A. Statement of Accuracy and Completeness

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

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Robert A. Altenkirch

President

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Introduction

NJIT enrolled more than 8,862 students in 2001 and enrollments are continuing to increase. NJIT awards approximately 1,800 degrees annually from the baccalaureate through the Ph.D. 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 twenty professional areas, master's programs in forty specialties, and thirty six 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 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 4,500 elementary and secondary school students and teachers annually through an array of pre-college programs.

NJIT was founded in 1881 as 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 outset of its history, 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 $60 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 45 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 the NJIT/Burlington County College Technology and Engineering Center (TEC), at extension sites at colleges and other locations throughout New Jersey and increasingly through a variety of electronically mediated distance learning formats.

Money Magazine 1998: Best College Buys Now ranked NJIT as the sixth "Best Value" among the top "Scientific and Technical Schools" in the United States. And *U.S. News and World Report: 1999 Annual Guide to America's Best Colleges* placed NJIT among the top one hundred "Best National Universities" for the fifth straight year. *U.S News and World Report* also ranked NJIT fifth lowest in the debt of graduating students among public universities. The Center (University of Florida) ranked NJIT 101st (adjusted for controls) of all 4,700 national universities and colleges in its 2001 report on *The Top American Research Universities*, and 69th in positive change in federal research funding from 1990 to 1999. *Yahoo!* ranked NJIT as the nation's "most wired " public university campus for three consecutive years from 1999 to 2001. *New Era* ranked NJIT as the fourth "most wired" U.S. college.

NJIT Mission Statement

NJIT is a ***public, urban 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*** in such multi-disciplinary areas as environmental engineering, materials science, manufacturing, productivity enhancement, transportation and infrastructure systems, infrastructure and communications technologies, and health sciences;
- in contributing to the state's ***economic development*** through partnerships and joint ventures with government and the business community and through the development of intellectual property;
- in ***service*** to both its local communities 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; and ***advances the uses of technology*** as a means of improving the quality of life.

NJIT offers a ***comprehensive array of programs*** in engineering and engineering technology, computer science, architecture, applied sciences, mathematics, management, policy studies, materials science, and related disciplines throughout New Jersey and the nation.

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.

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 448 in Fall 1998. In Fall 1996, the Honors College opened a second branch at the Technology and Engineering Center in Mount Laurel (which enrolled freshmen for the first time in Fall 1996). The university's plans call for further significant expansion of the Honors College.

NJIT also has an outstanding *Educational Opportunity Program* (EOP) with an enrollment of 584 undergraduates in Fall 1998. 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.

Vision Statement

AS NJIT looks to the future, its overarching goals are to be a forward looking research university, operating at the boundary of change, leading the development of new programs and modes of delivery to meet the needs of constituents, and reaching new levels of institutional excellence in service to the people of our community, state, and nation.

The NJIT of the twenty-first century will be a globally-oriented research university widely known for its emphasis on the design, development, management, interpretation, and application of sustainable technology for the benefit of society. The concept of multi-lifecycle education will be an integrating theme for the university's programs.

NJIT's institutional culture will encourage and reward entrepreneurial initiatives on the part of students, faculty, and staff. Programs will place special emphasis on quality and productivity in the context of a global economy. Partnership with private corporations, public agencies, and other research universities, both here and abroad, will be a standard operating mode.

NJIT's campus community will reflect the complexity of a pluralistic society. Its diverse composition will enrich and enhance the educational and cultural dimensions of the entire learning experience.

NJIT's degree programs and curricula will prepare students to assume positions of leadership as professionals and entrepreneurs in a global economy. It's graduates will be engineers, scientists, architects, technologists, managers, social scientists, and policy-makers with a broad understanding of economic, social, and organizational issues; with excellent communication skills as well as specialized technical competence; with the interpersonal skills needed to work well in teams; with social awareness, ethical values, and moral integrity as underpinnings for personal growth and responsible citizenship; and with a record of both practical work experience and community service as components of their education.

NJIT's faculty, administrators, and staff will assist students to meet the university's rigorous academic standards, fully develop their talents, and make their education a life-transforming experience. All will view students' success as the measure of their own effectiveness.

II. Data for 2001-2002 by Category

II.A. Accreditation Status

II.A.1. Regional Accreditation

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

II.A.2. Specialized 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)
- National League of Nursing (NLN)
- Council for Education on Public Health (CEPH)
- Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET)

II.B. Characteristics of Undergraduate Students

II.B.1. Mean Math and Verbal SAT Scores

Table II.B.1.
Mean Math and Verbal SAT for First-Time Freshmen,
by Admission Status and Overall

	Full-Time Students				Part-Time Students			
	Math	N	Verbal	N	Math	N	Verbal	N
Regular Admits	606.80	625	549.15	625	573.33	3	516.67	3
EOF Admits	551.49	87	496.21	87				
Special Admits								
All Admits	600.04	712	542.68	712	573.33	3	516.67	3
Missing Scores		1		1		0		0

II.B.2. Percentages of Freshmen Needing Remediation in Reading/Writing, in Math Computation, and in Elementary Algebra

Table II.B.2.
Percentage of First-Time Freshmen Needing Remediation, by Subject Area

	% of All FTFTF Tested	% of All FTFTF Needing Remediation
Reading	100%	24%
Writing	100%	24%
Math Computation	100%	12%
Elementary Algebra	100%	46%

Note: all students needing reading remediation are also considered to need writing remediation.

II.B.3

II.B.3.a. Race/ Ethnicity, Gender, and Age

Table II.B.3.a.
Undergraduate Enrollment by Race/Ethnicity

	White		Black		Hispanic		Asian		American Ind.		Alien		Race Unknown		Total	
	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct
Full-time	1,370	33.2	425	10.3	426	10.3	1,044	25.3	10	0.2	295	7.2	553	13.4	4,123	100.0
Part-time	553	35.1	212	13.5	162	10.3	248	15.7	1	0.1	41	2.6	358	22.7	1,575	100.0
Total	1,923	33.7	637	11.2	588	10.3	1,292	22.7	11	0.2	336	5.9	911	16.0	5,698	100.0

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.B.3.b. By Gender

Table II.B.3.b.
Undergraduate Enrollment by Sex

Full-time					Part-time					Total				
Male	Pct	Female	Pct	Total	Male	Pct	Female	Pct	Total	Male	Pct	Female	Pct	Total
3,229	78.3	894	21.7	4,123	1,231	78.2	344	21.8	1,575	4,460	78.3	1,238	21.7	5,698

II.B.3.c. By Age

Table II.B.3.c.
Undergraduate Enrollment by Age

		LT 18	18-19	20-21	22-24	25-29	30-34	35-39	40-49	50-64	65+	Unk	Total
Full-time	Num	24	1,211	1,286	1,077	336	100	51	34	0	0	4	4,123
	Pct	0.6	29.4	31.2	26.1	8.1	2.4	1.2	0.8	0.0	0.0	0.1	100.0
Part-time	Num	29	55	180	363	359	223	158	148	33	0	27	1,575
	Pct	1.8	3.5	11.4	23.0	22.8	14.2	10.0	9.4	2.1	0.0	1.7	100.0
Total	Num	53	1,266	1,466	1,440	695	323	209	182	33	0	31	5,698
	Pct	0.9	22.2	25.7	25.3	12.2	5.7	3.7	3.2	0.6	0.0	0.5	100.0

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

Table II.B.4.
Financial Aid from State-Funded Programs, FY 2002

	Recipients	Awards	Dollars($)	$/Recipient	$/Award
TAG	1,367	2,471	5,514,946	4,034.34	2231.87
EOF	394	732	385,950	979.57	527.25
Bloustein Scholars	86	170	85,000	988.37	500.00
Urban Scholars	97	192	96,000	989.69	500.00
NJCLASS Loans		167	1,078,868		6460.29
OSRP*		146	391,300		2680.14

* Only include state share.

II.B.5. New Jersey State Residence

Table II.B.5.
First-time Full-time Freshman in Fall 2001 Enrollment
by State Residence

State Residents	Non-State Residents	Total	% State Residents
668	45	713	93.69%

II.C. Degrees Conferred

II.C.1. By Ethnicity and Gender

II.C.l.a. By Ethnicity

Table II.C.1.a.
Baccalaureate Degrees Conferred by Race/Ethnicity

White		Black		Hispanic		Asian		American Ind.		Alien		Race Unknown		Total	
Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct
288	32.84	87	9.92	100	11.4	219	24.97	2	0.23	84	9.58	97	11.06	877	100.0

II.C.1.b. By Gender

Table II C.1.b.
Baccalaureate Degrees Conferred by Sex

Men	Pct	Women	Pct	Total
684	77.99	193	22.01	877

II.C.2. By General Field of Study

Table II.C.2:
Baccalaureate Degrees Conferred by General Field

IPEDS CIP Code Major Category	No.
Architecture & related Programs	61
Business Management & Administrative Services	95
Computer Sciences	221
Engineering	348
Engineering-Related Technologies	89
Health Sciences	17
English Language & Literature/Letters	5
Biological Sciences/Life Sciences	5
Mathematics	21
Multi/Interdisciplinary Studies	4
Physical Sciences	10
Public Administration & Services	1
Total	877

II.D. Student Outcomes

II.D.1. Graduation

II.D.1.a. Overall Graduation Rate

Table II.D.1.a.
Overall Graduation Rate for a Freshman Cohort

Institution	1993-2000	1994-2001	Change
NJIT	45.9%	50.3%	4.4%

II.D.1.b. Graduation Rate for At-risk Students

Table II.D.1.b.
Graduation Rate for TAG recipients in the
Bottom two cells of the TAG table

Institution	1991--1993	1992--1994	Change
NJIT	38.1%	41.8%	3.7%

II.D.2. Transfer

II.D.2.a. Relative Graduation Rate of Transfers and Natives

Table II.D.2.a.
Relative Graduation Rate of Transfers and Natives

Institution	Fall 2000	Fall 2001	Change
NJIT	18.9%	19.2%	0.3%

II.D.2.b. Graduation Rate of Transfers Students

Table II.D.2.b.
Measure 1: Graduation Rate for Transfer Students

Institution	1993-2000	1994-2001	Change
NJIT	64.4%	65.9%	1.5%

II.D.2.c. Graduation Rates of Transfer vs. Native Students

Table II.D.2.c.
Graduation Rates of Transfer vs. Native Students
Six-Year Graduation Rates for Fall 1995 Full-Time Degree-Seeking
Transfers from NJ Community Colleges
and Native Freshmen, Sophomores and Juniors

NJIT	No. in Cohort	Grad. Rate
All Transfers from CC	189	64.55%
Native Freshmen	552	45.11%
Freshman Transfers From CC	58	56.90%
Native Sophomores	408	63.48%
Sophomore Transfers from CC	67	61.19%
Native Juniors	389	72.24%
Junior Transfers from CC	63	76.19%

II.E. Faculty Characteristics

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

Table II.E.1.
Full-Time Faculty by Race/Ethnicity, Sex, and Tenure Status

	White		Black		Hispanic		Asian		American Ind.		Alien		Race Unknown		Total	
	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct	Num	Pct
Tenure	164	73.2	8	3.6	4	1.8	40	17.9	1	0.4	2	0.9	5	2.2	224	100.0
Female	26	92.9	1	3.6	1	3.6	0	0.0	0	0.0	0	0.0	0	0.0	28	100.0
Male	138	70.4	7	3.6	3	1.5	40	20.4	1	0.5	2	1.0	5	2.6	196	100.0
Without Tenure	130	52.2	6	2.4	1	0.4	27	10.8	0	0.0	45	18.1	40	16.1	249	100.0
Female	28	57.1	4	8.2	0	0.0	7	14.3	0	0.0	3	6.1	7	14.3	49	100.0
Male	102	51.0	2	1.0	1	0.5	20	10.0	0	0.0	42	21.0	33	16.5	200	100.0
Total	294	62.2	14	3.0	5	1.1	67	14.2	1	0.2	47	9.9	45	9.5	473	100.0
Female	54	70.1	5	6.5	1	1.3	7	9.1	0	0.0	3	3.9	7	9.1	77	100.0
Male	240	60.6	9	2.3	4	1.0	60	15.2	1	0.3	44	11.1	38	9.6	396	100.0

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.E.2. Percentage of Courses Taught by Full-time Faculty

Table II.E.2.
Percentage of Course Sections Taught by Full-Time Faculty

Sections	F.T.	P.T.	T.A.	Other
2,217	71.0	16.0	6.0	7.0

F.T.: Full time faculty
P.T.: Part time faculty
T.A.: Teaching Assistant

II.F. Efficiency and Effectiveness

II.F.1. Median Time to Degree

Table II.F.1.
Median Time to Completion of the Degree

Institution	FY 2000 Graduates	FY 2001 Graduates	Change
NJIT	5.37	5.23	-0.14

II.F.2. Percentage of Upper-division Undergraduate Programs with 25 or Fewer Students Enrolled

Table II.F.2.
Percentage of Upper-Division Undergraduate
Programs with 25 or Fewer Students Enrolled

Institution	Fall 2000	Fall 2001	Change
NJIT	21.4%	21.4%	0.0%

II.F.3. Percentage of Graduate Programs with 10 or Fewer Students Enrolled

Table II.F.3.
Percentage of Graduate Programs
with 10 or Fewer Students Enrolled

Institution	Fall 2000	Fall 2001	Change
NJIT	26.1%	21.7%	-4.3%

II.F.4. Cost per Student

Table II.F.4
Cost per Student

Institution	Peers	NJIT	Difference
NJIT	$22,882	$17,887	-$4,995

II.G. Diversified Revenues

II.G.1. Percentage Increase in External Funding Dollars.

Table II.G.1.
External Funding

Institution	FY(98-00)	FY(99-01)	Change
NJIT	$37,682,243	$39,521,777	4.8%

II.G.2. Increase in Tuition

Table II.G.2.
Increase in Tuition

Institution	FY 2001	FY 2002	Change
NJIT	5,758	6,158	400

II.H. Characteristics of the Trustees

II.H.1. Race/ Ethnicity and Gender

Table II.H.l.
Board of Trustees by Gender and Ethnicity

	B	AI/AN	A/PI	H	W	Total
Male	1	0	1	0	9	11
Female	0	0	0	0	1	1
Total	1	0	1	0	10	12

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.H.2. Members of the Board of Trustees

- Honorable James E. McGreevey, *ex-officio*; Governor of the State of New Jersey
- Honorable Sharpe James, *ex-officio*; Mayor of the City of Newark
- James A. Kennedy, *Chair*, Chairman and Chief Executive Officer (Retired), National Starch and Chemical Company
- John N. Bain, Esq., '53, *Vice Chair*; Carella, Byrne, Bain & Gilfillan
- Hamilton V. Bowser, Sr., PE, '52, President, Evanbow Construction Company, Inc.
- W. Stanley Brown, President, Brown Global Enterprises, L.L.C.
- Peter A. Cistaro, Vice President-Distribution, PSE&G Company
- Vincent L. DeCaprio, '72, President, Vyteris
- William Eventoff, President, ESTM Associates, Inc.
- Robert Christian Ferris, Jr.
- Michael A. Gallagher, (Retired), Executive Vice President, Dime Savings Bank
- Anthony J. Knapp, Jr., Owner, Black Horse Inn
- Arun Netravali, Senior Scientist, Bell Laboratories Lucent Technologies
- Martin Tuchman, '62, Chairman and Chief Executive Officer, Interpool, Inc.
- Arthur F. Weinbach, Chairman and Chief Executive Officer, Automatic Data Processing, Inc.
- Kathleen Wielkopolski, *Vice Chair*, Chief Financial Officer, The Gale Company
- Charles R. Bergmann, '35, *Trustee Emeritus*, Vice President (Retired), Western Electric Company, Inc.

II.H.3. Members of the Board of Overseers

For more than thirty-two years, the university's Foundation has contributed to the institution through the professional expertise of the NJIT Board of Overseers. Chartered as the Newark College of Engineering Research Foundation, its stated purpose includes the support and encouragement of research and the establishment of fellowships and lectureships. Its mission was later broadened to include fund raising and support of all the academic programs at the university. The current members of the Board of Overseers are:

- Robert A. Altenkirch, President and *Secretary of the Foundation,* President, New Jersey Institute of Technology
- James A. Kennedy, *Chair*, Chairman and Chief Executive Officer (Retired), National Starch and Chemical Company
- Emil C. Herkert, *Chair*, President and Chief Executive Officer, Killam Group of Companies

- John P. Murray, Chair Emeritus and *Vice Chair for Board Development*, Director Corporate Risk Management (Retired), Prudential Securities
- John H. Olson, ’61, ’66, *Vice Chair for Fund Raising Committee*, Senior Vice President, Regional Director, Morgan Stanley Dean Witter
- Randy Allen, Executive Vice President, Strategic Planning & CIO, Kmart Corporation
- Bruce I. Andrews, President, Animal Health Division, Alpharma
- Gastone Bello, Executive Vice President for Technical Operations, U.S. Dermatologics Inc.
- Charles R. Bergmann, ’35, Vice President (Retired), Western Electric Company, Inc.
- Judy Goss Boyd, Vice President University Advancement, New Jersey Institute of Technology
- Raymond G. Chambers, Chairman, Amelior Foundation
- James J. Coleman, Jr., Chairman, International Matex Tank Terminals
- Frederick D. D’Alessio, ’70, ’77, President, Advanced Services Verizon Communications
- Michele S. Darling, Executive Vice President and Chair of the Foundation, The Prudential Insurance Company of America
- Vincent L. DeCaprio, ’72, President, Vyteris
- Stephen P. DePalma, PE, ‘72, President and Chief Executive Officer, Schoor DePalma
- Albert A. Dorman, FAIA, ’45, Chairman (Retired), AECOM
- Irwin Dorros, Consultant, Dorros Associates
- Jerome Drexler, ’55, Chairman and President, Drexler Technology Corporation
- S. David Ellenbogen, ’60, Chairman and Chief Executive Officer, Hologic, Inc.
- Peter T. Francis, Board Chair, President and Chief Executive Officer, J. M. Huber Corporation
- David C. Garfield, President (Retired), Ingersoll-Rand Company
- J. Robert Hillier, FAIA, President, Chairman and Chief Executive Officer, The Hillier Group
- Howard S. Jonas, Founder, Chairman and Chief Executive Officer, IDT Corporation
- Ray Kapur, President, World Wide Generics, Schering-Plough
- William A. Liffers, Vice Chairman (Retired), American Cyanamid Company
- M. Brian Maher, Chairman and Chief Executive Officer, Maher Terminals, Inc.
- Henry A. Mauermeyer, ’72, ’74, Senior Vice President for Administration and Treasurer, New Jersey Institute of Technology
- Raymond J. McGowan, ’64, Executive Vice President, ExxonMobil Chemical Company
- John J. Nallin, Vice President, United Parcel Service, Inc.
- George M. Newcombe, ’69, Partner, Simpson Thacher & Bartlett

- Arthur F. Powell, President, Powell Capital Markets, Inc.
- William H. Powell, Chairman and Chief Executive Officer, National Starch and Chemical Company
- Philip L. Rinaldi, ’68, President and Chief Executive Officer, Mulberry Corporation
- John W. Seazholtz, 59’, Chairman of the Board, Westell Technologies
- Laurence C. Seifert, 63’, Senior Vice President, Wireless Local Technology Group, AT&T Wireless Services
- Stephen M. Solomon, President and Chief Executive Officer, ABB Lummus Global
- Benedict J. Torcivia, Jr., Executive Vice President, Torcon, Inc.
- William C. Van Buskirk, Provost and Senior Vice President for Academic Affairs, New Jersey Institute of Technology
- Robert C. Waggoner, President and Chief Executive Officer, Burrelle’s Information Services
- Joseph Weber, Vice President, Interclass
- Arthur F. Weinbach, Chairman and Chief Executive Officer, Automatic Data Processing, Inc.
- Joseph T. Welch, III, ’62, Division President (Retired), Becton Dickinson and Company

II.H.4. Boards of Visitors

Members of the advisory committees are chosen from business, industry, and government to advise the academic departments and the Board of Trustees on the current skills and knowledge areas needed in their respective organizations. This exchange of information ensures that NJIT graduates always demonstrate the cutting edge competencies needed in our economy. There are six Boards of Visitors and eighteen Boards of Advisors.

Boards of Visitors

- Albert Dorman Honors College
- College of Computing Sciences
- College of Science and Liberal Arts
- Newark College of Engineering
- School of Architecture
- School of Management

Boards of Advisors

- Applied Physics
- Biomedical Engineering
- Career Development Services

- Chemical Engineering
- Civil and Environmental Engineering
- Education Opportunity Program (EOP)
- Electrical and Computer Engineering
- Engineering Technology
    - Computer Technology
    - Electrical and Computer Engineering Technology
    - Manufacturing
    - Mechanical Engineering
    - Surveying
    - Construction
- Highlanders
- Humanities Department
- Industrial and Manufacturing Engineering
- Material Science and Engineering Program
- Mathematics Sciences – Statistics and Actuarial Science
- Mechanical Engineering
- Murray Center for Women in Technology
- Pre-College Program
- Solar Research
- York Center

II.I. Profile of the Institution

II.I.1. Degree Programs

NJIT currently offers 96 degree programs (36 bachelors degree programs, 40 masters programs, and 20 doctoral programs):

Bachelors Degrees (36 programs, CIP Code listed after program name)

Applied Mathematics (B.S.) 270301
Applied Mathematics[1] (B.A.) 270301
Applied Physics[1] (B.S.) 400899
Architecture (B.Arch.) 040201
Architecture (B.S.) 040201
Biology[1] (B.A.) 260101
Biology[1] (B.S.) 260101
Biomedical Engineering (B.S.) 140501
Chemical Engineering (B.S.) 140701
Chemistry (B.S.) 400501
Civil Engineering (B.S.) 140801
Computer Engineering (B.S.) 140901
Computer Science (B.S.) 110101
Computer Science[1] (B.A.) 110101
Electrical Engineering (B.S.) 141001
Engineering Science (B.S.) 141301
Engineering Technology (B.S.) 159999
Environmental Eng. (B.S.) 141401
Environmental Science[1] (B.S.) 030102
Geoscience Engineering[1] (B.S.) 141601
History[1] (B.A.) 450801
Human Computer Interaction[1] (B.S.) 110401
Industrial Engineering (B.S.) 141701
Information Systems (B.S.) 110401
Information Systems[1] (B.A.) 110401
Information Technology (B.S.) 119999
Management (B.S.) 520201
Manufacturing Engineering (B.S.) 141701*
Mathematical Sciences (B.S.) 270301
Mechanical Engineering (B.S.) 141901
Nursing[3] (B.S.N.) 511608 (Mt. Laurel Campus only)
Professional & Technical Comm. (B.A.) 231101
Professional & Technical Comm. (B.S.) 231101
Science Technology & Society (B.S.) 301501
Science Technology & Society[1] (B.A.) 301501
Statistics & Actuarial Science (B.S.) 270501

* No longer accepts freshmen

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 8 options within Engineering Technology (B.E.T.):

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

There are 3 options within Management (B.S.):

- E-Commerce
- Marketing
- Management Information Systems

There are 22 undergraduate minors offered (12-18 credits required for a minor):

Actuarial Science
Applied Mathematics
Applied Physics
Biology
Chemistry
Computer Engineering
Computer Science
Drama/Theatre
Economics
Environmental Engineering
Global Studies
History
Information Systems
Legal Studies
Literature
Management
Materials Engineering
Philosophy/Applied Ethics
Professional Communications
Sports Management
Statistics
Technology, Gender & Diversity

Masters Degrees (40 programs, CIP Code listed after program name)

Applied Chemistry (M.S.) 400501
Applied Mathematics (M.S.) 270301
Applied Physics[1] (M.S.) 400899
Applied Science* (M.S.) 409999
Applied Statistics (M.S.) 270501
Architectural Studies (M.S.) 040201
Architecture (M.Arch.) 040201
Biology[1] (M.S.) 260101
Biomedical Engineering (M.S.) 140501
Biomedical Informatics[2] (M.S.) 119999
Chemical Engineering (M.S.) 140701
Civil Engineering (M.S.) 140801
Computational Biology[1] (M.S.) 260699
Computer Engineering (M.S.) 140901
Computer Science (M.S.) 110101
Electrical Engineering (M.S.) 141001
Engineering Management (M.S.) 143001
Engineering Science (M.S.) 141301
Environmental Engr. (M.S.) 1401401
Environmental Policy Studies (M.S.) 440501
Environmental Science1 (M.S.) 030102
History[1] (M.A.) 450801
History[1] (M.A.T.) 450801
Industrial Engineering (M.S.) 141701
Information Systems (M.S.) 110401
Infrastructure Planning (M.I.P.) 040301
Interdisciplinary Studies* (M.S.) 309999
Internet Engineering (M.S.) 149999
Management (M.S.) 520201
Management of Technology (M.B.A) 520299
Manufacturing Systems Engr. (M.S.) 141701
Materials Science and Engineering (M.S.) 141801
Mechanical Engineering (M.S.) 141901
Nursing-Nursing Informatics Track[2] 511608
Occ. Safety & Health Engineering (M.S.) 149999
Occ. Safety & Industrial Hygiene (M.S.) 150701**
Professional & Technical Comm. (M.S.) 231101
Public Health[4] (M.P.H.) 512201
Telecommunications (M.S.) 141001
Transportation (M.S.) 140804

* No longer listed in catalog
** No longer accepts students unless they were promised entry into this degree from their certificate program.

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
- Transportation/Logistics
- Operations Management
- Electronic Commerce
- Financial Management
- Infrastructure Management

Doctoral Degrees (20 programs, CIP Code listed after program name)

Applied Physics[1] (Ph.D.) 400899
Biology[1] (Ph.D.) 260101
Biomedical Engineering [2] (Ph.D.) 140501
Biomedical Informatics[2] (Ph.D.) 119999
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 Science[1] (Ph.D.) 030102
Industrial Engineering (Ph.D.) 141701
Information Systems (Ph.D.) ***110401
Materials Science & Engineering (Ph.D.) 141801
Mathematical Sciences[1] (Ph.D.) 270101
Mechanical Engineering (Ph.D.) 141901
Transportation (Ph.D.) 140804
Urban Systems[4] (Ph.D.) 459999

*** The Computer and Information Science Ph.D. is being phased out and replaced by separate degrees – Computer Science Ph.D. and Information Systems Ph.D.

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

- Management *(Ph.D.)* 520201

NOTES:

- Joint degree program with Rutgers - The State University of New Jersey, Newark Campus
- Joint degree program with The University of Medicine and Dentistry of New Jersey
- Offered only at the Technology and Engineering Center (TEC) in Mount Laurel, New Jersey as a joint degree program with the University of Medicine and Dentistry of New Jersey
- 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 5 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./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./M.D. with St. George's University School of Medicine
- B.S./J.D. with Rutgers 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 4 colleges:

- Lincoln University in Pennsylvania
- Seton Hall University
- Stockton State College
- William Paterson University

II.I.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.I.2.a. NJIT eLearning Program

NJIT offers eight complete undergraduate and graduate degree programs, ten graduate certificates, and more than 160 individual college courses. Distance learning 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 70% and 84% respectively. That is, during the 1996-1997 academic year, there were 2,216 eLearning students who enrolled in 2,695 eLearning academic credit courses during Fall and Spring semesters and Summer sessions. NJIT's elearning NJIT has an inventory of nearly 200 courses produced in-house within twenty-three academic disciplines:

- Accounting
- Chemistry
- Chemical Engineering
- Computer Science
- Economics

- Electrical Engineering
- Engineering Management
- English
- Environmental Engineering
- Finance
- Humanities
- Industrial Engineering
- Industrial Management
- Information Systems
- 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.

Eight degree programs and ten graduate certificate programs are fully accessible through distance learning:

Undergraduate Degrees via eLearning

- Computer Science (B.S.) 134 credits
- Human Computer Interaction (B.S) 124 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 and Technical Communication (M.S.) 30 credits

Graduate Certificates via eLearning (each 12 credits)

- Computer Networking
- Enterprise Systems Modeling and Design
- Information Systems Design
- Information Systems Implementation
- Internet Applications Development
- Internet Systems Engineering

- Practice of Technical Communications
- Programming Environment Tools
- Project Management
- Telecommunications Networkin

Regarding our reputation in the now burgeoning field of eLearning, NJIT is 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.

II.I.2.b. Graduate Certificate Program

Structural shifts in the economy have caused many individuals in technological and managerial specialties to feel insecurities 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 current Graduate Certificates offered during FY02-03:

- Computer Networking
- eLearning Applications
- Enterprise System Modeling and Design
- Information Systems Design
- Information Systems Implementation
- Internet Applications Development
- Internet Systems Engineering
- Management of Technology
- Pharmaceutical Technology

- Polymer Engineering
- Practice of Technical Communications
- Programming Environment Tools
- Project Management
- Telecommunication Networking

The Graduate Certificate program had several hundred enrollments in Fall, Spring and Summer of AY 01-02 with the most popular certificates being those that are offered via distance learning (see section above).

II.I.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 AY03, NJIT will offer courses at 7 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.)

Bergen County

Bergen Community College in Paramus

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

Burlington County

NJIT @ Mt. Laurel

- 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 Ewing

- Transportation (M.S.)

Morris County

Drew University in Madison

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

Somerset County

Raritan Valley Community College in Somerville

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

II.I.2.d. Private Extension Sites

- AT&T in Middlesex County: Courses leading to MS in Computer Science.
- Fort Monmouth in Monmouth County: Courses leading to Executive MS in Electronic Engineering and MS in Electrical Engineering.
- National Starch and Chemical Co. 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.

II.I.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 01-02 NJIT's Customized Corporate Training program executed training contracts with 50 companies and trained 2865 employees.

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

The Professional Development and License Review Program offers non-credit short courses, certificates, and license reviews. In FY 01-02 over 145 non-credit courses enrolling over 4,000 students were conducted.

The non-credit WebMaster 2002 Program (launched in Fall 1996) escalated in course demand, particularly in the to-the-desktop version. Additional courses were added to the program, bringing the total number of courses offered from to twenty two, including:

- Web Author
- Web Developer
- Web Manager
- Java Programming
- Perl Programming
- Visual Basic Programming
- Photoshop
- Flash
- SMIL
- Advance Sun Java
- Dreamweaver
- Enterprise Java Beans
- ASP Programming
- Introduction to XML
- Cisco Networking
- Cisco Routing
- Windows 2000 Server Management
- A+: PC Repair

II.I.3. Affordability

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

Table II.I.3.a.

AY 2002-2003 Full-Time Undergraduate Student		
	In-State	Out-of-State
Tuition	$6,758	$11,710
Fees	$1,148	$1,142
Room (average)	$5,238	$5,238
Board (14 meal plan)	$2,332	$2,332
Total	$15,476	$20,422

AY 2002-2003 Full-Time Graduate Student		
	In-State	Out-of-State
Tuition	$8,866	$12,474
Fees	$1,134	$1,134
Room (average)	$5,238	$5,238
Board (14 meal plan)	$2,332	$2,332
Total	$17,570	$21,178

II.I.3.b. Financial Aid

Table II.I.3.b
Student Financial Aid Profile
(Excludes Graduate Fellowships Stipends)
Academic Year 2001-2002

	Total Awards	Amount Awarded	Percentage
Federal Grants			
PELL	1,355	$3,424,302	
SEOG	435	$299,861	
Total	1,790	$3,724,163	11%
State Grants and Scholarships			
TAG	1,377	$5,472,154	
EOF	399	$392,950	
DSS	108	$108,615	
OSRP	146	$551,250	
NJ Gear Up	3	$9,000	
Robert C. Byrd	1	$1,500	
Total	2,034	$6,535,469	20%
Scholarships			
NJIT - Institutional	1,601	$4,582,449	
NJIT - Other	157	$345,057	
Endowed	521	$729,156	
Alumni	185	$175,000	
Annual	194	$407,020	
Outside	180	$484,083	
Total	2,838	$6,722,765	20%
Work Study			
FCWS	356	$513,517	
IWS	985	$2,673,790	
Total	1,341	$3,187,307	10%
Loans			
Direct Subsidized	1,704	$6,180,369	
Direct Unsubsidized	189	$4,459,045	
Direct PLUS	141	$753,359	
Perkins	184	$294,388	
NJIT Loan	1	$3,062	
NJCLASS	93	$697,045	
Other	59	$498,066	
Total	2,371	$12,885,334	39%
GRAND TOTAL	8,003	$33,055,038	100%

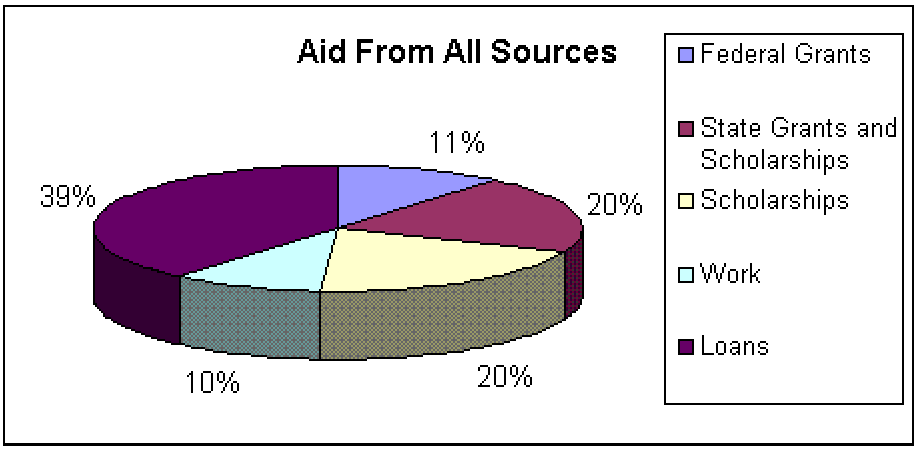


Figure II.I.3.b. Student Financial Aid from All Sources

II.I.3.c. Loans

The average loan debt at the time students receive their bachelors degree is currently less than $10,000.

II.J. Major Research and Public Service Activities

Strong research programs are critical to a university's intellectual vitality, attracting top-ranked senior researchers as well as the most promising junior faculty. Students have the opportunity to learn from professors who are at the forefront of their specialties and to participate in cutting-edge research. Research expertise forms the foundation for supporting state and municipal government requests for technical assistance in issues where technology impinges on public policy or as an aid to facilitating government operations. It also is a catalyst for new business initiation that may be created from the discovery of basic research or fueled by the availability of research staff and facilities to support an emergent business.

NJIT has built its research program around multi-disciplinary centers that encourage partnerships among various disciplines as well as with other educational institutions, private enterprise and government agencies. These centers concentrate resources on four distinct, cross-cutting thrusts:

- Bioengineering and Applied Life Sciences, including initiatives in computational biology and chemistry, biomaterials, molecular modeling, public health, biomedical engineering, and pharmaceutical engineering.
- Information Technology and Telecommunications, encompassing multimedia research, signal processing, wireless telecommunications, simulation and modeling, data mining, and software engineering.

- Material Science and Engineering, encompassing microelectronics, opto-electronics, micro-electromechanics, nanotechnology, microfluidics, particle processing, and macromolecular process technology.
- Sustainable Production Systems and Infrastructure, with programs ranging from hazardous substance management, airborne organics and membrane separation technologies to building sciences, industrial ecology, green manufacturing, and wastewater, power and transportation systems

Examples of current efforts in some of these areas follow.

II.J.1. Bioengineering and Applied Life Sciences

The Human Genome Project and other biomedical research initiatives have yielded huge amounts of new biological data. A major focus of such research is the identification of patterns in this biomolecular data, particularly in DNA and RNA. A research team at the Data and Knowledge Engineering Laboratory led by Jason Wang, associate professor of computer and information science, brings together computational molecular biology with the approach known as data mining.

Data mining is concerned with the theory and processes involved in the representation and extraction of "patterns" from large databases, using such techniques as graph theory, information theory, statistics, genetic algorithms, computer visualization, and vision. In the context of computational molecular biology, a pattern has a broad sense, which may refer to repeatedly occurring "words," or substrings, in a genomic sequence; blocks of conserved segments in a group of functionally related protein sequences; common motifs in RNA and protein secondary structures; or recurrent 3D structural motifs in the polymers. Such patterns have potential applications in the detection of genetic diseases, the classification of DNA sequences, the prediction of RNA and protein secondary and tertiary structures, the investigation of structure-function relationships, the understanding of protein evolution, and rational drug design.

Wang and his group have developed several specialized software tools designed for functions such as finding active motifs in a set of protein or DNA sequences, and classifying DNA sequences. Above, the group's TMATCH software is used to compare two suboptimal secondary structures of an mRNA sequence of the human rhinovirus, represented by molecular visualization. The program puts the structures into a tree format and identifies the minimum "edits" that would be required to make the two structures identical.

NJIT has been awarded a $120,000 Alfred P. Sloan Foundation grant to create a Master of Science degree in Computational Biology to help fill the need for biologists with mathematical and computer science skills. NJIT was among just

five schools awarded such grants out of dozens around the nation that submitted proposals.

The pharmaceutical industry, modern hospitals and medical suppliers have a substantial need for graduates trained in these disciplines. Students with training in the mathematical and computer sciences often lack the biological and health knowledge to recognize how their skills can be better utilized when combined with biological science study. A symposium on research areas in the new degree program was held in March 2000.

NJIT launched a new initiative in Pharmaceutical Engineering with a $250,000 grant from the Schering-Plough Foundation. The Master of Science Program in Pharmaceutical Engineering is an interdisciplinary program jointly developed by the Department of Chemical Engineering and the Department of Industrial and Manufacturing Engineering at NJIT. The primary objective of the program is to educate professionals and provide them with the skills required to work in the pharmaceutical field, with particular emphasis on the engineering aspects of drug manufacturing, pharmaceutical production, pharmaceutical development, and pharmaceutical operations.

The pharmaceutical/medical technology industry is the largest manufacturing industry in New Jersey. New Jersey is home to the headquarters of more global pharmaceutical and medical technology companies than any other state in the country, or any single country throughout the world. NJIT's M.S. program in Pharmaceutical Engineering provides the intellectual climate and the necessary tools needed to prepare students for positions and career advancement within the industry, based on the rigorous technological requirements of this highly regulated work environment.

The program is designed to provide opportunities for specialization in such areas as pharmaceutical processing and manufacturing, validation and regulatory issues in the pharmaceutical industry, pharmaceutical facility design, pharmaceutical packaging technology, reaction engineering for pharmaceutical production, pharmaceutical separation processes, pharmacokinetics and drug delivery, molecular modeling for drug discovery, pharmaceutical synthesis, fluid mixing in the pharmaceutical industry, instrumental analysis, and industrial quality control.

NJIT is a partner in the NJCS&T funded Center for Biomaterials (CBM) at Rutgers that operates among academic and industrial interests, and reaches out to the general public, governmental and private sectors as it builds partnerships for research and development of the next generation of biomaterials. Specifically, NJIT hosts the Medical Device Concept Laboratory, and its director is a research faculty member of the university. The mission of the CBM is fourfold:

- To establish teams of prominent researchers from both academia and industry who will attack cutting edge research challenges in biomaterials science
- To facilitate technology transfer and the creation of new jobs
- To strengthen the State's infrastructure in biomaterials science and medical device development
- To assist local industry by providing in-depth, interdisciplinary training for biomaterials scientists as part of the high-tech work force of the State

The Center for Applied Genomics includes as participants the Public Health Research Institute, NJIT, and UMDNJ New Jersey Medical School. Shared genomics facilities including an Affymetrix Gene Chip System will be established for widespread academic use. Efforts to improve bio-informatics support for genomics will also be undertaken.

In the program, Collaborative Telemedicine Environments, researchers at Rutgers University, the University of Medicine and Dentistry of New Jersey, and New Jersey Institute of Technology are working on the development of interactive multi-modal computer-based systems with medical diagnostic and treatment applications.

II.J.2. Information and Communications Systems

The Center for Wireless Networking and Internet Security, based at NJIT and in collaboration with Princeton University, will pursue research in developing future technologies to protect the Internet from cyber attacks. It will also protect and improve computer network management. The center will complement two others already at NJIT: the Center for Communications and Signal Processing, and the New Jersey Center for Telecommunications.

The center will also design computer systems that can predict, and thus prevent, a cyber attack, especially attacks on wireless multi-media networks. Researchers will also upgrade network management security. The center will also work to safeguard the Internet from consumer fraud. Researchers at the center will assure that the next generation of multimedia networking is well supported with security mechanisms for authorized use and data authenticity.

The New Jersey MEMS Initiative is a comprehensive research, development, commercialization and education program initiated through the NJ Commission on Science and Technology. This Initiative has (1) undertaken the assessment and improvement of NJ MEMS fabrication and characterization capabilities at the university level, helping to strengthen and make more accessible the state's university MEMS research infrastructure; (2) conducted specific, industry-driven pilot projects, moving them along the pathway from concept to commercialization; (3) gone beyond the practice of commercialization to explore

the theory of discontinuous innovation exemplified by the emerging MEMS field; and (4) developed an innovative educational program that attempts to couple training in leading-edge technological innovation with methodologies of entrepreneurship.

The lab now consists of 1200 square feet of class 10 environment and 200 square feet of class 1000 space, with state-of-the-art instrumentation to qualify a 1.5 micrometer CMOS fabrication process, while also enabling both bulk and sacrificial surface micromachining. These capabilities include wafer alignment and bonding (fusion and anodic), double-sided photolithography, low pressure and plasma-enhanced chemical vapor deposition, atmospheric diffusion, sputtering, wet and dry etching, as well as computer aided design, metrology and IR and optical inspection. For MEMS design and simulation, the MRC has recently installed MEMCAD. Also, an inductively coupled plasma (ICP) etching system, funded by NSF's Major Research Infrastructure program, has just been brought on-line together with an e-beam metallization system for the deposition of "dirty," low-stress metals. Ion implantation and mask fabrication are performed by external vendors. The cleanroom is staffed by five full-time scientists and engineers with extensive experience in semiconductor processes, equipment and fabrication.

Detailed information on the MEMS program is available at web address: http://www.njit.edu/mrc

The *New Jersey Center for Wireless Telecommunications* is a Center funded by the NJ Commission of Science and Technology R&D Excellence Program that is entering its second year of funding. There are four constituent institutions, NJIT (lead university), Princeton University, Rutgers University-Winlab, and Stevens Institute of Technology. There is a synergistic alliance among the four institutions in common research areas. The wireless communications group sponsored several national conferences in the last year, and is developing the core technologies required for next generation (3G) wireless devices that combine and extend the current capabilities of telephones, pagers, GPS devices, computers and palmtop devices. Detailed information is available at web address: http://www.njcmr.org/

Thanks to near-perfect climactic conditions and an unusual design, New Jersey Institute of Technology's Big Bear Solar Observatory provides new data and dramatic images that are expanding scientific knowledge about the sun. The California observatory, operated by NJIT since 1997, is considered the world's best site for studying the sun. Its location in the middle of Big Bear Lake reduces image distortion caused by heat rising off the ground. Plus, high elevation and usually cloudless skies enable scientists to observe daily changes in the sun.

Scientists' interest in our nearest star is not just academic. Solar activity directly affects many aspects of daily life on earth, including radio communication,

electric power systems, satellites, local and global climates, and depletion of the earth's ozone layer. Solar research will become increasingly significant as we on earth become more dependent on wireless communication. In addition, since the sun is the only star close enough to observe surface features, scientists can learn more about other stars by studying solar activity through the observatory's four specialized telescopes.

The Center for Solar Physics, which operates the observatory, has built on NJIT's expertise in optoelectronics and infrared imaging to develop new and enhanced devices that record high-resolution images of the sun and allow measurement of its magnetic fields. With funding from NASA, the National Science Foundation, the Office of Naval Research, the Air Force Office of Scientific Research, and other agencies, the observatory is providing new information about sunspots and solar eruptions, or coronal mass ejections and flares, that shower the earth with high-energy particles and can affect satellites and our communications and power systems.

These explosions occurring 150 million kilometers away are extremely significant to the scientific community. Big Bear provides a "space weather" forecasting service and posts solar activity reports on the Internet.

The Center for Solar Physics also operates a second California facility, the Owens Valley Radio Observatory, which complements Big Bear's research about the surface of the sun with data about what is occurring high in the sun's atmosphere. Radio antennae at Owens Valley map radiation coming from the sun to provide a greater level of understanding about solar activity. ¤

To learn more about solar research or view images of the sun recorded at Big Bear, visit its website at www.bbso.njit.edu.

New Jersey Information-Technology Opportunities for the Workforce, Education, and Research is a new program funded by the NJ Commission on Higher Education under a special Workforce Excellence grant program. The grant will strengthen the university's information technology programs to address the rapid developments in information technology now driving the economy in New Jersey and elsewhere. Increased opportunities for students to collaborate with industry and participate in research at the undergraduate and graduate levels will make NJIT a destination of choice for students preparing for careers in information technology. The grant funds will be used to connect industry and NJIT's Enterprise Development Center with classroom activity; disseminate NJIT information technology research and development to a global audience; provide an honors-quality experience to all undergraduates in IT programs; and enhance an already robust, nationally recognized distance education program in IT.

The Center for Embedded System-on-a-chip Design at Princeton is a collaborative effort between Princeton University, the New Jersey Institute of Technology and

Rutgers University. Systems are now being built on a single semiconductor chip using multiple embedded functional blocks called cores. Embedded systems are products that are implemented using programmable instruction-set processors, but which are not computers. The program will work to solve various important problems to maximize the potential of systems-on-a-chip through analysis, synthesis, verification, electrical modeling, testing, and industrial interaction and technology transfer.

Software Engineering for Distributed Computing and Networks is a NJ Commission of Science and Technology program at Stevens that is a collaborative effort between the Advanced Telecommunications Institute of Stevens Institute of Technology, Rutgers University, the New Jersey Institute of Technology and Lucent Technologies. Research goals entail advances in the state-of-the-art of software at the specification, design, and verification level; the system infrastructure level; and the application infrastructure level.

NJ Center for Pervasive Computing is a NJ Commission of Science and Technology program at Princeton. Pervasive information systems will allow people to work with information anywhere, at any time. A new generation of information appliances are expected to transform both the work place and the home in the next decade. The principal investigator Wayne Wolf of Princeton University is collaborating with NJIT, Rutgers University, NEC, IBM, T. J. Watson Research Center, and Lucent Technologies.

II.J.3. Materials Science and Engineering

During FY2002, NJIT launched a major statewide initiative in partnership with the other doctoral research universities in New Jersey and Lucent's Bell Laboratories to create the New Jersey Nanotechnology Consortium. The Consortium is a public-private partnership that will draw on the fully dedicated resources of the Lucent Silicon Fabrication Research Lab's (SFRL) nano-fabrication capabilities, e-beam writer labs along with the considerable set of characterization and fabrication equipment already resident at the partner universities. Nanotechnology has been recognized by many academic, industrial and governmental panels as the technology that will form the basis for next generation advances in materials, electronics, photonics, medicine, and energy. This Center will focus on the aspects nanotechnology that pertain to devices and systems and will produce the basis for commercialization of nanotechnologies in a few critical areas, integrated nanophotonics, molecular electronics and bio-nano-MEMS.

The Center will establish an integrated education program to be adapted by each partner university that couples well conceived, industry-driven research projects with a coherent program of courses and activities from several disciplines. This integrated program draws together disparate academic courses from the

departments of electrical, chemical and mechanical engineering, materials science, physics, humanities and social sciences, and the school of management to create a comprehensive program with technological, management and social aspects. The aim is to give graduates of the program a broad range of abilities through hands-on experience of market research, conceptualization of new devices and systems, design, simulation, optimization, fabrication, packaging, commercialization and project management. In addition, the program emphasizes industry interactions. This will reduce training time once graduates are placed in industry, and improve communication within and between the various corporate divisions. Such an approach prepares graduates for the challenges they will meet in their careers, giving them a broad understanding of various aspects of manufacturing, from technological innovation and development to product commercialization.

The NJ Commission on Science and Technology has provided seed funding of $500K, the Governor's FY2003 budget request included $2M in support and Cong. Rodney Frelinghuysen has added a $2M federal earmark to underwrite the first year of operation.

A $1M Federal appropriation in Fiscal Year 2002 has launched a new create a partnership between New Jersey Institute of Technology (NJIT) and Picatinny Arsenal to assist the U.S. Army Materiel Command (AMC) in developing the next generation of "smart" coatings for Army materiel through the use of nano-technology. As articulated by Vision 2010, the Army is transforming itself into an information-age, networked organization that leverages its intellectual capital to better train and equip a strategic land combat force. In order to meet future challenges, however, nanotechnology will have to play an increasingly important role in its operations. Smart coatings are just one example of how this powerful new technology can help the Army safeguard our national interests.

The coatings applied to weapon systems today are "dumb" in the sense that once applied they perform their function without the ability to self-correct because of changing circumstances or without the ability to tell the user of potential anomalies such as corrosion or adhesion problems. Their application and removal is also labor intensive and potentially hazardous to the people working with them. Most of these coatings need to be "touched-up" by hand and hide substrate damage from the user of the product. As a result, the Army estimates that the total cost for DOD corrosion related problems is $10 billion per year, $2 billion of which is related to painting/depainting operations.

Smart coatings serve multi-varied purposes for the products. For example, they may be self-healing or be able to change color and patterns to help camouflage Army material or permit easy removal when given the proper "orders". Smart coatings can, in addition, alert logistics staff when tanks or weaponry require more extensive repair so the materiel can be removed from the field and replaced. They can also be used to protect the items from the harsh environments endured

because of mission requirements, while also preserving them from the normal ravages of corrosion.

This initiative will support new generations of innovative materials and machines that exploit the organization of matter at nanoscale. These new high performance materials will be self-organizing and self-managing, yet affordable and more environmentally benign. They may sense and respond to changes in surroundings, may be ten times stronger than steel, may be ten times lighter than paper, may be paramagnetic or superconducting, optically transparent, and may have a higher melting point. Compared to conventional materials, nanostructured materials yield extraordinary differences in rates and control of chemical reactions, electrical conductivity, magnetic properties, thermal conductivity, strength, and fire safety.

Research activities of the *Particle Technology Group* have been awarded a new,five year, $2.3M grant from the NJCST R&D Excellence Program expanded to include nano-particle processing, surface coatings and environmentally conscious technologies. Particle Technology is concerned with the characterization, production, modification, flow, handling and utilization of granular solids or powders, both dry and in sluries. This technology is vital to both material science and manufacturing, as particles are found in most products either as raw materials or as the final product. The mission of the Particle Technologies Center is threefold:

- To conduct basic experimental research and mathematical modeling at the microlevel to gain an understanding of the macroscopic behavior of bulk solids in dry and slurry form;
- To educate undergraduate and graduate students and provide training to other professionals in the engineering practice of particle technology;
- To develop cost effective flow, handling, and processing technology of particulate systems relevant to existing and emerging industries, and transfer this technology to industrial companies working in partnership with the center.

The Commission program, New Jersey Program for Engineered Particulates, will work to develop predictable, environmentally conscious manufacturing processes and profitable applications for value-added powder materials having tailored surface or bulk properties (engineered particulates). The program will combine four different interdisciplinary areas of research: mechanical processing, supercritical fluid processing, hydrothermal processing, and microarc processing to produce several types of engineered particles. The principal investigator, Rajesh Dave from NJIT, will be collaborating with additional researchers from NJIT, Rutgers, Princeton, US Army - Tank Automotive and Armaments Command - Armament Research Development and Engineering Center, and companies such as Hosakowa Micron, Lucent Technologies, Dellsys Pharmaceutical Corporation, DuPont, and Union Carbide.

Also newly initiated is the New Jersey Center for Micro-Flow Control. Micro-Flow Control involves the beneficial manipulation of fluid flow fields by exploiting the natural response of the flow to disturbances triggered by small scale actuators. The program will work to develop novel, enabling technologies leading to new classes of products through radical flow performance gains via miniaturized actuation. Dr. Nadine Aubry, from the New Jersey Institute of Technology, the principal investigator, will be collaborating with researchers from NJIT, Princeton, and the City University of New York and companies such as Kleissler Company, U.S. Dermatalogics, Inc., Vision Research, and Honeywell.

The W.M. Keck Foundation has awarded NJIT $500,000 to establish a world-class laboratory to develop microchip technology for medical screening, which could lead to applications ranging from rapid identification of cancerous cells in the bloodstream to battlefield analysis of biological warfare agents.

The W.M. Keck Foundation Laboratory for Electro-Hydrodynamics of Suspensions at NJIT will develop miniaturized analytical systems - laboratories on a microchip - that use electric fields to manipulate and separate nanoscale-sized particles suspended in liquids. A nanometer is a billionth of a meter or a thousandth of a micron. A human hair is on average about 70,000 nanometers, 70 microns or 0.0028 inches in diameter.

II.J.4. Sustainable Infrastructure and Production Systems

The New Jersey Sustainable State Institute (NJSSI) was been established by the State of New Jersey in 2001 and will be operated by a partnership of New Jersey Institute of Technology, Rutgers University, and New Jersey Future, to help New Jersey achieve long-term economic, social and environmental prosperity, otherwise known as sustainable development.

A "Sustainable State" is one that:

- Meets the needs of the present society without compromising the ability of future generations to meet their own needs;
- Has an economy, environment and society that are healthy, just and efficient;
- Protects State resources for future generations to use and enjoy.

The NJSSI will provide a home for the New Jersey Sustainable State Goals, Indicators, and (once they are created) Benchmarks. The NJSSI will partner with government, business and non-profit organizations to convene an open, representative and high-profile public process to produce a set of goals, indicators and targets that describe and track progress toward a "Sustainable State." Its mission will be achieved by:

- Conducting research and public fact-finding;
- Providing the public with credible and understandable information relating to sustainable development;
- Working to establish and strengthen institutional mechanisms in the public and private sectors to ensure achievement of the goals and benchmarks.

NJIT has continued and expanded the *Sustainable Green Manufacturing Initiative* research and development partnership with the Industrial Ecology Center at Picatinny Arsenal and the National Defense Center for Environmental Excellence. Agreement has been reached to add the Physical Science Laboratory at New Mexico State University to the program. The initiative, with total second-year funding of $6 million, continues to broaden the technical base available to the Army to design, manufacture, use, and demilitarize defense-related products. NJIT research is focused on technical contributions toward the development of environmentally appropriate technology for ammunition, gun barrels, corrosion inhibitors, and modeling and simulation of lifecycle implications of military products and activities.

Multi-lifecycle engineering research is a comprehensive, systems approach to growing a strong industrial economy while maintaining a clean, healthy environment - not only today, but also for tomorrow. The *Multi-lifecycle Research Center*, established in 1996, is an industry-driven initiative involving broad interdisciplinary research and educational programs that cut across all the traditional engineering areas as well as architecture, economics, policy studies, management and computer science.

A major initiative at the Center is the Multi-lifecycle Engineering and Manufacturing Research Program, funded through the NJCST R&D Excellence Program. This program, a collaborative effort between NJIT, Rutgers University, Princeton University and Polymer Processing Institute, concentrates on a set of three-market driven applications that cut across industry sectors and span a range of products and materials from large-volume, low-valued commodity plastics to low-volume, high-valued biomedical and specialized electronic devices.

The culmination of this research partnership is an increase in productivity and economic activity. More than 36 companies are actively engaged in the research activities of the center through direct financial support and/or technical collaborative relations. Detailed information is available at the web address: http://www.njit.edu/merc.

Research at NJIT's Waterjet Technology Laboratory is developing environmentally benign processes for the pharmaceutical industry, the electronics industry, and other manufacturing applications. Ernest Geskin, professor of mechanical engineering and director of the laboratory, has developed techniques

for using high-velocity streams of water, robotically directed, to perform precision machining and cleaning procedures.

One mechanism applies waterjet technology for the cleaning operations used in the electronics industry, replacing chlorofluorocarbons (CFC) for the precision cleaning required to ensure operation of sensitive electronic devices. Other applications have included a chemical-free method for precision cleaning of metals and ceramics, as well as a cleaning system for pharmaceutical reactors.

In his most recent study, funded by a three-year grant from the National Science Foundation, Geskin is developing a "green" water-based machining technology. Manufactured items are "finished" by removing extraneous material with ultra high-speed water slugs, delivered through a nozzle integrated in a robotic workcell. The process requires only minimal water consumption and generates little debris and almost no emissions.

Phytoremediation of Dredge Spoils Using Living Plants and Associated Microorganisms is a program that is a joint effort of the Center for Agricultural Molecular Biology at Rutgers University, and the Hazardous Substance Management Research Center at the New Jersey Institute of Technology, develops, optimizes and evaluates plant and microbial decontamination technologies for the treatment of polluted dredge materials from harbors in New Jersey and New York, in an effort to provide an effective and low-cost long-term alternative for the handling of these contaminated materials.

Stevens Institute of Technology, New Jersey Institute of Technology and Rutgers University joined to create a research consortium known as the Sediment and Dredged Materials Technology Institute (SDMTI) to: conduct studies to facilitate development and implementation of sediment and dredged material technologies and management strategies; provide technical support and advice; conduct public outreach and education programs; foster collaborations with industry, government, the private sector and public interest groups for the development of cooperative solutions to dredging issues; and to serve as a clearing-house of information concerning dredged sediment and materials technologies and management.

The three institutions joined a Multi-State Alliance with Rensselaer Polytechnic Institute and Brookhaven National Laboratory to assist the USEPA and Corps of Engineers in demonstrating and developing a treatment train for processing contaminated sediments dredged from the New York/New Jersey Harbor. Removal and decontamination of these sediments is essential to keep the shipping channels and ports open.

In addition, YCEES worked with the Port Authority to select a Demonstration Test Site in Port Newark for the evaluation of technologies to treat these contaminated sediments. These sediments are contaminated with a range of

organic and inorganic contaminants. Working jointly with Brookhaven National Laboratory and the Multi-State Alliance of Universities, NJIT was responsible for managing the technical activities of vendors at this site.

The New Jersey Department of Transportation has designated New Jersey Institute of Technology as the International Intermodal Transportation Center (IITC). The Center supports the development and maintenance of a safe, efficient, integrated regional multi-modal transportation system serving the communities and residents of northern New Jersey and beyond. The IITC also addresses broader issues focusing on freight transportation while being mindful of the related issues of economic development, brownfields, and passenger transportation. The Center works in close coordination with the NJ Department of Transportation, state, bi-state and federal agencies as well as private sector transportation stakeholders. The Center is funded by a $2 million grant from the U.S. Department of Transportation Federal Highway Administration (FHWA) under the High Priority Projects Program of the Transportation Equity Act for the 21st Century (TEA-21).

High on the list of priorities will be support for Portway - a critical State program to strengthen and improve the immediate access corridor between the Newark-Elizabeth Seaport/Airport complex, nearby rail and trucking warehousing terminals, and the interstate and international surface distribution network. IITC also will address broader issues such as freight transportation, brownfields and passenger transportation. In addition, the Center will identify public and private sector investments made in the corridor communities to support mobility and advance intermodal related economic development.
http://transportation.njit.edu/iitc/Index_file

The National Center for Transportation and Industrial Productivity (NCTIP) is one of four national university centers designated under the landmark Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, which the U.S. Congress reauthorized, in 1998, as the Transportation Efficiency Act (TEA-21). NCTIP research efforts focus on:

- Freight Movement Efficiency - the movement of goods over complex networks of shippers, terminal facilities, carriers, distributors and receivers.
- Passenger Movement Efficiency - focusing on operations planning solutions for transit properties designed to stimulate productivity growth through improvements such as unimpeded access to jobs and services.
- Facility, Institutional and Regulatory Efficiency - the physical and regulatory environments in which vehicles function.

NCTIP endeavors to share information with potential users in forms that can be directly implemented, utilized or applied. In addition to the dissemination of research results and conference presentations to the public, NCTIP sponsors a seminars series on topics of current interest to students and other transportation

professionals, convenes periodic conferences on significant transportation issues, publishes a semiannual newsletter and co-publishes *InTransition*, a relatively new publication issued semiannually by NCTIP and the North Jersey Transportation Planning Authority.

NJIT worked in partnership with the Center for Urban Policy Research of Rutgers University, and the North Jersey Transportation Planning Authority, the 4th largest metropolitan planning organization in the nation, in the development of the Transportation, Economic and Land Use System (TELUS). With the passage by Congress in 1999 of the Transportation Equity Act for the 21st Century, $1 million per annum over a six-year period was included for the further development and nationwide deployment of TELUS. The Principal Investigator is Dr. Louis J. Pignataro. Detailed information is available at the web address: http://kimon.njit.edu/TELUS/

The NJCST R&D Excellence Program has funded the *New Jersey Transportation Information and Decision Engineering Center (TIDE)*. The Center is a collaborative effort involving New Jersey Institute of Technology (lead university), Princeton University and Rutgers University. TIDE will collaborate with private industries in New Jersey for the commercialization of research products and establish a viable traveler information industry in New Jersey. In addition, TIDE will establish working relationships with public agencies for the enhancement of their traveler information services. The Center's research activities will involve both graduate and undergraduate students in interdisciplinary departments at all three universities. Detailed information is available at the web address: http://www.kimon.njit.edu/TIDE/

NJIT has recently joined the Federal Aviation Administration's Airworthiness Assurance Center of Excellence. Established in 1997, the Airworthiness Assurance Center of Excellence (AACE), is making a long-term commitment to an innovative partnership of the leading talent in government, academia, and industry. Dedicated to the entire range of aircraft safety research and the application of that research to solving current and predicted problems, the AACE is the focal point for the FAA's research and development (R&D) efforts to enhance aircraft safety. NJIT involvement ranges from issues of digital communications technology to novel, nano-coatings for protection form ice build-up on aircraft exteriors.

II.J.5. New Jersey Initiatives

NJIT has a long tradition of providing policy analysis and technical assistance to public agencies. In recent years, the legislature and the Governor have commissioned the university to conduct a series of comprehensive studies on issues of importance to the State. The findings and reports from these studies have provided sound engineering and science-based analysis and advice that

contributes to public dialogue and significantly influences state policy and decision making. The following highlights some of the initiatives.

At the recommendation of the Speaker, the New Jersey Assembly created a special appropriation for NJIT to make recommendations on the technical feasibility of creating "smart guns" – weapons that would be in a normally locked position and release only in the hands of an authorized users (e.g. the owner). NJIT completed a comprehensive technology survey and has organizing various constituent interest groups to develop quantitative performance criteria for a "smart gun". The findings were presented to the New Jersey Legislature's Law & Public Safety Committee in April 2001 and will form the basis of future legislation regarding gun safety. NJIT also developed a unique biometric user-authentication system that is now being applied to prototype weapons for subsequent commercialization. A consortium that includes the major domestic manufacturers of handguns has been formed, and is working with NJIT to secure federal R&D support to advance the technology. NJIT is working with the US Army research centers at Picatinny Arsenal in Rockaway, NJ and Fort Monmouth, NJ as well as Offices of the Speaker of the Assembly and President of the NJ Senate, the NJ Attorney General's Office, and the Governor's Office. The project has staged quarterly public briefings as well as special session for NJ Executive and legislative leaders, and maintains an active web site for discussion and dissemination at: http://www.njit/edu/pwt.

The Governor's office authorized special funding to allow NJIT to work with Monroe Township to evaluate alternative energy schemes to reduce the residents heavy dependency on electric power. The study had been requested by Assemblyman Paul Kramer, District 14, and the Governor requested NJIT to do the study. The NJIT team evaluated several alternative energy production schemes to arrive at per capita conversion costs, and quantified additional energy conservations strategies for the residents of the community.

The National Center for Transportation and Industrial Productivity (NCTIP) completed the second iteration of its study "Mobility and the Costs of Congestion in New Jersey" that was funded by the U.S. Department of Transportation (USDOT) and a grant from the Foundation of the New Jersey Alliance for Action. "NJIT's analysis builds on a 1996 study by the Texas Transportation Institute which made state-to-state comparisons using national highway data," said Lazar Spasovic, NCTIP director. "By using more detailed data on traffic volume and roadway characteristics in New Jersey and an enhanced methodology, we were able to determine the cost of congestion on the roadway network throughout the state."

The NCTIP research team analyzed data from the N.J. Department of Transportation (NJDOT) to measure and compare congestion in terms of traffic volumes, travel speeds, trip lengths, fuel consumption and truck flows. The study assesses a dollar value for delays experienced by drivers under current conditions,

on a statewide and county level, as well as corridor and project level. New Jersey drivers spend about 34 hours — nearly one working week — in traffic delays each year . The study also projects the future cost of congestion in the state for the years 2005 and 2015.

II.J.6. Electronic Network Solutions for Rising Healthcare Costs

This comprehensive study completed by NJIT in cooperation with Thomas Edison State College found that the state's healthcare industry could save $760 million annually in the administrative costs of processing claims and medical information by adopting a set of standardized electronic forms and using electronic data interchange (EDI) technology. The 18-month study focused on identifying state-of-the-art information technologies, which when implemented, should result in major administrative cost saving for the state's $30 billion healthcare industry. The State has adopted several recommendations of the report. The Legislature is providing ongoing appropriations to the New Jersey Department of Health and Senior Services to continue to implement the report's major recommendations. NJIT and Thomas Edison State College to continue assisting the State in these efforts.

NJIT will receive more than a quarter million dollars to help fight bio-terrorism under a major grant awarded to New Jersey by the federal Center for Disease Control and Prevention (CDC). The NJIT award was issued by the N.J. Department of Health and Senior Services as part of a $1 million, one-year grant, which could be renewed each year for up to five years. The money will be used to strengthen the nation's overall public health system to better respond to man-made threats, such as the deliberate release of chemicals or disease-causing organisms, as well as newly emerging infectious diseases, such as antibiotic-resistant organisms or the next influenza pandemic.

Much of the grant will be used to create an Internet-based Health Alert Network. NJIT will develop the computer system that will connect the state health department and 115 local health departments in an around-the-clock system that can function dependably in an emergency. Local health departments, in turn, will be linked to community health and emergency response agencies through a rapid telefax system that can be used to communicate information and coordinate an emergency response. Further information on the grant can be obtained at the Department of Health and Senior Services web site:
http://www.state.nj.us/health/news/p90915a.htm

II.J.7. 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 (NJIIS) and the New Jersey Local Information Network and Communications System (NJLINCS) for the New Jersey Department of Health and Senior Services (NJDHSS).

NJIIS 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 NJIIS.

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.J.8. NJ Energy Research Consortium

Recently, the New Jersey Board of Public Utilities (NJ BPU) convened an Electric and Natural Gas Industry Task Force/Working Group to explore new distribution and transmission system technologies, which in the future would improve the reliability, safety, and power quality of those systems to end users. Given the establishment of full retail competition in the state for electric–and natural gas customers, respectively, the Task Force is to recommend to the NJ BPU future standards and measures to ensure high-quality performance of those distribution systems over time relating to reliability and safety, as well as to outages and restoration of power.

A Consortium for Energy Research and Development has been created through a synergy involving New Jersey's private sector and research universities to advance the safety, reliability and productivity of the state's energy industries, and assist in the development of new products and services, through a consortial program of pre-competitive research and technology development. For example, fuel cells and microturbines are beginning to enter the market, but the service infrastructure must be built and interconnect standards and local codes must be developed to support these technologies. NJIT will host the consortium and lead the formulation of R&D teams.

II.J.9. Major Research and Public Service Centers at NJIT

Bioengineering & Applied Life Sciences
- Center for Applied Genomics
- Center for Computational Biology and Bioengineering
- Collaborative Telemedicine Environments
- International Center for Public Health
- Human Movement Dynamics Laboratory
- New Jersey Center for Biomaterials
- Personalized Weapons Technology Project

Information Technology
- Center for Applied Mathematics and Statistics
- Center for Communications and Signal Processing Research
- Center for Embedded System-On-a-Chip Design
- Center for Next Generation Video
- Computerized Conferencing and Communications Center
- Data and Knowledge Engineering Laboratory
- Electronic Information Exchange System (EIES)
- Hypermedia Information Systems Research
- Microelectronics Research Center
- New Jersey Center for Internet Security
- New Jersey MEMS Initiative
- New Jersey Center for Multimedia Research
- New Jersey Center for Pervasive Computing
- New Jersey Center for Wireless Telecommunications
- Software Engineering for Distributed Computing and Networking

Sustainable Systems & Infrastructure
- Architecture and Building Sciences
  - Center for Architecture and Building Science Research
  - Concrete Testing Laboratory
  - Imaging Laboratory (CAD in Architecture)
  - Structural Testing Laboratory
- Environmental Science and Engineering
  - Center for Environmental Engineering and Science
  - Center for Airborne Organics
  - Hazardous Substance Management Research Center
  - Northeast Hazardous Substance Research Center Sustainable
  - Green Manufacturing Initiative
  - Geoenvironmental Engineering Laboratory
  - Hydraulics and Hydrogeology Laboratory
  - Laboratory for Process and Field Analytical Chemistry
  - Multi-lifecycle Engineering Research Center
  - Remote Sensing/Geographic Information Systems Laboratory

Solar Physics
- Center for Solar Research
- Big Bear Solar Observatory
- Owens Valley Solar Array

Transportation
- Center of Excellence for Airworthiness Assurance
- Global Positioning System Base Station
- International Intermodal Transportation Center
- National Center for Transportation and Industrial Productivity
- New Jersey Transportation Information and Decision Engineering Center
- North Jersey Transportation Planning Authority
- Transportation, Economic and Land Use

System Materials Science and Manufacturing
- Bearings and Bearing Lubrications Laboratory
- Center for Membrane Technologies
- Center for Ultrafast Laser Applications
- Dynamic Systems and Control Laboratory
- Electronic Imaging Center (Optoelectronics and Solid State Circuits)
- Ion Beam and Thin Film Research Laboratory
- Keck Laboratory for Electro-Hydrodynamics of Suspensions
- New Jersey Center for Engineered Particulates
- New Jersey Center for Microflow Control
- New Jersey Center for Optoelectronics
- Non-linear Nanostructures Laboratory
- Optical Science and Engineering
- Polymer Processing Institute
- Smart Coatings Research Initiaitve
- Waterjet Technology Lab

II.J.10. Sponsored Chairs

NJIT has four foundation chairs and six endowed chairs.

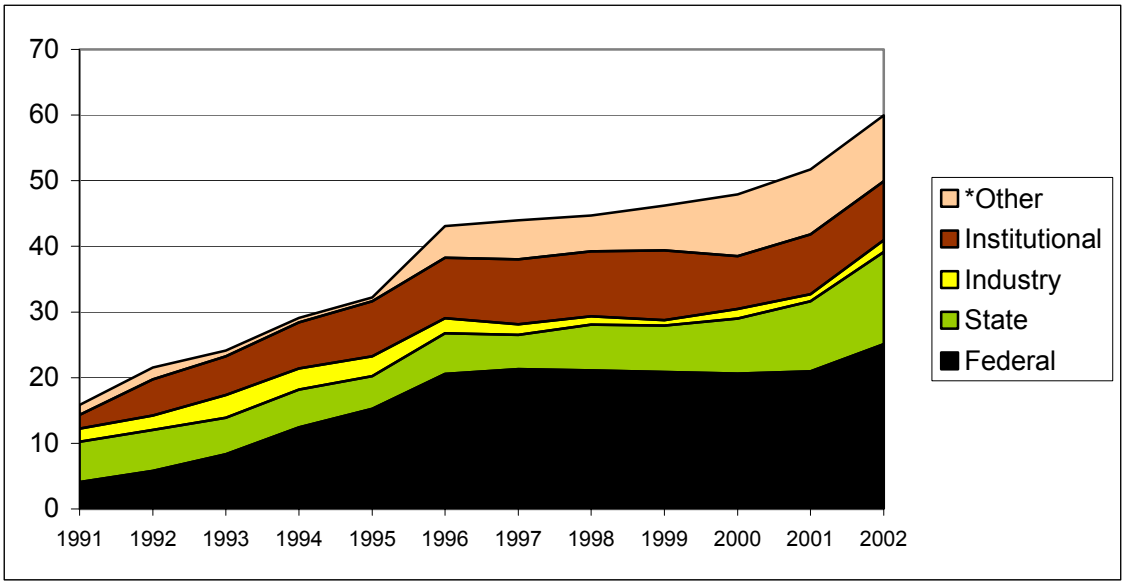
The Foundation Chairs are:
- Applied Mathematics
- Bio-Mechanical Engineering
- Management of Technology
- Membrane Separations

The Endowed Chairs are:
- Becton Dickinson Research Professorship in Public Health
- Leir Chair in International Trade
- Panasonic Chair in Multi-lifecycle Engineering

- Jacobus Chair
- Ada C. Fritts Professorship
- Hurlbert Professorship in Management Information Systems

II.J.11. NJIT Externally Funded Research Expenditures

NJIT Externally Funded Research Expenditures since 1990 are as under:



other =combined sources of funding

* funded by multiple sources.

II.J.12. 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)

II.J.13. 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 Micro-organisms (Rutgers, NJIT)
- Software Engineering for Distributed Computing and Networking (Stevens, Rutgers, NJIT)

II.J.14. 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 August, 2002 NJIT has granted 35,461 bachelor's degrees, 19,068 masters degrees, and 632 doctoral degrees
- Continuing professional education programs
- 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, courses offered in either a two semester or three semester format)

As an educational institution, NJIT has always tried to develop in its students the knowledge and skills they need. As workforce needs change, so does NJIT. In response to changing workforce needs, for example, NJIT has introduced more than 30 new degree programs over the last two decades. These programs include biomedical engineering, biological computational biology, human computer interaction, environmental engineering, environmental science, professional and technical communication, and nursing. In 2001 NJIT opened the College of Computing Sciences.

NJIT has also been a leader in developing a technologically trained workforce. Since 1985, for example, NJIT has been providing personal computers to all first-time full-time freshmen. These computers are "free" except for a small annual maintenance fee. This clearly makes personal computers affordable to many who would not otherwise be able to own one. This program combined with NJIT's extensive computing facilities helps to reduce greatly the barrier of financial resources to obtaining the computer literacy needed in the competitive global economy. ACCESS/NJIT allows more students to pursue higher education by reducing the barriers of time and geography. The University Research Experience (URE), University Learning Center (ULC), and McNair grant program provide 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. Project CAP, a Career Advancement Program for women and minorities, was established in 1987.

NJIT's expertise in workforce development has been widely recognized in many ways. For example, in 1995, NJIT undertook the New Jersey Manufacturing Extension Partnership (NJMEP): 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. Funded at a level of $4 million per year, half federal and half state support, 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 approximately 25 MEP field engineers is responsible for assisting small- and medium-sized businesses 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) has also played a substantial role workforce development. CPE provides in-house corporate customized training programs for NJ-based companies, agencies and government. As part of this activity, and where appropriate, NJIT staff works with the NJ-based organizations to help them to take advantage of training grants from the NJ Department of Labor. For example, in 00-01, NJIT conducted in-house training of 6,753 NJ employees at their places of work. CPE offers professionals in the general population the opportunity to upgrade their computing skills through short courses and non-credit certificate programs. For example, nearly 2,000 professionals enrolled in one or more of the various short courses that comprise the NJIT WebMaster Certificate Program and studied in classrooms across the state or online.

During the past two years NJIT has received substantial state grants to fund additional technology oriented workforce development projects. The 2000 NJ I-TOWER project's main goal is to create a technologically sophisticated workforce in New Jersey. The project builds connections between NJ industry, the NJIT Enterprise Development Center (EDC), and graduate and undergraduate classroom activity. It also works to disseminate IT research and promote education through NJIT's nationally recognized continuing education program. The 2001 Workforce Development Grant, Pre-Engineering Instructional and Outreach Program, is training teachers, grades 6-12 to do pre-engineering education and develop pre-college programs promoting technology education, particularly for minority and urban students. At the end of three years, 100 NJ schools will be trained.

II.J.15. 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 and II: 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;
- Technical Extension Center in Information Science: technical assistance in computer technology for small New Jersey businesses;
- 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.J.16. 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 1000 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.J.17. Sports/Sports Events

In its fifth year as a member of NCAA Division II, the NJIT Highlanders improved their winning percentage by five percent over 2000-01, and had six student-athletes named all-conference. The women's programs won 19 percent

more events. NJIT's membership in the Central Atlantic Collegiate Conference, which includes such local schools as Felician, Caldwell, and Bloomfield, has significantly cut down on travel time and costs while affording NJIT the opportunity to foster local rivalries. To further increase our visibility in New Jersey, the baseball squad played selected home games at Riverfront Stadium in downtown Newark for the third consecutive year.

Fifty-seven students received athletic scholarships in AY 2001-2002 used to supplement the unmet tuition need of student athletes identified by the athletic administration. The total amount awarded in AY 2001-02 was more than $350,000. These students are all highly qualified student athletes whose academic and athletic skills will benefit the university as NJIT moves into the highly competitive and visible ranks of Division II athletics. During 2001-2002, NJIT honored 91 scholar-athletes who participated in varsity sports and earned a GPA of at least 3.0 for either Spring 2001 or Fall 2001. NJIT also had had six all-conference athletes and six Arthur Ashe Sports Scholars. Currently the university offers 12 intercollegiate varsity sports: baseball, M/W basketball, Coed fencing, M/W soccer, M/W swimming, M/W tennis, and M/W volleyball.

II.J.18. 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 AYOl. 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.J.19. 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. A 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.K. Facilities and Major Capital Projects/Improvements

In the spring of 2001, the NJIT campus consisted of 2 million gross square feet of built environment on a 45 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. NJIT through its resources and a special appropriation has also acquired some additional land and has other parcels under contract. In addition, 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, now nearing completion, is a 170,000 square foot laboratory building that will house certain departments of the nearby University of Medicine and Dentistry of New Jersey and the Public Health Research Institute which is relocating from New York City.

II.K.1. The Next Phase of the Building Plan

The Board of Trustees has recently approved a major facilities and financing plan. The overall plan totals $145.2 million. The major projects are summarized in Table 19 below. Adjustments may be forthcoming.

Table II.K.1
Summary of the Building Plan Projects and Budget Allocations

Project Title	Budget in $000
Parking Facility Addition	6,000
Residence Hall	17,500
Campus Center	45,000
Cullimore Hall Phases I and II (multiple purpose building)	37,000
Eberhardt Hall	4,000
Major maintenance Projects	13,000
Addition to Electrical and Computer Engr.	4,000
Enterprise Development Center III	15,200
Total	145,200

II.K.2. Current Construction

Based on the priorities agreed on as the Plan was being developed, certain construction has begun or been completed. Already built is a two-story addition to the parking structure. Utilizing connections that had been built as part of the original project, 450 spaces were added during summer 2000. Also completed for the fall of 2001 was a 300 bed residence facility which will share an entrance with an existing hall. The facility will also have a small convenience store accessible directly from the outside of the building to service the broader campus community. This brings the campus residential capacity to 1,500.

The new Campus Center is under construction. This is an involved project which required the demolition of the one-story Alumni Center which was attached to the Campus Center to provide a building site for a four-story addition. Once completed the addition will serve as "The Center" while the existing Center undergoes major renovations and further additions. The Alumni office has been temporarily relocated and will be moved back to a renovated Eberhardt Hall.

Cullimore Hall Phases I ands II include the construction of a multi-level structure which will include two levels of parking beneath the building. Certain offices will be moved from Cullimore to provide expansion for departments in the College of Science and Liberal Arts. While the original plans called for a direct link between Cullimore I and II, the addition will have greater floor-to-floor heights needed to accommodate current systems. Phase II of Cullimore Hall will provide space for the recently created Department of Biomedical Engineering. It will also provide space for the relocation of the Departments of Admissions and Continuing Professional Education.

The space vacated by the latter two functions will provide for the planned expansion space for the Library and the newly authorized College of Computing Sciences.

Eberhardt Hall is on the national register of historic buildings. The planned renovations will make it more suitable for the Alumni Association as both a place for its administrative functions and, more importantly, a place for a variety of gatherings. The space will also provide additional meeting and seminar space for the university. Upgrades to the bathrooms and an elevator will make almost all of the building barrier free.

The Department of Electrical and Computer Engineering project will include a two-story addition to its existing facility. There were provisions made for this expansion at the time the building was originally designed.

II.K.3. 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.K.4. Financing

The financing for the foregoing projects comes 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 can 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 residence hall rentals and tenant income from EDCIII. The university issued general obligation bonds through the NJ Educational Facilities Authority. 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 designated Series 2001 Bonds underlying ratings of "A2" and "A+," respectively.

II.K.5. 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. While the overall enrollment is projected to only have modest growth in the next 5 to 10 years and therefore significant additional student service and traditional class facilities are not projected, there will be a need to provide additional facilities to accommodate distance education. Inasmuch as the five residence halls are 100% full, we may also need to consider additional residential facilities. 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 must continue to pursue multiple paths. Limitations on funding and available land makes 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. It should be noted that this arrangement will also move the Rutgers Geology Department into the NJIT building that houses the Department of Civil and Environmental Engineering as soon as space becomes available.

No further borrowing is anticipated at this time. Future facilities needs will be met by State and Federal appropriations and vigorous fund raising.

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
- 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

- Technology and Engineering Center (NJIT, Burlington County College)
- 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

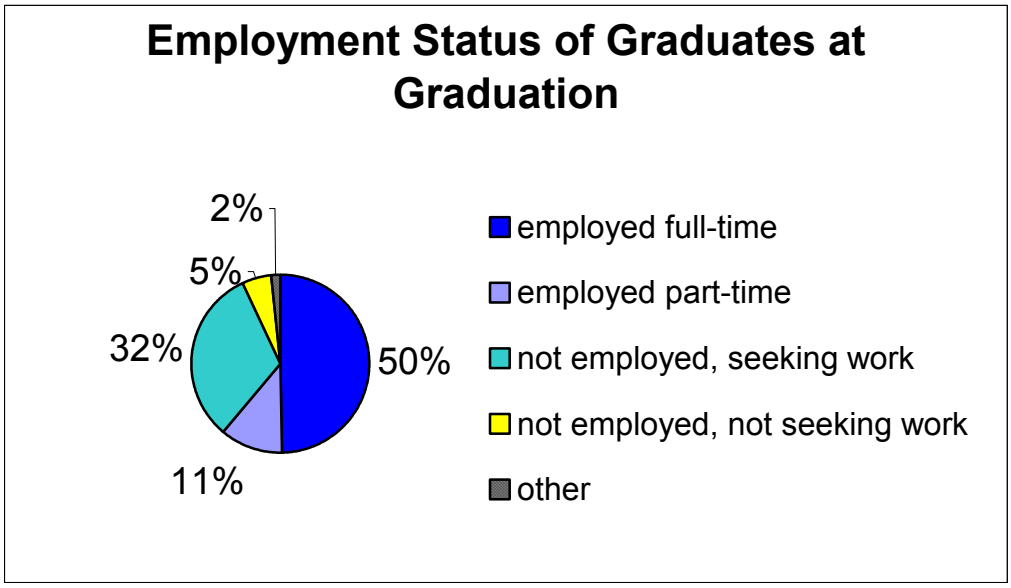
NJIT assesses outcomes for graduates through a program that includes multiple measures and surveys. Most programs of the college include exit examinations and projects completed in capstone courses. In addition, all graduates have the opportunity to participate in the survey program conducted by the 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, the Alumni Survey and Employer Survey.

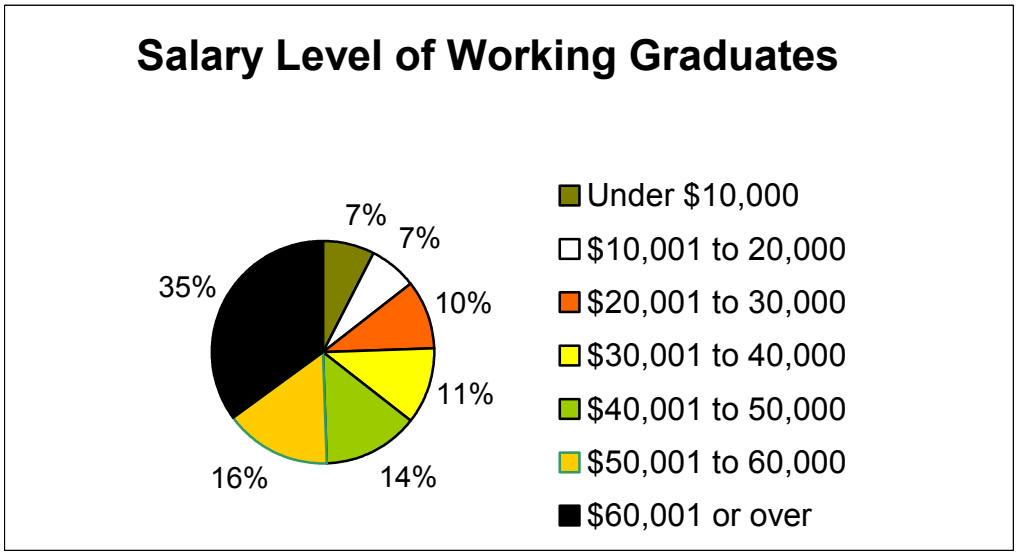
II.C.1. Graduating Student Survey

All students who graduated in the academic year 2001-2002 were mailed survey forms in May 2002. The instrument includes 80 items on an op-scan format. There are scaled items relating to achievement of Goals, self-assessment of acquired skills and knowledge, and 23 items evaluating academic programs and student services. Graduates are also asked to describe current employment and educational plans and expectations. The final 13 items provide demographic information about respondents.

Most graduates report that they have successfully reached Goals relating to meeting degree requirements, preparing for graduate educational programs, and improving professional status and job-related skills.

Graduates were also asked about their employment and educational status at the time of graduation. At graduation, 50 percent of graduates were employed full-time, and 11 percent were employed part-time. Thirty two percent were seeking employment. The figure below shows results on employment status for graduates overall. The table below shows employment status by school.





II.C.2. Alumni Survey

A draft of the alumni survey form was prepared in fall 1999 by the Office of Institutional Research. Items were developed from a review of alumni survey research, prior NJIT alumni survey forms, and specific information requests from offices and individuals at NJIT. The instrument includes fifty-one survey questions using scale, categorical and open comment questions as well as demographic items allowing description of the sample and analyses of data for some specific sub-groups of alumni.

The effectiveness of the university in meeting its mission is chiefly reflected in student program completion, and alumni success in developing careers and participating in higher levels of educational experiences. Alumni were given the opportunity to reflect on the NJIT educational program and student services provided, and their views are useful in reviewing curriculum, educational methodologies and strategies, and student services. Alumni were asked to rate how well NJIT prepared them to perform in 12 key learning areas on a 5-point scale. Alumni reported that preparation was generally good (4), and better than satisfactory (3) in all areas. Alumni rated preparation highest in problem-solving, program-specific skills, critical thinking, and teamwork. Gains were satisfactory, but most modest in humanities and social sciences, oral and written communications, and interpersonal communications. Preparation in math, science, computer skills, and current technologies were good and clustered in the approximate center of ratings.

The experience at NJIT clearly improved the career status of participating alumni within 3 years of graduation. A total of 94.3% of respondents indicated that they are employed (96.45% of males, 88.4% of females). In addition, 72.9% reported that the degree earned improved their employment status, and 73.1% indicated that the degree improved the level of earned income. Figures below show post-degree employment results for alumni by school and salaries by school.

In other data, alumni report that they are generally positive about the experiences that they had at NJIT, and the survey provides opportunity for alumni to give feedback and recommendations for improvement.

II.C.3. Employer Survey

A pool of 175 employers of NJIT students and graduates was provided by the Office of Career Development Services. These employers were administered a structured telephone interview of employers of NJIT graduates designed by the Office of Institutional Research in early October of 1999. The survey included categorical, scale, and open-ended items, and was fully scripted for telephone inquiry. The content of questions includes business demographics, questions on the current and regional business environment, employee recruitment practices, and scales on desired employee traits. Respondents are also asked to rate the performance of NJIT graduates on the job.

Employers generally rated NJIT graduates positively on all competencies, and especially on computer skills, life-long learning, professional and ethical responsibility, team-work skills, and discipline-specific skills. The figure below shows the comparison of items rated high and low in importance by employers, and high and low in NJIT graduate performance as rated by supervisors. Generally, NJIT graduates perform best in the most highly-rated areas.

Employer Ratings of Employee
Competencies Compared with Employer Assessment of
NJIT Student and Graduate Performance On-the-Job
(Low=bottom 1/3, high=top 1/3 of 17 items)

Relative Performance	Relative Importance: LOW	Relative Importance: HIGH
LOW	Leadership skills Professional practice on a global scale Management skills Knowledge of industry practices and standards	---
HIGH	Science	Professional and ethical responsibility Computer skills Team-work skills

II.C.4. 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. Degree

III.D.1. Bachelor's Degrees Awarded 2002

Table III.D.1
Bachelor's Degrees Awarded 2002 (Number)

CIP Code	Institutional Program Title	Total
30102	ENVIRONMENTAL SCIENCE	10
40201	ARCHITECTURE / ARCHITECTURAL STUDIES	67
110101	COMPUTER SCIENCE	196
110401	INFORMATION SYSTEMS / HUMAN COMPUTER INTERACTION	29
119999	INFORMATION TECHNOLOGY / BIOMEDICAL INFORMATICS	7
140501	BIOMEDICAL ENGINEERING	3
140701	CHEMICAL ENGINEERING	41
140801	CIVIL ENGINEERING	35
140901	COMPUTER ENGINEERING	82
141001	ELECTRICAL ENGINEERING / TELECOMMUNICATION	60
141301	ENGINEERING SCIENCE	13
141701	INDUSTRIAL & MANUFACTURING ENGINEERING	14
141901	MECHANICAL ENGINEERING	42
159999	ENGINEERING TECHNOLOGIES	120
231101	PROFESSIONAL & TECHNICAL COMMUNICATION	2
260101	BIOLOGY	7
270301	APPLIED MATHEMATICS	7
270501	STATISTICS & ACTUARIAL SCIENCE / APPLIED STATISTICS	7
301501	SCIENCE TECHNOLOGY & SOCIETY	6
400501	CHEMISTRY	1
400899	APPLIED PHYSICS	2
450801	HISTORY	3
511608	NURSING	4
520201	MANAGEMENT, BUSINESS ADMINISTRATION	76
	Total	834

III.D.2. Master's Degrees Awarded 2002

Table III.D.2
Master's Degrees Awarded 2002 (Number)

CIP Code	Institutional Program Title	Total
30102	ENVIRONMENTAL SCIENCE	9
40201	ARCHITECTURE / ARCHITECTURAL STUDIES	29
40301	INFRASTRUCTURE PLANNING	3
110101	COMPUTER SCIENCE	300
110401	INFORMATION SYSTEMS / HUMAN COMPUTER INTERACTION	92
140501	BIOMEDICAL ENGINEERING	10
140701	CHEMICAL ENGINEERING	11
140801	CIVIL ENGINEERING	20
140804	TRANSPORTATION	6
140901	COMPUTER ENGINEERING	25
141001	ELECTRICAL ENGINEERING / TELECOMMUNICATION	71
141301	ENGINEERING SCIENCE	1
141401	ENVIRONMENTAL ENGINEERING	3
141701	INDUSTRIAL & MANUFACTURING ENGINEERING	26
141801	MATERIAL SCIENCE & ENGINEERING	4
141901	MECHANICAL ENGINEERING	16
143001	ENGINEERING MANAGEMENT	54
149999	OCCUPATIONAL SAFETY & HEALTH ENGINEERING / INTERNET ENGINEERING / PHARMACEUTICAL ENGINEERING	5
150701	OCCUPATIONAL SAFETY AND INDUSTRIAL HYGIENE	8
231101	PROFESSIONAL & TECHNICAL COMMUNICATION	1
260699	COMPUTATIONAL BIOLOGY	2
270301	APPLIED MATHEMATICS	4
270501	STATISTICS & ACTUARIAL SCIENCE / APPLIED STATISTICS	5
400501	CHEMISTRY	6
440501	ENVIRONMENTAL POLICY STUDIES	4
520201	MANAGEMENT, BUSINESS ADMINISTRATION	86
520299	MANAGEMENT OF TECHNOLOGY	48
	Total	849

III.D.3. Doctoral Degrees Awarded 2002

Table III.D.3
Doctoral Degrees Awarded 2002 (Number)

CIP Code	Institutional Program Title	Total
30102	ENVIRONMENTAL SCIENCE	3
110401	INFORMATION SYSTEMS / HUMAN COMPUTER INTERACTION	2
140701	CHEMICAL ENGINEERING	6
140801	CIVIL ENGINEERING	4
140804	TRANSPORTATION	1
141001	ELECTRICAL ENGINEERING / TELECOMMUNICATION	7
141701	INDUSTRIAL & MANUFACTURING ENGINEERING	2
141901	MECHANICAL ENGINEERING	8
270101	MATHEMATICAL SCIENCES	6
400899	APPLIED PHYSICS	9
	Total	48