td>
<td>$21,477</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$2,180,473¹</td>
<td>$2,198,718²</td>
<td>$1,290,271³</td>
</tr>
<tr>
<td>Alum</td>
<td>23.9%</td>
<td>29.6%</td>
<td>29.9%</td>
</tr>
<tr>
<td></td>
<td>3,315</td>
<td>2,739</td>
<td>2,686</td>
</tr>
<tr>
<td></td>
<td>$3,241,884⁴</td>
<td>$2,891,992⁵</td>
<td>$2,143,182⁶</td>
</tr>
<tr>
<td>Corp</td>
<td>35.5%</td>
<td>38.9%</td>
<td>49.8%</td>
</tr>
<tr>
<td></td>
<td>194</td>
<td>229</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>$2,493,415⁷</td>
<td>$1,930,158⁸</td>
<td>$398,488</td>
</tr>
<tr>
<td>Foundations</td>
<td>27.3%</td>
<td>25.9%</td>
<td>9.26%</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>$1,008,531⁹</td>
<td>$307,374</td>
<td>$327,971</td>
</tr>
<tr>
<td>Friends</td>
<td>11.0%</td>
<td>4.14%</td>
<td>7.62%</td>
</tr>
<tr>
<td></td>
<td>235</td>
<td>256</td>
<td>259</td>
</tr>
<tr>
<td></td>
<td>$193,767</td>
<td>$98,892</td>
<td>$143,744</td>
</tr>
<tr>
<td>Other</td>
<td>2.13%</td>
<td>1.33%</td>
<td>3.34%</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Totals:</td>
<td>$9,118,070</td>
<td>$7,427,135</td>
<td>$4,303,657</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>$4,303,657</td>
<td>52%</td>
</tr>
</tbody>
</table>

¹ Alumni – Spatz Bequest $1M
² Alumni – Spatz Bequest $977K
³ Alumni – Ref Bequest $600K
⁴ Corporations – Anonymous $1.9M
⁵ Corporations – Anonymous $1.2M
⁶ Corporation – FMC Corp $504k, Anonymous $314K
⁷ Foundation – Stable $1.9M
⁸ Foundation – Stable $1M
⁹ Friends – Murawski $700K
4J. Fund Raising Growth Strategies
Chairperson’s Closing Statement
BOARD OF TRUSTEES

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 APRIL 8, 2010 AT 9:30 AM, EBERHARDT HALL NJIT ALUMNI CENTER BOARD ROOM.