

**NJIT BOARD OF TRUSTEES**  
**Thursday, February 10<sup>th</sup>, 2011**

**PUBLIC SESSION MEETING**



# **NEW JERSEY INSTITUTE OF TECHNOLOGY**

## **BOARD OF TRUSTEES**

### **PUBLIC SESSION**

**February 10, 2011**

**11:00 AM**

#### **Call to Order**

- 1. Notice of Meeting to Public** (statement to be read by the Chair, a requirement of the NJ Open Public Meeting Act)
- 2. Public Comments**
- 3. Action Items**
  - A.** Approve minutes of the November 4, 2010 and December 15, 2010 meetings of the Board of Trustees
  - B.** Approve Sabbatical Leave Applications
  - C.** Approve Resolution to Authorize New MS in Cyber Security and Privacy
  - D.** Approve Resolution to Make Student Housing Payment
- 4. Reports**
  - A.** Update on Middle-States Self Study
  - B.** Update on Central King Building
  - C.** Update on status of NJIT Campus Gateway Plan
  - D.** Intangible Asset Review
  - E.** Honorary Doctorate Degrees for 2011
  - F.** Operating Statement Year to Date
  - G.** Schedule of Short Term Investments
  - H.** Spring 11 enrollment
  - I.** Report on gifts and fund raising activities
- 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 7, 2011, 9:30 AM, Eberhardt Hall NJIT Alumni Center Board Room

Announce next public meeting: Thursday, April 7, 2011, 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**

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**“NOTICE OF THIS MEETING WAS PROVIDED TO THE PUBLIC  
AS REQUIRED BY THE NEW JERSEY PUBLIC MEETING ACT, IN  
THE SCHEDULE OF MEETING DATES OF THE BOARD OF  
TRUSTEES OF THE NEW JERSEY INSTITUTE OF TECHNOLOGY  
WHICH WAS MAILED TO THE STAR LEDGER, THE HERALD NEWS,  
AND THE VECTOR ON NOVEMBER 19, 2008. THIS SCHEDULE WAS  
ALSO MAILED TO THE COUNTY CLERK ON NOVEMBER 19, 2008  
FOR FILING WITH THAT OFFICE AND POSTING IN SUCH PUBLIC  
PLACE AS DESIGNATED BY SAID CLERK.”**

## **2. Public Comments**

**3A. Approve Minutes of the  
November 4, 2010 and  
December 10, 2010 Meeting  
of the Board of Trustees**

**NEW JERSEY INSTITUTE OF TECHNOLOGY  
BOARD OF TRUSTEES  
MINUTES OF MEETING (DRAFT)  
(November 4, 2010)**

1. The meeting was called to order by Chairperson Wielkopolski, at 12:50 p.m. Other Trustees in attendance were Vice Chairs DeCaprio and DePalma, and Board Members Garcia, Knapp, Sugla and Wolff. Also in attendance were President Altenkirch, Mr. Mauermeyer, Board Treasurer, and Ms. Holly Stern, Board Secretary.

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

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

2. BY A MOTION DULY MADE BY MR. KNAPP, SECONDED BY DR. DeCAPRIO AND UNANIMOUSLY PASSED, the minutes of the September 16, 2010 meeting of the Board of Trustees were approved.
3. BY A MOTION DULY MADE BY MR. WOLFF, SECONDED BY MR. DePALMA AND UNANIMOUSLY PASSED (Chairperson Wielkopolski abstaining, as she was not in attendance at that meeting), the minutes of the October 21, 2010 meeting of the Board of Trustees were approved.
4. BY A MOTION DULY MADE BY MR. WOLFF, SECONDED BY MR. SUGLA AND UNANIMOUSLY PASSED, the Board voted to APPROVE THE SCHEDULE OF MEETINGS FOR FY 2013.
5. BY A MOTION DULY MADE BY MR. WOLFF, SECONDED BY DR. DeCAPRIO AND UNANIMOUSLY PASSED, the Board voted to APPROVE RESOLUTION TO AMEND INVESTMENT POLICY.
6. The Board determined to postpone a vote on the RESOLUTION TO ADOPT SUPPLEMENTAL BENEFIT PROGRAM AND TRUST, in order to better evaluate the impact of this currently unbudgeted expense, for this year and for



future years. It is anticipated that with additional information the Board will consider this issue at a telephonic meeting prior to the end of the year.

7. The Board of Trustees Scholarship recipient, Andrew Harrison, addressed the Board. Mr. Harrison is an IT major, and a junior at NJIT, and attends the Honors College. Mr. Harrison thanked the Board of Trustees and the Honors College, remarking that it is the people at the Honors College who make it what it is. Chairperson Wielkopolski thanked Mr. Harrison on behalf of the Board.
8. President Altenkirch discussed the NJIT Campus Plan/Greek Village. The plan is moving along with respect to the Greek Village and parking deck over the next few months.
9. President Altenkirch discussed the Strategic Plan and the Middle States Self-Study. We've collected all the information from the Vice Presidents and assimilated that information into a spreadsheet. The Middle States Self-Study is moving along well.
10. President Altenkirch next addressed the status of the former Central High School property. We are undergoing renovations in order to use the second floor for final examination space and additional classroom space.
11. Sr. Vice President Sebastian gave a report on Research Growth Strategies, indicating that this was the short version, with the subject being revisited at the April meeting. We are aggressively pursuing focal points of research identified and made part of the updated Strategic Plan. As part of our wired telecommunications plan, we have forged a new relationship with Alcatel-Lucent.
12. Vice President Bloom gave a report on Spring Enrollment targets. We've had a record enrollment this Fall of 8926, and the projected Spring enrollment is 8466, approximately a 5% drop off, which is a reasonable pattern from Fall to Spring. We are concerned over the drop in graduate students. In all, there is a delta of 113 over our Spring of 2009 enrollment, which is a smaller increase than in the past.
13. The Board next discussed the report on NJIT Community Service. Chairperson Wielkopolski praised the report, noting that NJIT's civic engagement was impressive. Vice Chair DeCaprio concurred.
14. Treasurer Mauermeyer reported on the Operating Statement Year to Date and Schedule of Short Term Investments, referring to the board materials. We are currently on target, all the way around.
15. Vice President Dees reported on Gifts and Fund Raising Activities. He discussed the handouts, and gave an update on the Celebration event. The number of alumni making gifts is down significantly from last year. He noted that the

university e-mail system was down for a week, and we are currently still catching up. We have been fortunate this year with a few windfall gifts.

16. The Chairperson announced that the next scheduled closed session would be convened on Thursday, February 11, 2011 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 11, 2011 at 9:30 AM, Eberhardt Hall Board Room.

The next Public Session of the Board will take place on Thursday, February 11, 2011 at 11:00 AM, Eberhardt Hall Board Room, following the Closed Session of the Board. A Board retreat will follow after the close of the Public Session.

10. The meeting was adjourned at 1:10 pm.

11. After a lunch break, the Board reconvened for the retreat portion of the meeting. President Altenkirch began the meeting by noting that there will be a few general presentations. Anthony Cicatiello of CN Communications will lead the discussion on branding, followed by a presentation by the President. After general discussion, there will be individual presentations from Career Development Services, Admissions, and the Office of Strategic Communications.

12. Mr. Cicatiello began by presenting an overview of the efforts of CN Communications since their retention five years ago. Branding is a multi-year sustained coordinated effort. It includes everything from environmental graphics, targeted mailing of the branding kit, airport advertising, and on-line advertising. Looking ahead, the website and NJIT's on-line presence is critical. Board Member Knapp asked about our advertising efforts in community colleges, as they are a source of our transfer population.

13. President Altenkirch next lead a discussion on NJIT Brand Messaging, discussing our audiences, messages, delivery vehicles, the web evolution, delivery planning, branding messaging impact, and future NJIT brand messaging. A board discussion then ensued. Vice President Bloom noted that we are a specialty school, not always on the radar of guidance counselors in general, though high-tech high schools are very aware of us. Chairperson Wielkopolski asked about engagement activities, and how we get the word out. Dr. Bloom answered that this takes place largely through the university website.

14. Kathy Kelly, Associate Vice President of University Admissions, next gave a presentation on message delivery, strategy and outcomes. Specifically, she discussed these issues with respect to both undergraduate and graduate students, noting delivery formats and methods, as well as opportunities for future messaging. In the Board discussion following, it was noted that companies are cutting their funding for tuition remission for employees. Other topics discussed included overseas recruiting, and surveying students for reasons they did not select NJIT.

15. Jim Robertson, Director of Web Services and Jean Llewellyn, Executive Director of Strategic Communications from the Office of Strategic Communications presented next. Mr. Robertson discussed the high-level website redesign goals. We have contracted with White Whale Web Design, and will launch a new home page by the end of December.

16. Gregory Mass, Director of Career Development Services presented last. He gave an overview of marketing our brand, and discussed promotion of NJIT to employers and agencies, which employ NJIT students and graduates.

The meeting was adjourned at 4:30 p.m.

**NEW JERSEY INSTITUTE OF TECHNOLOGY  
BOARD OF TRUSTEES  
MINUTES OF SPECIAL MEETING (DRAFT)  
(December 15, 2010)**

1. The meeting was called to order by Chairperson Wielkopolski, at 12:10 p.m. Trustees in telephonic attendance were Vice Chairs DeCaprio and DePalma, and Board Members Beachem, Cistaro, Knapp, O'Brien, Sugla and Wolff. Also in attendance were President Altenkirch and Ms. Holly Stern, Board Secretary (telephonically).

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

“Notice of this special meeting was provided to the public as required by the New Jersey Meeting Act, pursuant to a notice which was mailed to the Star Ledger, The Herald News and Vector on December 9, 2010. The Schedule was also mailed to the City Clerk of Newark on December 9, 2010, for filing with that office and posting in such public place as designated by said Clerk.”

2. The Board then moved to go into closed session to discuss matters regarding personnel.
3. The Board continued the public portion of the meeting at 1:05 p.m.
4. BY A MOTION DULY MADE BY MR. DePALMA, SECONDED BY MR. WOLFF AND UNANIMOUSLY PASSED, the Board voted to approve RESOLUTION TO ADOPT SUPPLEMENTAL BENEFIT PROGRAM AND TRUST.
5. The meeting adjourned at 1:10 p.m.

## **3B. Approve Sabbatical Leave Applications**

To: Robert A. Altenkirch  
President

From: Ian Gatley  
Provost and Senior Vice President for Academic Affairs

Re: Sabbatical Recommendations for AY 2010 – 2011

Date: January 28, 2011

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Following our standard procedure of inviting proposals for sabbaticals, fifteen proposals were received from faculty members for sabbatical leave to be taken during Academic Year 2011-2012. 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 recommend that the following twelve faculty members be approved for sabbatical leave for the period indicated.

|                    |            |           |
|--------------------|------------|-----------|
| Cristian Borcea    | CS         | 2011-2012 |
| Zeynep Celik       | CoAD       | 2011-2012 |
| Janice Daniel      | CEE        | 2011-2012 |
| Rajesh Dave        | CPB        | 2011-2012 |
| Hongya Ge          | ECE        | 2011-2012 |
| Shidong Jiang      | Math       | 2011-2012 |
| Carol Siri Johnson | Humanities | Fall 2011 |
| Eric Katz          | Humanities | 2011-2012 |
| Rajiv Mehta        | SoM        | 2011-2012 |
| Richard Moore      | Math       | 2011-2012 |
| Stephen Pemberton  | History    | 2011-2012 |
| Anthony Rosato     | MIE        | 2011-2012 |



To: Members of the Board of Trustees

From: Ian Gatley  
Provost and Senior Vice President for Academic Affairs

Re: Sabbatical Leave Recommendations for AY 2011-2012

Date: January 28, 2011

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Pursuant to the Faculty Handbook and with the concurrence of Dr. Altenkirch, I recommend that the twelve faculty members listed on the attached memo be awarded sabbatical leaves during academic year 2011-2012. Fifteen 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 2011-2012 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

| Academic Year |             | Total New Leaves |
|---------------|-------------|------------------|
| AY            | 1993 - 1994 | 13               |
| AY            | 1994 - 1995 | 15               |
| AY            | 1995 - 1996 | 13               |
| AY            | 1996 - 1997 | 14               |
| AY            | 1997 - 1998 | 12               |
| AY            | 1998 - 1999 | 14               |
| AY            | 1999 - 2000 | 15               |
| AY            | 2000 - 2001 | 4                |
| AY            | 2001 - 2002 | 13               |
| AY            | 2002 - 2003 | 17               |
| AY            | 2003 - 2004 | 20               |
| AY            | 2004 - 2005 | 9                |
| AY            | 2005 - 2006 | 9                |
| AY            | 2006 - 2007 | 13               |
| AY            | 2007 - 2008 | 14               |
| AY            | 2008 - 2009 | 16               |
| AY            | 2009 - 2010 | 6                |
| AY            | 2010 – 2011 | 10               |



## **SABBATICAL PROPOSALS FOR ACADEMIC YEAR 2011 – 2012**

### **SUMMARY**

#### **BOARD OF TRUSTEES**

**FEBRUARY 10, 2010**

#### **Professor Cristian Borcea – Department of Computer Science**

This is Dr. Borcea's first sabbatical application and he is requesting a leave for academic year 2011-2012. The purpose of this leave is to conduct research on mobile computing and networking at two world-class institutions: National Institute of Informatics (NII), Tokyo, Japan and at University of Bologna (UB), Italy. He plans to spend two months in Japan with his host Prof. Yamada where he will conduct research and present six or seven research seminars. He also plans to spend five months in Italy with Dr. Bellavista, conducting research mainly on delay tolerant networks, middleware. He has ongoing research relationships with both hosts and he believes that collaborating with colleagues at these two institutions will provide him with fresh perspectives in his research. The remaining time of his sabbatical leave will be devoted to writing papers, as well as grant proposals and supervising Ph.D. students at NJIT. He has exceptionally strong publication and grant records in the domain of mobile computing. The sabbatical committee believes that Dr. Borcea will accomplish his proposed research plan and outcomes and strongly recommends him for a sabbatical leave.

#### **Distinguished Professor Zeynep Celik – College of Architecture and Design**

Professor Zeynep Celik is a well known architectural historian – nationally and internationally. She is a prolific writer with several books and many published articles that are accepted as classics in her field. She has established an enviable academic reputation recognized over the world. She was the winner of the very prestigious Spiro Kostof Book Award by the Society of Architectural Historians in 2010. Prof. Celik is applying for a sabbatical leave for one year (2011 – 2012) to undertake a major research project and write a book manuscript to be titled "Empires and Antiquities: Appropriating the Past". She will engage in a comparative study of the discourse on claims to the past in London, Paris, Berlin, New York and Istanbul covering the period around 1900. This will involve several archival works abroad and in the NY Public Library. She has agreed to publish the book by the University of Texas press. In addition, she will be a curator of two exhibitions in Istanbul, related to her two earlier books. She will then travel to several Middle East cities and Berlin, where she will also be giving lectures and organizing symposia on these topics. These projects will further enhance her recognition as an international scholar and therefore add to NJIT CoAD's world wide exposure. Based on her well written proposal and her track record of accomplishments, the Committee believes that Prof. Celik will realize most of her sabbatical research and other goals and recommends her strongly.

#### **Associate Professor Janice Daniel – Department of Civil and Environmental Engineering, NCE**

This is Dr. Daniel's first sabbatical application; she has requested a sabbatical leave for academic year 2011-2012. Professor Daniel's leave will be spent at the Turner-Fairbank Highway Research Center in Mclean, Virginia which is home to the Federal Highway Administration's (FHWA) Office of Research, Development, and Technology. She received an invitation from the Director of the FHWA Office of Research, Development and Technology committing to work with NJIT once her application is accepted (by NJIT). The research question to be studied during her proposed sabbatical leave is to explore crash causation models in determining the extent to which funding in infrastructure improvements have contributed to reducing fatal crashes in the United States. She hopes that her sabbatical research project will shed light on quantifying the impacts of infrastructure improvements on fatal crash reduction. Dr. Daniel's record shows great productivity in acquiring research grants from the NJ Department of Transportation. Her previous grant funding is of over \$2 million and helped her produce a significant number of Ph.D. students in the CEE department. If successful, this sabbatical leave will help Dr. Daniel develop a strong relationship with FHWA which should lead to future opportunities in obtaining federally funded transportation research projects. The committee trusts that Dr. Daniel will deliver on her sabbatical goals and recommends her strongly for the leave she is requesting.

**Distinguished Professor Rajesh Dave, Department of Chemical, Biological and Pharmaceutical Engineering, NCE**

Professor Rajesh Dave is requesting a one year sabbatical leave for the 2011 – 2012 academic year. Professor Dave is a Distinguished Professor with an excellent record of research, teaching, very active NSF and other grant funding, and innovative program creations at NJIT. He plans to spend a year to collaborate with researchers at a prestigious center at Rutgers University. He received a strong invitation letter from Professor Fernando Muzzio, Director of the Pharmaceutical Engineering Program, Dept. of Chemical and Biochemical Engineering, Rutgers University. Dr. Muzzio offers to host him at the NSF funded Engineering Research Center for Structured Organic Particulate Systems (ERC-SOPS), and he will give him access to the resources of the SOPS including an office. For his sabbatical year, Professor Dave plans to work collaboratively with the researchers at the ERC-SOPS Center to pursue three crucial goals: (1) increase the depth in predictive particle engineering; (2) carry out activities that will lead to new large scale funded projects and collaborations; and (3) publish archival position papers. Professor Dave hopes that his research will lead to advance his understanding of structure-function-performance relationships that may have substantial impact on oral and lung delivery of active pharmaceutical ingredients. According to his proposal, Professor Dave will not only be working with the ERC-SOPS research team, but he will also join forces with other key faculty members who are engaged in innovative bio and materials related research in collaboration with the center. Professor Muzzio promises to fully support Professor Dave's plan, which he hopes will clearly lead to significant professional growth for Professor Dave and thus greatly benefit both NJIT and the ERC-SOPS. Based on his superior research record and leadership at the Ortho Engineering Center at NJIT, the committee believes that Professor Dave will deliver on his sabbatical leave plans. The committee strongly recommends him.

**Professor Hongya Ge, Department of Electrical and Computer Engineering, NCE**

Professor Hongya Ge is an established researcher with a respectable number of publications. She is requesting a sabbatical leave for one academic year (2011 – 2012) during which she is planning to establish long term funded research collaborations with Government Laboratories and Universities. She received a strong invitation letter from the commander of the Naval Undersea Warfare Center Division in Newport. Professor Hongya Ge has research experience with the NUWC-Newport Division and has been involved in funded underwater acoustic research projects working with scientists from the NUWC-Newport. The committee believes that her visit will further strengthen her collaboration with this prestigious center and can lead to securing more funding. In addition, she has an invitation to visit the Nanyang Technological University in Singapore that will help her establish international collaborations. The committee believes that this sabbatical leave will provide her an excellent opportunity to explore new research topics which outcome will benefit NJIT. Based on her strong research record and the existing relationship with NUWC-Newport, the committee believes that she will accomplish her sabbatical goals. The committee strongly recommends her.

**Associate Professor Shidong Jiang – Department of Mathematical Sciences, CSLA**

Dr. Jiang is requesting a sabbatical leave for academic year 2011-2012. This is Professor Jiang's first sabbatical application. He plans to visit the Courant Institute of Mathematical Sciences at NYU and has received an invitation letter and partial financial support from the Director, Dr. Leslie Greengard. He will collaborate with several prominent researchers in the area of analysis-based fast numerical algorithms for solving partial differential equations using integral equation formulations and fast multiple methods. In addition to working with Dr. Greengard in the area of computational fluid dynamics, he plans to visit Dr. J. Huang at the Department of Mathematical Sciences at the University of North Carolina, Chapel Hill. He also plans to continue his collaboration with Professors Sun and Pitsianis of Duke University, with whom he has a joint NSF grant. He expects to write several proposals for grant opportunities and publish several journal papers. The committee strongly recommends him for his sabbatical leave.

**Associate Professor Carol Johnson – Department of Humanities, CSLA**

This is Professor Johnson's first sabbatical application. Professor Johnson plans to use her Fall 2011 sabbatical leave to write a second book on technical communication at Lukens Steel covering the years 1925-1998. Her research project will involve several trips to the Hagley Museum and Library archives, in Wilmington, Delaware, where she will review and collect data from several voluminous technical and business communication files and other secondary data sources. She has gained the support of scientists, historians, and professional communicators as indicated by being invited to continue her research on communication in the steel industry at the Hagley Museum. Dr. Johnson has presented her research at engineering conferences as well as at technical English communication conferences. Her first book, *The Language of Work, Technical Communication at Lukens Steel 1810-1925*, recently won a highly prestigious award from the National Council of Teachers of English for Best Book in Technical and Scientific Communication. During Fall 2011 she plans to write the first draft of the book, which would be published the following year. Professor Johnson has demonstrated a strong and successful commitment to historical and pedagogical research in the technical communication discipline. Given her strong record of past performance, the sabbatical committee is convinced that she would complete the

project as described in her proposal. The committee strongly recommends Professor Johnson's applicant for sabbatical leave for the Fall 2011 semester.

**Professor Eric Katz – Department of Humanities, CSLA**

Professor Eric Katz has requested a sabbatical leave for one academic year. During his sabbatical leave Professor Katz proposes to complete a book manuscript on the Holocaust and Technology that explores how the Nazis used technology as a material and conceptual part of their program of domination before and during World War II. The book is a philosophical inquiry into the nature of evil as related to the ethics of technology. The book emerges from Professor Katz's earlier projects, especially Death by Design, a book he edited in 2006. Katz has already published two peer-reviewed articles that will be expanded into chapters for the proposed book manuscript. Professor Katz also intends to use the sabbatical leave period to revisit death camp sites in Europe in order to photograph and document them as part of his research. This new material will be incorporated into the planned manuscript and into his science and technology courses at NJIT. The sabbatical committee strongly recommends Professor Katz's application for leave during the 2011-2012 academic year.

**Professor Rajiv Mehta – School of Management**

This is the first sabbatical leave request from Professor Mehta. His proposal for academic year 2011- 2012 includes plans to visit the Warsaw School of Economics in Poland to work with Dean Jolanta Mazur who will provide resources to Professor Mehta to conduct his collaborative research that has already begun through joint publications. He also plans to visit Ube National College of Technology, Japan, to work with Dr. Takao Ito of the Department of Business Administration; he has an invitation from the president of the Ube National College of Technology. His research plans are to work on: (1) empirically analyzing primary data gathered from senior managers of exporting firms in Poland and Japan to identify criteria that firms employ for the selection, management, and control (performance evaluation) of their international distribution channel partners, and (2) discerning if differing cross-cultural dimensions and economic orientations influence the management of international distribution channel alliance partners relative to U.S. coalitions. He has already published papers on these topics and expects to produce 4-5 additional journal publications from the sabbatical leave. Based on his well written proposal and strong research record, the committee strongly recommends his sabbatical leave application.

**Associate Professor Richard Moore – Department of Mathematical Sciences, CSLA**

This is the first sabbatical leave request from Professor Richard Moore. He is requesting a one academic year leave to accomplish two primary goals. The first is to participate in the 2011-2012 program on Uncertainty Quantification at the Statistical and Mathematical Sciences Institute (SAMSI). He has received invitation letters and partial financial support from SAMSI and Dr. Chris Jones at UNC-Chapel Hill, in the Research Triangle Park of North Carolina. While at SAMSI, Professor Moore plans to collaborate with research fellows and other faculty in the Research Triangle and at UNC-Chapel Hill. This sabbatical leave will strengthen his research by allowing him to extend in new areas of interest including: (1) rare event analysis in non linear optical contexts, specifically bit error computations in fiber-optic communication lines, and (2) phase slip

predictions in frequency combs generated by mode-locked lasers to more realistic models incorporating a variety of physically relevant effects. His second sabbatical goal is to adapt the methods he has developed in this context to a new problem in the geosciences. This will involve new collaborations with other research fellows at SAMSI and with faculty at other institutions within the Research Triangle and the University of North Carolina at Chapel Hill. The committee is convinced that Dr. Moore will realize his sabbatical goals and recommends him strongly.

**Associate Professor Stephen Pemberton – Department of Federated History, CSLA**

Professor Pemberton is requesting a sabbatical leave for one academic year. This is Professor Pemberton's first sabbatical application. During his sabbatical leave, he proposes to conduct research and begin writing his third book, titled Blood and Heredity: The Discipline of Hematology and its Embrace of Genetics in the 20<sup>th</sup> Century. This book builds on work of his first two books (both published by Johns Hopkins University press) and examines how the burgeoning field of genetics appropriated the work of hematologists and how hematologists began to rationalize their work through reference to genetics. During his sabbatical, Professor Pemberton intends to conduct research in scholarly and historical archives at medical institutions located on the east coast. He plans to complete two book chapters and a detailed book prospectus. He has already presented two scholarly papers on the subject, most recently at a meeting at the National Institutes of Health. Given Professor Pemberton's past accomplishments, the sabbatical committee is convinced that he will complete the projects as described in his proposal. The committee strongly recommends this applicant for leave during the 2011-2012 academic year.

**Professor Anthony Rosato – Department of Mechanical and Industrial Engineering, NCE**

Professor Anthony Rosato has requested a sabbatical leave for the academic year 2011-2012. He plans to conduct research in collaboration with scholars at three locations, namely (1) at the University of Salerno in Italy, (2) at Grainflow Dynamics Research Center, and (3) at the New Mexico Resonance, Inc. He has received invitations from collaborators at all three locations. His overall research goal is to advance the understanding of the behavior of granular materials in motion. He recently received funding from the National Science Foundation on a research project dealing with this important problem. He also recently received a grant from the Fulbright Foundation to work on a similar problem. It is noteworthy to mention that his Fulbright grant is very prestigious and was obtained through a very competitive process. The level of collaborative activities he is doing with several faculty members in NCE and CSLA, and with graduate students in the Departments of Mechanical and Industrial Engineering and Mathematical Sciences, as well as, the Honors College, suggests that his sabbatical leave will result in more research initiatives within NJIT upon his return. The Sabbatical Committee believes that Dr. Rosato and NJIT will benefit from this sabbatical leave. The committee strongly recommends Professor Rosato for sabbatical leave.

**3C. Approve Resolution to  
Authorize New MS in Cyber  
Security and Privacy**

## **STATEMENT**

The objective of the MS in Cyber Security and Privacy program is to create a strong foundation and detailed technical knowledge in security, privacy/anonymity, and cryptography applied to computer systems, networks, and web applications. Graduates will have broad expertise in all of these areas, with an option to cover not only technical but also legal, policy, and ethical aspects of security and privacy. In addition to in-depth knowledge of security mechanisms, standards, and state-of-the-art capabilities, they will also be able to design new systems and infrastructure-level security solutions. The need for the new program is rooted in the increasing demand for a workforce skilled in all aspects of cyber security. The reliance of critical industries such as transportation, energy, or finance on computer networks, coupled with a growing number of cyber attacks accentuates the need for expertise in defensive techniques against cyber threats.

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

## **RESOLUTION TO APPROVE THE MS in CYBER SECURITY AND PRIVACY**

WHEREAS, the Board of Trustees has examined materials provided by the President of the University relative to a proposed program leading to the MS in Cyber Security and Privacy; 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 MS in Cyber Security and Privacy.

February 10, 2011



## PROGRAM ANNOUNCEMENT

**October 2010**

|  |   |
|--|---|
| Institution:   | New Jersey Institute of Technology                |
| New Program Title:   | MS in Cyber Security and Privacy                  |
| Degree Designation:  | MS in Cyber Security and Privacy                  |
| Degree Abbreviation:   | MS CSP  |
| CIP Code and Nomenclature (if possible):                                   | 11.1003 Computer and Information Systems Security |
| Campus(es) where the program will be offered:                              | Newark Campus, NJIT                               |
| Date when program will begin (month and year):                             | September 2011                                    |
| List the institutions with which articulation agreements will be arranged: | None  |

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:

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### Program Announcement Narrative

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## **Descriptive Information**

### **I. Objectives**

The objective of the MS in Cyber Security and Privacy (MSCSP) program is to create a strong foundation and detailed technical knowledge in security, privacy/anonymity, and cryptography applied to computer systems, networks, and web applications. Graduates will have broad expertise in all these areas, with an option to cover not only technical but also legal, policy, and ethical aspects of security and privacy. In addition to in-depth knowledge of security mechanisms, standards, and state-of-the-art capabilities, they will also be able to design new systems and infrastructure-level security solutions.

### **II. Need**

#### **II.A. Need for the Program**

The need for the new program is rooted in the increasing demand for a workforce skilled in all aspects of cyber security. Over the next decade, the need for information security specialists is expected to grow rapidly in both government and private sector. The reliance of critical industries such as transportation, energy, or finance on computer networks, coupled with a growing number of cyber attacks accentuates the need for expertise in defensive techniques against cyber threats. Moreover, as larger amounts of sensitive data are being transmitted and stored electronically, and as more databases are being connected to the Internet, data security and privacy becomes increasingly important. Finally, the ever-growing software complexity and attack sophistication has given rise to new software needs that will result in significant investment in software that protects computer systems and networks.

This program will prepare its graduates for jobs such as: Information Security Engineer, Network Security Engineer, Network Security Architect, Systems and Software Security Engineer, Security Analyst, Computer/Network Security Consultant, Computer Security Specialist<sup>1</sup>. The hiring companies prefer applicants with an MS degree in an information security-related area for these jobs because the necessary advanced coursework ensures a solid knowledge of security principles and practices.

In addition, a growing number of other computing jobs (e.g., Computer Scientist, Information Scientist, Computer Software Engineer, Computer Programmer, System Analyst<sup>2</sup>) include security-related tasks among their job responsibilities.

#### **II.B. Relationship to the Institute Master Plans**

At the Institute level, the only other MS program that has some similarities with the proposed program is the MS in Information Technology Administration and Security (MSITAS), which is also administered by CCS. The MSITAS focuses on IT

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<sup>1</sup> Job titles from advertised job openings of companies such as Google, Symantec, Cisco, AT&T, Lockheed Martin, Northrop Grumman, Raytheon, etc. (as of March 2010).

<sup>2</sup> Job titles from the Bureau of Labor Statistics, United States Department of Labor (as of March 2010).

Administration aspects, with a secondary focus on the security aspects of IT Administration, whereas the proposed MSCSP program focuses primarily on the design, development and operation of techniques and methods to defend against current and future security and privacy threats. The two programs also differ in the type of jobs their graduates will be prepared for: The MSITAS trains students to fill IT administration roles (e.g., network, system, and database administrators), whereas the MSCSP targets jobs that fit under the security specialist umbrella (e.g., engineers, analysts, or consultants in the security of systems, networks, information and software).

The MS in IT Administration and Security produces administration experts, who understand security issues, enforce security strategies and procedures, and use existing tools to secure systems and applications by identifying weaknesses and outlining defense strategies.

The MS in Cyber Security and Privacy (MSCSP) produces experts who analyze new and existing security threats and devise solutions against them. Specifically, graduates of the program use in-depth knowledge of network-based and system-level attacks and appropriate countermeasures to ensure that the software and the infrastructure is designed and implemented with the best security practices in mind, thus, offering protection against attacks and vulnerabilities. This requires the ability to perform sophisticated security design review of applications and infrastructure, coupled with the ability to investigate security breaches and perform forensic analysis. It also requires the ability to design, develop, and maintain new tools and technologies at both system and network level to enhance the security of applications and infrastructure. The design, development, and operation of advanced security techniques and advanced cryptographic systems require both a deep understanding of theoretical security concepts and detailed knowledge of security practices. Moreover, graduates of the program will be able to conduct research on existing and emerging security threats and vulnerabilities, which is critical in order to stay abreast of rapidly evolving technologies and to design and maintain secure and safe operating environments.

### **II.C. Relationship to Similar Programs in the State and Regions**

There are no similar programs offered by a public university in the state and region. Two private institutions offer similar programs:

- Stevens Institute of Technology (MS in Security and Privacy)
- Polytechnic Institute of New York University (MS in Cybersecurity).

### **II.D. Distinguished Programs Nationally**

Nationwide, several well-known universities offer MS degree programs that have a significant security component:

- Johns Hopkins University (MS in Security Informatics)
- Indiana University (MS in Security Informatics)
- Carnegie Mellon University (MS in Information Security Technology and Management; MS in Information Security Policy and Management)

- Purdue University (interdisciplinary MS program in Information Security; MS in Computer Science with a specialization in information security)
- George Mason University (MS in Information Security and Assurance)

### **III. Student Enrollments**

We expect domestic students to be drawn from several different sources:

- Undergraduates at NJIT: Students completing their undergraduate studies in computing-related majors at NJIT who are interested in security.
- Undergraduates at other institutions in the state and region: These students in computing-related majors, who are interested in security, will be provided a public university program in security in the state and region.
- Working professionals: There is a large regional pool of professionals in the NY-NJ area with jobs related to computing who are potentially interested to pursue an MS degree in security.

In addition, NJIT's certification by the National Security Agency as a Center of Academic Excellence in Information Assurance Education (certificate attached in Appendix A) makes MS students eligible for scholarships and grants through both the Federal and Department of Defense Information Assurance Scholarship Programs.

We also expect to recruit foreign students, who will find the combination of high quality education in security and access to a large job market attractive.

We anticipate an enrollment of approximately 20 new students in the first year, increasing to 60-80 students over the next four years.

The College of Computing Sciences will continue to work with both Graduate Admissions and the Murray Center for Women in Technology to target women and minority students.

**Admission Requirements.** To be eligible for admission, a student must have completed an undergraduate degree, preferably in Computer Science, Computer Engineering, Information Systems, Information Technology, or a related field, with a minimum GPA of 3.0 on a 4.0 scale. Students not satisfying these criteria will be considered for conditional admission on a case-by-case basis. This includes students whose bachelor's degree is in a non-computing field but have professional experience in computing or systems administration. Any such student who is admitted will be required to complete the following bridge courses with a GPA of 3.0 or higher: CS 505 Programming, Data Structures and Algorithms, CS 506 Foundations of Computer Science. The bridge courses will not be counted toward the MS degree.

### **IV. Resources to Support the Program**

Although many of the courses applicable to the new MS in Cyber Security and Privacy degree presently exist at NJIT, a number of new core courses must be developed and taught. The existing faculty in the Department of Computer Science will handle the

majority of the coursework and will be complemented by faculty from the Department of Information Systems and the School of Management. Laboratory and equipment requirements are described under IV.D.

#### **IV.A. Course Development**

The following new courses will need to be developed to complete the curriculum:

CS 6xx - Security and Privacy in Computer Systems

CS 6xx - Network Protocols Security

CS 6xx - Counter-Hacking Techniques

#### **IV.B. Faculty**

Several faculty members from the Department of Computer Science will support the majority of the educational effort for this program. Faculty members from the Department of Information Systems, the Information Technology program, the Department of Electrical and Computer Engineering, and the School of Management will complement this effort. Together, they will provide extensive expertise in various aspects of security, including computer and systems security, network security, privacy and anonymity, forensics, and legal and ethical issues pertinent to information technology.

#### **IV.C. Libraries and Computing Facilities**

Since this program will draw upon existing courses and the same supplemental literature that supports other related NJIT programs, library holdings are more than adequate to support the new program. NJIT's Van Houten Library has a collection of more than 130,000 books and subscribes to about 500 printed journals and about 13,000 electronic journals. The library's home page provides access to the library's online catalog and links to a wide array of information services. The library purchases between 2,500 and 3,000 new books each year. Requests for new books or journals are made through the academic department's faculty representative to the library.

The library has a wide array of networked PCs that provide access to a large number of bibliographical databases and full-text electronic journals, for searching Internet sites, searching each library's on-line catalog, and access to various on-line journal databases. VCR's for viewing videocassettes reserved for courses are also available. Journal and conference literature in engineering, science, management, architecture and other subject areas is accessible through a variety of indexing and abstracting databases. Among the databases available on line are CompendexWeb (Engineering Index); ProQuest Direct (articles on business, management and industry), Applied Science and Technology Index. The library also borrows through interlibrary loan (ILL) for materials.

The libraries web site describes the services and resources more completely. Please see <http://www.library.njit.edu>.

As a technological research university, NJIT has excellent computing systems, networks and software to support this program. The Newark campus' gigabit Ethernet network backbone connects more than 6,000 nodes in classrooms, laboratories, residence halls, faculty and staff offices, the library, and student organization offices. Wireless access is

available in over 90% of campus buildings and locations. The network provides access to a wealth of shared information services. Some of these include high-performance computing servers providing CPU cycles for simulation and computational research, disk arrays for storage of large data sets, communication servers for electronic mail and document exchange, databases, digital journal subscriptions and a virtual "Help Desk." A virtual private network combined with Internet access, plus a large ISDN modem bank extend access to campus information resources to faculty, staff and students working at home, work, any of the university's extension sites or throughout the world. Wide-area network access through NJEDge.Net (New Jersey's Higher Education Network) and the Internet provide collaboration opportunities with students, faculty, and researchers, locally, regionally, nationally, and throughout the world.

#### **IV.D. Classrooms and Laboratories**

There is a broad range of classrooms and laboratories available to offer the courses in the proposed program, including many with Internet access and multimedia facilities. In particular, the Center for Information Protection (CIP) (<http://www.cip.njit.edu>) provides a laboratory with a network of computers that can be used as a testbed for educational and research purposes. Thus, no new classrooms or laboratories are specifically needed for the program.

## **V. Curriculum (on a separate page)**

The Department of Computer Science will administer the MS in Cyber Security and Privacy. A CS faculty committee composed of CS faculty and lecturers together with CS administrative staff will oversee advisement of students in the program and monitor their progress.

The Faculty Advisory Committee for the program will consist of the following CS faculty:

- R. Curtmola (Security and Cryptography)
- D. Karvelas (Networking and Security)
- B. Verkhovsky (Security and Cryptography)
- G. Wang (Networking and Security)
- C. Borcea (Networking and Distributed Systems)

The following Administrative Staff will assist the Faculty Advisory Committee:

- K. Price (MS Advisor)

The courses supporting the MSCSP program are divided in three categories: (i) Core; (ii) Elective; (iii) Foundational. An MSCSP student may require the background represented by Foundational courses in order to prepare for the Core and Elective courses.

An MSCSP course program must satisfy the following distribution requirement:

- 30 credits are required, which can be satisfied as either one of the following options:
  - o Courses (30 credits)
  - o Courses (27 credits) + MS Project (3 credits)
  - o Courses (24 credits) + MS Thesis (6 credits)
- All Core courses are required.
- At most two courses can be Foundational courses.
- At most two courses can be chosen from outside the Department of Computer Science.

If a student chooses the MS project or MS thesis option, the project or thesis must be related to cyber security.

### **Core Courses**

- CS 608 - Cryptography and Security
- CS 656 / ECE 637 - Internet and Higher-Layer Protocols
- CS 6xx - Security and Privacy in Computer Systems (new course to be developed)
- CS 6xx - Network Protocols Security (new course to be developed)
- CS 6xx - Counter-Hacking Techniques (new course to be developed)
- CS 696 / ECE 638 - Network Management and Security

### **Elective Courses**

- CS 633 - Distributed Systems
- CS 660 - Digital Watermarking

CS 673 - Software Design and Production Methodology  
CS 680 - Linux Kernel Programming  
CS 708 - Advanced Data Security and Privacy  
CS 734 - Data Mining  
CS 755 / ECE 782 - Security and Privacy in Wireless Networks  
IS 680 - Information Systems Auditing  
IS 681 - Computer Security Auditing  
IS 682 - Forensic Auditing for Computing Security  
IS 687 - Transaction Mining / Fraud Detection  
IT 620 - Wireless Network Security & Administration  
IT 640 - Network Services Administration  
ECE 636 – Computer Networking Laboratory  
MGMT 688 - Information Technology, Business, and the Law  
MGMT 691 - Legal and Ethical Issues

### **Foundational Courses**

CS 610 - Data Structures and Algorithms  
CS 630 - Operating System Design  
CS 631 - Data Management System Design

### **New Course Descriptions**

#### **CS 6xx - Security and Privacy in Computer Systems (3 credits)**

The course covers fundamental principles of building secure systems and techniques to protect data privacy. Topics include access control mechanisms, operating systems security, malicious code threats and software security, trusted computing, content protection, and database security. The course will also study existing technical approaches to protecting privacy, including Web anonymizers and anti-censorship tools, as well as policy and legal aspects of privacy.

Topics include:

1. Introduction (security goals, overview of course topics, overview of attacks)
2. Crypto crash course
3. Access control mechanisms
4. Operating systems security
5. Software security, Secure Programming
6. Malicious code, Malware, Rootkits
7. Trusted computing
8. Introduction to security of networked systems
9. Privacy and anonymity on the Web
10. Content protection, Software obfuscation, Digital rights management
11. Database security
12. Security of electronic voting
13. Computer crime – laws and ethics, Security & privacy policy (Sarbanes Oxley, HIPAA)
14. Miscellaneous Topics: side-channel attacks, gaming security, information assurance (common criteria), risk analysis



### **CS 6xx – Network Protocols Security (3 credits)**

The course focuses on the security of network protocols. The goal of the course is to familiarize students with common threats and attacks, and to study the fundamental techniques used to secure network communication over insecure channels. The course will have an applied component, which will help students gain practical experience in attacking and defending networked systems. Topics include authentication systems, secure communication at data link, network, transport and application layers, vulnerabilities of Internet protocols, DNS and routing security, firewalls, intrusion detection, honeypots, wireless networks security, malware propagation and detection, and web security.

Topics include:

1. Introduction (overview of network security issues, cryptographic algorithms, authentication techniques)
2. Authentication systems, Key establishment protocols, Kerberos
3. Secure communication at the data link and network layers (IPSEC and IKE)
4. Secure communication at the transport and application layers (SSL/TLS, email security, PGP)
5. Vulnerabilities of Internet protocols
6. Denial of service (DoS) attacks and defenses
7. Firewalls, IP spoofing prevention
8. Routing protocols security and router security
9. Domain name server (DNS) security
10. Traffic monitoring, Intrusion detection, Honeypots
11. Wireless networks security
12. Spam, Phishing, and Pharming
13. Malware propagation and containment, Botnets
14. Anonymity and privacy on the Web
15. VoIP, Skype, RFID security

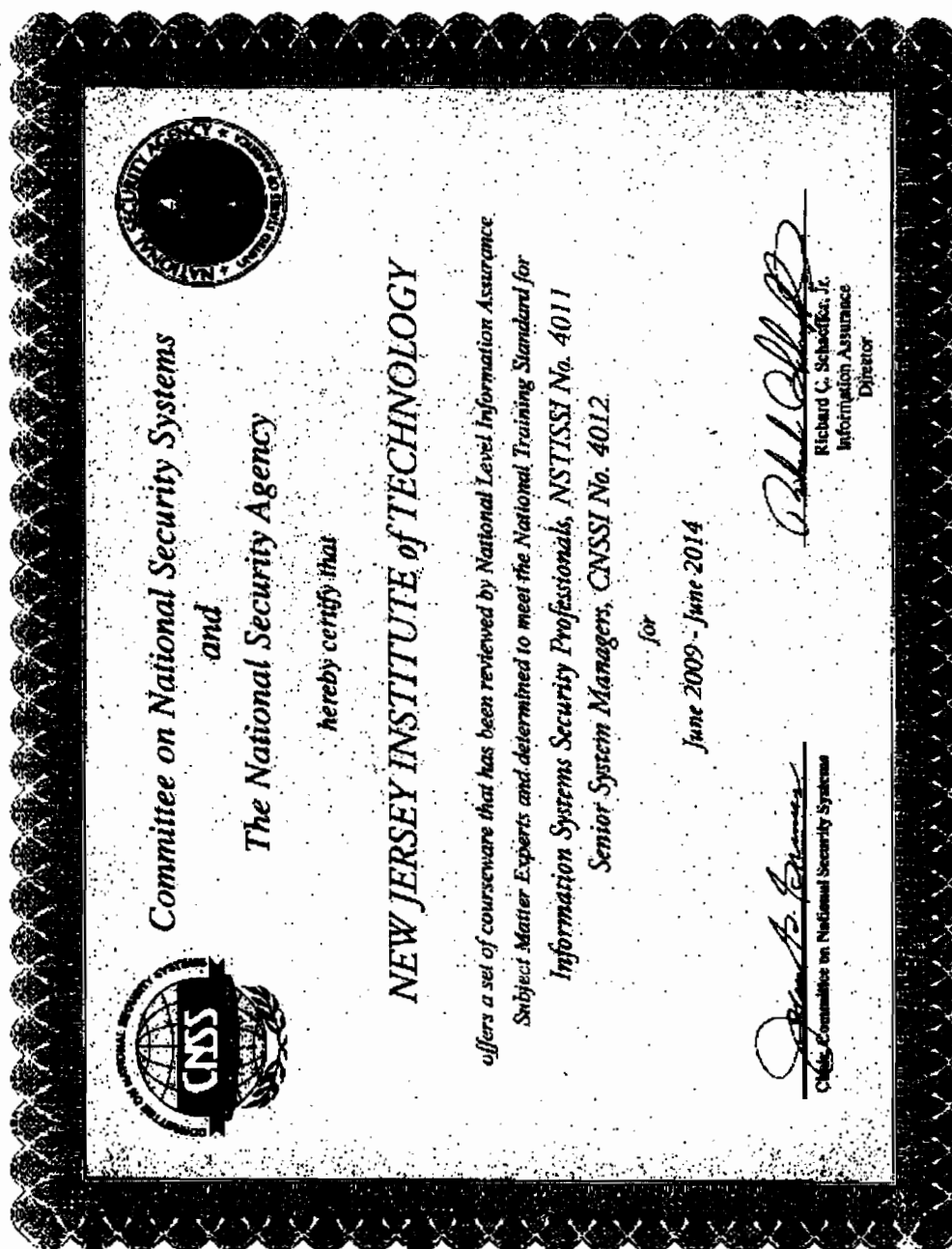
### **CS 6xx - Counter-Hacking Techniques (3 credits)**

This course will cover advanced techniques for analyzing the behavior and functionality of applications in order to discover potential vulnerabilities and propose appropriate countermeasures. Topics covered include memory organization, CPU registers, assembly language fundamentals, development of local and remote Linux exploits, writing Linux shellcode, conducting stealthy attacks, Windows debuggers and code analysis, metasploit framework exploits, fuzzing based security testing, web application attacks.

Topics include:

1. Network hacking attacks
2. Overview of computer memory organization, CPU registers, assembly language basics, AT&T vs NASM, debugging and disassembly with GDB.

3. Local Linux exploits
4. Remote Linux exploits
5. Writing Linux shellcode
6. Conducting stealthy attacks
7. Windows exploits
8. Developing exploits using metasploit framework
9. Exploiting Windows access controls
10. Security testing through fuzzing
11. SQL injection attacks and defenses
12. Client-side browser exploits
13. Other web application attacks



**Consultant's Report on a New Academic Program  
New Jersey Institute of Technology  
MS in Cyber Security and Privacy**

**Prepared by: Prof. Rebecca Wright, Rutgers University  
October 7, 2010**

Specific recommendation: Approval upon minor modification by the institution.

Summary: Cyber Security and Privacy is a topic that is both of extreme current relevance and of long-standing importance. A MS program in cyber security and privacy will educate future professionals and academics in this critical area, and in doing so will help NJIT fulfill its educational mission. The planned program is a high quality program that is well conceived and leverages the existing expertise and infrastructure at NJIT in a way that can be scaled to start primarily using existing resources and to expand as the program grows. My report raises a few minor concerns or omissions that I believe can be easily addressed.

**A. Objectives**

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

The objectives and underlying principles of the program are sound and clearly stated.

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

The program is consistent with the Institution's programmatic mission and educational goals. In particular, it is consistent with many items in the NJIT strategic plan, including the pursuit of excellence in graduate and continuing professional education, preparing students for productive careers and amplifying their potential for lifelong personal and professional growth, preparing its graduates for positions of leadership as professionals and as citizens, and responding to needs of large and small businesses, state and local governmental agencies, and civic organizations.

Additionally, in the College of Computing Sciences's strategic goals, CyberSecurity and Privacy is one of the five areas listed in a goal "to stay current with technology and the changing needs of the workforce."

**B. Need for the Program**

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

Based on my experience as a faculty member at Rutgers University as well as earlier at Stevens Institute of Technology, I believe that there is healthy student demand for a program such as this one, as well as ample employment opportunity. The program is also designed in such a way that students in the program who want to continue for more advanced study will be in a good position to do so.

At Stevens, when a similar program (though at the undergraduate level) was developed, it attracted students, some of whom indicated they applied to Stevens specifically because of the program. There are a number of federal government programs demonstrating evidence of the demand for trained security professionals: NSA and DHS jointly sponsor a program of National Centers of Excellence in Information Assurance (IA) education (of which NJIT is one) with the goal of “promoting higher education and research in IA and producing a growing number of professionals with IA expertise. NSF’s Federal Cyber Service: Scholarship for Service program provides scholarships for students to obtain training in information assurance and computer security fields in order to “increase the number of qualified students entering the fields of information assurance and computer security and to increase the capacity of the United States higher education enterprise to continue to produce professionals in these fields to meet the needs of our increasingly technological society.” The Department of Defense offers similar scholarships, saying “Achieving Information Assurance (IA), however, requires more than possessing leading-edge technologies and superior operational capabilities. It requires well-educated, highly skilled, and technically savvy people in a variety of IA-related disciplines. Finding and properly training an adequate number of such personnel is one of the most important challenges DoD faces as we look to the future.” I have also frequently seen articles in major newspapers as well as trade magazines noting the large, and potentially growing, gap between the supply and the demand for well trained IT-security specialists.

2. In the case of career programs:

- Do the results of market surveys indicate a sufficient level of student demand to justify the creation of the proposed program? (Please explain.)
- Do employment projections indicate a sufficient number of job opportunities in the region and the State to justify the creation of the program? (Please explain.)

I have not carried out, nor been provided with, market surveys or employment projections. However, as described above, I believe there is demand both for the program and for its graduates.

### C. Educational Programs

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

The distribution and nature of the required courses, electives, and research are largely consistent with the objectives of the program. However, is that is it not clear to me (1) if the current required (not just elective) course work meets the stated goal that “graduates will have broad expertise in these areas, covering ... legal, policy, and ethical aspects of security and privacy,” and (2) which classes, if any, cover enterprise-level security solutions. Can this be clarified, or the program objectives rewritten accordingly?

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

Yes. The courses include a mix of instructional modes, including some project-based coursework. Additionally, the MS project and thesis option allow those interested in independent research an opportunity to carry it out within the program.

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

Yes. The core courses provide a strong base in cyber security for all the students, while the broad range of electives allow students to explore additional topics in detail according to their specific interests.

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

N/A

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

Yes. In particular, the inclusion of up to two foundational courses for credit will allow students who need a modest amount of additional background before taking the core and elective courses to obtain it as part of the program, while still ensuring that all students take a sufficient number of cyber security courses. The program also allows for additional “bridge” courses, not counted for credit toward the MS degree, for admitted students whose bachelor’s degree is a non-computing field.

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

Yes, except that the program description should clearly state that if students chose the MS project or MS thesis option, the project or thesis must be related to cyber security, and, perhaps, approved by the faculty advisory committee.

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

As far as I am aware, there is no formal mechanism. However, the bridge courses and foundation courses could potentially serve as a mechanism for students wishing to transfer into the program from other areas. For students transferring from computing-related programs at NJIT, particularly computer science, they may have already completed some of the necessary course credits that can be used towards the MS in Cyber Security and Privacy.

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

The program will be run by faculty from the Computer Science department, which will also provide administrative support for the program. The required core courses are all run by the Computer Science department, which is committed to creating the necessary new courses. Elective courses include a number of computer science courses as well as some existing courses from IS, IT, ECE, and MGMT. While I did not receive any specific information about those departments' commitment to running a sufficient number of sections of these courses, presumably they can easily support a modest number of additional students with their existing resources, and they can be given additional resources to expand these offerings as the program grows.

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

N/A

#### D. Students

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

I was not given specific projections. The program can be run consistent with its goals regardless of the percentage of part-time students.

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

I was not given specific information about such provisions. The program will be run through the Computer Science department and can leverage existing mechanisms to research target populations to the extent that the target populations are the same.

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

The counseling and advisement will be provided by the faculty advisory committee and MS advisor. If necessary due to program growth, the faculty advisory committee could be expanded in the future.

#### E. Faculty

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

Yes. The current faculty possess the appropriate credentials to provide a program of high quality. Furthermore, both the Dean of the College of Computing and the Provost stated their commitment to hire additional faculty with cyber security expertise should the current cyber security faculty leave NJIT for any reason.

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

The members of the faculty advisory committee are involved to varying degrees in the different activities. As a whole, their involvement is more than sufficient for the proposed program.

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

With current resources, it will be possible for one section of each core and elective course to be offered. If the program grows sufficiently to require more than this, this will enable additional resources to cover the additional needs.

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

The program will initially be supported with existing Computer Science department staff, which will be sufficient to handle modest program growth. As with



other aspects of the program, these can be scaled appropriately should the program grow beyond the current capacity.

#### G. Finances

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

Initial roll-out of the new program will not require substantial additional resources. While a number of new courses need to be developed, these are already under development by members of the faculty advisory committee. Other aspects required for the program already exist at the Institution in sufficient levels to cover expected initial enrollments. Additionally, both the Dean of the College of Computing and the Provost stated their ongoing commitment to the area of cyber security.

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

None needed.

#### H. Physical Facilities

1. Discuss the adequacy of laboratory, special facilities, and equipment intended to support the program and indicate if they are consistent with offering a program of high quality.

No new facilities are needed. Of course, existing facilities must be appropriately maintained and/or upgraded in order to continue to ensure high quality in the future.

2. Comment upon the adequacy of classroom facilities.

The current facilities are adequate. Again, existing facilities must be appropriately maintained and/or upgraded in order to continue to ensure high quality in the future.

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

I see no evidence to suggest that an existing program will be adversely affected.

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

I was not provided specific information about accessibility to program facilities by the handicapped. The program will use existing physical facilities at the Institute. In

particular, qualified students with disabilities can obtain support services, at no cost to the student, from the NJIT Student Disability Services, which works in partnership with the faculty and the student to provide accommodations and supportive services to qualified students with disabilities.

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

The library support is consistent with the goal of offering a program of high quality, with good coverage of materials and on-line access. A possible exception is the Springer LNCS series, which I was told is not currently available via on-line access at NJIT.

#### J. Computer Facilities

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

The program makes use of existing computing facilities and labs, which are adequate to support a program of quality. As with other facilities, these must be appropriately maintained and expanded as needed in the future.

#### K. Administration

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

The program will be administered through the Computer Science Department. Additionally, the administrative structure consists of a faculty advisory committee, with assistance from an MS advisor. This is sufficiently defined and reasonable.

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

There is no inter-institutional cooperation. For intra-institutional, it is clearly defined that the Computer Science will provide administrative support and most of the courses, while other departments will provide some courses. I was not provided information about how budgets and resources are handled when students from one department take classes from another. In the case that program growth puts demands on the departments outside of Computer Science, an appropriate amount of the resources will need to be shared to cover the additional costs and ensure that the program continues to be able to operate at a high quality.

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

No formal mechanism has been developed. The program could benefit from some tracking and analysis of data such as numbers of students entering the program, number graduating, tracking job placements, and more.

## Rebecca N. Wright

DIMACS and Department of Computer Science  
Rutgers University  
CoRE Building, Room 404  
Piscataway, NJ 08854 USA

Phone: +1 (732) 445-5931  
Fax: +1 (732) 445-5932  
E-mail: [rebecca.wright@rutgers.edu](mailto:rebecca.wright@rutgers.edu)  
Web: [www.cs.rutgers.edu/~rebecca.wright](http://www.cs.rutgers.edu/~rebecca.wright)

### Research Interests

Computer and communications security, particularly in the areas of privacy, cryptographic protocols, and networked computing. Designing protocols, systems, and services that perform their specified computational or communication functions even if some of the participants or underlying components behave maliciously.

### Education

#### Yale University

New Haven, CT

Ph.D. in Computer Science, December 1994.  
Dissertation: *Achieving Perfect Secrecy Using Correlated Random Variables*.  
Advisor: Professor Michael J. Fischer.  
M.S. in Computer Science, May 1992.

#### Columbia University

New York, NY

A.B., May 1988.  
Double major in Computer Science and Mathematics.

### Professional Experience

#### Rutgers University

Piscataway, NJ

#### Associate Professor

September 2007 – present

#### Deputy Director, DIMACS

September 2007 – present

Engaged in research in security and privacy with a focus on privacy-preserving distributed protocols, foundations of networked computing, and voter registration databases. As Deputy Director of DIMACS, playing a leading role in setting direction for DIMACS, running programs, and obtaining funding.

**Stevens Institute of Technology**  
Hoboken, NJ

**Professor**  
September 2006 – July 2007

**Associate Professor**  
September 2002 – August 2006

Conducted research in privacy and security with a focus on privacy-preserving data mining and other technologies that balance individual needs such as privacy with collective needs such as network survivability and public safety. Introduced privacy-preserving solutions for Bayesian networks, clustering, frequency mining, and  $k$ -anonymization. Co-developed a new cybersecurity undergraduate degree program.

**DIMACS, Rutgers University**  
Piscataway, NJ

**Visiting Research Associate**  
March–August 2002

Conducted research in privacy-preserving data mining and in shared-memory protocols resilient to malicious process behavior.

**AT&T Labs—Research**  
Florham Park, NJ

**Principal Technical Staff Member**  
1999 – 2002

**Senior Technical Staff Member**  
1996 – 1999

Developed a broad research program in computer and communications security for distributed computer networks, spanning mathematical and empirical analysis of secure communication and fault-tolerant distributed computing. Specific topics include secure multiparty computation, Byzantine fault tolerance, and public-key infrastructures. Extended the notion of secure multiparty computation to approximation algorithms. Developed efficient solutions for privacy-protecting statistical analysis. Introduced probabilistic quorum systems.

**AT&T Bell Laboratories**  
Murray Hill, NJ

**Member of Technical Staff**  
1994 – 1996

Key contributor in the design and development of the Omega key management service, both as a research project and as a potential AT&T certificate authority (CA) service. Negotiated with Netscape to have Omega recognized as a CA in version 1.1 of Netscape's Web browser, one of the first to support public-key authentication. Developed a formal logic to extend reasoning about cryptographic protocols to include revocation, authentication, and security policies.

**3D. Approve Resolution to  
make Student Housing  
Payment**

## Resolution to Confirm Payment for Student Housing

Whereas the Board of Trustees approved budget included expense of \$1,651,200 for the rental of 235 beds in the American Campus University Center residential facility at Lock Street, and

Whereas, the payments to American Campus Community are fully funded by the housing fees paid by the students, and

Whereas, the specific payment of the \$1,651,200 was not previously approved by the Board, and

Whereas, the contract with American Campus Community required payment prior to the Board meeting,

Now Therefore Be It Resolved that the Board of Trustees confirms the payment of \$1,651,200 million to American Campus Community as provided in the Board approved FY 11 Budget.

9 February 2011

## **4A. Update on Middle-States Self Study**



## **4B. Update on Central King Building**

## **4C. Update on Status of NJIT Campus Gateway Plan**

## **4D. Intangible Asset Review**

**NJIT Board of Trustees**  
Intangible Asset Review

Dr. Donald H. Sebastian, Sr. Vice President for Research & Development  
Judith A. Sheft, Assoc Vice President for Technology Development  
February 10, 2011

NJIT's activities in patents and licensing continue the trend established since the restructuring of the Office of Technology Development (OTD) and the implementation of the new Patent Policy in 2003. Invention Disclosures have more than doubled from < 30 in 2003 to an average of 80 the past two fiscal years. One of the metrics a number of universities use to compare their performance to other US universities is the number of Invention Disclosures per million dollars of Sponsored Research. For the past four years NJIT's ratio has been 90% or better (the average is 45%). In FY2009 NJIT ranked 15th of 170 US universities and research institutions responding to the annual AUTM survey. The pipeline of NJIT patent applications pending with the USPTO is about the same as last year (currently 177 vs 193 last year). Table 1 summarizes the activity for the past 3.5 fiscal years. The number of issuing patents continues to increase (on average patents issue 3 to 4 years after a Non-Provisional Patent Application is submitted to the USPTO). The addition of an in-house patent attorney has enabled us to cost effectively handle both the filing of provisional patents and the management of the patent prosecution process.

**Table 1. Patent Statistics**

|                         | FY 08 | FY 09 | FY 10 | FY 11<br>YTD |
|-------------------------|-------|-------|-------|--------------|
| Invention Disclosures   | 93    | 84    | 76    | 33           |
| US Patent Applications* | 65    | 97    | 60    | 24           |
| US Issued Patents       | 11    | 13    | 17    | 21**         |

\* Includes conversions; \*\*includes both issued and allowed

The other significant change coming out of the restructuring of the OTD is the growth in licensing revenues, which has increased from only \$16K in 2003 to >\$500k for FY10. FY11 is currently forecast at ~\$250k. Although we continue to receive milestone payments upon issuance of the patents our primary licensee is prosecuting on behalf of NJIT, we are not enjoying the same level of success we previously enjoyed with that licensee due to a change in their licensing strategy. To offset this loss of income, we are focusing more on other opportunities and are in fact currently negotiating several deals we hope will bear substantial fruit in the future as well as exploring other opportunities for our expanding portfolio of licensable IP.

**Table 2. License Statistics**

|                                | FY 08  | FY 09  | FY 10    | FY 11<br>YTD |
|--------------------------------|--------|--------|----------|--------------|
| IP Assets Licensed or Optioned | 103    | 117    | 234      | 196          |
| License Income                 | \$334K | \$448k | \$507.5k | \$228k*      |

\*Assured to date

NJIT's performance in management of its IP assets relative to a comparable set of institutions (Lehigh, Michigan Tech, Rensselaer, Rice, Stevens and Temple) is above average. Based on 2010 reporting for FY2009, NJIT ranks FIRST in 5 of 11 metrics: Sponsored Research \$\$, Invention Disclosures, Licenses & Options Executed, Licenses Yielding Income, and Patents Filed. Our Legal Fees are next to lowest among this group, indicating NJIT is doing a better job of leveraging other people's money to finance our patent prosecution expenses than the others.

**NJIT Board of Trustees**  
Intangible Asset Review

The Office of Technology Development continues to participate in several external venues to showcase various NJIT technologies available for licensing: NJEN Poster Exhibit, NJTC Venture Conference, NJTC Regional Commercialization Conference, and the Venture Forum/Faculty Pitch Fair at Rutgers. These venues have resulted in our attracting several new parties with whom we are now in early licensing and/or sponsored research discussions. In addition NJIT is a founding member of Innovation NJ the state public/private/academic partnership focused on promoting policies that expand and strengthen the culture of innovation in New Jersey including the commercialization of new medicines, technologies and products to improve the quality of life globally.

OTD also continues to work with faculty members who have expressed interest in forming ventures based on the technology developed at NJIT: biofuel cells, SmartCampus, energetic materials, environmental monitors, and underwater communications. We also encourage both students and faculty interested in starting a venture to participate in the periodic Venture Acceleration Boot Camps run by the NJIT Center for Innovation Acceleration and the EDC Incubator.

Since our last review 32 new US Patents have either been granted or allowed, as follows:

**06-020** ALIGNED EMBOSSED DIAPHRAGM BASED FIBER OPTIC SENSOR (Chin, Ken K. / Padron, Ivan / Feng, Guan-Hua / Roman, Harry T.) US Patent Number 7,697,797 Issued on 4/13/2010

**04-006** SYSTEM AND METHOD FOR REVERSIBLE DATA HIDING BASED ON INTEGER WAVELET SPREAD SPECTRUM (Shi, Yun-Qing) US Patent Number 7,706,566 Issued on 4/27/2010

**03-030** SYSTEM AND METHOD FOR ROBUST LOSSLESS DATA HIDING AND RECOVERING FROM THE INTEGER WAVELET REPRESENTATION (Shi, Yun-Qing / Zou, Dekun / Ni, Zhi-Cheng) US Patent Number 7,720,305 Issued on 5/18/2010

**10-005** IMPROVISED EXPLOSIVE DEVICE DETECTION / DESTRUCTION / DISABLEMENT (Niver, Edip / Nguyen, Hai-Long / Kamel, Aladin H. / Poreira, Carlos M. / Salem, Mohamed A.) US Patent Number 7,717,023 Issued on 5/18/2010

**04-033** SYSTEM AND METHOD FOR DATA HIDING USING INTER-WORD SPACE MODULATION (Shi, Yun-Qing) US Patent Number 7,724,916 Issued on 5/25/2010

**06-033** METHOD FOR IDENTIFYING MARKED CONTENT, SUCH AS BY USING A CLASS-WISE NON-PRINCIPAL COMPONENT APPROACH (Shi, Yun-Qing / Xuan, GuoRong) US Patent Number 7,738,709 Issued on 6/15/2010

**07-048** METHOD OF ASSEMBLY USING ARRAY OF PROGRAMMABLE MAGNETS (Ravindra, N. M. / Kasisomayajula, Vijay / Shet, Sudhakar / Fiory, Anthony T.) US Patent Number 7,737,515 Issued on 6/15/2010

**07-060** METHOD OF FORMING NANOTUBE VERTICAL FIELD EFFECT TRANSISTOR (Farrow, Reginald C. / Goyal, Amit) US Patent Number 7,736,979 Issued on 6/15/2010

**07-029** MICROFLUIDIC DEVICE FOR THE ASSEMBLY AND TRANSPORT OF MICROPARTICLES (Khusid, Boris / Kumar, Anil / James, C.D. / Acrivos, Andreas) US Patent Number 7,744,737 Issued on 6/29/2010

**NJIT Board of Trustees**  
Intangible Asset Review

**04-019** MIMO - OFDM PEAK TO AVERAGE POWER RATION REDUCTION BY CROSS ANTENNA ROTATION AND INVERSION (Bar-Ness, Yeheskel / Latinovic, Zoran / Tan, Mizhou) US Patent Number RE41,433 Issued on 7/13/2010

**04-029** MICROWAVE INDUCED FUNCTIONALIZATION OF SINGLE WALL CARBON NANOTUBES (Mitra, Somenath / Iqbal, Zafar) US Patent Number 7,754,054 Issued on 7/13/2010

**05-016** SOLID HOLLOW FIBER COOLING CRYSTALLIZATION SYSTEMS AND METHODS (Sirkar, Kamalesh K. / Zarkadas, Dimitrios) US Patent Number 7,754,083 Issued on 7/13/2010

**06-038** SYSTEM AND/OR METHOD FOR IMAGE TAMPER DETECTION (Shi, Yun-Qing / Fu, DongDong) US Patent Number 7,778,461 Issued on 8/17/2010

**05-020** APPARATUS AND METHOD FOR STEGANALYSIS (Shi, Yun-Qing / Xuan, GuoRong) US Patent Number 7,783,074 Issued on 8/24/2010

**06-022** COMPOSITE FLOOR SYSTEM HAVING SHEAR FORCE TRANSFER MEMBER (Hsu, C.T. T. / Punurai, Sun / Munoz, Pedro R.) US Patent Number 7,779,590 Issued on 8/24/2010

**05-022** MIMO CHANNEL ESTIMATION USING COMPLEMENTARY SETS OF SEQUENCE IN MULTIUSER ENVIRONMENTS (Abdi, Ali / Wang, Shuangquan) Notice of Allowance Issued on 8/31/2010

**05-025** METHOD AND/OR SYSTEM FOR SPACE-TIME ENCODING AND/OR DECODING (Haimovich, Alexander M. / Chen, Hang Jun) US Patent Number 7,882,413 Issued on 2/1/2011

**05-035** DYNAMIC BANDWIDTH ALLOCATION AND SERVICE DIFFERENTIATION FOR BROADBAND PASSIVE OPTICAL NETWORKS (Ansari, Nirwan / Luo, Yuan Qiu) US Patent Number 7,808,913 Issued on 10/5/2010

**07-019** MIXING AND PACKING OF PARTICLES (Pfeffer, Robert) US Patent Number 7,806,150 Issued on 10/5/2010

**06-064** ANTISOLVENT CRYSTALLIZATION IN POROUS HOLLOW FIBER DEVICES AND METHODS OF USE THEREOF (Sirkar, Kamalesh K. / Zarkadas, Dimitrios) US Patent Number 7,811,381 Issued on 10/12/2010

**06-008** METHOD FOR IDENTIFYING MARKED IMAGES USING STATISTICAL MOMENTS BASED AT LEAST IN PART ON A JPEG ARRAY (Shi, Yun-Qing / Chen, ChunHua) US Patent Number 7,822,223 Issued on 10/26/2010

**02-006** METHODS AND APPARATUS FOR LOSSLESS DATA HIDING (Shi, Yun-Qing / Guorong, Xuan) US Patent Number 7,826,638 Issued on 11/2/2010

**02-020** CLIPPING DISTORTION CANCELLER FOR OFDM SIGNALS (Haimovich, Alexander M. / Chen, Hang Jun) Notice of Allowance Issued on 11/10/2010

**06-063** A METHOD AND APPARATUS FOR STEGANALYSIS FOR TEXTURE IMAGES (Shi, Yun-Qing / Chen, ChunHua) Notice of Allowance Issued on 11/12/2010

**03-027** ACCOMODATING FRAGMENTATION IN DETERMINISTIC PACKET MARKING (DPM) (Ansari, Nirwan / Belenky, Andrey) Notice of Allowance Issued on 11/16/2010

**NJIT Board of Trustees**  
Intangible Asset Review

**07-051** SCALABLE TWO-STAGE CLOS-NETWORKING SWITCH AND MODULE-FIRST MATCHING (Rojas-Cessa, Roberto / Lin, Chuan-bi) US Patent Number 7,843,908 Issued on 11/30/2010

**06-007** METHOD FOR IDENTIFYING MARKED IMAGES USING BASED AT LEAST IN PART ON FREQUENCY DOMAIN COEFFICIENT DIFFERENCES (Shi, Yun-Qing / Chen, ChunHua) Notice of Allowance Issued on 12/10/2010

**04-001** COMBINED FREQUENCY-TIME DOMAIN POWER ADAPTATION FOR CDMA COMMUNICATION SYSTEMS (Bar-Ness, Yeheskel / Lee, Ye-Hoon) US Patent Number 7,860,179 Issued on 12/28/2010

**03-001** METHODS AND APPARATUS FOR MULTI-LEVEL DYNAMIC SECURITY SYSTEM (Dhawan, Atam P.) US Patent Number 7,864,959 Issued on 1/4/2011

**06-021** METHODS AND APPARATUS FOR THE NON-DESTRUCTIVE DETECTION OF VARIATIONS IN A SAMPLE (Federici, John F. / Federici, Rose M.) Notice of Allowance Issued on 1/4/2011

**07-039** APPARATUS AND METHOD FOR REVERSIBLE DATA HIDING FOR JPEG IMAGES (Shi, Yun-Qing / Xuan, GuoRong) Notice of Allowance Issued on 1/5/2011

## **4E. Honorary Doctorate Degrees for 2011**



## Daniel Henderson

An entrepreneur, inventor, and sculptor, Daniel A. Henderson has been granted 26 U.S. patents covering telecommunication systems and devices. His prototype wireless picturephone was received by the National Museum of American History at the Smithsonian Institution in October 2007 and he has been recognized in *Bloomberg Business Week* and the *Wall Street Journal*. He has vast experience in the overseas manufacturing of his own products and has successfully founded and managed several technology companies; his patents, products and multiple companies have generated in excess of 150 million dollars.

Mr. Henderson began his career with IBM and was invited to work with Kazuo Hashimoto known as the inventor of Caller ID and the modern answering machine. We have been privileged to have Mr. Henderson present the Hashimoto Prize to outstanding doctoral graduates of NJIT during our Commencement ceremonies.

For over 10 years, Daniel Henderson has been an NJIT enthusiast. He serves on the Board of Visitors of the Albert Dorman Honors College and frequently participates in colloquia for the Honors College students. The Albert Dorman Honors College Computer Lab was dedicated to Mr. Henderson in 2008 and he created the NJIT-ECE Phonetel scholarship. His sculpture, entitled "The Brick" was donated to the University in 2009 and is permanently installed in the main entry of Fenster Hall.

He is also involved in other philanthropic efforts including the Tech Museum of Innovation in San Jose, California, the Cliburn Foundation in Fort Worth, Texas, and the digital Stone Project in Hamilton, New Jersey. Since 2007, he has been engaged in the ambitious pursuit of outsized public sculpture. His first solo museum exhibition is currently on the display at the Schneider Museum in Ashland, Oregon.

## Joseph M. Taylor

Joseph M. Taylor was named Chairman and Chief Executive Officer of Panasonic Corporation of North America on February 22, 2010. He is a 26 year Panasonic veteran who has served as Panasonic Corporation of North America's Chief Operating Office since 2007. Mr. Taylor has led many of the company's strategic business efforts, including creating a B2B enterprise solutions group and launching and coordinating companywide Full HD 3D TV product and promotion initiatives. Prior to becoming Chief Operating Officer, Mr. Taylor was President of Panasonic Industrial Company, a division that supplies industrial components and electronic devices to the nation's largest manufacturers and assemblers.

In addition to his role in Panasonic's U.S. operations, Mr. Taylor also serves as an Executive Officer of parent company Panasonic Corporation. Through this position, Mr. Taylor is involved in formulating and executing Panasonic's global business strategy.

Mr. Taylor has served on numerous boards and technical education initiatives including programs with New Jersey's Liberty Science Center, the New Jersey Institute of Technology, and Rutgers University. He has been a member of the Board of the National Association of Manufacturers, Chairman of the Board for the Electronic Manufacturers Recycling Company, and serves on the boards of several Panasonic companies.

Panasonic Corporation of North America provides a broad line of digital and other electronic products for consumer, business, and industrial use. It is the principal North American subsidiary of Osaka, Japan-based Panasonic Corporation and the hub of Panasonic's U.S. branding, marketing, sales, service, and R&D operations.

## **4F. Operating Statement Year to Date**

New Jersey Institute Of Technology  
Statement of Current Fund Revenues and Expenditures  
For the Six Months Ended December 31, 2010  
(Dollars in Thousands)

| Restricted Funds        |            |                      |        |     | Unrestricted Funds |   |                      |        |         |     |     |
|-------------------------|------------|----------------------|--------|-----|--------------------|---|----------------------|--------|---------|-----|-----|
| FY2011 Budget           | FY2011 YTD | 50% of Budget FY2011 | FY2010 |     | FY2011 Budget      | FY2011 YTD                                  | 50% of Budget FY2011 | FY2010 |         |     |     |
| Revenues                |            |                      |        |     |                    |   |                      |        |         |     |     |
| Education and General   |            |                      |        |     |                    |   |                      |        |         |     |     |
| \$                      | 74,596     | \$                   | 38,774 | 52% | 52%                | \$  | 122,301              | \$     | 112,986 | 92% | 93% |
|                         |            |                      |        |     |                    |   | 67,313               |        | 33,965  | 50% | 47% |
|                         |            |                      |        |     |                    |   | 12,691               |        | 5,388   | 42% | 49% |
|                         |            |                      |        |     |                    |   | 5,895                |        | 2,948   | 50% | 50% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         | 74,596     |                      | 38,774 | 52% | 52%                | Total                                       | 208,200              |        | 155,287 | 75% | 74% |
|                         |            |                      |        |     |                    | Auxiliary Enterprises                       | 15,171               |        | 13,192  | 87% | 87% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         | 74,596     |                      | 38,774 | 52% | 52%                | Total Revenues                              | 223,371              |        | 168,479 | 75% | 75% |
| Expenditures            |            |                      |        |     |                    |   |                      |        |         |     |     |
| Educational and General |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         | 1,175      |                      | 1,035  |     |                    | Instruction                                 | 75,648               |        | 39,908  | 53% | 51% |
|                         | 40,745     |                      | 25,249 |     |                    | Research                                    | 7,030                |        | 3,248   | 46% | 49% |
|                         | 413        |                      | 173    |     |                    | Public Service                              | 3,485                |        | 1,368   | 39% | 59% |
|                         | 273        |                      | 63     |     |                    | Academic Support                            | 19,703               |        | 9,521   | 48% | 43% |
|                         | 1,687      |                      | 859    |     |                    | Student Services                            | 14,424               |        | 6,999   | 49% | 47% |
|                         | 303        |                      | 167    |     |                    | Institutional Support                       | 30,915               |        | 13,623  | 44% | 41% |
|                         |            |                      |        |     |                    | Operation and Maintenance of Physical Plant | 16,415               |        | 6,006   | 37% | 43% |
|                         | 30,000     |                      | 11,228 |     |                    | Financial Aid to Students                   | 20,601               |        | 10,796  | 52% | 52% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         | 74,596     |                      | 38,774 | 52% | 52%                | Total Educational and General               | 188,221              |        | 91,469  | 49% | 48% |
|                         |            |                      |        |     |                    | Transfers                                   | 19,979               |        | 9,784   | 49% | 49% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         | 74,596     |                      | 38,774 | 52% | 52%                | Total                                       | 208,200              |        | 101,253 | 49% | 48% |
|                         |            |                      |        |     |                    | Auxiliary Enterprises                       | 9,780                |        | 4,872   | 50% | 51% |
|                         |            |                      |        |     |                    | Auxiliary Transfers                         | 5,391                |        | 2,655   | 49% | 50% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         |            |                      |        |     |                    | Total Auxiliary                             | 15,171               |        | 7,527   | 50% | 51% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
|                         | 74,596     |                      | 38,774 | 52% | 52%                | Total Expenditures & Transfers              | 223,371              |        | 108,780 | 49% | 48% |
|                         |            |                      |        |     |                    |   |                      |        |         |     |     |
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**New Jersey Institute Of Technology**  
**Expense Report**  
**For the Six Months Ended December 31, 2010**  
**(Dollars In Thousands)**

|  | Current<br>Month | FY2011<br>YTD     | FY2011<br>Budget  | 50% of Budget             |                                       |                 |
|--|------------------|-------------------|-------------------|---------------------------|---------------------------------------|-----------------|
|  |                  |                   |                   | Actual<br>Year to<br>Date | Includes Commitments<br>Prior<br>Year | Current<br>Year |
| <b>Academic</b>                                |                  |                   |                   |                           |                                       |                 |
| Salaries & Fringe Benefits                     | \$ 8,913         | \$ 55,327         | \$ 104,893        | 53%                       | 96%                                   | 97%             |
| Equipment Purchases                            | 52               | 831               | 2,868             | 29%                       | 49%                                   | 41%             |
| Financial Aid to Students                      | 38               | 10,796            | 20,601            | 52%                       | 52%                                   | 52%             |
| <i>Other Operating Expenses:</i>               |                  |                   |                   |                           |                                       |                 |
| Materials & Supplies                           | 55               | 581               | 1,735             |                           |                                       |                 |
| Travel & Development                           | 108              | 715               | 1,480             |                           |                                       |                 |
| Library Collections                            | 16               | 260               | 1,209             |                           |                                       |                 |
| Other General Operating                        | 531              | 3,330             | 8,104             |                           |                                       |                 |
| Total Other Operating                          | 710              | 4,886             | 12,528            | 39%                       | 57%                                   | 54%             |
| <b>Total Academic</b>                          | <b>9,713</b>     | <b>71,840</b>     | <b>140,890</b>    | <b>51%</b>                | <b>85%</b>                            | <b>86%</b>      |
| <b>Support</b>                                 |                  |                   |                   |                           |                                       |                 |
| Salaries & Fringe Benefits                     | 2,345            | 14,890            | 31,344            | 48%                       | 95%                                   | 95%             |
| Equipment Purchases                            | 14               | 118               | 436               | 27%                       | 34%                                   | 41%             |
| Utilities                                      | 549              | 3,393             | 10,386            | 33%                       | 91%                                   | 90%             |
| <i>Other Operating Expenses:</i>               |                  |                   |                   |                           |                                       |                 |
| Materials & Supplies                           | 44               | 377               | 1,243             |                           |                                       |                 |
| Travel & Development                           | 34               | 162               | 344               |                           |                                       |                 |
| Other General Operating                        | 15               | 689               | 3,578             |                           |                                       |                 |
| Total Other Operating                          | 93               | 1,228             | 5,165             | 24%                       | 81%                                   | 86%             |
| <b>Total Support</b>                           | <b>3,001</b>     | <b>19,629</b>     | <b>47,331</b>     | <b>41%</b>                | <b>91%</b>                            | <b>93%</b>      |
| Transfers                                      | 1,632            | 9,784             | 19,979            | 49%                       | 88%                                   | 98%             |
| <b>Total Academic, Support &amp; Transfers</b> | <b>14,346</b>    | <b>101,253</b>    | <b>208,200</b>    | <b>49%</b>                | <b>87%</b>                            | <b>88%</b>      |
| Auxiliary Enterprises                          | 612              | 4,872             | 9,780             | 50%                       | 92%                                   | 84%             |
| Auxiliary Transfers                            | 442              | 2,655             | 5,391             | 49%                       | 100%                                  | 99%             |
| Total Auxiliary Expenses                       | 1,054            | 7,527             | 15,171            |                           |                                       |                 |
| <b>Total Unrestricted Expenses</b>             | <b>15,400</b>    | <b>108,780</b>    | <b>223,371</b>    | <b>49%</b>                | <b>86%</b>                            | <b>88%</b>      |
| Restricted Expenses                            | 5,297            | 38,774            | 74,596            | 52%                       | 75%                                   | 82%             |
| <b>Total Expenses And Transfers</b>            | <b>\$ 20,697</b> | <b>\$ 147,554</b> | <b>\$ 297,967</b> | <b>50%</b>                | <b>84%</b>                            | <b>87%</b>      |

## **4G. Schedule of Short Term Investments**

# NEW JERSEY INSTITUTE OF TECHNOLOGY

## SCHEDULE OF INVESTMENTS AS OF DECEMBER 31, 2010

|   | US BANK             | WACHOVIA<br>BANK     | CITY<br>NATIONAL<br>BANK | WELLS<br>FARGO      | JP MORGAN<br>CHASE  | 12/31/2010<br>TOTAL  | 12/31/2009<br>TOTAL  |
|---|---------------------|----------------------|--------------------------|---------------------|---------------------|----------------------|----------------------|
| Cash and cash equivalents:                |                     |                      |                          |                     |                     |                      |                      |
| Money market funds                        | \$ 1,875,201        | \$ 12,099,000        | \$ -                     | \$ 247,786          | \$ 2,287,276        | \$ 16,509,263        | \$ 10,253,591        |
| Commercial paper                          | -                   | -                    | -                        | -                   | -                   | -                    | 1,549,574            |
|   | <u>1,875,201</u>    | <u>12,099,000</u>    | <u>-</u>                 | <u>247,786</u>      | <u>2,287,276</u>    | <u>16,509,263</u>    | <u>11,803,165</u>    |
| Investments:                              |                     |                      |                          |                     |                     |                      |                      |
| Certificate of deposit                    | -                   | -                    | 500,000                  | -                   | -                   | 500,000              | 500,000              |
| U.S. Treasury and government agency bonds | <u>1,187,877</u>    | <u>-</u>             | <u>-</u>                 | <u>4,316,077</u>    | <u>-</u>            | <u>5,503,954</u>     | <u>6,178,078</u>     |
|   | <u>1,187,877</u>    | <u>-</u>             | <u>500,000</u>           | <u>4,316,077</u>    | <u>-</u>            | <u>6,003,954</u>     | <u>6,678,078</u>     |
| Total                                     | <u>\$ 3,063,078</u> | <u>\$ 12,099,000</u> | <u>\$ 500,000</u>        | <u>\$ 4,563,863</u> | <u>\$ 2,287,276</u> | <u>\$ 22,513,217</u> | <u>\$ 18,481,243</u> |

## **4H. Spring 11 Enrollment**



# 2011 Spring Enrollment

|                          |           | Read-<br>mit | Contin-<br>uing | Non-<br>Matric | New<br>Graduate | Transfer | First-<br>Time<br>Fresh-<br>man | Totals       |
|--------------------------|-----------|--------------|-----------------|----------------|-----------------|----------|---------------------------------|--------------|
| G                        | Full Time | 7            | 925             | 20             | 255             |          |                                 | 1207         |
|                          | Part Time | 34           | 1119            | 199            | 170             |          |                                 | 1522         |
|                          | Total     | 41           | 2044            | 219            | 425             |          |                                 | 2729         |
| U                        | Full Time | 72           | 4390            | 16             |                 | 177      | 12                              | 4667         |
|                          | Part Time | 65           | 604             | 385            | 1               | 69       | 2                               | 1126         |
|                          | Total     | 137          | 4994            | 401            | 1               | 246      | 14                              | 5793         |
| Total Number of Students |           | 178          | 7038            | 620            | 426             | 246      | 14                              | 8522         |
| Total number of Students |           | Spring, 2010 |                 |                |                 |          |                                 | 8383<br>+169 |

## **4I. Report on Gifts and Fund Raising Activities**

**Summary - 2009 (7/1/2008 to 12/31/2008) vs 2010 (7/1/2009 to 12/31/2009) vs 2011 (7/1/2010 to 12/31/2010)**

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

|                                    | 2009                     |             | 2010  |                          | 2011   |             |
|------------------------------------|--------------------------|-------------|-------|--------------------------|--------|-------------|
| All Sources:                       |                          | \$7,434,635 |       | \$4,619,505              |        | \$3,809,624 |
| All Sources without Gifts in Kind: |                          | \$5,902,458 |       | \$3,552,263              |        | \$3,366,873 |
| Matching Gifts:                    |                          | \$46,583    |       | \$24,477                 |        | \$13,651    |
| Category                           | \$ Giving                | %           | #     | \$ Giving                | %      | #           |
| Alum                               | \$2,206,493 <sup>1</sup> | 29.68       | 2,748 | \$1,290,034 <sup>2</sup> | 27.93  | 2,693       |
| Corp                               | \$2,883,492 <sup>4</sup> | 38.78       | 223   | \$2,307,482 <sup>5</sup> | 49.95  | 208         |
| Foundations                        | \$1,937,658 <sup>7</sup> | 26.06       | 15    | \$420,988                | 9.11   | 7           |
| Friends                            | \$307,099                | 4.13        | 255   | \$456,791                | 9.89   | 265         |
| Other                              | \$99,892                 | 1.34        | 16    | \$144,209 <sup>8</sup>   | 3.12   | 13          |
| Totals:                            | \$7,434,635              | 100.00      | 3,257 | \$4,619,505              | 100.00 | 3,186       |
|                                    |                          |             |       |                          |        | \$3,809,624 |
|                                    |                          |             |       |                          |        | 100.00      |
|                                    |                          |             |       |                          |        | 2,811       |

**Year End Total Comparison to 2007 Base Year**

|      | Total Dollars | % of FY 07 Funds Raised | % of Year Elapsed |
|------|---------------|-------------------------|-------------------|
| 2007 | \$8,205,293   | 100%                    | 100%              |
| 2008 | \$13,324,197  | 163%                    | 100%              |
| 2009 | \$9,391,314   | 114%                    | 100%              |
| 2010 | \$7,882,525   | 96%                     | 100%              |
| 2011 | \$3,809,624   | 46%                     | 50%               |

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- <sup>1</sup> Alumni – Spatz Bequest \$977K, Nudenberg Bequest \$284K, Naimoli \$217K
  - <sup>2</sup> Alumni – Reif Bequest \$600K, Naimoli \$109K
  - <sup>3</sup> Alumni – Adams Bequest \$613K, Naimoli \$100K
  - <sup>4</sup> Corporations – Anonymous \$1.28M GIK
  - <sup>5</sup> Corporations – Anonymous \$315 GIK, FMC \$504K, Schering \$300K
  - <sup>6</sup> Corporations – Anonymous \$383K GIK
  - <sup>7</sup> Foundations – Stable \$1M, Ridgefield \$500K, Kessler \$223K
  - <sup>8</sup> Other – Northeast CIM \$100K

# **Chairperson's Closing Statement**

**BOARD OF TRUSTEES**

**RESOLUTION RE: CLOSED SESSION TO DISCUSS PERSONNEL MATTERS,  
REAL ESTATE AND CONTRACT MATTERS.**

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**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 7, 2011 AT 9:30 AM, EBERHARDT HALL NJIT ALUMNI  
CENTER BOARD ROOM.**