

Institutional Profile Report

2008

Prepared by the Office of Institutional Research and Planning
New Jersey Institute of Technology

September 2008

A. Statement of Accuracy and Completeness

The information contained in this report is, to the best of my knowledge, complete and accurate.

A handwritten signature in black ink that reads "Robert A. Altenkirch". The signature is written in a cursive style with a large initial 'R'.

Robert A. Altenkirch

President

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I. Introduction

NJIT enrolled 8288 students in Fall 2007. NJIT also awarded 1,859 degrees including baccalaureate through doctorate in the 2007-2008 academic year in an array of engineering and technology disciplines, computer and information science, architecture, management, applied sciences, mathematics and biotechnology. The university offers Ph.D. programs in nineteen professional areas, master's programs in forty-one specialties, and thirty five baccalaureate degree programs; conducts research with important commercial and public policy applications; and performs a broad spectrum of economic development and public service activities. NJIT has one of the most computing-intensive campuses in America. NJIT also contributes significantly to New Jersey's economy and economic development. NJIT's students have provided 70,000 hours of community service over the past five years, and the university serves more than 5,000 elementary and secondary school students and teachers annually through an array of pre-college programs.

NJIT was founded in 1881 as the Newark Technical School. Today, the university has six schools: Newark College of Engineering (1919), the New Jersey School of Architecture (1973), the College of Science and Liberal Arts (1982), the School of Management (1988), the Albert Dorman Honors College (1993), and the College of Computing Sciences (2001). From the beginning, NJIT has provided government, industry, and the larger community with a technologically educated workforce. Today's emphasis on graduate studies and research builds upon the fine undergraduate programs that have distinguished the institution since its earliest days. Currently, about one-third of NJIT's students are enrolled in master's and doctoral programs.

NJIT's evolution as a significant research university has been achieved through an aggressive faculty recruitment plan matched by an extensive building effort that doubled the size of the main campus over the past decade and added major research facilities for environmental engineering and science, advanced manufacturing, and microelectronics. Annual research expenditures are now approximately \$90 million. The strong applications orientation of the university's research program has allowed NJIT to respond to state, federal, and industrial initiatives, to help address pressing public policy issues, and stimulate economic growth. Research activities, often carried out by interdisciplinary teams of investigators, are focused especially on manufacturing systems, infrastructure, information technologies, environmental engineering and science, architecture and building science, and management. Major funding for instructional and research programs is obtained from leading corporations, foundations and government agencies including the National Science Foundation, the United States Department of Defense, the U.S. Environmental Protection Agency, the U.S. Department of Transportation, the New Jersey Commission on Science and Technology, the New Jersey Department of Environmental Protection and many others.

NJIT's 48 acre, computing-intensive, residential campus is located in the University Heights section of Newark, less than 10 miles from New York City and Newark

International Airport. It is easily reached by interstate highways and public transportation. Graduate, undergraduate, and continuing education classes are offered at the main campus, at extension sites at colleges and other locations throughout New Jersey and increasingly through a variety of electronically mediated distance learning formats.

I.A. NJIT Mission Statement

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.

As defined in The Statewide Plan for Higher Education (1981), the programmatic mission of NJIT is:

... to provide undergraduate and graduate education in architecture, engineering, engineering technology, applied sciences, management, and related professional fields, and doctoral education specifically, in engineering, the sciences, mathematics, management and related areas. The programs in architecture should be offered solely by NJIT in the public sector. In addition, the university should offer the opportunity for practitioners in the industrial community to pursue part-time evening degree programs from the baccalaureate through the master's to the doctoral degree. It should also play a leadership role in continuing professional education, providing courses ranging from state-of-the-art offerings in new fields to more formal certification programs for state or municipal licensure. NJIT's research programs, as well as its public service activities, should be primarily, but not exclusively, applications oriented.

I.B. Undergraduate Recruitment and Admissions Policies

As a public institution, NJIT strives to achieve three complementary and mutually reinforcing goals through its undergraduate recruitment and admissions policies:

- To attract highly talented students who are fully prepared for the university's rigorous curricular demands and can satisfy the highest academic standards;
- To enroll students from population groups that are under-represented in the professions, while providing the extra academic support they may need; and
- To recruit and admit students who will successfully complete one of NJIT's curricula in numbers large enough to make a substantial contribution toward meeting state and national demands for technological and managerial professionals.

These three goals are complementary and mutually reinforcing. They clearly reflect the responsibilities of a public institution with a public mission. And they are consistent with NJIT's long-range vision of joining the ranks of the nation's leading technological research universities.

There are four avenues to undergraduate admission:

- Admission to the Albert Dorman Honors College
- Regular admission
- Admission to the Educational Opportunity Program (EOP)
- Admission as a transfer student from another college or university

NJIT uses multiple methods to determine an applicant's admissibility. No single measure is sufficient to predict success. Therefore, all of the following are considered: high school transcripts and rank-in-class data; college or university transcripts where applicable; recommendations; SAT scores; interviews of candidates seeking admission to the Honors College or admission through the Educational Opportunity Program; and portfolios for candidates seeking admission to the School of Architecture.

The *Albert Dorman Honors College* program is designed to attract exceedingly able and highly motivated students to NJIT, to provide a rich and challenging educational experience, and to prepare them for positions of leadership. Some NJIT courses are open only to honors students, but most include both honors and non-honors students; by participating in classes and laboratories with others, the honors students raise the level of discourse in all of NJIT's curricula. The SAT profile of the honors students (required minimum composite score of 1250) falls within the range that many people believe is not served by New Jersey's institutions. Enrollment in the *Albert Dorman Honors College* increased from 209 scholars in Fall 1993 to 634 in Fall 2007. The university's plans call for further significant expansion of the Honors College.

NJIT also has outstanding *Educational Opportunity Program (EOP)* with an enrollment of about 636 undergraduates in Fall 2007. It is a program of extraordinary importance to the state and nation because the people it typically serves are under-represented in the fields which NJIT prepares students to enter, and successful completion of an NJIT degree program generally leads to a productive career. The success of EOP graduates over a quarter century is further proof that multiple criteria should be used in determining who can benefit from the higher education experience. It should also be noted that the state, through its Educational Opportunity Fund, has by regulation required institutions to admit educationally and economically disadvantaged students in numbers equal to at least ten percent of the New Jersey high school graduates in each entering class. Because of NJIT's specialized mission and sense of commitment, NJIT has historically exceeded this percentage. NJIT firmly believes holding open this door to opportunity is one of the strengths of our state system of higher education.

NJIT is proud of the results achieved with its undergraduate recruitment and admissions policies. *Diversity* is a hallmark of the campus community. As the state's public technological research university, NJIT admits individuals who want to study in the fields it offers, regardless of personal background or family finances. NJIT selects those who indicate a strong desire to succeed. For those who do succeed, the experience is life transforming. We believe this is what a public university should be about in a democratic society.

I.C. Vision Statement

A preeminent technological research university known for innovation, entrepreneurship, and engagement.

Core Values

Our core values reflect our beliefs, guide our behavior, shape our culture, and in so doing establish a sense of community and common purpose.

- Excellence: We pursue excellence in all that we do and will be satisfied with nothing less than meeting and sustaining the highest standards of performance.
- Integrity: We are honest and ethical in all we do, keep our promises, and acknowledge our mistakes.
- Student-Centered: We care for our students as individuals and make every effort to build enduring relationships by responding to their needs.
- Civility: We treat each other with respect and with dignity and communicate frequently and with candor.

- Diversity: We celebrate the diversity of our university community and are sensitive to cultural and personal differences. We do not tolerate discrimination of any form.

Value Proposition

NJIT provides accessible, affordable education for the technological professions to a diverse student body, delivers practical research results to its sponsors, and is an active participant in the life of the community in which it lives.

Goals

NJIT's goals are to 1) enhance our educational programs, 2) enhance and focus our research efforts, 3) strengthen our sense of community, 4) enhance our revenue base, 5) impact the economy, and 6) strengthen our efforts in civic engagement.

Strategic Priorities

-- *Enhance and enrich the quality of life of the university community and ensure a focus on the student.*

- Develop and implement a landscaping/campus appearance enhancement plan, including improvement of the interior condition of buildings, by 2005 followed by completion of a facilities and infrastructure master plan by 2006.
- Systematically reengineer administrative and academic processes to improve customer and student satisfaction over the next five years.
- Move the men's soccer program to NCAA Division I status by spring 2005 as an integral part of the move of the university's intercollegiate athletics program from NCAA Division II to Division I.
- Implement high-profile, intellectually stimulating on-campus events by 2005.

-- *Increase revenue from private sources.*

- Increase the percentage of alumni donors from 16% to 21%.
- Increase unrestricted gift revenue from private sources, exclusive of gifts-in-kind, by 5% annually for the next three years.
- Successfully launch and complete two focused capital campaigns within the next three years.
- Launch the quiet phase of a comprehensive capital campaign in three years.

-- *Develop a core of nationally recognized programs.*

- Build three programs to national prominence by 2008.
- Strengthen by 2005 three niche areas with high potential for NJIT and the State of New Jersey.
- Develop and implement a marketing program by 2005 that impacts constituents and local, regional, and national media.

-- *Improve national rankings in research and intellectual property development.*

- Double externally sponsored research and development expenditures over the next 5 years.
- Increase number of faculty recognition awards to at least the average of a select set of benchmark peer institutions within five years.
- Increase the number of licenses from university held intellectual property to at least the average of a select set of benchmark peer institutions within five years.
- Reach and maintain a three-year average of 60 Ph.D. graduates per year in 15 disciplines within five years.

-- *Become nationally recognized for attracting high achieving students from diverse national and international populations.*

- Increase enrollment by fall of 2008:
 - in the Dorman Honors College to 1 of 5 freshmen
 - of newly admitted undergraduate students, excluding undeclared, to
 - 25% women, and
 - 15% African-American, and
 - 15% Hispanic.
- Increase the graduation rate of first-time, full-time freshmen (FTFTF) to 55% by fall 2010.
- For an incoming freshman class of at least 750 students, Increase the mean SAT score by 20 points by 2005.

II. Data for 2007-2008 by Category

II.A. Accreditation Status

II.A.1. Institutional Accreditation

- The Middle States Association of Colleges and Schools (2002)

II.A.2. Professional Accreditation

- American Assembly of the Collegiate Schools of Business (AACSB)
- Computer Accreditation Commission of the Accreditation Board for Engineering and Technology (CAC/ABET)
- Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET)
- National Architecture Accrediting Board (NAAB)

II.B. Number of Students Served

II.B.1. Number of Undergraduates by Attendance Status

NJIT Table II.B.1: Undergraduate Enrollment by Attendance Status, Fall 2007					
<u>Full-time</u>		<u>Part-time</u>		<u>Total</u>	
<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>		
4,353	80.2%	1,075	19.8%	5,428	

II.B.2. Number of Graduates and First-professionals by Attendance Status

NJIT Table II.B.2: Graduate Enrollment by Attendance Status, Fall 2007					
<u>Full-time</u>		<u>Part-time</u>		<u>Total</u>	
<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>		
1,641	57.4%	1,219	42.6%	2,860	

II.B.3. Number of Non-credit Students Served

NJIT Table II.B.3: Non-Credit Enrollment by Attendance Status, Fall 2007					
<u>Full-time</u>		<u>Part-time</u>		<u>Total</u>	
<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>		
0	0.0%	4,800	100.0%	4,800	

II.B.4. Unduplicated Number of Students for Entire Academic Year

NJIT Table II.B.4: Unduplicated Enrollment, FY 2007			
	<u>Headcount</u>	<u>Credit Hours</u>	<u>FTE</u>
	<u>Enrollment</u>		
Undergraduate	6,225	147,664	4,922
Graduate	3,533	73,602	3,067
TOTAL	9,758	221,266	7,989

II.C. Characteristics of Undergraduate Students

II.C.1. Mean Math, reading and writing SAT Scores

NJIT												
Table II.C.1:												
Mean Math, Reading and Writing SAT for First-Time Freshmen, by Admission Status and Overall, Fall 2007												
	Full-Time Students						Part-Time Students					
	<u>Mat</u> <u>h</u>	<u>N</u>	<u>Readin</u> <u>g</u>	<u>N</u>	<u>Writin</u> <u>g</u>	<u>N</u>	<u>Mat</u> <u>h</u>	<u>N</u>	<u>Readin</u> <u>g</u>	<u>N</u>	<u>Writin</u> <u>g</u>	<u>N</u>
Regular Admits	611.6	60	544.5	60	533.5	59	494.8	4	435.9	4	439.8	4
EOF Admits	549.3	11	490.4	2	485.9	9	460.0	7	421.4	7	418.6	7
Special Admits	601.9	71	536.0	4	526.1	7	490.2	5	434.0	3	436.8	5
All Admits		18		18		25		1		1		4
Missing Scores												

II.C.2. Enrollment in Remediation Courses by Subject Area
NJIT

Table II.C.2 ENROLLMENT IN REMEDIATION COURSES

1 Name of basic skills placement test administered and criteria (if any) for selecting test takers in fall 2007

English and Math

2 Total Number of Undergraduate Students Enrolled in Fall 2007

Total Fall 2007 Undergraduate Enrollment	Number of Students Enrolled in One or More Remedial Courses	% of Total
5,428	395	7.2

Total Enrollment = includes all students, FT, PT, returning, transfer, etc.

3 Total number of First-time, Full-time (FTFT) students enrolled in remediation in fall 2007

Total Number of FTFT Students	Number of FTFT Students Enrolled in One or More Remedial Courses	Percent of FTFT Enrolled in One or More Remedial Course
731	287	39.2

4 First-time, Full-time students (FTFT) enrolled in remediation in fall 2007 by subject area

<u>Subject Area</u>	Number of FTFT Enrolled In:	Percent of all FTFT Enrolled In:
Reading		
Writing		
Math Computation	169	23.1
Elementary Algebra	169	23.1

(For institutions who do not separate reading & writing):

Total English	191	26.1
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II.C.3 Race/ Ethnicity, Gender, and Age

II.C.3.a. By Race/ Ethnicity

NJIT
Table II.C.3.a
Undergraduate Enrollment by Race/Ethnicity, Fall 2007

	<u>White</u>		<u>Black</u>		<u>Hispanic</u>		<u>Asian</u>		<u>American Ind.</u>		<u>Alien</u>		<u>Race Unknown</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Full-time	1,544	35.5%	403	9.3%	735	16.9%	929	21.3%	25	0.6%	259	5.9%	458	10.5%	4,353	100.0%
Part-time	371	34.5%	138	12.8%	180	16.7%	150	14.0%	7	0.7%	23	2.1%	206	19.2%	1,075	100.0%
Total	1,915	35.3%	541	10.0%	915	16.9%	1,079	19.9%	32	0.6%	282	5.2%	664	12.2%	5,428	100.0%

II.C.3.b. By Gender

Table II.C.3.b
Undergraduate Enrollment by Sex, Fall 2007

	<u>Full-time</u>					<u>Part-time</u>					<u>Total</u>				
	<u>Male</u>	<u>Pct</u>	<u>Female</u>	<u>Pct</u>	<u>Total</u>	<u>Male</u>	<u>Pct</u>	<u>Female</u>	<u>Pct</u>	<u>Total</u>	<u>Male</u>	<u>Pct</u>	<u>Female</u>	<u>Pct</u>	<u>Total</u>
	3,443	79.1%	910	20.9%	4,353	873	81.2%	202	18.8%	1,075	4,316	79.5%	1,112	20.5%	5,428

II.C.3.c. By Age

Table II.C.3.c
Undergraduate Enrollment by Age, Fall 2007

		<u>LT 18</u>	<u>18-19</u>	<u>20-21</u>	<u>22-24</u>	<u>25-29</u>	<u>30-34</u>	<u>35-39</u>	<u>40-49</u>	<u>50-64</u>	<u>65+</u>	<u>Unknown</u>	<u>Total</u>
		Full-time	Num	203	1,309	1,310	1,111	299	63	27	27	2	0
	Pct	4.7%	30.1%	30.1%	25.5%	6.9%	1.4%	0.6%	0.6%	0.0%	0.0%	0.0%	100%
Part-time	Num	2	82	78	219	286	144	99	130	30	0	5	1,075
	Pct	0.2%	7.6%	7.3%	20.4%	26.6%	13.4%	9.2%	12.1%	2.8%	0.0%	0.5%	100%
Total	Num	205	1,391	1,388	1,330	585	207	126	157	32	0	7	5,428
	Pct	3.8%	25.6%	25.6%	24.5%	10.8%	3.8%	2.3%	2.9%	0.6%	0.0%	0.1%	100%

II.C.4. Numbers of Students Receiving Financial Assistance under Each State-funded Aid Program: Need-based and Merit-based, Grants and Loans.

NJIT Table II.C.4: Financial Aid from State-Funded Programs, FY 2007					
	<u>Recipients</u>	<u>Awards</u>	<u>Dollars(\$)</u>	<u>\$/Recipient</u>	<u>\$/Award</u>
TAG	895	1,709	4,755,702	5,313.63	2,782.74
EOF	396	744	460,800	1,163.64	619.35
Bloustein Scholars	1,185	2,351	1,092,596	922.02	464.74
Urban Scholars	138	275	127,445	923.51	463.44
NJCLASS Loans		185	1,972,194		10,660.51
NJ Stars II (2007)	5		10,340	2,068.00	
OSRP		100	251,125		2,511.25

II.C.5. Percentage of Students Who are New Jersey Residents

NJIT Table II.C.5 Total First-time Undergraduates, Fall 07 by State Residence				
<u>State Residents</u>	<u>Non-State Residents</u>	<u>Total</u>	<u>% State Residents</u>	
730	56	786	92.9%	

II.D. Degrees Conferred/ Characteristics of graduates

II.D.1. By Race/Ethnicity and Gender

II.D.1.a. By Race/ Ethnicity

NJIT																
Table II.D.1.a:																
Degrees Conferred by Race/Ethnicity, FY 2007																
	<u>White</u>		<u>Black</u>		<u>Hispanic</u>		<u>Asian</u>		<u>American Ind.</u>		<u>Alien</u>		<u>Race Unknown</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Baccalaureate	346	35.5%	80	8.2%	125	12.8%	256	26.3%	1	0.1%	55	5.6%	111	11.4%	974	100.0%
Masters	191	22.3%	67	7.8%	48	5.6%	130	15.2%	1	0.1%	370	43.1%	51	5.9%	858	100.0%
Doctoral	10	19.2%	0	0.0%	1	1.9%	2	3.8%	0	0.0%	37	71.2%	2	3.8%	52	100.0%
Total	547	29.0%	147	7.8%	174	9.2%	388	20.6%	2	0.1%	462	24.5%	164	8.7%	1,884	100.0%

II.D.1.b. By Gender

Table II.D.1.b:						
Degrees Conferred by Sex, FY 2007						
	<u>Men</u>		<u>Women</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Baccalaureate	785	80.6%	189	19.4%	974	100.0%
Masters	611	71.2%	247	28.8%	858	100.0%
Doctoral	39	75.0%	13	25.0%	52	100.0%
Total	1,435	76.2%	449	23.8%	1,884	100.0%

II.D.2. By General Field

NJIT Table II.D.2: Degrees Conferred by General Field, FY 2007							
IPEDS CIP Code Major Category	Certificate	Associate	Bachelor	Master	Doctor	1st Pro	Total
03 Agriculture	0	0	0	10	1	0	11
04 Architecture	0	0	101	31	0	0	132
11 Computer Science	0	0	179	248	5	0	432
14 Engineering	0	0	404	350	33	0	787
Engineering Related							
15 Technology	0	0	139	53	0	0	192
23 English/Letters	0	0	8	14	0	0	22
Biological & Biomedical							
26 Sciences	0	0	10	5	0	0	15
27 Mathematics	0	0	24	18	4	0	46
Multi/Interdisciplinary							
30 Studies	0	0	9	0	0	0	9
40 Physical Sciences	0	0	6	6	6	0	18
44 Public Administration	0	0	0	4	0	0	4
45 Social Sciences	0	0	0	0	1	0	1
51 Health Professions	0	0	0	0	0	0	0
52 Business/Management	0	0	89	119	2	0	210
54 History	0	0	5	0	0	0	5
Total	0	0	974	858	52	0	1,884

II.E. Student Outcomes

II.E.1. Graduation Rates by Race/ Ethnicity and Income

II.E.1.a. Four-, Five-, and Six-year Graduation Rate

II.E.1.a.i. By Race/ Ethnicity

NJIT
Table II.E.1.a
Four-, Five- and Six-Year Graduation Rates of Fall 2001 Full-time First-time Freshmen by Race/Ethnicity

	<u>White</u>		<u>Black</u>		<u>Hispanic</u>		<u>Asian</u>		<u>Alien</u>		<u>Other *</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Fall 2001 Cohort	303		56		75		165		22		92		713	
Graduates after 4 Years	41	13.5%	3	5.4%	5	6.7%	31	18.8%	9	40.9%	14	15.2%	103	14.4%
Graduates after 5 Years	123	40.6%	15	26.8%	28	37.3%	84	50.9%	11	50.0%	32	34.8%	293	41.1%
Graduates after 6 Years	152	50.2%	19	33.9%	36	48.0%	99	60.0%	14	63.6%	44	47.8%	364	51.1%

* Other includes American Indian and Unknown Race.

II.E.1.a.ii. By Income

NJIT
Table II.E.1.b
Four-, Five- and Six-Year Graduation Rates of Fall 2001 Full-time First-time Freshmen by Income

	<u>Low Income *</u>		<u>Non-Low Income</u>		<u>Unknown</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Fall 2001 Cohort	126		407		180		713	
Graduates after 4 Years	12	9.5%	51	12.5%	40	22.2%	103	14.4%
Graduates after 5 Years	43	34.1%	171	42.0%	79	43.9%	293	41.1%
Graduates after 6 Years	60	47.6%	214	52.6%	90	50.0%	364	51.1%

* Low Income is defined as student with a NJ Eligibility Index between 1 and 2,499.

II.E.2. Third Semester Retention Rates

II.E.2.a. By Race/ Ethnicity

NJIT
Table II.E.2.a
Third Semester Retention of Full-time First-time Freshmen by Race/Ethnicity, Fall 2006 to Fall 2007

	<u>White</u>		<u>Black</u>		<u>Hispanic</u>		<u>Asian</u>		<u>American Ind.</u>		<u>Alien</u>		<u>Race Unknown</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Retained	248	77.0%	65	77.4%	140	83.3%	124	84.4%	5	62.5%	22	73.3%	29	74.4%	633	79.3%
Not Retained	74	23.0%	19	22.6%	28	16.7%	23	15.6%	3	37.5%	8	26.7%	10	25.6%	165	20.7%
Total	322	100.0%	84	100.0%	168	100.0%	147	100.0%	8	100.0%	30	100.0%	39	100.0%	798	100.0%

II.E.2.b. For Low-Income Students

NJIT
Table II.E.2.b
Third Semester Retention of Full-time First-time Freshmen by Income, Fall 2006 to Fall 2007

	<u>Low Income *</u>		<u>Non-Low Inc.</u>		<u>Unknown</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Retained	124	82.7%	382	80.9%	127	72.2%	633	79.3%
Not Retained	26	17.3%	90	19.1%	49	27.8%	165	20.7%
Total	150	100.0%	472	100.0%	176	100.0%	798	100.0%

* Low Income is defined as student with a NJ Eligibility Index between 1 and 2,499.

II.E.3. Transfers

II.E.3.a. Percentage of Entering Students who are Transfers

NJIT						
Table II.E.3:						
Entering Undergraduates by Admission Status and Attendance Status, Fall 2007						
	<u>New Transfer</u>		<u>First-time</u>		<u>Total</u>	
	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
Full-time	311	24.8%	945	75.2%	1,256	100.0%
Part-time	105	35.5%	191	64.5%	296	100.0%
Total	416	26.8%	1,136	73.2%	1,552	100.0%

II.F. Faculty Characteristics

II.F.1. Full-time Faculty by Race/Ethnicity, Gender, and Tenure Status

NJIT																
Table II.F.1:																
Full-Time Faculty by Race/Ethnicity, Sex, Tenure Status and Academic Rank, Fall 2007																
	<u>White</u>		<u>Black</u>		<u>Hispanic</u>		<u>Asian</u>		<u>American Ind.</u>		<u>Alien</u>		<u>Race Unknown</u>		<u>Total</u>	
	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>	<u>Men</u>	<u>Wom</u>
Tenured																
Professors	80	12	2		1		28				5		5		121	12
Associate Prof.	42	9	5	3	2	1	8	3			8		2	2	67	18
Assistant Prof.	2														2	0
All Others															0	0
TOTAL	124	21	7	3	3	1	36	3	0	0	13	0	7	2	190	30
Without Tenure																
Professors															0	0
Associate Prof.	5						2						2		9	0
Assistant Prof.	17	4			1		10	5			1		7		36	9
All Others	71	22	4	0	3	0	21	9	0	0	5	1	18	2	122	34
TOTAL	93	26	4	0	4	0	33	14	0	0	6	1	27	2	167	43
Total																
Professors	80	12	2	0	1	0	28	0	0	0	5	0	5	0	121	12
Associate Prof.	47	9	5	3	2	1	10	3	0	0	8	0	4	2	76	18
Assistant Prof.	19	4	0	0	1	0	10	5	0	0	1	0	7	0	38	9
All Others	71	22	4	0	3	0	21	9	0	0	5	1	18	2	122	34
TOTAL	217	47	11	3	7	1	69	17	0	0	19	1	34	4	357	73

II.F.2. Percentage of Course Sections Taught by Full-time Faculty

NJIT	
Table II.F2	
Percentage of Course Sections Taught by Full-time Faculty, Fall 2007	
F.T.	P.T.
73.0%	27.0%

F.T.: Full time faculty

P.T.: Part time faculty

II.F.3. Ratio of Full-time to Part-time Faculty

NJIT Table II.F.3: Ratio of Full- to Part-time Faculty, Fall 2007					
<u>Full-time</u>		<u>Part-time</u>		<u>Total</u>	
<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>	<u>Num</u>	<u>Pct</u>
430	65.0%	232	35.0%	662	100.0%

II.G. Characteristics of the Trustees or Governors

II.G.1. Race/ Ethnicity and Gender

	B	AI/AN	A/PI	H	W	Total
Male	1	0	0	0	7	8
Female	0	0	0	1	2	3
Total	1	0	0	1	9	11

B : Black/African American, Non-Hispanic
 AI/AN : American Indian/Alaskan Native
 A/PI : Asian/Pacific Islander
 NRA : Non-Resident Alien
 H : Hispanic
 W : White, Non-Hispanic
 U : Unknown

II.G.2. List of Trustees/ Governors with Titles and Affiliations

- Hon. John Corzine, Ex-Officio, Governor of the State of New Jersey
- Hon. Corey Booker, Ex-Officio, Mayor of the City of Newark
- Kathleen Wielkopolski, Chair, Formerly of The Gale Company
- Stephen P. DePalma, PE '72, Vice-Chair, Chairman & CEO, Schoor DePalma Inc.
- Philip K. Beachem, President, New Jersey Alliance for Action
- Dennis M. Bone, President, Verizon New Jersey, Inc.
- Peter A. Cistaro, '68, Vice President - Distribution, Public Service Electric and Gas Company
- Vincent L. DeCaprio, Ph.D. ' 72, President, Vyteris
- Elizabeth Garcia, Manager, Public Affairs, Infineum USA, L.P.
- Anthony J. Knapp Jr., Proprietor, Black Horse Restaurant Group
- Diane Montalto, Senior Director Corporate Engineering, Par Pharmaceutical Incorporated
- Arthur F. Powell, Chief Executive Officer, Powell Capital Markets, Inc.
- David J. Samuel, Managing Partner, CME Associates

II.G.3. URLs of WebPages with Information on Trustees/ Governors

- <http://www.njit.edu/about/boards/trustees/members.php>

II.H. Profile of the Institution

II.H.1. Degree Programs

NJIT currently offers 95 degree programs (35 bachelors degree programs, 41 masters programs, and 19 doctoral programs):

Bachelors Degrees (35 programs, CIP Code listed after program name)

Applied Mathematics ¹ (B.A.) 270301	Engineering Technology (B.S.) 150000
Applied Physics ¹ (B.S.) 400899	Environmental Engineering (B.S.) 141401
Architecture (B.Arch.) 040201	Environmental Science ¹ (B.S.) 030104
Architecture (B.S.) 040201	Geo-science Engineering ¹ (B.S.) 143901
Bioinformatics (B.S.) 119999	History ¹ (B.A.) 540101
Biology ¹ (B.A.) 260101	Human Computer Interaction ¹ (B.S.) 110401
Biology ¹ (B.S.) 260101	Industrial Engineering (B.S.) 143501
Biomedical Engineering (B.S.) 140501	Industrial Engineering ¹ (Dual B.A. in Physics) 143501
Chemical Engineering (B.S.) 140701	Information Systems (B.S.) 110401
Chemistry (B.S.) 400501	Information Systems ¹ (B.A.) 110401
Civil Engineering (B.S.) 140801	Information Technology (B.S.) 110103
Communication (B.A.) 231101	Management (B.S.) 520201
Communication (B.S.) 231101	Manufacturing Engineering (B.S.) 143601
Computer Engineering (B.S.) 140901	Mathematical Sciences (B.S.) 270301
Computer Science (B.S.) 110101	Mechanical Engineering (B.S.) 141901
Computer Science ¹ (B.A.) 110101	Science/Technology & Society (B.S.) 301501
Electrical Engineering (B.S.) 141001	Science/Technology & Society ¹ (B.A.) 301501
Engineering Science (B.S.) 141301	

There is now a Mathematical Sciences B.S. that will replace the Applied Mathematics B.S. and the Statistics and Actuarial Science B.S. No new students will be admitted to either the Applied Mathematics B.S. or the Statistics and Actuarial Science B.S; they will both be phased out as students currently in the programs complete.

There are 4 options within Engineering Science (B.S.):

- Materials Science and Engineering
- Pre-medical
- Pre-dental
- Pre-optometry

There are 9 options within Engineering Technology (B.E.T.):

- Computer Technology (not ABET accredited)
- Concrete Industry Management Technology (not ABET accredited)
- Construction Engineering Technology
- Construction Management Technology (not ABET accredited)
- Electrical and Computer Engineering Technology
- Manufacturing Engineering Technology (not ABET accredited)
- Mechanical Engineering Technology
- Surveying Engineering Technology
- Telecommunications Management Technology (not ABET accredited)

There are 4 options within Management (B.S.):

- E-Commerce
- Finance
- Marketing
- Management Information Systems

There are 23 undergraduate minors offered (12-18 credits required for a minor):

Applied Mathematics	History
Applied Physics	Industrial Engineering
Applied Statistics	Information Systems
Biology	Leadership and Aerospace Studies (AFROTC only)
Chemistry	Legal Studies
Communication	Literature
Computer Engineering	Management
Computer Science	Materials Engineering
Drama/Theatre	Philosophy/Applied Ethics
Economics	Science, Technology and Society
Environmental Engineering	Technology, Gender & Diversity
Global Studies	

Masters Degrees (41 programs, CIP Code listed after program name)

Applied Mathematics (M.S.) 270301	History ¹ (M.A.) 540101
Applied Physics (M.S.) 400899	History ¹ (M.A.T.) 540101
Applied Physics ¹ (M.S.) 400899	Industrial Engineering (M.S.) 143501
Applied Science (M.S.) 409999	Information Systems (M.S.) 110401
Applied Statistics (M.S.) 270501	Infrastructure Planning (M.I.P.) 040301
Architectural Studies (M.S.) 040201	Interdisciplinary Studies (M.S.) 309999
Architecture (M.Arch.) 040201	Internet Engineering (M.S.) 149999
Biology ¹ (M.S.) 260101	Management (M.S.) 520201
Biomedical Engineering (M.S.) 140501	Management of Technology (M.B.A) 520299
Chemical Engineering (M.S.) 140701	Manufacturing Systems Engr. (M.S.) 143601
Chemistry (M.S.) 400501	Materials Science and Engineering (M.S.)
Civil Engineering (M.S.) 140801	Mechanical Engineering (M.S.) 141901
Computational Biology ¹ (M.S.) 261103	Nursing-Nursing Informatics ² (M.S.N.)
Computer Engineering (M.S.) 140901	Occ. Safety & Health Engineering (M.S.)
Computer Science (M.S.) 110101	Occ. Safety & Industrial Hygiene (M.S.)
Electrical Engineering (M.S.) 141001	Pharmaceutical Engineering (M.S.) 149999
Engineering Management (M.S.) 151501	Professional & Technical Comm. (M.S.)
Engineering Science (M.S.) 141301	Public Health ⁴ (M.P.H.) 512201
Environmental Engineering (M.S.)	Telecommunications (M.S.) 141001
Environmental Policy Studies (M.S.)	Transportation (M.S.) 140804
Environmental Science ¹ (M.S.) 030104	

There are 4 options within Management (M.S.):

- Management Information Systems
- E-Commerce
- Organization Management
- Management of Technology (pending approval)

There are 6 areas of concentration within the M.B.A.:

- Management Information Systems
- Operations Management
- E-Commerce
- Marketing
- Finance

Doctoral Degrees (19 programs, CIP Code listed after program name)

Applied Physics¹ (Ph.D.) 400899
 Biology¹ (Ph.D.) 260101
 Biomedical Engineering ² (Ph.D.) 140501
 Chemical Engineering (Ph.D.) 140701
 Chemistry (Ph.D.) 400501
 Civil Engineering (Ph.D.) 140801
 Computer & Information Science (Ph.D.) 110101
 Computer Engineering (Ph.D.) 140901
 Computer Science (Ph.D.) 110701
 Electrical Engineering (Ph.D.) 141001
 Environmental Engineering (Ph.D.) 141401
 Environmental Science¹ (Ph.D.) 030104
 Industrial Engineering (Ph.D.) 143501
 Information Systems (Ph.D.) 110401
 Materials Science & Engineering (Ph.D.) 141801
 Mathematical Sciences¹ (Ph.D.) 270101
 Mechanical Engineering (Ph.D.) 141901
 Transportation (Ph.D.) 140804
 Urban Systems⁴ (Ph.D.) 459999

NJIT teaches, advises, and mentors doctoral students in one degree program where Rutgers University is the degree-granting institution:

- Management (*Ph.D.*) 520201

NOTES:

1. Joint degree program with Rutgers - The State University of New Jersey, Newark Campus
2. Joint degree program with The University of Medicine and Dentistry of New Jersey.
3. Joint degree program with both The University of Medicine and Dentistry of New Jersey and Rutgers - The State University of New Jersey, Newark Campus.

NJIT's accelerated programs

NJIT offers or participates in 9 accelerated programs:

- B.S./M.S.
- B.Arch./M.S.
- B.S./D.M.D. with the University of Medicine and Dentistry of New Jersey
- B.S./M.D. with the University of Medicine and Dentistry of New Jersey
- B.S./M.D. with St. George's University School of Medicine
- B.S./O.D. with the State University of New York-New York School of Optometry
- B.S./D.D.S. with the New York University-College of Dentistry
- B.S./J.D. with Rutgers School of Law-Newark
- B.S./J.D. with Seton Hall University School of Law-Newark

NJIT's 2+2 and 3+2 programs

NJIT offers 2+2 programs through a joint admissions agreement with 10 county colleges:

- Bergen Community College
- Brookdale Community College
- Burlington County College
- Essex County College
- Hudson County Community College
- Mercer County College
- Middlesex County College
- Ocean County College
- Raritan Valley Community College
- Union County College

NJIT offers 3+2 programs through a joint admissions agreement with 3 colleges:

- Seton Hall University
- Stockton State College
- William Paterson University

NJIT's articulation arrangements

NJIT currently has articulation arrangements with the following 19 institutions:

- Bergen Community College
- Brookdale Community College
- Burlington County College
- Camden County College
- County College of Morris
- Cumberland County College
- Essex County College
- Hudson County Community College
- Mercer County College
- Middlesex County College
- Morris County College
- Ocean County College
- Paul Smith's College
- Passaic County Community College
- Raritan Valley County College
- Union County College
- Seton Hall University
- Stockton State College
- William Peterson University

NJIT currently offers an accelerated B.S. in Information Technology at Camden County College and partners with Camden County College to offer courses leading to masters degrees in Engineering Management, Computer Science, and Information Systems

II.H.2. Continuing and Professional Education Activities at NJIT

NJIT's Division of Continuing Professional Education (CPE) is a coordinated unit focusing on the development, management, and execution of five major educational programs that fall into two major categories:

Academic Credit Learning (Degree and Certificate Programs)

- NJIT eLearning Program
- Graduate Certificate Program
- Extension Programs

Non-Credit Learning (Training and Certificate Programs)

- Corporate Training
- Professional Development and License Reviews

II.H.2.a. NJIT eLearning Program

NJIT offers seven complete undergraduate and graduate degree programs, seven graduate certificates completely online, eight graduate certificate partially via eLearning, and more than 218 individual eLearning college courses in an academic year. eLearning courses are available three times per year in the standard NJIT Fall and Spring semesters and in a ten-week Summer Session. NJIT eLearning courses consist of both an electronic lecture component conducted by an NJIT faculty member and an electronic discussion through which students conduct dialogue with their instructor and other classmates at any time of the day or night. Courses utilize computer conferencing platforms (e.g. WebCT, WebBoard), and multimedia methodologies delivered via CD-ROMS, streaming audio/video, and/or videotapes. Over the past five years, the number of eLearners and eLearning course enrollments have grown as much as 21% averaging 16% a year growth. During the 2007-2008 academic year, there were about 4,800 eLearning students who totaled an eLearning enrollment of more than 6,000 in over 190 eLearning academic credit courses during Fall and Spring semesters and Summer sessions. NJIT's has an inventory of over 200 courses produced in-house within 27 academic disciplines:

- Accounting
- Chemistry
- Chemical Engineering
- Computer Science
- Economics
- Electrical and Computing Engineering
- Electrical Engineering
- Engineering Management
- English
- Environmental Engineering
- Finance
- Human Resource Management
- Humanities and Social Sciences
- Industrial Engineering
- Industrial Management
- Information Systems
- Information Technology
- Literature

- Mathematics
- Management
- Management Information Systems
- Manufacturing Engineering
- Marketing
- Physics
- Professional and Technology Communication
- Science Technology & Society
- Social Science

Over 100 NJIT faculties have originated courseware for NJIT's eLearning Program.

Seven undergraduate and graduate degree programs are available through eLearning as well as, seven graduate certificates completely online and eight graduate certificates offered partially via eLearning:

Undergraduate Degrees via eLearning in whole or in part

- | | |
|---------------------------------|-------------|
| • Computer Science (B.S.) | 134 credits |
| • Information Systems (B.A.) | 129 credits |
| • Information Systems (B.S.) | 130 credits |
| • Information Technology (B.S.) | 127 credits |

Graduate Degrees via eLearning

- | | |
|---|------------|
| • Engineering Management (M.S.) | 30 credits |
| • Information Systems (M.S.) | 36 credits |
| • Professional & Technical Communication (M.S.) | 30 credits |

Graduate Certificates in whole or part via eLearning (each 12 credits)

- Bioinformatics
- Business Management Fundamentals
- Construction Management
- Health Communications
- Information Assurance
- Information Systems Auditing
- Information Systems Design
- Information Systems Implementation
- Internet Applications Development
- Management Essentials
- Management of Technology
- Operations Productivity
- Pharmaceutical Management
- Pharmaceutical Technology
- Practice of Technical Communications

- Project Management
- Sustainable Architecture
- Telecommunications Networking
- Virtual Tools for Professional Communities

Regarding our reputation in the now expanding field of eLearning, NJIT has placed in the top 10 in "eLearning enrollments" among America's Best Online Graduate Degree Programs in the *U.S. News & World Report* magazine's surveys for 2006 and 2007.

NJIT was also ranked by *Yahoo! Internet Life* (1998 through 2002) as the nation's "Perennially Most Wired University", in part due to the large volume of distance learning activity.

In the last five years, the number of NJIT learners and eLearning course enrollments in academic programs has increased an average of 16% each year and over the last ten years has grown nearly 2600%.

II.H.2.b. Graduate Certificate Program

Structural shifts in the economy have caused many individuals in technological and managerial specialties to feel insecure about their jobs. Others see a reduction in opportunities for advancement in their current careers. For many, education is the key to career transition but earning a Master's degree is not always necessary or appropriate. The NJIT Graduate Certificate Program is designed to facilitate a return to formal advanced education for people whose schedules are too busy to enroll in a more traditional program.

Key features of the Graduate Certificate Program include the following: 12-credit Graduate Certificates are milestones in their own right or springboards to MS degrees at NJIT or elsewhere. Graduate Certificates are offered in fields of study designated by outside authorities as likely to offer the highest growth opportunities for employment. Program duration is one calendar year.

Study is possible through distance learning, which provides greater flexibility for the busy professional to study any time, anywhere. Entry is open to applicants with a BA/BS degree with a satisfactory grade point average.

The following is the list of the 22 current Graduate Certificates offered during Academic Year 07-08:

- Bioinformatics
- CAD/CAM
- Computer Networking
- eCommerce
- eLearning Applications
- Enterprise System Modeling and Design
- Environmental Assessment
- Environmental Infrastructure and Management
- Health Communications
- Information Systems Auditing
- Information Systems Design
- Internet Applications Development
- Internet Systems Engineering
- Managing Human Resources
- Object Oriented Design
- Operations Productivity
- Physical and Digital Counter Terrorism
- Polymer Engineering
- Programming Environment Tools
- Supply Chain Management
- Telecommunications Networking
- Virtual Tools for Professional Communities

II.H.2.c. Extension Programs

NJIT's Division of Continuing Professional Education provides access to their courses and programs to part-time, evening students who prefer to attend classes at locations throughout the state. The extension program began in 1974 when courses in Computer and Information Science were offered at Drew University.

During AY07-08, NJIT will offer courses at 6 extension sites throughout New Jersey including:

Public Extension Sites:

Atlantic County:

Atlantic Cape Community College in Mays Landing

- Computer Science (M.S.)
- Information Systems (M.S.)

- Computer Science (M.S.)
- Engineering Management (M.S.)

- Information Systems (M.S.)

Mercer County

Department of Environmental Protection in Trenton

- Environmental Policy Studies (M.S.)
- Environmental Science (M.S.)

Department of Transportation in Trenton (Ewing)

- Transportation (M.S.)

Morris County

Drew University in Madison

- Computer Science (M.S.)
- Information Systems (M.S.)
- Management (M.B.A. & M.S.)

Ocean County

New Jersey Coastal Community at Camp Evans in Wall

- Information Technology

Somerset County

Raritan Valley Community College in Somerville

- Management (M.B.A. & M.S.)
- Information Technology (B.S.)

II.H.2.d. Private Extension Sites

- Chubb in Morris County leading to a Master's of Business Administration and Master's of Management of Technology.
- Fort Monmouth in Monmouth County: Courses leading to Executive MS in Electronic Engineering and MS in Electrical Engineering.
- Howmedica in Bergen County leading to a Master's of Business Administration and Master's of Management of Technology.
- National Starch and Chemical Company in Somerset County: Courses leading to Graduate Certificate in Management of Technology, Graduate Certificate in Applied Chemistry, MS in Applied Chemistry, and MS in Management or MBA in Management of Technology.
- Telcordia in Somerset County leading to a Master's of Business Administration and Master's of Management of Technology.
- Wyeth in Pearl River, New York State leading to a Graduate Certificate in Pharmaceutical Management and Pharmaceutical Technology.

II.H.2.e. Customized Corporate Training

For fifty years, NJIT has been designing and conducting customized non-credit courses that meet technology-based organizations' needs for high-quality, lifelong workforce education. Representing the arm of NJIT that brings the university's areas of academic specialization into the workplace, this unit has developed particularly close relations with the NJ Department of Labor (DOL). The DOL's Office of Customized Training implements aspects of the NJ Workforce Development Partnership Program through which eligible New Jersey companies can receive state subsidization for sixty percent of the cost of initiating on-site training programs. Qualified educational providers (such as NJIT's Customized Corporate Training Program) oversee these programs. In FY 07-08 NJIT's Customized Corporate Training program executed training contracts with over 50 companies and trained over 2,000 employees.

II.H.2.f. Professional Development and License Review

The Professional Development and License Review Program offers non-credit short courses, certificates, and license reviews. In AY 07-08 over 145 non-credit courses were offered.

In Academic Year 07-08 many new courses were added to the program, bringing the total number of courses offered to over 60 courses. Among the new offerings, a Certification in Open Source Unix was initiated. At this time, NJIT is the only University nationwide that offers this program and is endorsed to offer a professional development certificate in Open Source Operating Systems

Also added was an expansive Architecture Program for Review and Professional Development. NJIT is the only facility in New Jersey to offer this array of courses and NJIT is an approved provider in the American Institute of Architects' Continuing Education System.

The non-credit Professional Development program escalated in course demand and variety. Additional courses were added to the program and include:

Architecture

- Architecture Review Courses
- Design of Steel and Wood Structures
- Marketing/Communications for Design Firms
-

Cable Telecommunications Industry

- Introduction to the Cable Telecommunications Industry
- Cable Telecommunications Installation
- Digital and High Speed Data
- Customer Service
- Broadband Telephony

Cisco Networking Academy

- Preparing for the CISSP Credential

Computing and Technology

- A+ Certification
- .Net Comprehensive
- C Sharp Basics and Advanced C# programming
- Fireworks MX
- Windows Application Programming using Visual C#
- Web Application Development using Visual C#
- XML Comprehensive
- Voice XML
- Introduction to EDI – Electronic Data Interchange
- Advanced EDI Concepts

Open Source UNIX Operating Systems – NJIT is the only University nationwide that offers and is endorsed to offer a professional development certificate in Open Source Operating Systems

- Introduction to UNIX Free BSD
- UNIX Administration I
- UNIX BSD Administrator II

*Oracle Database Technology**Safety and Environment*

- Hazwoper Refresher
- Supervisor Training
- OSHA Hazwoper Training
- Certified Hazardous Materials Manager (CHMM)
- NJ's Underground Storage Tanks Regulations

Web Master

- Web Manager
- Web Developer
- Web Author
- Dreamweaver
- Flash
- Fireworks MX

- Programming for the Web
- Visual Basic Programming
- Multimedia:SMIL

II.H.3. Affordability

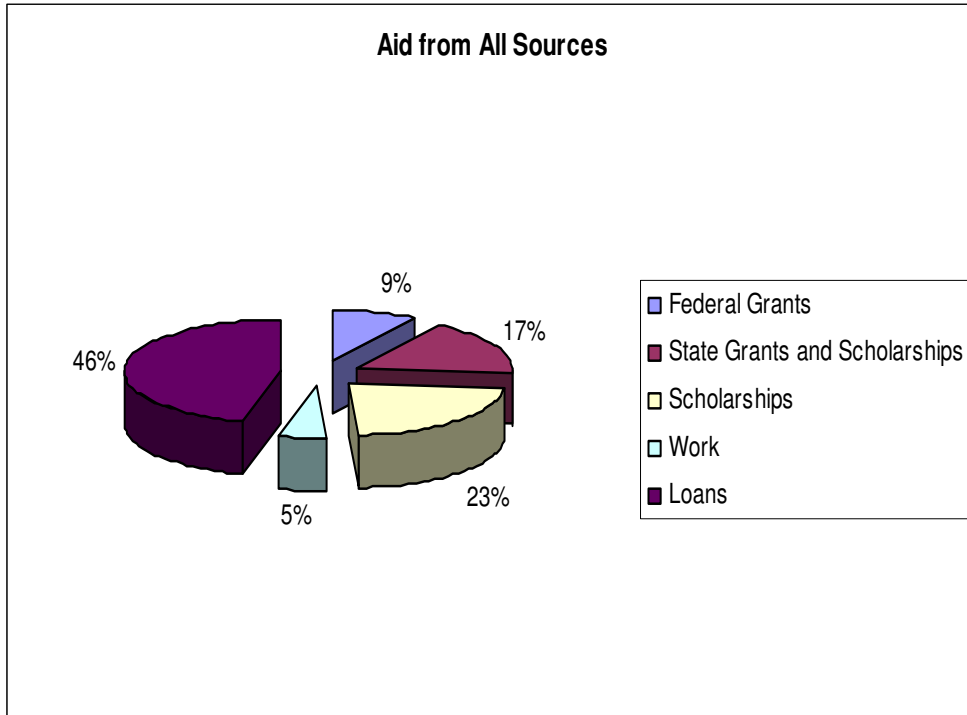
II.H.3.a. Cost of Attending NJIT

Table II.H.3.a. Cost of Attending NJIT		
AY 2007-2008 Full-Time Undergraduate Student		
	In-State	Out-of-State
Tuition	\$9,700	\$18,432
Fees	\$1,650	\$1,650
Room & Board	\$9,264	\$9,264
Total	\$20,614	\$29,346
AY 2007-2008 Full-Time Graduate Student		
	In-State	Out-of-State
Tuition	\$12,730	\$18,090
Fees	\$1,624	\$1,624
Room & Board	\$9,264	\$9,264
Total	\$23,618	\$28,978

II.H.3.b. Financial Aid

NJIT Financial Aid Profile Academic Year 2007-2008				
Award Type	Amount Awarded		Percent of Grand Total	
	Sub-Totals	Totals	Percent of Grand Total	
Federal Grants				
Pell	3,941,091			
Smart	404,000			
ACG	164,575			
SEOG	293,238			
		4,802,904		9%
State Grants and Scholarships				
TAG	7,967,946			
EOF	688,844			
DSS	223,138			
OSRP	358,750			
Gear Up	9,000			
		9,247,678		17%
Scholarships				
NJIT – Institutional	9,823,692			
NJIT – Other	131,360			
Endowed	1,192,998			
Alumni	198,750			
Annual	440,751			
Outside	440,086			
NJIT Graduate Tuition Remiss. *	4,189,693			
NJIT Graduate Fees Remiss. *	322,632			
NJIT Graduate Other *	218,737.20			
NJIT Graduate	1,672,516.29			
		12,227,637		23%
Work				
FCWS	372,391.00			
IWS	2,190,991.00			
Stipend	6,290,751.18			
		2,563,382		5%
Loans				
Direct Subsidized	8,802,302			
Direct Unsubsidized	5,742,274			
Direct PLUS	1,491,340			
Perkins	249,244			
NJIT Loan	3,503			
NJCLASS	1,798,001			
Other	6,861,626			
		24,948,290		46%
GRAND TOTAL		53,789,891		100%

Figure II.H.3.b. Student Financial Aid from All Sources



II.H.3.c. Loans

The average loan debt at the time students receive their bachelors degree is currently less than \$18,000.

II.I. Major Research and Public Service Activities

R&D EXPENDITURES : Fiscal Year 2008

Institution: New Jersey Institute of Technology

	Amount (\$)
Federally Financed Academic R&D Expenditures	40,287,000
Institutionally Financed Academic R&D Expenditures	30,871,000
State, Industry & Other Financed R&D Expenditures	18,599,000
Total Academic R&D Expenditures	89,757,000

Note: Dollar amount as reported to the National Science Foundation (NSF) on Form #411 (*Survey of Research and Development Expenditures at Colleges and Universities*).

Research and development is a fundamental component of the NJIT mission. NJIT is one of only three public research universities within the state system – that is, mission directed to offer a comprehensive array of Ph.D. programs – and of the three the only one specifically oriented towards professional studies including engineering, the physical sciences, computing sciences, architecture, and management. It is “New Jersey’s Science and Technology University”.

While *research* activity may be viewed as end unto itself, it is also a powerful enabler for all of the university’s mission elements. Faculty members engaged in research bring real-world application and a contagious enthusiasm to the classroom, and in some cases even advance the technologies used in *instructional* activities. The competency built through independent scientific research allows the university to assist the state in a wide variety of *public service* activities that range from community planning and transportation policy to child-safe hand gun technology development. With strong roots in the application of scientific discovery to practical purpose that comes from a 125 year-long heritage in engineering, the university recognizes the importance of contributing to the local, regional and national *economic development*. The university fosters an intimate connection between its faculty and student researchers and the business community in the form of formal partnerships with companies ranging from incubator start-ups to global OEMs.

NJIT research is “at the edge of knowledge”. By that we mean that our researchers are at the forefront of their professions and proactively working to connect scientific discovery to practical application. Some examples follow that are organized around thematic areas

of particular significance to new Jersey – healthcare, homeland security, information and communication technology, nanotechnology and sustainable systems.

II.I.1. Healthcare Systems

Amazing progress is occurring in the life sciences as improved understanding of the molecular origins of life move medicine from heuristic and statistical approaches to predictive models. This is the province of engineering, math, physics chemistry and computing that are the defining disciplines of NJIT. From miniaturized, implantable sensors and advanced imaging through new bio-inspired materials to biological and pharmaceutical drug discovery NJIT has the disciplinary tools to break new ground. Some examples of NJIT research at the edge of healthcare systems follow.

NJIT was designated as the host institution for a research collaboration designed to advance **stem cell therapies**. The Newark Institute for Regenerative Healthcare is dedicated to creating technologies to translate basic research on stem cell science into practical and deliverable therapies for patients. The Institute's program will create a stem cell industry from stem cell science, integrating efforts from across the state, the nation and the globe to accelerate the translation of research into cures. New medical equipment, sensor, control system, information technology and service industries will be defined by these activities and will create a new stem-cell economy with the potential for extraordinary economic benefit to the State of New Jersey. A comprehensive pilot scale production center will be the central element that supports the research, serves as a supplier of stem cell lines for basic research and clinical trials, and provides a test-bed for a wide variety of custom equipment manufacturers that will be drawn to the Newark Innovation Zone to gain regular access to the showcase operation. The Institute has been approved to receive a \$50M construction grant from EDA as part of a statewide bond initiative supporting stem cell research facilities and equipment.

Trenea Livingston Arizneh, assistant professor of biomedical engineering, winner of an NSF Presidential Early Career Award for Scientists and Engineers (PECASE) award, the highest national honor for young scientists and engineers, for her **research with adult stem cells** received a \$700,000 grant from the New Jersey Commission on Spinal Cord Research, a state agency that funds spinal cord research. She will use the grant to build a laboratory to test if stem cells taken from adult bone marrow can be made to turn into neurons. If her research shows that the cells can turn into neurons -- the nerve cells in the body that control brain and spinal cord function -- patients with spinal cord injuries could be healed with injections of stem cells. Arizneh's second \$300,000 grant, from the New Jersey Commission on Science and Technology, will allow her to apply her stem cell techniques to help patients who have cartilage damage. She and Jaffe will spur **cartilage regeneration** by combing stem cells with bio-degradable scaffolds that mimic fibers found in human cartilage tissue. They will test different scaffolds

and determine which biomaterial is the best catalyst for stem cell differentiation. Again, their hope is that stem cells can soon be used to treat patients with damaged cartilage.

NJIT researchers Iqbal Zafar, PhD, research professor and Somenath Mitra, PhD, acting chair and professor, department of chemistry and environmental sciences have developed the concept for a **biologically powered fuel cell** that would utilize sugars in the blood stream as a renewable energy source for implanted medical devices. The approach integrates micro- and nano-fluidic platforms, electrodes and membrane/electrolyte separator into a biologically compatible, encapsulated biomedical device. It utilizes aligned single wall carbon nanotubes with high ballistic electrical conductivity, and rapid, green microwave-assisted enzyme covalent functionalization of nanotube tips or sidewalls to provide for stable long term performance.

Tara Alvarez, assistant professor of biomedical engineering, received a prestigious Faculty Early Career Development Award from the NSF to support her work in **neural engineering and vision research** and to enhance the Vision and Neural Engineering Laboratory. The grants support the early career development of teacher-scholars who integrate research and education. Her research focuses on how the brain learns when visually locating objects in three dimensional space to gain a better understanding of basic motor control and motor learning. She also plans to offer courses for undergraduates and to develop educational programs for pre-college girls to attract them to the field of neural engineering.

Michael Jaffe, research professor of biomedical engineering and chemistry directs **collagen research** at the Medical Device Concept Laboratory (MDCL). MDCL projects focus on reconstituted collagen fiber formation, collagen characterization -- both as a "material" and as tissue engineering substrate, collagen mechanical properties and transport of small molecules through skin. One project of special interest is a collaboration among Treena Arinzeh and Sam Hessami (OB/GYN) and Fred Silver (pathology) of UMDNJ, aimed at understanding the collagenous failure that leads to uterine prolapse, a major problem in women's health.

Biomedical engineers at NJIT will use new technology to **help children with cerebral palsy** improve their movements, reduce stiffness in their joints and live fuller and more independent lives. Small robots mounted on wheelchairs, interactive video games and a robotic arm that can be programmed to guide and aid human motion – these are just a few of the technologies the engineers will use to help these children improve their muscular control and movements. The program led by BME Professor Richard Foulds is part of a the newly formed **Rehabilitation Engineering Research Center (RERC)** at NJIT, funded by a \$4.75 million grant from the National Institute on Disability and Rehabilitation Research, in Washington, D.C. The institute supports research for the

rehabilitation of people with disabilities. The grant, awarded on Nov. 1, 2005, will run for five years.

A \$1 million, three-year grant from the Howard Hughes Medical Institute awarded jointly to NJIT, Rutgers-Newark and UMDNJ-New Jersey Medical School will be used to develop a novel doctoral program designed to **train future neuroscientists** who can integrate approaches used in mathematics, biomedical sciences and computation. “With their physical proximity and close ties among the faculty, these three institutions will create a unique environment unparalleled in interdisciplinary neuroscience training,” said Robert Miura, professor and acting chair of the department of mathematical sciences at NJIT.

New Jersey Institute of Technology (NJIT) computer scientist Yehoshua Perl, PhD, creates elegant logical structures to track **down errant or misplaced medical terms**. The errors creep into documents and databases developed by corporations, government agencies, hospitals and academic institutions that design, maintain and use terminologies throughout a variety of systems. Perl’s research is funded by a three-year **\$1.43-million grant from the National Library of Medicine** (NLM), a branch of the National Institutes of Health.

Interactions among neuropeptides and microglial cells in the brain are the research focus of G. Miller Jonakait, dean of the College of Science and Liberal Arts and professor of biological sciences. With grant support from the National Science Foundation, she is looking at how neurons and glia interact both in the normal brain and in the damaged or diseased brain. Several specific neuropeptides seem to play a role **in regulating microglial responsiveness**, particularly in dampening the inflammatory response. Dr. Jonakait is exploring this neuronal/glia cross-talk hoping to understand the ways in which neurons affect glia and glia affect neurons.

Associate Professor Sheldon Wang has two new NSF grants — a project to study manufacturing processes for **biocompatible implant materials**, and a study to develop new computational models for **normal and sickle red blood cells** in an aqueous environment with the goal of developing a better understanding of sickle cell diseases and their treatments

II.I.2. Homeland Security

The threat to national security represents a fundamental change to a society that has been built around the concept of invulnerability of our borders, and defense against an enemy that shares the same hierarchical power structure and basic assumptions of self preservation as we do. Responding to the new challenge requires a systemic re-engineering of physical and social infrastructure based on the new modality of threat. Technology is not a panacea, but it will be the key

productivity gain that elevates our response to the level required without draining our human and financial resources and constraining our way of life to unacceptable limits. NJIT is in the field driving this process and in turn bringing back to the university and its incubator firms issues that demand new thinking and a structure of performance and interoperability standards that encourage competition and innovation. Some examples of NJIT research at the edge of homeland security follow.

One of the most significant spurs to the growth of NJIT's research program has been the university's emphasis on technologies to assist in homeland security. NJIT is home to **New Jersey's Homeland Security Technology Systems Center**. The center works to identify faculty expertise as well as technologies under study within the university that have potential to assist in the nation's security programs and to facilitate partnerships with local, state and federal agencies for homeland security initiatives. One of the first projects undertaken by the Homeland Security Technology Systems Center was smart camera surveillance system at the **Garden State Plaza Mall** in Paramus, directed by Donald H. Sebastian, the university's senior vice president for research and development. The system, developed as a national prototype, uses mall security cameras in combination with special software designed to search for suspicious objects or behavior and alert local authorities. With special funding from Acting Governor Richard Cody, a similar model system has been installed at the **Beatrice Gilmore School in West Paterson**. NJIT has funding from the N.J. Department of Law and Public Safety to protect schools and shopping malls.

In one of the most promising homeland security initiatives, university researchers continue to develop applications that utilize terahertz (THz) electromagnetic radiation to detect and **identify explosives and biological agents**. A team of researchers led by John Federici, professor of physics, received a patent for a terahertz imaging system that could be used in airports to detect potentially harmful materials even if they are concealed in clothing, sealed packages, or suitcases. The team also has funding from the Army Research Office, and their industrial collaborator, Picometrix, Inc., of Ann Arbor, Mich., a manufacturer of high-speed optical receivers and ultrafast instrumentation, has a Phase II Small Business Innovative Research (SBIR) grant to develop the system. Above, Federici displays one of the homodyne modules developed by Picometrix that will collect data for the system. Other projects related to homeland security include: • With NSF funding, Haim Grebel, professor of electrical and computer engineering, is developing new concepts for producing infrared filters based on integrated circuit microstructure technology. His group plans to develop and test filters for all types of spectral sensors applied to a broad range of monitoring and detection systems from the visible to the THz region.

NJIT is partnering with Iowa State University (ISU) to develop the **Center for Information Protection (CIP)**, an NSF-supported Cooperative Research Center in Information Assurance. Constantine Manikopoulos, associate professor of

electrical and computer engineering, will head the NJIT component that will focus on research in intrusion detection, network security, privacy, and attack-tolerant systems. The center is designed to improve the security of the nation's **cyber infrastructure**. The CIP will partner with industries that provide security solutions as well as industries that use these solutions in the creation of an overall security perimeter designed to protect data and information assets critical to their industry.

A new technology that can verify a person's identity using facial images is the goal of research by Chengjun Liu, assistant professor of computer science. He has developed a **face recognition system** that improves on previous technology by taking into account such factors as lighting and facial expressions. The system has tested 100 percent effective in matching videotaped images to those stored in government databases by comparing 62 features or facial landmarks. Such a technology can be used as a security system with facial identification replacing a physical key or a password. An effective face recognition system could also assist law enforcement officials in locating fugitives by means of video cameras strategically placed in public places such as airports. Liu recently received funding from the Department of Defense to support his research as part of the government's effort for combating terrorism using face recognition technologies.

The development of a portable MEMS (micro-electromechanical systems) device as part of a biological detection system is the focus of a joint research project between NJIT and Sandia National Laboratories in Albuquerque, N.M., the government facility charged with developing technologies to support national security. The device -- known as a trigger -- is the key component in a system for the rapid and accurate **identification of harmful biological agents** in field and urban environments. The team includes Boris Khusid, professor of mechanical engineering, and his doctoral students in mechanical engineering from NJIT along with Sandia researchers.

A biometric identification system based on **Dynamic Grip Recognition** developed in NJIT's personalized weapons project could also be effective in preventing skyjackers from taking control of aircraft. The research team is developing a prototype "smart gun" using silicon-based piezo-electric pressure sensors embedded in the gun grip. The system can identify the user based on the unique "signature" of the individual hand during the first instant of trigger pull. On-board decision electronics and micro-mechanical systems-based actuators then react to either enable or block the firing mechanism. Biometrics expert, Michael Recce, professor of information systems, has also applied for a patent to adapt his hand grip technology for use by airplane pilots. Since operation of modern aircraft frequently shifts between the pilot and ground controllers, Recce reasoned that the installation of his grip sensors in the cockpit controls could be achieved with relative ease because only the authenticated grips of the pilot or copilot could be programmed to operate the plane. When the pilot releases his or her grip, control of the plane would revert to the ground. The concept of dynamic

biometrics is also being extended to other devices such as keypad entry systems where the rhythmic pattern of data entry reveals an underlying structure that is unique to the individual, reproducible and detectable.

M. Ala Saadeghvaziri, professor of civil and environmental engineering, has received start-up funding from the Multidisciplinary Center for Earthquake and Engineering Research at the University of Buffalo to develop proof of concept for an innovative water-based protective technology that could be used to **mitigate the effects of explosions** or earthquakes on public buildings such as schools and hospitals.

David Mendonca, assistant professor of information systems, is investigating how training in improvisation can help **improve the tactical response to large-scale emergencies** like the 2001 World Trade Center attack. With a prestigious NSF Faculty Early Career Development award, he hopes to develop software that can help emergency response personnel to make the right decisions under pressure.

The work of Associate Professor Eliza Michalopoulou in ocean acoustics has a compelling and timely bottom line — national defense. With expertise in both mathematical analysis and signal processing, she studies how sounds move in the ocean and how they are affected by factors like temperature, ocean depth, seafloor composition and currents. The main goal is to help the U.S. Navy, which supports her research through the Office of Naval Research, to identify better techniques for **detecting underwater vehicles**, particularly along the nation's seacoasts. The end products of her work are algorithms that can be used in developing next-generation security systems.

Dr. Michael Chumer of the Information Systems department is working on a variety of advanced software architectures to **support emergency response and homeland security** applications. By developing interoperability standards these architectures facilitate rapid integration of high performance software applications into a virtual command and control support system. With direct support from the US Army, some of these concepts are being demonstrated in conjunction with combat unmanned systems management.

II.I.3. Information and Communication Technology

The mass-impact of computing technology and the ultimate delivery on the promise of digital convergence will only come when information is available anywhere, anytime and for anyone (or anything!). The development of ubiquitous broadband connectivity will in turn drive transformational products based on distributed intelligence and novel human interface concepts. Some examples of NJIT research at the edge of information and communications technology follow.

Envisioning a future in which wearable computers help students locate their friends on campus and even facilitate introductions to new acquaintances with similar interests, a team of researchers led by Constantine Manikopoulos, associate professor of electrical and computer engineering, and Quentin Jones, assistant professor of information systems, are working to make NJIT a national prototype **SmartCampus**. The project is supported by funding from the National Science Foundation and Hewlett-Packard. The team will develop a mobile, wireless NJIT campus community system along with the software and protocols to support a wide range of location-based computing services. The team will create privacy-sensitive applications that make use of contextual factors — the properties of people and places and the relationships between them — that are unique to people to people to places, or P3 systems such as SmartCampus. The project will also enrich the curriculum — the team foresees the development of masters programs in human-computer interaction and information assurance and new courses in such areas as wireless security and wearable computing.

Technologies to enable the **next generation of wireless digital communications** are the focus of research at the Center for Wireless Communications and Signal Processing. Yeheskel Bar-Ness, distinguished professor of electrical and computer engineering and director of the center, leads a team of researchers working to develop the infrastructure needed to support the burgeoning demand for wireless communication. The group addresses issues such as privacy and security, interference and jamming, ever heavier user traffic, and rapid transmission of data through wireless networks. Dr. Bar-Ness recently filed for patents on next-generation devices with two of his doctoral students. One, a parallel decoding algorithm of Turbo Codes provides scalable decoding delay without any additional computation or performance degradation. Another, creates a new phase noise suppression method for high speed wireless data communications.

Alex Haimovich, professor of electrical engineering, is developing a new type of network using multiple antennas that could accommodate both a **high-speed information link** and a sensor network for security or medical monitoring within the same frequency space. With NSF funding, his research team is seeking to develop solutions that can support a wide variety of applications simultaneously within a home or business. The team's goal is a new type of network characterized by multiple antennas and multiple appliances (MAMA).

Roberto Rojas-Cessa, assistant professor of electrical and computer engineering, is leading a team of researchers who are developing a **new service model concept**, called service vector, as a solution for providing quality of service support for a large variety of traffic classes — Internet, video, audio, business and data services — that challenge the next-generation information networks. The study has NSF funding.

Data watermarking, intrusion alarm systems and distortionless data hiding are some of the techniques under study at the **Center for Wireless Networking and Internet Security**. A partnership between NJIT's Department of Electrical and Computer Engineering and Princeton University, the center was supported by a \$2.6 million R&D Excellence Grant from New Jersey Commission on Science and Technology.

Michael Bieber, associate professor of information systems, is leading a project to develop a Digital Library Service Integration (DLSI) infrastructure. Supported by the National Science Foundation under its National Science, Technology, Engineering, and Mathematics Education Digital Library (NSDL) program, the project aims to provide a systematic approach **for integrating digital library collections** and services. Digital library services are emerging, such as classification, searching, and peer review, as well as hypermedia functionality such as annotation and guided tours. Using the Dynamic Hypermedia Engine (DHE) developed at NJIT's Collaborative Hypermedia Research Laboratory, the DLSI program will integrate relatively simple services that may be used without modification. The research team believes that DLSI can form the core of vibrant virtual educational communities by supporting a broad range of community support services.

II.I.4. Nanotechnology

Nanotechnology is neither a passing fad of the scientific community nor clever repackaging of existing disciplinary knowledge. It is a disruptive technology that will influence product design and manufacture across the spectrum of every imaginable application. The projected impact of nanotechnology may have been an article of faith several years ago, but there is now evidence that “nano” has gone from frontier science to a practicable technology. The most notable accomplishments have come in the limited field of carbon nanotube (CNT) based systems. At NJIT, alone, our researchers have developed reliable technology to produce molecular scale “wires”, solar cells, and biologically fueled power cells based on CNT. This has wide reaching implications for applications ranging from alternative energy to revolutionary, implanted medical devices. Some examples of NJIT research at the edge of nanotechnology follow.

A team led by Iqbal Zafar, PhD, research professor and Somenath Mitra, PhD, acting chair and professor, department of chemistry and environmental sciences, has developed a quick and simple method to **produce water-soluble carbon nanotubes**. This is something that has never been done before. The new nanotubes are 125 times more water soluble than existing ones. In addition, the new nanotubes, following a short heat treatment, can conduct electricity as well as the non-soluble ones. There are many benefits, the most obvious ones are their value in electronic coatings and films or plastic or polymer composites. The former are used in electronic manufacturing to create lead-free, less toxic,

conductive and soldering materials. The computer industry uses these coatings and films to remove heat, because they do that well.

In less than 20 minutes, NJIT researchers can now seed, heat and **grow carbon nanotubes** in 10-foot-long, hollow thin steel tubing. The ground-breaking method will lead to improvements in cleaner gasoline, better food processing and faster, cheaper ways to clean air and water. The discovery was recently described in the Journal of Material Chemistry, June 14, 2006, by lead researcher Somenath Mitra, PhD, professor and acting chair of NJIT's Department of Chemistry and Environmental Science and his team in "Selective Self-assembly of Single Walled Carbon Nanotubes in Long Steel Tubing for Chemical Separation." Other journals featuring their work are Chemical Physics Letters and Carbon and Analytical Chemistry.

Functional nanostructures for novel electron devices are the focus of the Integrated Nanostructures Laboratory, headed by Leonid Tsybeskov, associate professor of electrical and computer engineering. In one project supported by the National Science Foundation, the team is investigating links between structural and optical properties in **three-dimensional nanostructures** made of silicon and germanium, the most common materials for semiconductors. Visible photo luminescence from Si nanocrystals and different forms of organization in Ge nanocrystals grown on a Si substrate are recent discoveries, and Dr. Tsybeskov is exploring the feasibility of novel devices that make use of efficient light emission in these nanostructures. Hewlett-Packard and IBM are partners on the project.

The team is also continuing its work on **silicon quantum dots** -- molecule-sized crystals of silicon that could allow a new generation of computer chips just a few atoms across in size. Dr. Tsybeskov's group has invented a novel fabrication technique for these silicon nanostructures and demonstrated how these structures can be used in non-volatile memories and other electronic devices. Supported by the National Science Foundation and the French National Center for Scientific Research, the research is continuing with in an international collaboration with the Material Technology Laboratory at Motorola, the Institute for Electronic and Microelectronic Research in Lille, France, and the University of Rochester.

New techniques for **processing nanostructured powders** are the research focus of Robert Pfeffer, distinguished professor of chemical engineering. Although the unique properties of nanostructured materials can greatly benefit many industries, such as, food, pharmaceutical, petroleum, chemical, agricultural and ceramics, little attention has been paid to flow around nanoparticles and flow in nanodomains. With funding from the National Science Foundation, Dr. Pfeffer's research team at the New Jersey Center for Engineered Particulates, together with researchers from the Illinois Institute of Technology, is seeking to solve the challenging problem of understanding the physics of fluidization and transport of nanoparticles. The goal is to be able to process nanoparticles to produce nanomixtures and nanocomposites with tailored properties.

II.I.5. Sustainable Systems Technology

New Jersey is prototypical of many areas where the co-location of dense population centers and industrial systems needs to be successfully managed to maintain quality of life while promoting economic development. Preservation of air, water and land quality; efficient transportation systems for goods and people; affordable, environmentally benign housing and office space; disaster resistant infrastructure; are all empowered through the technological developments at NJIT. The combustion of petroleum-based fuels is the least thermodynamically efficient technique for powering the global demands for energy. The oil crisis of the 70's, repeated now, and the recognition that global warming due to the accumulation of the products of combustion has at least some scientific merit makes it clear that disruptive technology is required. Alternative energy research is actively underway at NJIT. Some examples of NJIT research at the edge of sustainable systems technology follow.

Chemical engineer Kamalesh Sirkar, PhD, a distinguished professor and an expert in membrane separation technology, is leading a team of researchers to develop a **breakthrough method to desalinate water**. Sirkar holds more than 20 patents in the field of membrane separation. Using his technology, engineers will be able to recover water from brines with the highest salt concentrations. The process will work especially well with brines holding salt concentrations above 5.5 percent. Currently, 5.5 percent is the highest percentage of salt in brine that can be treated using reverse osmosis. The Bureau of Reclamation in the Department of Interior is funding the project.

Michael Jaffe, research professor of biomedical engineering and director of the Medical Device Concept Laboratory has teamed with the Iowa Corn Promotion Board to identify polymer opportunities based on monomers derived from corn. The study will look at the potential of **corn derivatives** as readily available and inexpensive sources of new polymeric materials. Materials to be investigated range from new, bio-erodible polymers for medical applications to improved, bio-compatible coatings and plastics.

Microscopic sensors that will **prevent disruptions in electrical power** are the focus of a project led by Ken Chin, professor of physics. A joint effort between the NJIT and Public Service Enterprise Group, the project is developing fiber optical MEMS "microphones" that will alert utilities of irregularities or deterioration within the power grid that may signal a system failure. The first device in development targets a condition known as partial discharge (PD) activity that occur in high voltage cables as a result of defects such as voids or contaminants. This device is currently in field tests and a PSEG field station. Another novel MEMS device monitors the integrity of cable splices so as to provide early detection of incipient failure before it results in an outage of service.

Organic photovoltaics (OPVs) are a promising low-cost **alternative to silicon solar cells** and thus a great deal of effort is being devoted, in both academic and industrial laboratories to increase the power conversion efficiency and scale-up production processes. An attractive feature of the OPVs is that they can be fabricated by a coating process (e.g., spin coating) to cover large areas and may be formed on flexible plastic substrates. Iqbal Zafar, PhD, research professor and Somenath Mitra, PhD, acting chair and professor, department of chemistry and environmental sciences are developing the science and the technology for the next generation OPVs to overcome the limitations of existing photovoltaics through the preparation and investigation of new types of photoactive nanocomposites of derivatized single-wall carbon nanotubes. This research is made possible by the unique expertise of the PIs' in synthesis of fully dispersed SWNTs in any solvent using microwave processing and their functionalization.

A better understanding of the **solar flares that can interfere with wireless communication** and damage satellites in Earth's orbit is the focus of research by the Center for Solar-Terrestrial Research. Professor Phil Goode directs the Big Bear Solar Observatory on a mountaintop in California. In the fall of 2007 he will complete a multi-year, multi-million dollar, federally financed construction project that will result in the **world's largest optical solar telescope**. CSTR research will lead to new understandings of the sun's complex behavior and its effect on our own environment. Dale Gary, professor of physics and specialist in radio solar physics, is leading a design study for the Frequency Agile Solar Radiotelescope (FASR). The project, supported by the National Science Foundation, will construct a **new radio telescope capable of making high-resolution images of the solar corona**. The telescope, which will consist of 100 receiving dishes, will allow scientists to study the birth of coronal mass ejections, violent phenomena associated with the Sun's magnetic fields that can cause sudden, intense fluctuations in the solar wind and serious consequences on Earth. The high-energy particles that characterize these ejections have the potential to destroy satellites. The satellites in turn may impact television viewing, pagers, cellular phones and other wireless devices. With the ability to observe these phenomena, especially those on the near face of the sun that most affect Earth, researchers will be able to provide better information on the space environment to airlines, power companies and satellite operators. Eventually, solar researchers may be able to predict the severity of such incidents and when they will occur.

Establishing remote sensing as an operational management tool in assessing the **quality of New Jersey's nearshore waters** is the focus of research by Sima Bagheri, professor of civil and environmental engineering. Under a NASA Faculty Fellowship, she participated in the NASA Airborne Oceanographic LIDAR (light detection and ranging) remote sensing data acquisition over the East Coast. The program remotely measures biological and chemical substances in the world's oceans and coastal zones, using sensors that are flown in aircraft to make

measurements. The research supports satellite measurements of water quality parameters important in global warming, carbon flux and climate change research.

The New Jersey Applied Water Research Center, directed by Taha Marhaba, associate professor of environmental engineering, has been established by NJIT in partnership with the American Water Works Association to unite industry, government and academia in a common effort to research and **improve the state's drinking water**. Researchers from NJIT and the Water Works Association, a non-profit group dedicated to providing the state with safe drinking water, expect to have a significant impact on the state's water infrastructure. The center's emphasis on applied research specific to New Jersey will fill in the gaps that national research programs have not addressed. Researchers will also work to assure that the region's water supply is safe from bio-terrorist attacks, developing monitoring systems to identify biological agents deposited in the water infrastructure.

Transportation planners from Houston, Texas recently commended researchers at New Jersey Institute of Technology for enabling them to make better use of a technology product developed to assist in the transportation project funding process known as the Transportation, Economic and Land-Use System or TELUS. TELUS is a fully integrated data-management and decision-support system designed to **help Metropolitan Planning Organizations (MPOs)** and state departments of transportation prepare Transportation Improvement Programs – better known in the industry under the acronym TIP. Researchers at NJIT led by Lazar Spasovic, PhD, professor in the civil engineering department at NJIT developed TELUS under a federal grant, and recently spent time helping the planners in Houston customize the system.

NJIT has been designated as the **Liberty Corridor Planning Institute**. In this capacity, NJIT researchers are engaged in creating the framework under which over \$100M in federal funds will be invested to improve New Jersey's transportation infrastructure to support the ten-fold growth in containerized shipping that is projected as part of the Port Newark expansion. The objective is to facilitate the movement of import and export goods within the already congested Port district to facilitate job growth and economic development in the associated trades.

II.I.6. Research Centers and Specialized Labs

NJIT's research program focuses on applied research in the most promising of emerging technologies, with emphasis on technology transfer and commercialization. Research at NJIT is organized around multi-disciplinary centers of excellence that encourage partnerships among various disciplines, as well as with other educational institutions, private enterprise and government agencies.

APPLIED LIFE SCIENCES

- Newark Institute for Regenerative Healthcare develops process technology to bring stem cell – based therapies to practical, reproducible, commercial scale..
- Biomedical Engineering: Stem cell applications in tissue regeneration, vision and neural engineering, bioMEMS, motion analysis and rehabilitation engineering, biomaterials and biopolymers.
- Center for Applied Genomics: Development and application of DNA microarray technology.
- The Medical Device Concept Laboratory : Synthetic materials in biomedicine.
- Membrane and Separation Technologies: Micro- and nanoporous filters for medicine and pharmaceutical manufacture.
- ProjectFusion: Technologies to support SmartCampus, a mobile, wireless NJIT campus community system with applications to protect privacy and maintain security..
- The Vision and Neural Engineering Lab: Oculomotor dynamics, vergence eye movements.

ARCHITECTURE AND BUILDING SCIENCES

- Center for Architecture and Building Science Research: Educational facilities, health care and aging environments, developmental disabilities planning, historic preservation, housing and community development.
- Concrete Testing Laboratory: Reinforced and high-strength concretes.
- Imaging Laboratory: Computer-aided design in architecture.

COMPUTING, MATHEMATICS AND TELECOMMUNICATIONS

- Center for Applied Mathematics and Statistics: Mathematical biology, fluid dynamics, wave propagation.
- Center for Wireless Communications and Signal Processing Research: Multi-carrier systems, Turbo Coding techniques, ultra-wideband communications, MIMO systems.
- Collaborative Hypermedia Laboratory: Asynchronous learning systems, online communities, digital libraries.
- Cryptography & Telecommunication Laboratory: Cryptography, computer security and telecommunications networks.
- Data and Knowledge Engineering Laboratory: Data mining, bioinformatics, computational biology.
- electronic Arts Habitat (eArtH): Multimedia, social computing, human-computer interaction.

- New Jersey Center for Wireless Networking and Internet Security: Intrusion detection, watermarking, mobile networks.

ENVIRONMENTAL SCIENCE AND ENGINEERING

- York Center for Environmental Engineering and Science: Hazardous substance management, pollution remediation and prevention, sustainable manufacturing.
- Northeast Hazardous Substance Research Center: Hazardous substance handling, reduction, assessment and management.
- Geoenvironmental Engineering Laboratory: Solid waste management and disposal, environmental systems, waste water treatment, site remediation.
- Laboratory for Process and Field Analytical Chemistry: On-line process analysis, environmental monitoring, portable instruments for on-site environmental measurement. .

MATERIALS SCIENCE AND MANUFACTURING

- Bearings and Bearing Lubrications Laboratory: Hydrodynamic, hydrostatic, rolling element bearings and novel designs of unique bearings.
- Computational Fluid Dynamics: Particulate flows, mixing enhancement, suppression/enhancement of turbulence, drag minimization, thermal management.
- Electro-hydrodynamics Laboratory: Sensors and separation devices for a wide variety of systems for environment monitoring, health care, and medical diagnostics
- Electronic Imaging Center: Infrared filters, sensors and detectors utilizing terahertz radiation, carbon nanotubes.
- W.M. Keck Laboratory: Manipulation of liquid flows and the small particles/microorganisms they transport in biological and biomedical technologies.
- Materials Characterization Laboratory: Elemental, organic and structural analysis
- Metal Combustion Laboratory: Propellants, explosives, pyrotechnics, and incendiaries.
- Microelectronics Fabrication Center: Application-specific integrated circuits, optical switches, pressure sensors, and MEMS for biomedical, biometrics, and microfluidics application.
- Microgravity Research Laboratory: High energy density additives to propellants and explosives, gas sensors, fuel cells, and ultra-hard material coatings
- New Jersey Center for Engineered Particulates: Tailored particle coatings for pharmaceuticals, food, cosmetics, ceramics, defense, electronics and specialty chemicals.

- New Jersey Center for Microflow Control: Fluidic devices, with a focus on miniaturized flows, and miniaturized sensors and actuators.
- Optical Science and Engineering: optoelectronics, environmental monitoring, industrial process monitoring and position control, and ultrafast optical and optoelectronic phenomena.
- Polymer Processing Institute: Modification of polymers processing into special property products for the medical, health care, automotive, electronics, construction, and packaging industries
- Waterjet Technology Lab: Waterjet machining and cleaning applications.

SOLAR PHYSICS

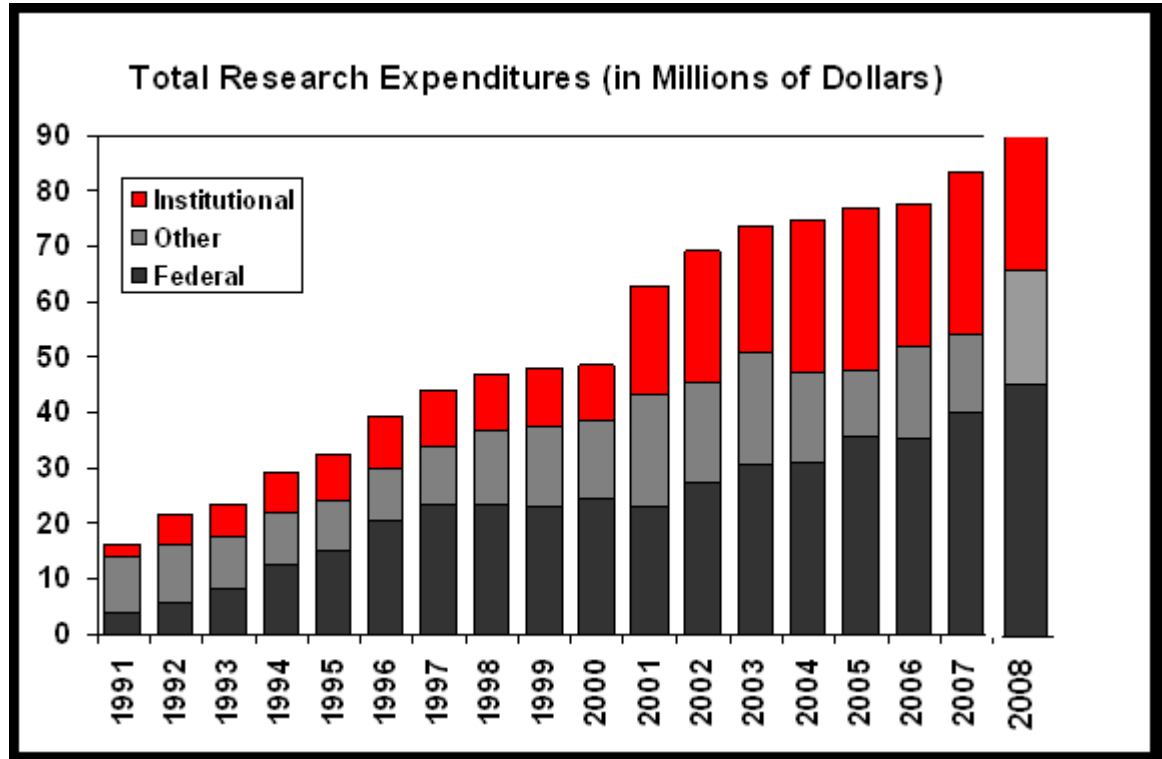
- Center for Solar-Terrestrial Research: Solar optical astronomy, solar radiophysics, terrestrial science.
- Big Bear Solar Observatory: Solar observation, helioseismology.
- Owens Valley Solar Array: Transient energetic phenomena, coronal magnetic fields.
- The Frequency-Agile Solar Radiotelescope (FASR) Project: Nature and evolution of coronal magnetic fields, physics of solar flares, drivers of space weather, the quiet Sun.
- Global High-Resolution H-Alpha Network: Round-the-clock solar observation.
- Space Weather Project: Monitoring and forecasting solar activity that may affect Earth's climate and technologies.

TRANSPORTATION

- Liberty Corridor Planning Institute: Port Newark, Elizabeth, Bayonne redevelopment; Freight transportation, brownfields and passenger transportation
- National Center for Transportation and Industrial Productivity: Freight movement at domestic and international gateways, global competitiveness, intermodal passenger and freight transportation systems.
- North Jersey Transportation Planning Authority: Maintaining and improving transportation systems.
- Transportation, Economic and Land Use System (TELUS): Computerized transportation planning and programming.

II.I.7. NJIT Research Expenditures

NJIT research expenditures since 1991 have grown six-fold and Federally funded research expenditures have grown even more dramatically – more than ten fold in seventeen years.



II.I.8. Incubator Expansion

The opening of a third Enterprise Development Center (EDC III) in 2002 makes NJIT's small business incubation program one of the largest in the nation. With 80,000 square feet in five stories, EDC III doubles the previous incubation space. Three floors in the new structure are earmarked for technology start-up businesses, while the remaining two floors will provide "graduation" space for companies that have outgrown an incubation program.

EDC, founded in 1988 by NJIT, with assistance along the way from Prudential, the New Jersey Commission on Science and Technology, the New Jersey Economic Development Authority, and the U.S. Economic Development Administration, is the oldest and largest incubator facility in New Jersey, with the capacity for serving more than 60 client businesses. EDC provides a broad base of support and acts as a "proving ground" for new and developing high-tech products. Many client companies are developing commercial enterprises that reflect the university's major thrusts in information technology, health sciences, environmental science and engineering, and materials science and engineering.

The university provides the latest technical information, including access to the university's specialized equipment, faculty experts and students. The success rate for EDC businesses is higher than 85 percent; more than 50 businesses have graduated from the incubator facility.

Based on its experience in high-tech business incubation, NJIT has placed a focus on increasing the depth and breadth of services that these incubators can offer to resident firms. In particular, the objective should be to promote **business acceleration** – growing companies more rapidly from business concept to fledgling business. On the technological front, underwriting the expense of access to university based personnel and equipment assets and facilitating the ability to compete for federal and foundation grant funding will more rapidly move companies to critical “proof of concept” and reduce the inherent risk to investors. In addition, adding new professional services like shared support for marketing, information technology infrastructure, management team building and other critical growth items will increase the flow of successful businesses from existing incubators. NJIT has won several grants from the NJCS&T and has application spending with the National Science Foundation to further enhance its concepts for new business acceleration – and these are viewed as critical competitive advantages for the NJ-EDA led **Innovation Zone** program in Newark.

II.I.9. Helping Businesses Get Lean

More than 100 New Jersey manufacturing firms benefited this year from the technical assistance programs of the Center for Manufacturing Systems (CMS). The center, directed by Wayne Chaneski, offers services that range from identifying short-term productivity improvement opportunities to long-term engagements geared toward streamlining entire operations. CMS also assisted companies with product design and prototyping, process development, plant layout, machining of complex parts, and training in modern manufacturing concepts.

Training in lean manufacturing is one of the center's most popular services. Lean techniques -- inventory reduction, reduced lead time, continuous flow, increased flexibility -- are critical to the small and mid-sized manufacturing businesses that are the center's clients. One project for Purepac Pharmaceutical, an Elizabeth-based manufacturer of generic drugs, focused on reducing setup time -- the time a machine is out of service for changeover between the end of one run and the beginning of another. The CMS team videotaped an actual machine setup, then helped employees to review the process and identify solutions to problems. One department also got 5S training (Sort, Set-in-Order, Shine, Standardize, and Sustain) for improving efficiency by reorganizing workspace.

II.I.10. New Jersey Immunization Information System and the New Jersey Local Information Network & Communications System

NJIT has put into production for statewide use the New Jersey Immunization Information System (NJIS) and the New Jersey Local Information Network and Communications System (NJLINCS) for the New Jersey Department of Health and Senior Services (NJDHSS).

NJIS is an on-line immunization registry capable of enrolling all New Jersey children at birth and recording and evaluating their immunization histories for completeness under the Center for Disease Control and Prevention's current guidelines. Over 150,000 children are currently in the registry and more than 150 health departments, clinics and private physician's offices are currently participating via dial in modems or the Internet. NJIT installs client software at user sites, operates the servers and provides administrative and technical support for the NJIS.

NJLINCS is an Internet based communications system that will link all local health departments with the NJDHSS in Trenton. NJLINCS provides rapid, two-way communication between state health officials and local health officers for dissemination and collection of health related information and data. NJIT operates the servers and provides administrative and technical support for the NJLINCS.

II.I.11. Assistance to Business

NJIT offers direct assistance to business through several services to small- and medium-sized businesses to encourage their growth and success. These services are delivered primarily through NJIT's six-business assistance centers:

- Technology Extension Program in Manufacturing Engineering (a component of the New Jersey Manufacturing Extension Partnership – NJMEP): a statewide manufacturing extension program to help small- and medium-sized manufacturing businesses to modernize and become more competitive
- Center for Information Age Technology (CIAT): integrates computer technology into the operations of New Jersey business, government, non-profit and educational organizations
- Center for Manufacturing Systems: assists manufacturers with prototype product development, process improvement and modernization with high speed machining center, advanced CAD/CAM and rapid prototyping facilities.
- Defense Procurement Technical Assistance Center: helps New Jersey small businesses obtain defense and other federal contracts

- Enterprise Development Center I, II and III: small business incubators that help new and developing enterprises survive the typically difficult start-up stages;
- New Jersey Technical Assistance Program (NJTAP): helps New Jersey small- and medium-sized businesses comply with state and federal pollution prevention regulations;
- Micro-fabrication Center: serves to assist businesses with design and fabrication services related to silicon processing technologies in the university's clean room for MEMS and CMOS processing;
- Polymer Processing Institute: provides assistance to small businesses in processing of polymers and plastics.

NJIT also provides assistance to business through workforce development activities, research activities, economic development activities, and public service activities.

II.I.12. Workforce Development

Almost all NJIT activities are related to workforce development. These activities include, but are not limited to:

- Undergraduate and graduate degree programs – as of June 2006 NJIT has granted 870 bachelor's degrees, 917 masters degrees, and 75 doctoral degrees
- Continuing professional education programs
- Weekend University Program
- Cooperative education program
- Community and Public Service program
- Career Planning and Placement programs
- Programs designed to recruit and retain under-represented groups in NJIT's technology oriented degree fields (e.g., women and minorities are nationally under-represented in the engineering profession)
- Assessment of the skills and knowledge needed by the workforce
- Continual curriculum review to ensure that NJIT students develop the needed skills and knowledge
- Development of additional ways to develop needed skills and knowledge (e.g., Distance Learning, blended/hybrid courses, and courses offered in either a two semester or three semester format)
- Business Incubation programs
- Manufacturing Extension program

As an educational institution, NJIT has always tried to develop in its students the knowledge and skills they need to meet the needs of the New Jersey economy. In addition, NJIT has always designed and conducted programs which serve "cradle to gray" educational needs. That is, at the one end, there are programs for K-12

students which build the pipeline of future professionals; at the middle end, our undergraduate and graduate programs for traditionally aged college students emphasize relevant learning both inside and outside the classroom and are conducted in ways which overcome obstacles of socio-economic class and geography so as to enable access to higher education goals; and, at the other end, there are programs for incumbent and dislocated professionals which upgrade skills and knowledge and combat obsolescence. Together these programs produce the human capital that helps the economy of New Jersey resist and respond to the accelerating pressures of globalization and business restructuring. As workforce needs change, so does NJIT.

In response to changing workforce needs, for example, NJIT has introduced more than 10 new degree programs over the last two decades; introduced a Weekend University Program in 2005 for adults 24 years and older; and launched an activity in 2006 to provide advanced education at the workplace to professionals in industrial sectors important to the NJ economy. These programs include pharmaceutical engineering, homeland security, physical and digital counter-terrorism; emergency response management; biomedical engineering, biological computational biology, environmental engineering, engineering management, and environmental science.

Effective in 2002, the NJIT College of Computing Sciences introduced a completely re-designed senior project Capstone course, utilizing projects from industry, faculty and students as the basis for team-oriented projects. In these projects, student teams analyze, diagnose and model system requirements to produce well-engineered and well-documented software products. The capstone program was able to establish project-based relationships with sponsors in which more than 50 are external business or organizations to NJIT.

Long recognized for its prowess in quality distance learning, NJIT continued to make select distance-based undergraduate and graduate degrees and high employment demand graduate certificates available both to full and part-time students and to youthful and older learners. By permitting access to learning through a means which overcomes barriers of time and geography, NJIT helps to build the capacity of New Jersey's professional workforce.

The University Research Experience (URE), University Learning Center (ULC), and McNair grant program provided a range of technical assistance to Educational Opportunity Program (EOP) and minority students who historically have been under-represented in masters and Ph.D. degree programs. URE enables undergraduates, as early as the freshman year, to work with faculty on research projects and McNair takes their work into graduate degrees. }

Career Development Services (CDS) contributes to the university's and the state's economic and workforce development priorities by assisting New Jersey employers to become more productive and therefore more profitable. During

2008, over 4,400 companies used CDS as a source of prospective candidates for their organizations. Experiential education programs such as cooperative education and internships help organizations to greatly reduce the learning curve for new college graduates. Each year the university graduates a significantly greater percentage of students who enter the workplace at a more advanced knowledge and skill level. The conversion of cooperative education and internship assignments to full-time employment for students at or near graduation is a regular occurrence at NJIT. In many cases companies create positions within their organizations for purpose of retaining their valued student employees. Actual examples of where co-op conversion to full time positions occurred include: Mercedes-Benz USA; Eric Mullen Architect; Citigroup; Johnson & Johnson; Boston Scientific; and Bristol Myers.

Each year at NJIT over 1,000 students participate in some form of experiential education in such high demand fields of information technology, biomedical engineering and informatics, telecommunications and construction. One employer, Michael Smith, founder and president of General Devices, in Ridgefield, New Jersey, states, "All but a few of the 20 employees at General Devices have joined the company through student experiential education at NJIT. They design and manufacture advanced telemedicine and communications products for emergency medical services, hospital emergency rooms and public safety departments. We now depend on NJIT as our prime source of technical talent. As a small firm competing in a high-tech field, it's the talented, enthusiastic people coming to us at entry level who make it possible for us to succeed."

NJIT's expertise in workforce development has been widely recognized in many other ways. Recognizing that NJ is an under-producer of Science, Math, Engineering and Technology (SMET) undergraduate majors (less than 6% of NJ high school graduates intend to study engineering compared to the national average of 9%), NJIT has forged extensive partnerships with the math, science and technology high school "academies" of the county vocational-technical schools to deliver joint admissions, pre-engineering and college-level courses, articulated curricula, and advanced standing, thus enabling numerous students to enter NJIT in the last two years directly as sophomores. Similar initiatives exist between NJIT and the community colleges for students to progress seamlessly toward the completion of their BS degrees. In 2006, an innovative program of this nature was launched with Camden County College in Blackwood, NJ to permit their alumni to complete an NJIT BSIT degree in less than two years of full time study in courses offered on an accelerated basis. At the graduate level, there is a shortage of domestic students receiving SMET-related masters and PhD degrees. NJIT offers graduate certificates and executive master's degrees in subject areas of specific importance to New Jersey's economy at corporate extension sites (e.g.; Strkyer Orthopaedics and Verizon Wireless) and through distance learning. Showcased subject areas include: biomedical engineering, pharmaceutical manufacturing, homeland security, and engineering management.

As another example of an initiative to address this shortage, in 2006, NJIT formed separate agreements for accelerated programs with both New Jersey City University and William Paterson University. These programs permit these colleges' undergraduates in their senior year to progress seamlessly to NJIT MS degrees in computer science, information systems, applied mathematics and applied statistics in just one more year of full-time study.

In addition, NJIT has a well established network of business incubators with locations throughout the State, with NJIT currently housing New Jersey's largest concentration of incubator activity. Realizing the benefit to shifting the focus from merely adding capacity to a system for increasing the depth and breadth of services that incubators offer to resident firms, during this period, NJIT initiated a business acceleration program in order to facilitate the growth of companies more rapidly from business concept to fledgling business. Critical catalysts to growth made available to resident firms included underwriting the expense of access to NJIT-based personnel and equipment assets, strengthening the ability of resident firms to compete for federal and foundation grant funding, and providing shared support for marketing, and information technology infrastructure.

New Jersey Manufacturing Extension Partnership (NJMEP) is another example of a business acceleration program which is geared, in particular, to small- and medium-sized manufacturers. Effective in 1995, NJIT became part of a national program of manufacturing technical assistance run by the National Institute of Standards and Technology (NIST) of the U.S. Department of Commerce. The NJMEP incorporates a number of existing NJIT resources. Five manufacturing sub-sectors were identified as both critical to the growth of the regional economy and at-risk in the absence of assistance: metalworking and machinery, electronics and instrumentation, rubber and plastics, food processing, and textiles and apparel. A staff of 15 MEP field engineers is responsible for assisting small- and medium-sized businesses to adapt to changing regulations and business conditions by bringing them into contact with existing sources of aid, and for refining the state's understanding of their needs.

Continuing Professional Education (CPE) at NJIT has long been recognized as a leader in industry training and workforce development, as exemplified by the NJ Department of Labor and Workforce Development's Office of Customized Training. For example, during the last two years, NJIT conducted tailored in-house training for 3,400 NJ employees at their places of work. Other training partnerships were forged with NJ AFL-CIO for petro-chemical counter-terrorism security awareness, with the NJ State Police for counter-terrorism training and with several NJ Workforce Investment Boards (i.e. Newark and Atlantic/Cape May) and community colleges for training in specific skill set areas. Alone and in partnership with the NJ Community College Workforce Consortium, CPE continued to use a distributed system of training at company sites and community colleges; and to select and oversee flexible teams of trainers who adeptly utilize selected teaching tools so as to accommodate adult learning styles and needs.

During the past two years NJIT has received substantial state grants to fund additional technology oriented workforce development projects. The Workforce Development Instructional and Outreach Program (PrE-IOP) is one example of such project which was concluded during this time period. It was created to enlarge the pool of qualified high-tech workers, including those who have been historically under-represented. The grant helped create standards-based engineering curricula for secondary schools and provided training for nearly 450 educators representing 147 New Jersey Schools. Evaluation results indicated that high school student attitudes towards engineers and engineering as a career increased from the beginning to the end of the school year following teachers' attendance in a PreE-IOP program.

Over the past two years, because of its successful track record with cutting edge academic curricula, customized contract training, distance learning technology utilization, business incubation, and manufacturing extension, among others, the institutional infrastructure of NJIT has been significantly strengthened to be poised to lead the development of workforce capacity building in the NJ higher education sector.

II.I.13. Culture/Cultural Events

NJIT provides a variety of cultural events. For example, NJIT collaborates with Rutgers-Newark to present four plays each year attended by a total of approximately 1200 people. There are also guest musicians and acting workshops. A co-curricular activity with both the "Musical Theater" and "Living Theater" courses at NJIT are student scripted and presented plays called "Stories from Home." To date, more than 150 stories have been told and approximately 50 have been scripted and performed.

In collaboration with Rutgers Newark and Essex County College, all special months are celebrated (Black History, Hispanic Heritage, Asian Pacific and Women's History). NJIT also celebrates World Week. In addition, on-going programs and activities are sponsored throughout the year. These include evening and weekend events with jazz bands and open mikes. Trips to diverse plays and events off-campus are also sponsored.

Student groups and the Office of the Dean of Student Services also present a variety of cultural events. NJIT is a co-sponsor of the annual Black film festival together with the Newark Museum and Rutgers University and the sponsor of the Black Maria Film Festival for young film makers.

II.I.14. Sports/Sport Events

The 2007-08 academic year set the stage for increased visibility for NJIT's athletic department in the seasons to come. Highlighting the changes was the completion of a plan to reclassify the men's soccer program into NCAA Division I. In fall 2004, the team, in its second year of the reclassification process, played a Division I schedule for the first time. The following year, they became members of the NCAA's highest-profile division. The university also anticipates full reclassification of its athletics program within the next year.

The university's athletic facilities were also improved. Lubetkin Field, home to the soccer teams, underwent a \$1.2 million renovation which provided a new artificial grass surface, a walking track and improved landscaping. The main gymnasium floor and the four tennis courts were also resurfaced. For the baseball team, NJIT came to an agreement with the Newark Bears for the Highlanders to play all of their home games at Bears & Eagles Riverfront Stadium. The team responded by setting a school record for wins and having five all-conference performers, plus the Player of the Year and Coach of the Year. In total, nine athletes earned all-conference recognition and four were academic all-conference selections. NJIT continued its membership in the Central Atlantic Collegiate Conference, joining such local schools as Felician, Caldwell, and Bloomfield, which has significantly cut down on travel time and costs while affording NJIT the opportunity to foster local rivalries.

A total of 180 students received athletic scholarships in AY 2007-2008, used to supplement the unmet tuition need of student athletes identified by the athletic administration. The total amount awarded in AY 2007-08 was nearly \$800,000. These students are all highly qualified student athletes whose academic and athletic skills will benefit the university as NJIT moves fully into Division I sports. During 2007-2008, NJIT honored 99 scholar-athletes who participated in varsity sports and earned a GPA of at least 3.0 for either Spring 2006 or Fall 2007. In 2007-08, the university will once again offer 15 intercollegiate varsity sports: baseball, M/W basketball, M/W cross country, M/W fencing, M/W soccer, M/W swimming, M/W tennis, and M/W volleyball.

II.I.15. Public Service, Charitable Efforts, Volunteerism

NJIT has produced numerous studies for the development of state policies, particularly for projects involving technology, transportation, alternative energy, and technology infrastructure. Most recently, NJIT has taken a leading role in the development of a security plan following the events of September 11 and in response to the need for greater homeland security. NJIT also has established a substantial level of outreach to the K-12 educational community in providing teacher development and special opportunities for children in science, math,

technology, and engineering education. Outstanding among NJIT's public service initiatives are:

- Activities related to University Heights Science Park (expected to generate 3000 jobs)
- Activities of the Center for Pre-College Programs – a national model for K-12 students and teachers in the sciences, mathematics and engineering. The program now serves over 3500 teachers, students, administrators, and parents.
- Activities of the Office of Community and Public Service which links classroom theory and concepts with practical applications in the community.

These practical applications include:

- Community Service Work-Study: More than twenty NJIT students worked for a dozen Newark area non-profit organizations during AY01. Agencies sites included Newark Center for Families, Community in Schools-NJ, Community Agency Corporation, St Phillips Academy, Newark Emergency Services for Families, and the Historical Society. "
- NJIT Literacy Corps: Through collaboration with the Newark, America Reads Partnership, 40 NJIT work-study students tutored over 350 elementary age school children at 15 schools & organizations throughout the area.
- Service Learning: Over 350 NJIT students partnered with 75 non-profit agencies to complete over 10,000 hours of volunteer service linking their academic learning with practical experience. This year, EOP and Athletics Department incorporated service-learning activities into their programs to promote civic engagement opportunities for participants. Recent projects included: a group of CIS students who designed and constructed a major volunteer database for the United Way of Essex and West Hudson; for the Clifton Public Library and an EOP student, interested in oral communication, who interviewed senior citizens and developed a video documentary of community historical information for the Newark West Ward Neighborhood Association.
- Volunteer Clearinghouse: Collaborative volunteer activities were sponsored during the year with IFSC, Health Services, DOS, Residence Life, etc. Over 200 NJIT students volunteered for activities such as NJIT/Prudential Global Volunteer Day", NESF Community Tech Network ", United Way "Celebrity Reads" project, Newark Do Something "Give Back Day" and the annual IFSC "Blood Drive".

II.I.16. Special Recognition Projects

The *New Jersey Inventors Hall of Fame*, established in 1987, recognizes the state's inventing heritage and provides a permanent tribute to the individuals and corporations who have worked to advance technology. Outstanding New Jersey inventors are inducted into the Hall of Fame at an annual banquet held during the second week of February. At the same time, a select group of New Jersey inventors holding current patents are awarded *Inventor of the Year* citations and one corporation is named to the *Corporate Invention Hall of Fame*.

The *New Jersey Literary Hall of Fame* is dedicated to remembering and perpetuating the work of New Jersey authors. This recognition was started in 1976 to bring attention to the state's writers past and present. Each year, writers, known nationally and internationally, have been inducted. Books and other memorabilia of New Jersey's major writers have also been collected.

NJIT Archives now houses the collections of Dr. Herman Estrin and Edward Weston long time faculty member and founder of the New Jersey Literary Hall of Fame and the New Jersey Writers Conference. The NJIT Archives also includes the Edward Weston Collection. Edward Weston, one of the founders of the Newark Technical School, is known for his research and development in the fields of electroplating, lighting, and electronic measurements. The NJIT Archives now has many of his papers, including patent litigation, hundreds of mechanical drawings of his equipment, and museum displays of his equipment. The NJIT archives have also begun to digitize and make accessible over the web, NJIT theses and dissertations as well as some yearbooks and other university materials of interest to researchers and alumni.

II.J. Facilities and Major Capital Projects/Improvements

In the fall of 2008, the NJIT campus consisted of 2.6 million gross square feet of built environment on a 48 acre campus. With the recently completed construction and major rehabilitation, the average age of campus facilities is 14 years. This is in spite of the original building dates of the pre-1967 expansion campus which includes Eberhardt Hall built in 1897, Colton Hall in 1911 and Campbell Hall in 1930. In concert with the development of University Heights Science Park, NJIT was able to consolidate a whole block just west of the major portion of the campus, but contiguous to the land acquired for its Enterprise Development Center II, in a “land swap” with the NJ Economic Development Agency of several disparate parcels that NJIT had acquired over time with land the EDA was acquiring on behalf of Science Park. The third building in Science Park Newark, a 170,000 square foot laboratory building and an addition have now been completed.

NJIT, with active participation of area stakeholders, has recently embarked on a major project to lead a redevelopment effort in a portion of the historic James Street section of Newark adjacent to campus. This project will involve repurposing some facilities from NJIT, Saint Michael's Hospital, the relocation of Greek housing to campus land along Warren Street, and the systematic creation of a model residential and small business zone within walking distance of Newark's central business district. NJIT has been selected and the work plan was submitted to the city for the selection of a planner / developer of this project. The Newark City Council recently adopted a redevelopment plan for the Broad Street Station Area which includes the NJIT gateway plan. The Council also confirmed NJIT as the redeveloper for the Gateway Project.

II.J.1. Planning, the next step

In 2005 the previous building phase was completed and NJIT has embarked on a comprehensive facilities planning project to identify facilities needs for the next five to ten years. This effort will take a comprehensive look at the curriculum and instructional needs for a growing campus in addition to the student service infrastructure that growing campus will require.

II.J.2. Deferred Maintenance

Another critical element of the facilities plan addresses the outstanding major items of deferred maintenance. To this end, a significant allocation of resources has been made. It should be noted that NJIT has, on an annual basis, continually made progress on this important issue.

II.J.3. Financing

The financing for the recent projects came from several sources. Several of the projects have multiple sources of funding reflective of certain restrictions on funds. For example, the US Economic Development funds could only be used for Enterprise Development III. While the overall debt of the university has risen owing to this construction, the annual debt service is covered from operating revenues, including student fees, residence hall rentals and tenant income from EDCIII. The university issued general obligation bonds through the NJ Educational Facilities Authority. As usually issued Moody's Investors Service and Standard and Poor's Ratings Group have assigned Series 2001 bond ratings of "Aaa" and "AAA," respectively. Moody's Investors Service and Standard and Poor's Ratings Group have used underlying ratings of "A2" and "A+," respectively.

II.J.4. Future Needs

With all the expansion and new facilities, can there be further needs? In a growing technological university the answer is a firm yes. As NJIT continues to place greater emphasis on the use of technology in the life sciences, new spaces will be needed. Further, as new research oriented faculty join NJIT, more laboratory space will be necessary. The overall enrollment is projected to have modest growth in the next 5 to 10 years. The new Master Plan addresses these issues in more detail. Additionally, in the long term, NJIT has utilized almost all of the available land as building sites. These represent the major challenges facing the university with respect to facilities.

To meet these challenges, NJIT will continue to pursue multiple paths. Limitations on funding and available land make it imperative that alternative solutions be found. As a critical element of its planning process, NJIT has developed and strengthened strategic alliances with its university neighbors. The Council for Higher Education in Newark (CHEN), which is discussed more fully earlier in this report, consists, in addition to NJIT, of the Newark campus of Rutgers University, the University of Medicine and Dentistry of New Jersey and Essex County College. This consortium has developed both joint academic and administrative programs. In the area of facilities this has enabled a researcher in the College of Computing Sciences to test computer models on learning curves in laboratory animals by using the animal facilities just across the street. There are several federated departments at NJIT and Rutgers University, including history, physics, and biology, which permit NJIT to have a faculty critical mass without the full facilities burden.

In addition, NJIT and the Newark Public Schools have executed a purchase agreement for Central High School and the completion or rehabilitation of another (West Side) high school. This could provide future classroom space, relieve a growing demand on physical education facilities as well as space for our math, science teacher education efforts.

III. Other Institutional Information

III.A. Number of Collaborative Academic Programs

Collaborative Academic Programs

Joint Programs

- Rutgers - The State University, Newark Campus
- University of Medicine and Dentistry of New Jersey (UMDNJ)

Joint programs with Rutgers - The State University, Newark Campus include:

- Applied Mathematics (B.A.) 270301
- Applied Physics (B.S.) 400899
- Biology (B.A.) 260101
- Biology (B.S.) 260101
- Computer Science (B.A.) 110101
- Environmental Science (B.S.) 030102
- Geoscience Engineering (B.S.) 141601
- History (B.A.) 450801
- Human Computer Interaction (B.S.)
- Information Systems (B.A.) 110401
- Science, Technology, and Society (B.A.) 301501
- Applied Physics (M.S.) 400899
- Biology (M.S.) 260101
- Computational Biology (M.S.)
- Environmental Science (M.S.) 030102
- History (M.A.T.) 131328
- History (M.A.) 450801
- Public Health (M.P.H.) 512201
- Applied Physics (Ph.D.) 400899
- Biology (Ph.D.) 260101
- Environmental Science (Ph.D.) 030102
- Mathematical Sciences (Ph.D.) 270101
- Public Health (M.P.H.)
- Urban Systems (Ph.D.)

Joint programs with the University of Medicine and Dentistry of New Jersey include:

- Nursing (B.S.N.)³ 511608 (Mt. Laurel Campus only)
- Biomedical Informatics (M.S.) 119999 (will be solely UMDNJ after 12/06)
- Nursing (M.S.N., Nursing Informatics Track only)

- Public Health (*M.P.H.*) 512201
- Biomedical Engineering (Ph.D.) 104501
- Biomedical Informatics (Ph.D.) 119999 (will be solely UMDNJ after 12/08)
- Urban Systems (Ph.D.) 459999

Joint Research Programs – Centered at NJIT

- Center for Solar Research (NJIT, Cal. Tech.)
- Hazardous Substance Management Research Center (NJIT, UMDNJ, Rutgers, Princeton, Stevens)
- Microelectronics Research Center (NJIT, Rutgers, Columbia)
- Multi-Lifecycle Engineering Research Center (NJIT, Rutgers, Princeton, Stevens)
- National Center for Transportation and Industrial Productivity (NJIT, Rutgers)
- New Jersey Program for Engineered Particulates (NJIT, Princeton, Rutgers)
- New Jersey Center for Micro-Flow Control (NJIT, Princeton)
- New Jersey Center for Multimedia Research (NJIT, Princeton)
- New Jersey Center for Transportation Information and Decision Engineering (NJIT, Princeton)
- New Jersey Center for Internet Security (NJIT, Princeton, Stevens)
- New Jersey Center for Wireless Telecommunications (NJIT, Rutgers, Princeton, Stevens)
- New Jersey MEMS Initiative: From Concept to Commercialization (NJIT, Rutgers, Columbia)
- Northeast Hazardous Substance Research Center (NJIT, UMDNJ, Rutgers, Princeton, Stevens, Tufts, MIT)
- Polymer Engineering Center (NJIT, Stevens)

Research Partnerships Centered at Other Institutions

- Center for Airborne Organics (MIT, NJIT, Cal. Tech.)
- Center for Applied Genomics (NJIT, UMDNJ)
- Center for Embedded System-On-a-Chip Design (Princeton, Rutgers, NJIT)
- Center for Ultra-fast Laser Applications (Princeton, Rutgers, NJIT, UMDNJ)
- New Jersey Center for Biomaterials and Medical Devices (Rutgers, UMDNJ, Princeton, NJIT)
- Collaborative Telemedicine Environments (Rutgers, NJIT, UMDNJ)
- New Jersey Center for Optoelectronics (Princeton, NJIT)
- New Jersey Center for Pervasive Computing (Princeton, NJIT, Rutgers)
- Particle Processing Research Center (Rutgers, NJIT)
- Phytoremediation of Dredge Spoils Using Living Plants/Associated Microorganisms (Rutgers, NJIT)
- Software Engineering for Distributed Computing and Networking (Stevens, Rutgers, NJIT)

NJIT's articulation arrangements

NJIT currently has articulation arrangements with the following 18 institutions:

- Bergen Community College
- Brookdale Community College
- Burlington County College
- Camden County College
- County College of Morris
- Cumberland County College
- Essex County College
- Hudson County Community College
- Mercer County College
- Middlesex County College
- Ocean County College
- Passaic County Community College
- Raritan Valley County College
- Union County College
- Lincoln University of Pennsylvania
- Seton Hall University
- Stockton State College
- William Peterson University

III.B. Number of Collaborative Student Service and Administrative Programs*Collaborative Student Service and Administrative Programs*

- South Jersey Economic Development Network (NJIT, Burlington, Cumberland, Georgian Court, Ocean, Salem, UMDNJ)
- Council for Higher Education in Newark (NJIT, Rutgers-Newark, Essex, UMDNJ)
- University Heights Science Park (NJIT, Rutgers-Newark, UMDNJ)
- Cross registration of courses (NJIT, Rutgers-Newark, Essex, UMDNJ)
- Joint student cultural events (NJIT, Rutgers-Newark)
- Joint shuttle bus service (NJIT, Rutgers-Newark)
- Joint library privileges and interlibrary loan arrangements (NJIT, Rutgers-Newark)
- Coordination of security and public safety programs (NJIT, Rutgers-Newark)
- Federated Department of History (NJIT, Rutgers-Newark)
- Federated Department of Physics (NJIT, Rutgers-Newark)
- Southern CIM Consortium (NJIT, Camden + 5 additional county colleges)
- Northern/Central Advanced Technology Consortium
- Joint admissions programs (NJIT, Bergen, Burlington, Essex, Hudson, Mercer, Middlesex, Ocean, Union) Cooperative agreement on B.S. in Engineering Science/M.D. or D.M.D. sequence (NJIT, UMDNJ)

- Articulation agreements (NJIT, 18 county colleges)
- Sharing of facilities: extension sites (NJIT, Bergen, Drew, Mercer, Paterson, Ramapo, Raritan)
- Energy Conservation Committee (NJIT, Rutgers-Newark)
- Joint street cleaning program (NJIT, Rutgers-Newark)
- Consortium for Pre-College Education in Newark (NJIT, Rutgers-Newark, UMDNJ)
- Communiversity
- New Jersey Higher Education Network

III.C. The Process for Assessing Outcomes for Graduates

NJIT assesses outcomes for graduates through a program that includes multiple measures and surveys. Most programs of the college include exit examinations and projects completed in capstone courses. In addition, all graduates have the opportunity to participate in the survey program conducted by the Office of Institutional Research and Planning. In order to help in assessing outcomes for graduates, the program surveys graduating students, alumni, and employers of NJIT graduates. General results from the surveys include the Graduating Student Survey, and Alumni Survey.

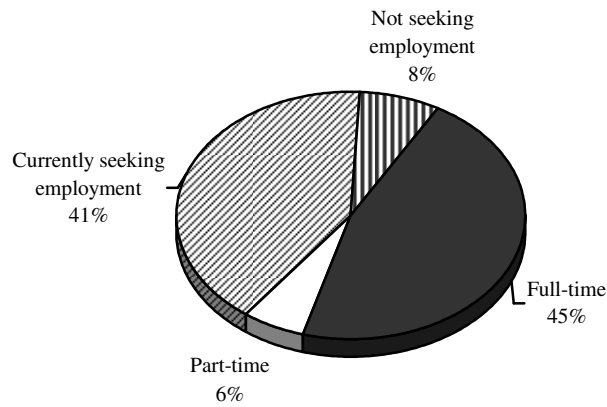
III.C.1. Graduating Student Survey

The Graduating Student survey was redesigned in Fall 2007 to improve its assessment effectiveness in its delivery via the web. The survey instrument consists of scaled items relating to achievement of goals, self-assessment of acquired skills and knowledge, and items evaluating academic programs and student services. Graduates were also asked to describe current employment and educational plans. Response rates soared from 11% (mail survey) to over 60 percent (web survey). Delivery via the web also greatly increased the participation of students who graduated with advanced degrees (i.e. Masters, Ph.D.). All students who graduated were invited by email to participate in the survey and follow up reminder emails were sent.

On a five point scale (5=high, 1=low), both undergraduate and graduate graduates rated NJIT highly. Undergraduates rated all goals and knowledge and skills items above a mean of 3.50 and all education and services above a mean of 3.05. Eighty percent of all undergraduate and graduate students would recommend NJIT to a friend.

Compared to last year, the job market improved for both undergraduate and graduates. Forty-five of undergraduate graduates reported full-time employment, 7% rise from Spring 2005.

Undergraduate Employment Status at Graduation



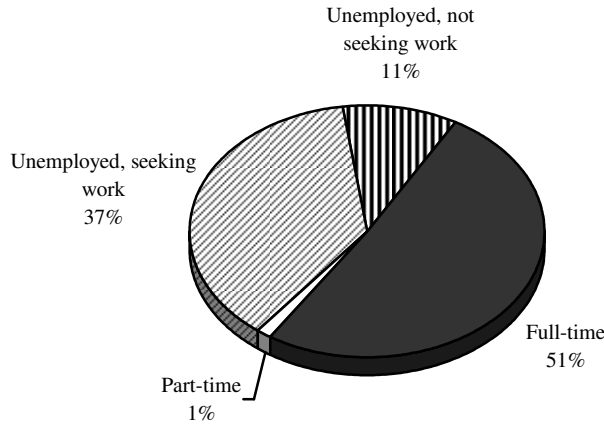
The percentage of undergraduates making \$70,000 and above more than doubled (6% in 2005 to 15% in 2008).

	2006 Undergraduate Graduates (<i>n = 188</i>)
Under \$30,000	10%
\$30,001 to \$35,000	6%
\$35,001 to \$40,000	11%
\$40,001 to \$45,000	18%
\$45,001 to \$50,000	13%
\$50,001 to \$55,000	15%
\$55,001 to \$60,000	14%
\$60,001 to \$65,000	5%
\$65,001 to \$70,000	2%
\$70,001 to \$75,000	10%
\$75,001 to \$80,000	2%
\$80,001 or more	1%

The positive job environment leads to a 9% decrease in those stating that they would attend graduate school this year.

Fifty-one percent of graduate graduates reported full-time employment, a 5% rise from Spring 2005.

Graduate Employment Status at Graduation

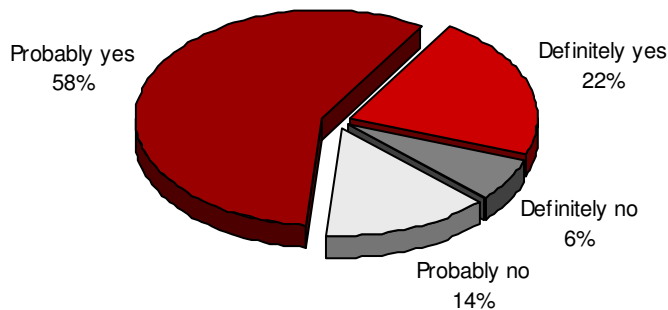


There was a 7% increase in graduate graduates obtaining a new job.

III.C.2. Alumni Survey

In Fall of 2005, after an environmental scan of our peers, the Alumni survey was redesigned with input from Advancement and Career Development services. The instrument consisted of 36 items that asked alumni to rate their overall experience, assess their skill development, education and student services. Alumni were also asked if they had undertaken further formal education and their employment status. An email invitation and subsequent email reminders were sent to all alumni who graduated in the last three years. Many of the respondents reported that classes, classmates and professors were the most meaningful part of their university experience. If they had to choose a college again, eighty percent of the respondents would choose NJIT.

Alumni Survey Fall 2005: If you had to do it over again, would you choose NJIT? (n = 438)



In general, alumni rated their education and student services positively especially intellectual atmosphere, faculty relationships with student and the general professionalism of the program. All skills were rated above a mean of 3.25 (5=high, 1=low) and NJIT preparation for their career/profession received a positive rating of 3.51. Within three years of graduation, eighty-five percent of NJIT graduates were employed full-time. Since graduating, 37% have undertaken further formal education. Seventy-one percent sought a Master's degree and 20% pursued a doctorate or other professional degree.

III.C.3. Tracking by Office of Career Development, Faculty & Others

In addition to the survey program, numerous other mechanisms are in place that help to provide NJIT with feedback and information about graduates. The Office of Career Development conducts a survey of graduates at the time of graduation, and this survey occurs approximately 1 month after the graduating student survey. At the time of graduation, the number of students reporting that they are employed increased several percentage points across all levels. Many alumni of NJIT continue to participate in the life of the NJIT community through membership in the alumni association, advisory boards established for academic programs, and through other events. Such participation generally includes the opportunity to advise NJIT on the graduate's experiences, achievements, and recommendations regarding programs.

III.D. Degrees

III.D.1. Bachelor's Degrees Awarded 2007

Table III.D.1		
Bachelor's Degrees Awarded 2007 (Number)		
CIP Code	Institutional Program Title	Total
40201	Architecture	99
110101	Computer Science	74
110103	Information Technology	72
	Information Systems / Human Computer Interaction / Biomedical	
110401	Informatics	28
119999	Bioinformatics	1
140501	Biomedical Engineering	57
140701	Chemical Engineering	36
140801	Civil Engineering	61
140901	Computer Engineering	63
141001	Electrical Engineering / Telecommunications	95
141301	Engineering Science	7
141401	Environmental Engineering	2
141901	Mechanical Engineering	63
143501	Industrial Engineering	15
150000	Engineering Technology	139
231101	Professional & Technical Communication	5
260101	Biology	10
270101	Mathematical Sciences	22
270501	Applied Statistics	1
301501	Science/Technology & Society	9
400501	Chemistry	3
400899	Applied Physics	3
520201	Management of Technology	79
540101	History	5
	Total	949

III.D.2. Master's Degrees Awarded 2007

CIP Code	Institutional Program Title	Total
30104	Environmental Sciences	10
40201	Architecture	24
40301	Infrastructure Planning	7
110101	Computer Science	194
	Information Systems / Human Computer Interaction / Biomedical	
110401	Informatics	54
140501	Biomedical Engineering	41
140701	Chemical Engineering	13
140801	Civil Engineering	59
140804	Transportation	8
140901	Computer Engineering	24
141001	Electrical Engineering / Telecommunications	131
141401	Environmental Engineering	5
141801	Material Sciences & Engineering	6
141901	Mechanical Engineering	22
143501	Industrial Engineering	10
143601	Manufacturing Engineering	6
	Internet Eng. / Occupational Safety & Health Eng. / Pharmaceutical	
149999	Eng.	25
151501	Engineering Management	53
231101	Professional & Technical Communication	14
261103	Computational Biology	5
270301	Applied Mathematics	4
270501	Applied Statistics	14
400501	Chemistry	4
400899	Applied Physics	2
440501	Environmental Policy Studies	4
520201	Management	39
520299	Management of Technology	80
	Total	858

III.D.3. Doctoral Degrees Awarded 2007

Table III.D.3 Doctoral Degrees Awarded 2007 (Number)		
CIP Code	Institutional Program Title	Total
30104	Environmental Sciences	1
110401	Information Systems / Human Computer Interaction / Biomedical Informatics	5
140501	Biomedical Engineering	3
140701	Chemical Engineering	5
140801	Civil Engineering	1
140804	Transportation	2
140901	Computer Engineering	2
141001	Electrical Engineering / Telecommunications	11
141401	Environmental Engineering	2
141801	Material Sciences & Engineering	2
141901	Mechanical Engineering	5
270101	Mathematical Sciences	4
400501	Chemistry	2
400899	Applied Physics	4
459999	Urban Systems	1
520201	Management	2
Total		52